# LANDSCAPE STRATEGY FOR BUILDING SOCIAL, ECONOMIC, AND ECOLOGICAL RESILIENCE

## CROCKER RANGE BIOSPHERE RESERVE, SABAH

## SGP MALAYSIA

**PREPARED BY**

PACOS Trust

## 1.1 PRIORITY AREA

### 1.1.1 Considerations in Selecting the Location

Starting in OP7, Malaysia has been included in the Upgraded Country Programme (UCP) of the SGP. With the aim of achieving impacts at scale and ensuring sustainability of results achieved, the programme level strategy of the UCP is based on a landscape approach, following the United Nations Development Programme (UNDP) approach of community-driven planning and management of socio-ecological production landscapes and seascapes. The Crocker Range Biosphere Reserve (**Figure 1**) is one of three landscapes selected for the GEF SGP OP7 in Malaysia which covers expansive and complex rural and urban geographies and globally significant biodiversity but faces a variety of threats influenced by a variety of drivers, e.g., infrastructure development and increased global demand for food and plantation commodities. These factors, many of which have been exacerbated by the impacts of climate change, have led to biodiversity loss, degradation of fragile ecosystems, and restricted opportunities for local communities to sustain nature-based livelihoods. Considering this, a Landscape Strategy was seen as prudent to stop further deterioration and ensure sustainable management by enabling communities to take collective action for adaptive landscape management and building social, economic and ecological resilience.

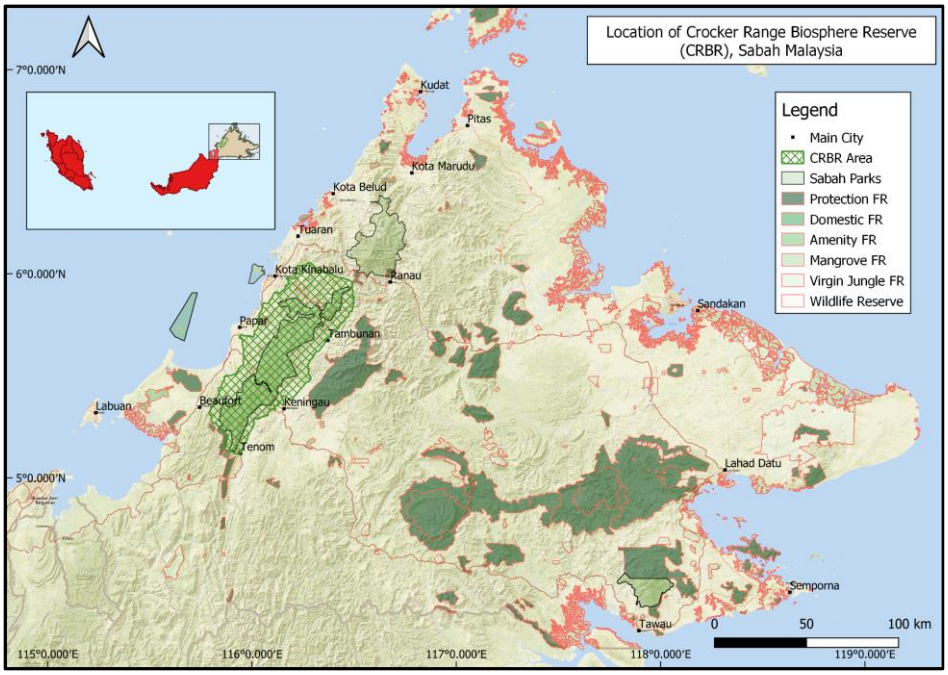


**Figure 1:** Location of the Crocker Range Biosphere Reserve in Sabah.

The Crocker Range Biosphere Reserve is the largest terrestrial protected area in Sabah and the 2nd biosphere reserve in Malaysia under the Man and the Biosphere (MAB) Programme by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) aimed at establishing a scientific foundation to create a balance between human activities and environmental sustainability. According to UNESCO (2014), there are about 30 families inside the core area (144,492 ha), 52 villages in the buffer zone (60,313 ha), and at least 264 villages in the transition area (145,775 ha). As such, local community involvement is essential in the management and sustainability of the landscape as stakeholders living in the core, buffer and transition zones of the CRBR.

### 1.1.2 Geographical Conditions and Characteristics of the Crocker Range Biosphere Reserve

Designated in 2014, the Crocker Range Biosphere Reserve includes one state terrestrial park, Crocker Range Park (139,919 ha), and 3 forest reserves, Crocker Range Virgin Jungle Reserve (3,279 ha), Rafflesia Virgin Jungle Reserve (356 ha) and Kawang Protected Forest Reserve (1,551 ha), covering a total area of 350,584 ha which stretches approximately 120 km north and south, and 40 km east and west[1], across 10 administrative districts, namely Penampang, Papar, Kota Kinabalu, Tuaran, Ranau, Keningau, Tambunan, Tenom, Membakut and Beaufort (**Figure 2**). Boasting a rocky topography consisting solely of mountains, hills and small basins dissected by deep river valleys, it is geologically made up of uplifted and folded tertiary sedimentary rocks (mudstone and sandstone) from the Eocene-Oligocene age.[2] Elevation above sea level of the CRBR ranges from 6 m to 2,076 m[3] and receives around 3,000 mm of rainfall a year on average with the northwest receiving more rainfall than the southeast due to the range blocking wet winds from the west.[4]

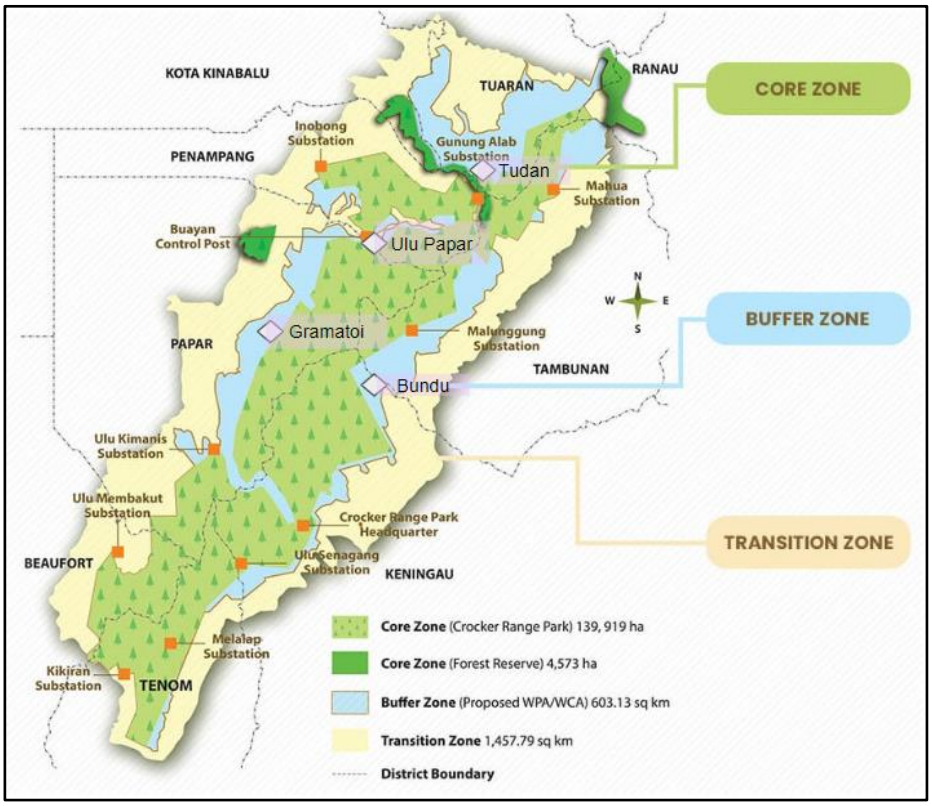


**Figure 2:** Map of Crocker Range Biosphere Reserve showing the three zones and four case study areas. (Source: Crocker Range Biosphere Reserve, Man & Biosphere (MAB), 2023)

Recognized as one of 16,337 Key Biodiversity Areas in the world (61 of which can be found in Malaysia)[5], the Crocker Range Biosphere Reserve is made up of a variety of ecosystems ranging from

[1] UNESCO (2014): http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/asia-and-the-pacific/malaysia/crocker-range

[2] Sabah Parks (2006). *Crocker Range management plan*. Bornean Biodiversity and Ecosystems Conservation Programme: Kota Kinabalu.

[3] UNESCO (2014): http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/asia-and-the-pacific/malaysia/crocker-range

[4] Sabah Parks (2006). *Crocker Range management plan*. Bornean Biodiversity and Ecosystems Conservation Programme: Kota Kinabalu.

[5] http://www.keybiodiversityareas.org/

hill, lowland rainforest, lower and upper montane and dipterocarp forests home to a wide range of species of flora and fauna (Repin et. al, 2012; Sabah Parks, 2023). Animal species that have been recorded in Crocker Range Park and its surrounding area number about 106 mammals, 265 birds, 52 reptiles, 67 frogs[6], and 42 freshwater fishes, including the critically endangered Orangutan (*Pongo pygmaeus*), and the vulnerable Clouded Leopard (*Neofelis nebulosa*) and Sun Bear (*Helarctos malayanus*).[7] There are also several hundred insects, a few of which are hyper-endemic to Crocker Range and cannot be found anywhere else on the Borneo Island such as the *Cyclommatus chewi*, *Odontolabis schenki* and *Odontolabis katsurai* stag beetles.[8] In terms of flora, species composition is considered moderately to high diversity in the mixed dipterocarp forest[9], with at least 527 tree species (73 endemic to Borneo)[10], 2 Rafflesia species (endemic to Borneo)[11], 293 moss species[12] and 341 orchid species (100 endemic to Borneo and 53 endemic to Sabah)[13] having been recorded in Crocker Range Park alone. The Crocker Range is also a main water catchment area for the west coast and interior of Sabah, housing the watersheds of 12 main rivers that contribute to about one third of the total water supply for Sabah.[14] These water resources are especially important as they provide irrigation for rice fields, wet paddy and hill paddy, which Sabah Parks (2006) mentions are concentrated on the west coast and interior of Sabah.

In terms of demography in the Crocker Range Biosphere Reserve, there are an estimated 99,101 people living in the three zones of the reserve from about 387 villages, with an estimated 210 people (as of 2010) living within the core.[15] In general, these communities engage in agricultural activities including hill paddy, fruit farming, rubber plantation (outside the core area), and vegetable gardening. There is also natural resource use from nearby forests and rivers such as game, medicinal plants[16] and wild vegetables[17]. Before the construction of roads, jungle trails crossing the mountains of Crocker Range existed where communities would transport commodities and goods by foot through what is known as the 'Salt Trail' named after the main commodity traded back in the day. Nowadays, this trail is still used by remote villages in Ulu Papar and Tambunan area and for eco-tourism.

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[6] Sabah Parks (2023). Flora & fauna: https://www.sabahparks.org.my/crocker-range-park/flora-fauna

[7] Crocker Range Biosphere, Man & Biosphere (MAB) (2023): https://crbr.sabahparks.org.my/

[8] Chung, A. Y., Bosuang, S., Majapun, R., & Nilus, R. (2016). Diversity and geographical ranges of insects in Crocker Range Forest Reserve, Sabah, Malaysia. *Journal of Tropical Biology & Conservation (JTBC)*, *13*.

[9] Sabah Parks (2023). Flora & fauna: https://www.sabahparks.org.my/crocker-range-park/flora-fauna

[10] Repin, R., Majuakim, L., Suleiman, M., Nilus, R., Mujih, H., & Gunsalam, G. (2012). Checklist of trees in Crocker Range Park Permanent Research Plot, Sabah, Malaysia. *Journal of Tropical Biology & Conservation (JTBC)*, *9*.

[11] Sabah Parks (2006). *Crocker Range management plan*. Bornean Biodiversity and Ecosystems Conservation Programme: Kota Kinabalu.

[12] Suleiman, M., Masundang, D. P., & Akiyama, H. (2017). The mosses of Crocker Range Park, Malaysian Borneo. *PhytoKeys*, (88), 71.

[13] Majit, H.F., Lamb, A., Miadin, R., & Suleiman, M. (2014). The wild orchids of Crocker Range National Park, Sabah, Malaysia. *Malayan Nature Journal*, 66(4), 440-462.

[14] Regis (2000) in Hee, K. B. (2005). 'Anurans Tourism' in Crocker Range Park: Convergence of Research and Local People Involvement towards Conservation.

[15] Nais, J. & Jetony, G. (Eds.) (n.d.). *Crocker Range Biosphere Reserve Management Plan 2023-2029*.

[16] Ahmad, F. B., & Ismail, G. (2003). Medicinal plants used by Kadazandusun communities around Crocker Range. *ASEAN Review of Biodiversity and Environmental Conservation (ARBEC)*, *1*(1), 1-10.

[17] Noweg, T., Abdullah, A. R., & Nidang, D. (2003). Forest plants as vegetables for communities bordering the Crocker Range National Park. *ASEAN Rev Biodiv Environ Conser*, 1-18.

### 1.1.3 Location of the Studied Villages

Considering how large the landscape is and the time and financial constraints involved, our study focused on four areas close to the border of the core areas of the Crocker Range Biosphere Reserve: Kg. Tudan to the northeast side of CRBR in Tuaran, Ulu Papar communities to the northwest in Penampang, Kg. Gramatoi to the west in Papar, and Bundu communities to the east in Keningau (see **Figure 2**). All four of these areas demonstrate different landscapes within the Biosphere Reserve but are in no way completely representative of the whole landscape. They are discussed in this document as case studies that will provide some basis to the landscape strategy that will be presented in Section 1.3 later.

Kg. Tudan is located inside the buffer zone of the CRBR at the border between the Tuaran and Penampang Districts near the Crocker Range Park and Crocker Range Forest Reserve. It is about 62 km away from Donggongon Town in Penampang, 32 km from Tambunan and 80 km from Tuaran. The landscape comprises steep slopes and narrow river valleys. This community of mainly Dusun has a population of 368 people and agriculture is their main economic activity (**Photo 1**). They are actually one of the producers of vegetables for the areas of Tambunan, Penampang and Tuaran and will usually will sell their vegetables during the weekly *tamu* (market) in Tambunan and Donggongon Town and there are also outsiders who come to their village to buy in bulk.

**Photo 1:** Aerial view of the Kg. Tudan landscape.

Ulu Papar is located at the uppermost reaches of the Papar River in the district of Penampang. The landscape is inhabited by about 1000 indigenous Dusun people, in nine small settlements. Almost all villages have no good road access, and the rugged and hilly terrain makes Ulu Papar a remote and difficult area to reach and dependent on the natural resources around them.[18] In the baseline study, we consulted with four villages, namely Kg. Buayan, Kg. Tiku, Kg. Terian, Kg. Longkogungan which are located inside the buffer and transition zone of the CRBR between the Papar and Penampang District, about 15-38km from Donggongon Town. The main economic activities inside these villages are in

[18] John, T., John, P., & Bugiad, L. (2012). Creating the Ulu Papar biocultural community protocol. *Biodiversity and culture: exploring community protocols, rights and consent*, 141-150.

agriculture and collecting river and forest resources (**Photo 2**). However many villagers, especially the young people, are working outside in towns and cities for cash income.

**Photo 2**: Aerial view of the Ulu Papar landscape.

Bundu is located in Apin-Apin, Keningau and is mostly within the transition zone of the Crocker Range Biosphere Reserve, with some parts within the buffer zone such as their community forest. The Bundu area refers to a combination of several neighbouring villages, that is Kg. Tiga, Kg. Bundu (Kg. Naukab & Kg. Tuad), Kg. Rantai (and Kg. Motomou), and Kg. Donggiluang with an estimated population of about 1,000 people. Similar to Tudan, administration for Bundu is split between different districts as they are located at the boundaries between the Tambunan District and Keningau District. Though the nearest town is in Keningau, they still have to travel to Tambunan for some of their affairs. The majority of villagers here come from the Dusun ethnic group and engage in agriculture and gather resources from forest and river for their livelihood (**Photo 3**).


**Photo 3:** Aerial view of Bundu area. (Source: Google Earth)

Kg. Gramatoi is located in the western side of Crocker Range Biosphere Reserve and is mostly within the buffer zone. Kg. Gramatoi is located in the Papar District and has a small population of about 20 houses. Administration of this village is under the leadership of the Village Head of Kg. Ovai which is located roughly 12 km away. The villagers, mostly from the Dusun community engage in agricultural activities in the village (**Photo 4**) but mostly work outside the village and only come back during the weekends.

**Photo 4**: Aerial view of Kg. Gramatoi.

Due to proximity, the small number of participants available from Kg. Gramatoi, and the fact that villagers in Kg. Ovai have history and land in Kg. Gramatoi as well as shared history with Kg. Kombizaan, we have also included the views of villagers from both Kg. Ovai, and Kg. Kombizaan, to assess the resilience of the wider landscape. During the community consultations in Papar there were also participants from Kg. Bolotikon and Kg. Mandalipau, whose views we also include in the baseline assessment but in a separate analysis from the Gramatoi region due to proximity, differences in situation and history. Beyond the four areas mentioned in detail here, we also included information from various villages in the CRBR for the situation analysis through secondary information to give a more holistic view of the situation in the biosphere reserve. In the OP7 project document, besides Ulu Papar there were two other areas proposed to be the focus for the CRBR landscape: the Kinabalu Ecolinc area and Ulu Senagang-Mongool Baru area. In the end these two areas were not chosen for the baseline assessment. This is because Ulu Senagang-Mongool Baru area is located in the core zone and the focus of the landscape strategy should be on management outside of the core zone (that is under management of local authorities) while as for the Kinabalu Ecolinc area, there already has been many activities conducted in the area especially as a focus area by local authorities for ecological linkage between Crocker Range Park and Kinabalu Park through community conserved areas. However, information from these two areas will be included in the situational analysis as secondary data.

## 1.2 SITUATION ANALYSIS

### 1.2.1 Methodologies

In order to understand the landscape, several methods were employed to gather data and make an analysis. First, desktop research to get a preliminary understanding of the landscape was conducted, including information collected by SGP Malaysia during the inception workshop for the seventh operational phase of the GEF Small Grants Programme in Malaysia with stakeholders in the Crocker Range on 18 August 2022. Baseline assessments were then conducted through observations and community workshops in the four areas. Each community workshop included an explanation on the purpose of the workshop, sketch mapping of community land use, group discussion of issues and challenges in the landscape, and scoring exercise on the socio-ecological resilience of the landscape using the Community Development and Knowledge Management for the Satoyama Initiative (COMDEKS) Indicators of Resilience in Socio-ecological Production Landscapes and Seascapes (SEPLS) Toolkit which was translated into the local language, Malay, and adapted to the local context. **Table 1** gives a brief overview of the indicators which are divided into five categories and requires respondents to rate from a scale of 1 to 5 with 1 being very low and 5 being very high.

**Table 1**: Overview of the SEPLS resilience indicators

| Category | Indicators |
|---|---|
| **Landscape diversity and ecosystem protection** | 1. Landscape composed of diverse natural ecosystems and land uses<br>2. Areas in the landscape are protected (formal or informal)<br>3. Ecological interactions between different components of the landscape are considered while managing natural resources<br>4. Landscape able to recover and regenerate after extreme environmental shocks |
| **Biodiversity (including agricultural biodiversity)** | 1. Community consumes a diversity of locally-produced food<br>2. Different local crops, varieties and animal breeds are conserved and used in the community<br>3. Common resources are managed sustainably |
| **Knowledge and innovation** | 1. Community develops, improves or adopts innovation in agriculture and conservation practices to adapt to changing conditions<br>2. Local knowledge and cultural traditions related to biodiversity are transmitted from older generation to younger generation<br>3. Agricultural biodiversity and associated knowledge is documented and exchanged<br>4. Knowledge, experience and skills of women are recognized and respected |
| **Governance and social equity** | 1. Community has customary and/or formally recognized rights over land, water and natural resources<br>2. Multi-stakeholder landscape platform or institution able to plan and manage landscape resources<br>3. Community able to connect, coordinate and cooperate for natural resource management<br>4. Access, opportunities and resources are fair and equitable |
| **Livelihoods and well-being** | 1. Socio-economic infrastructure is adequate for community needs<br>2. General health of local people considering prevailing environmental conditions |

| | |
|---|---|
| | 3. Households are involved in a variety of sustainable income-generating activities<br>4. Community develops innovative use of local biodiversity for their livelihood<br>5. Community members are able to move around between production activities and locations as necessary |

Data obtained from these baseline assessments were then analysed and supplemented with other secondary information on the landscape to provide a glimpse of the overall situation of the Crocker Range Biosphere Reserve landscape which informed the recommendations for the landscape strategy later described in Section 1.3.

### 1.2.2 Baseline Assessment

Community workshops in the four case study areas in the Crocker Range Biosphere Reserve were conducted from 03 May 2023 to 05 June 2023 with a total of 106 participants (64 males, 42 females) from 13 villages. The details of each community workshop is listed below:

**Table 2:** Community workshops held in the focus areas.

| **Area** | **Date** | **Communities Involved** | **Number of participants** |
|---|---|---|---|
| Ulu Papar | 03 May 2023 | Kg. Buayan, Kg. Tiku, Kg. Terian, Kg. Longkogungan | 24 people (11 males, 13 females) |
| Ulu Tuaran | 13 May 2023 | Kg. Tudan | 25 people (17 males, 8 females) |
| West of Crocker Range | 16 May 2023 | Kg. Gramatoi, Kg. Ovai, Kg. Kombizaan, Kg. Bolotikon, Kg. Mandalipau | 32 people (23 males, 9 females) |
| East of Crocker Range | 05 June 2023 | Kg. Rantai, Kg. Bundu, Kg. Tiga | 25 people (13 males, 12 females) |

The field data collected from community inputs during the workshops and observations from the field team were then consolidated and grouped based on proximity and similarities or shared history of the people and landscape for analyses and overall understanding of the wider landscape. For this purpose, the western region of Crocker Range is split into two separate analyses: one for the Gramatoi, Ovai and Kombizaan landscape and another for the Bolotikon and Mandalipau landscape, while the other areas are combined together with other villages studied in the same area.

**Photo 5**: Ulu Papar communities sketching community land use on a printed topography map.

**Ulu Papar**

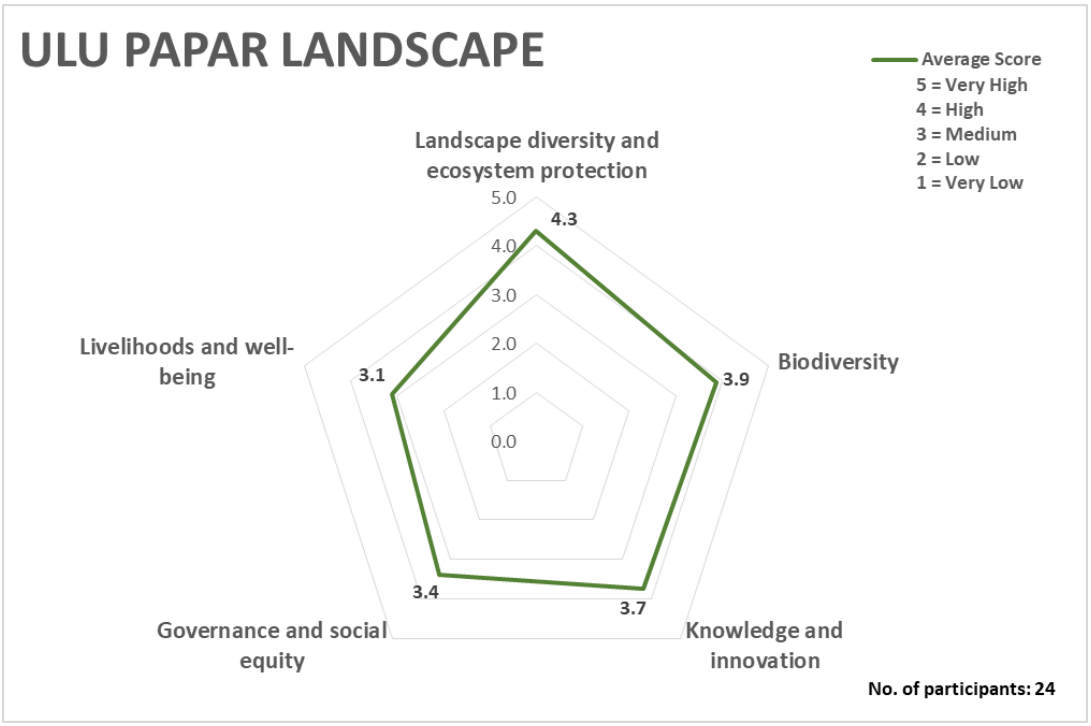


**Figure 3**: Radar graph showing the average scores given by participants from Kg. Buayan, Kg. Terian, Kg. Tiku and Kg. Longkogungan during the socio-ecological production landscape resilience scoring exercise.

In general, the communities in Ulu Papar scored medium to high on average in the five categories with Livelihoods and Well-being scoring the lowest at 3.1. One of the reasons for this lower score is because of accessibility to markets as they lack paved roads. Unpaved red soil pathways make it difficult and costly for communities to transport their produce and goods to and from the village. Governance and Social Equity scored the second lowest between medium and high at 3.4 because although they have community protocols for governance of their village and water catchment, the community feels that their management of the landscape is recognized at the village level but not by the government

agencies. They also feel their rights towards their land and natural resources are not recognized because despite the designation of CRBR and community use zone in their area, the government is still planning to build a mega dam that will affect their communities and livelihoods.

In terms of Knowledge and Innovation which is at 3.7, the score was not high mainly due to lack of indigenous ecological knowledge documentation in some villages. Longkokungan particularly mentioned that their youths do not know much about their traditional practices, especially with them migrating out for education and work. For Biodiversity, the Ulu Papar communities rated quite high for food diversity and sustainable resource management with 4.6 and 3.8 respectively but only a moderate 3.3 for their diversity in crops and animal breeds, noting a downward trend, especially in livestock. The communities believe the landscape is well managed, especially with community protocols and community management of forest, watershed and river (*Tagal*) as well as Sabah Parks, which contributes to the high score in Landscape Diversity and Ecosystem Protection at 4.3. However, they mention that floods and landslides do occur quite frequently and the ability of the landscape to recover after such occurrences is okay but slower than before.

**Ulu Tuaran (Tudan)**

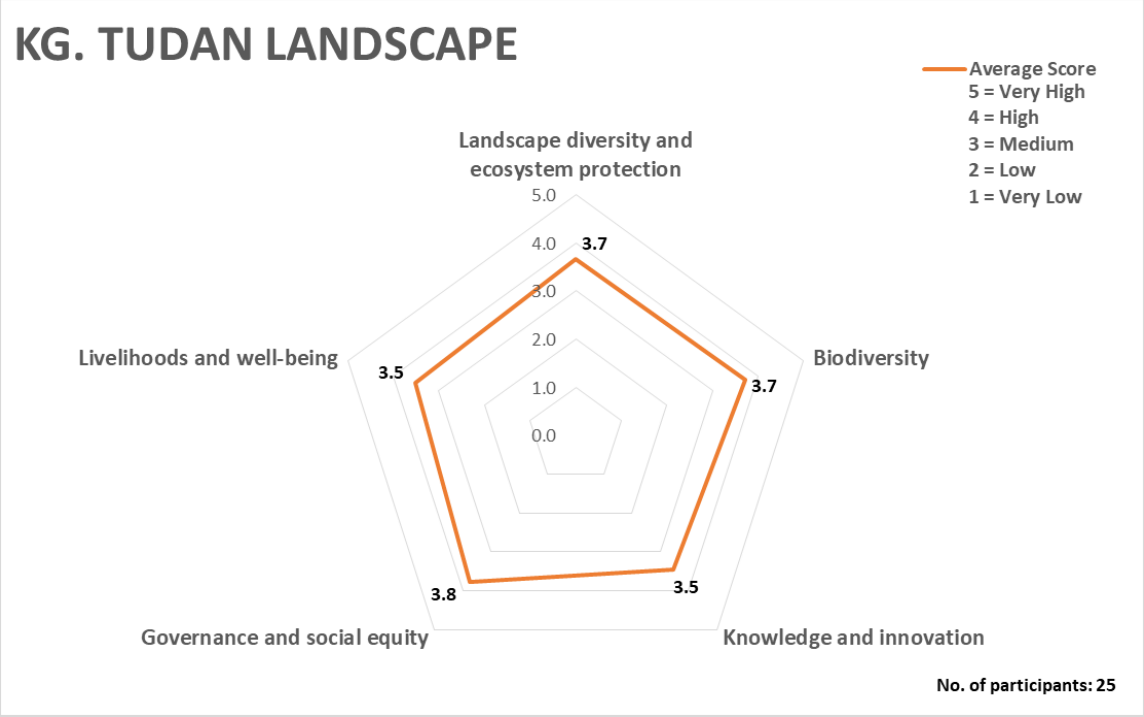


**Figure 4:** Radar graph showing the average scores given by participants from Kg. Tudan, Tuaran during the socio-ecological production landscape resilience scoring exercise.

In **Figure 4** above, we can see that from the perspective of the community in Kg. Tudan, the performance of the landscape for all 5 areas is between medium to high. Both Livelihoods and Well-being; and Knowledge and Innovation scored the lowest at 3.5. The reason for the lower score for Knowledge and Innovation is because they feel that there is not much documentation on their biodiversity knowledge and some are not even aware of the documentation that has been done. They stated that they do pass down their traditional knowledge from the older generation to the young but in terms of documenting such knowledge they are still lacking. As for Livelihoods and Well-being, they gave lower scores due to facilities and income diversity which both scored on average 3.1 and 3.2

respectively because they do have some but can still be improved, such as access to healthcare. As for Landscape Diversity and Ecosystem Protection, overall they believe that they still have high diversity of natural ecosystems and understand its interconnectedness but the management of natural resources can still be improved as they see that there is decrease in wildlife. Furthermore, they feel that the ability of the landscape to recover is not so good, especially with the effects of climate change. In terms of Biodiversity, indicator scores were between 3.5-3.9: they have good diversity of food and management of the landscape, however they feel there is a downward trend in the variety of crop and animal breeds, with a few citing livestock dying from diseases and no longer having water buffaloes. Governance and Social Equity, the highest at 3.8, scored high in both governance and social capital (4.1), and moderate in social equity (3.6) but only scored 3.1 in rights to land as they have issues of land ownership and suffer from land encroachment by outsiders.

**Photo 6**: Community members in Tudan during the SEPLS resilience indicator scoring exercises.

**<u>West of Crocker Range</u>**

**a) Gramatoi, Ovai and Kombizaan**

Overall, the performance of this socio-ecological production landscape in this area is between low to medium with Knowledge and Innovation scoring the lowest at 2.5 on average and Livelihoods and Well-being scoring the highest at 3.1 on average. Knowledge and Innovation scored relatively low because only a little knowledge is passed down and some communities have not documented their knowledge at all. Landscape Diversity and Ecosystem Protection also scored low owing to weak ecosystem protection and thus impaired recovery of landscape. Kg. Ovai has issues of logging which has affected their forests and caused flash floods. In Kg. Gramatoi, land bordering Sabah Parks has been logged and occupied by large-scale plantation of Musang King Durian and some community members have planted oil palm in the village, affecting their river and availability of resources (river and forest). This is also why they scored similarly low in Governance and Social Equity and Biodiversity as there is a lack of sustainable management of resources. In Kombizaan, they mention the ineffectiveness of the *Tagal* committee and village leaders to enforce community rules to protect the river from encroachment. However, all three communities did agree that there is some equitable access and opportunities to resources among community members and some recognition of rights to land and resources in the village. As for Livelihoods and Well-being, the reason the score is not higher is also related to the poor management of the landscape, as they feel that environmental conditions

and health of their villagers are not so good, scoring only 2.7 on average. The score was also affected by lack of access to healthcare and the bad road conditions to Kg. Gramatoi. Similar to Ulu Papar, lack of access to paved roads affected transport of goods and access to markets and services.

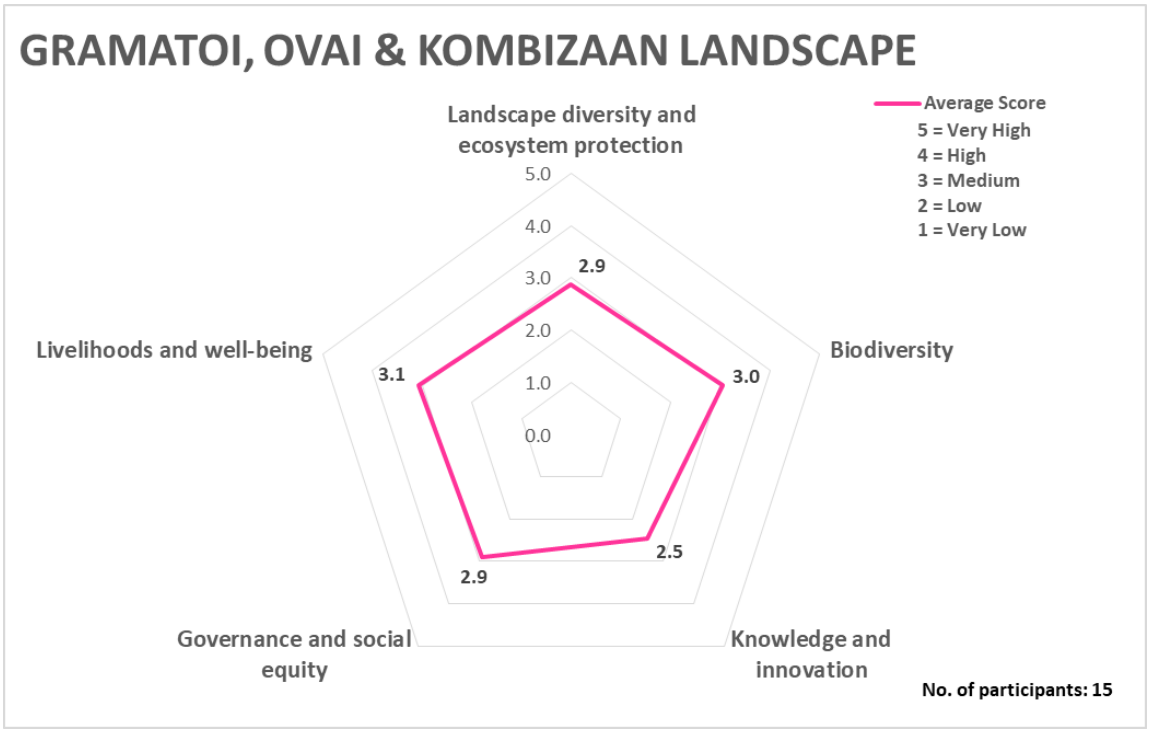


**Figure 5**: Radar graph showing the average scores given by Kg. Gramatoi, Kg. Ovai and Kg. Kombizaan during the socio-ecological production landscape resilience scoring exercise.

**Photo 7**: Women from Kg. Kombizaan presenting the results of their group discussion during the community workshop.

### b) Bolotikon and Mandalipau

In general, Bolotikon and Mandalipau on average scored medium for almost all aspects with the exception of Governance and Social Equity which only scored 2.9. This low score is mainly due to the

unequal access to resources and inability of institutions in the community to manage resources effectively. Similarly, the average score in Biodiversity also suffered because the communities perceived that their resources are not managed as sustainably. Bolotikon mentioned challenges of competition for resources especially land and pollution while Mandalipau cited the failure of their *Tagal* committee to combat encroachment and control fishing in their river. Livelihoods and Well-being scored the second lowest mostly due to socio-economic infrastructure and income diversity which both scored 2.5. Both communities feel that they are lagging behind in development with limited facilities and infrastructure.

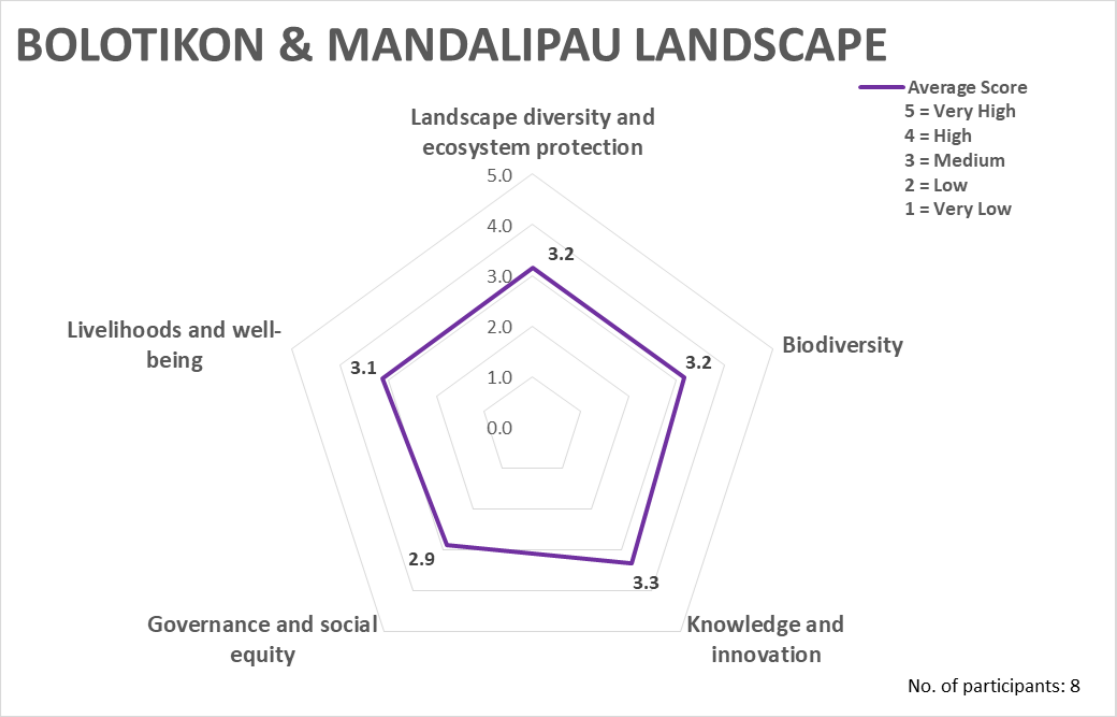


**Figure 6**: Radar graph showing the average scores given by Kg. Bolotikon and Kg. Mandalipau during the socio-ecological production landscape resilience scoring exercise.

When discussing about Landscape Diversity and Ecosystem Protection, participants see that the diversity of the landscape is good and there is some form of ecosystem protection, especially with Bolotikon having not only *Tagal* for their river but also forest. However, they did mention that they are seeing the ability of their environment to recover after shocks and stresses is low and not as it used to be. For Mandalipau, this is especially true after logging activities from outsiders which caused landslides and has polluted their river. As for Knowledge and Innovation which scored the highest on average among the 5 categories at 3.3, actually scored above 3.6 for 3 out of the 4 questions under this category on innovation in practices, transfer of knowledge and acknowledgement of women's knowledge. What affected the score for this category the most was in documentation of biodiversity-associated knowledge, which all the participants in Mandalipau stated that they did not have any at all while in Bolotikon there is some that has been documented.

**Photo 8**: Representative from Kg. Gramatoi presenting the results from the group discussion.

**East of Crocker Range (Bundu)**

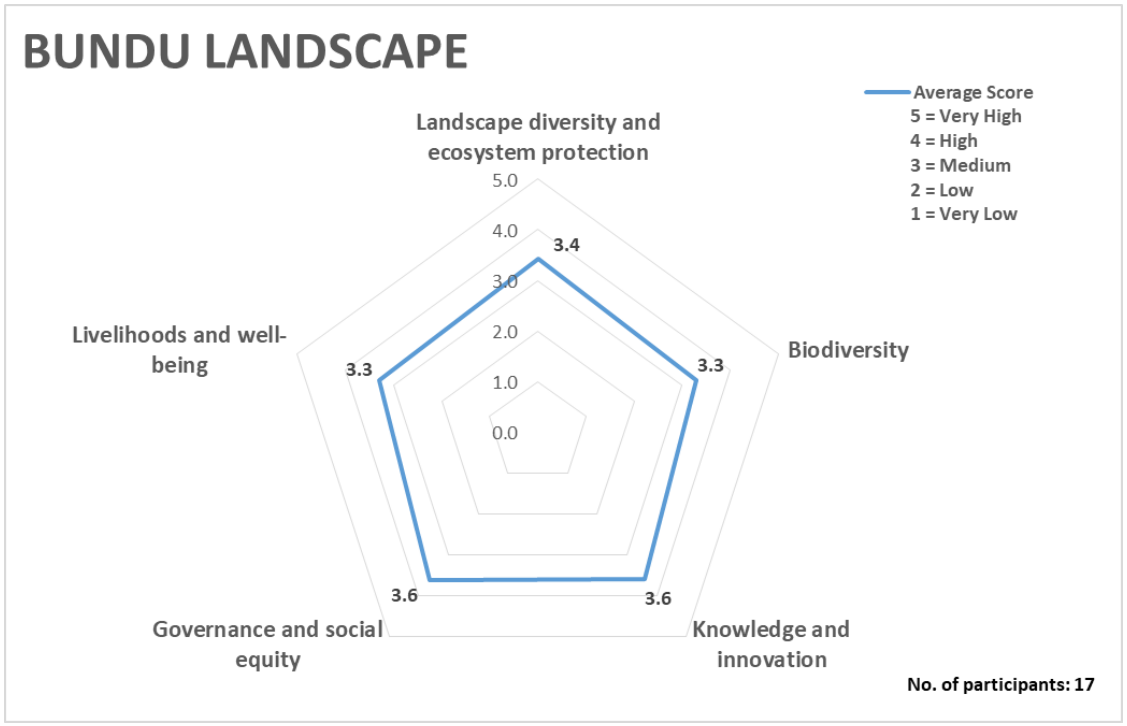


**Figure 7**: Radar graph showing the average scores given by participants during the socio-ecological production landscape resilience scoring exercise in Bundu, Apin-Apin, Keningau.

Overall, all five areas of the assessments scored between medium to high with Livelihoods and Well-being as well as Biodiversity scoring the lowest on average at 3.3. The communities feel that there is not a lot of income diversity among the villagers, especially from the biodiversity around them. The varieties of crop and livestock are also not as diverse. However, they are very interested in finding new ways of improving their livelihoods and are open to innovations or new practices which contributes to the slightly higher score in Knowledge and Innovation at 3.6. The higher score also comes from awareness of passing down traditional biodiversity knowledge and in respecting and

taking into account knowledge held by women. Documentation of such knowledge however could still be improved. Landscape and Ecosystem Protection also scored a relatively low score among the 5 areas of resilience at 3.4, owing to a slightly degraded landscape and ability to recover due to logging in their watershed areas by companies and smallholder oil palm plantation by some community members which has affected the water quality and supply in several rivers as well as ecosystem and biodiversity in some areas due to loss of natural habitats, animals and plants. After such destruction, the communities did have better awareness on the interconnectedness of different parts of the landscape and have improved their environmental protection which contributed to the relatively higher score in Governance and Social Equity at 3.6. They believe that there is cooperation between the communities to manage natural resources in their area, which has been strengthened through the establishment of the community organization and the development of their community protocol for their community forest.

### 1.2.3 Problems and Threats in the Crocker Range Biosphere Reserve

The rich biodiversity of the Crocker Range makes it a prime target for illegal harvesting of forest resources, animal and plant poaching, including various species of orchids as well as animals believed to have medicinal benefits. Furthermore, Crocker Range Park is fragmented into three areas by two major roads: Penampang Tambunan road to the north and Kimanis-Keningau road to the south. Not only does it cause fragmentation of habitats but it also makes the areas beside the roads (in the core, buffer and transition area) vulnerable to encroachment, illegal logging, poaching and also ecosystem degradation due to increased accessibility.

Illegal logging and commercial logging are major threats to the Crocker Range Biosphere Reserve. Logging can cause soil disturbance, erosion, pollution of waterways, and even affect water supply and there have been incidences of logging in water catchment areas, with the foothills of Crocker Range being significant water catchment areas. It can be seen through satellite imaging around the CRBR that there are several big plantations within and near the buffer and transition zones (even bordering the core zone) of the Crocker Range Biosphere Reserve. This is detrimental to the health of the Biosphere Reserve because plantation agriculture carries further risks of soil erosion, landslide and degradation of water quality and stream systems. This is demonstrated in Bundu, Mandalipau and Gramatoi where logging activities has affected their rivers, land and biodiversity. According to Suis et. al (2019), degraded forests and secondary vegetation are also more prone to wildfires and they have observed that due to repetitive wildfire events, the eastern slope of the Crocker Range was razed. They further noted that having patches of secondary vegetation tend to lead to forest simplification, where the area will become simpler in structure and less diverse over time, affecting both biotic and abiotic components in the ecosystems. Besides logging and plantations, other development activities may also pose threats. The proposed mega dam on the Papar River will also pose a risk to the biodiversity and lives of communities living around it as it will involve inundation of areas (and its biodiversity) and displacement of communities with history, culture and livelihood tied to the landscape.

Other than these issues, discussions with communities also highlighted the problem of increasingly limited land in the village, partly due to their growing population and also inclusion of their customary territories into protected areas (Crocker Range Park and Crocker Range Forest Reserve) which placed many restrictions on resource access and infrastructure development. In Bolotikon, the situation of limited resources has caused competition between community members for resources and pollution. For Ulu Papar, they are still able to access customary areas in Crocker Range Park for livelihood activities because there is agreement with Sabah Parks on community use zones though it comes with

some restriction on activities such as no expansion of agricultural land. In Tudan, they still farm along the road that crosses through the forest reserve. Bundu on the other hand, does not have the flexibility of community use zones and there is bound to be conflict after regazettement of Crocker Range Park boundaries in 2006 extended beyond the initial boundaries mutually acknowledged by the community, including their customary and agricultural land. In Ulu Papar and Gramatoi, lack of paved roads also adds to the problem as it limits the economic activities in the village (including the type of agricultural products that can be produced for cash income) and access to goods and services.

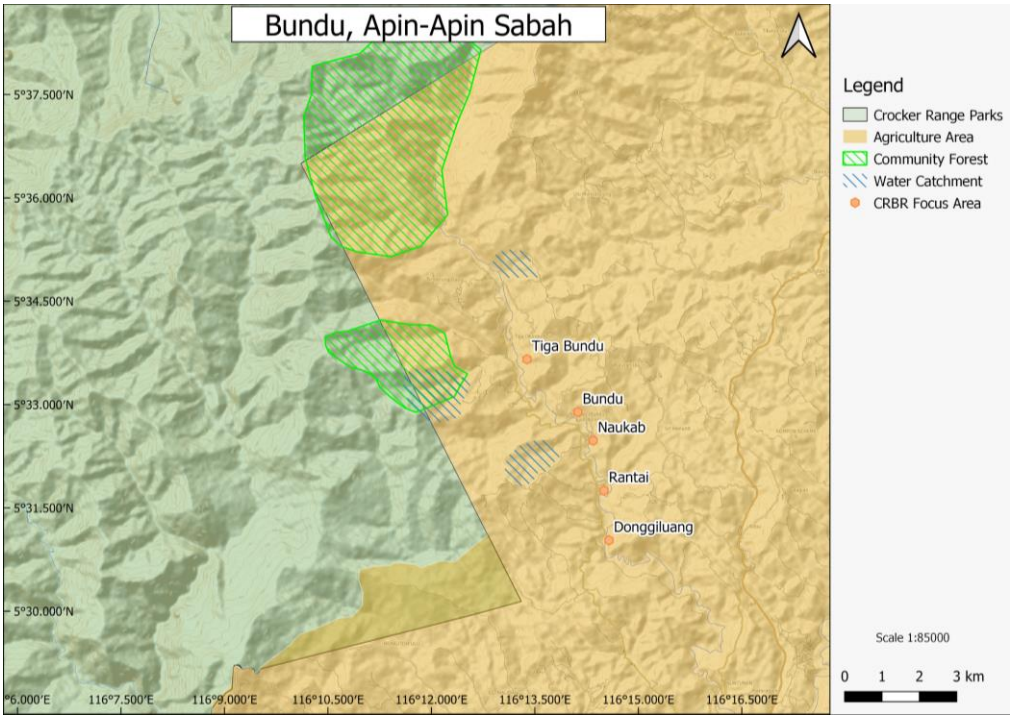


**Figure 8**: Overview of the land use in Bundu Apin-Apin area where there are overlaps between agriculture and community forest with the Crocker Range Park.

There are also problems of land ownership. Absence of land titles allows their land to be open to application which puts it at risk for acquisition by others for resource extraction and development. This includes areas conserved by the communities such as community forests and water catchment areas which are hard to apply for land title as state laws on land tend to view land as only being able to be owned by communities if it is 'actively' cultivated[19]. In this case, having their forests and water catchments overlapping with protected area boundaries at least provides a form of protection from such problems though it comes with the issue of not being able to access livelihood resources, unless there is some agreement with authorities.

Many of the communities interviewed also mentioned youth migration and transfer of traditional knowledge as a challenge. Due to perceived limited economic opportunities, youth are migrating out of the village to find work. Youth are also away from villages for most of the time if there are no nearby schools and have to live in dorms. For Ulu Papar in particular, the remoteness of their village which requires travel by 4WD means high costs of travelling out and to the village due to their remoteness. People studying and working outside are disrupted from partaking in community activities that

[19] Majid Cooke F and Vaz J. 2011. *The Sabah ICCA Review: A review of Indigenous Peoples' and Community Conserved Areas in Sabah*. Kota Kinabalu: Global Diversity Foundation.

facilitate the transfer of knowledge and are separated from the land and its resources where they derive their traditional ecological knowledge from.

**Photo 9:** Kg. Rantai community during the group discussion on issues in the landscape.

### 1.2.4 Socioeconomic Conditions of the Communities

In general, apart from working outside the village in the public and private sector, communities in all four areas studied engage in agriculture as a main source of livelihood in the village. However, the crop that they plant varies according to area. For the following discussion, examples from four villages or one from each study area will be given.

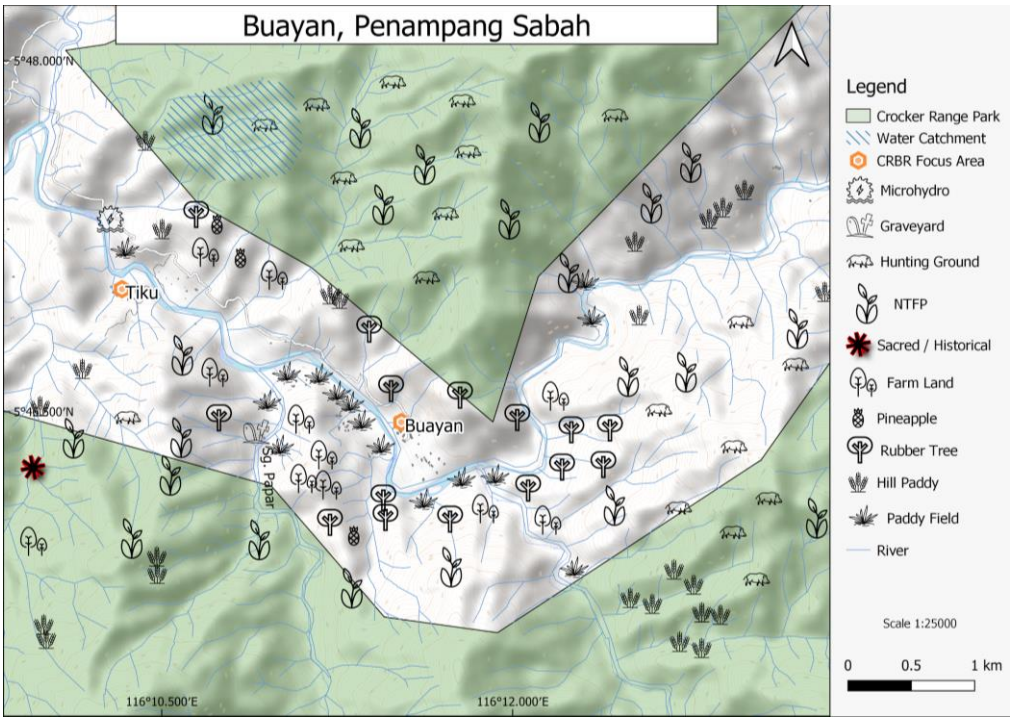


**Figure 9**: Map of land use in Kg. Buayan, Penampang.

For the Buayan community, rubber planted through the Sabah Rubber Industry Board (LIGS) scheme provides the main source of cash income for the community through agriculture. Besides planting rubber and paddy (hill and wet paddy) for subsistence, the community in Kg. Buayan also plants

pineapple, fruit trees and vegetables such as chili. They also heavily rely on the natural resources around them, especially given how remote they are. They catch fish, hunt game and gather non-timber forest products such as wild vegetables to provide for their families. The river is also a source of irrigation for their farmland, especially their wet paddy fields. Their community water catchment area is located within the Crocker Range Park and not only supplies clean water to their village through a gravity-fed water system but also their electricity supply through a micro-hydropower system which is shared with the nearby Kg. Tiku. The beautiful landscape of forests and rivers around them provides additional income to the community through eco-tourism, especially with their village being part of the historical Salt Trail, a route traditionally followed by villagers to transport their produce to weekly markets in the west coast to exchange for salt and other goods. With this potential for tourism activities, quite a number of villagers work as guides and porters, bringing people through hiking trails.

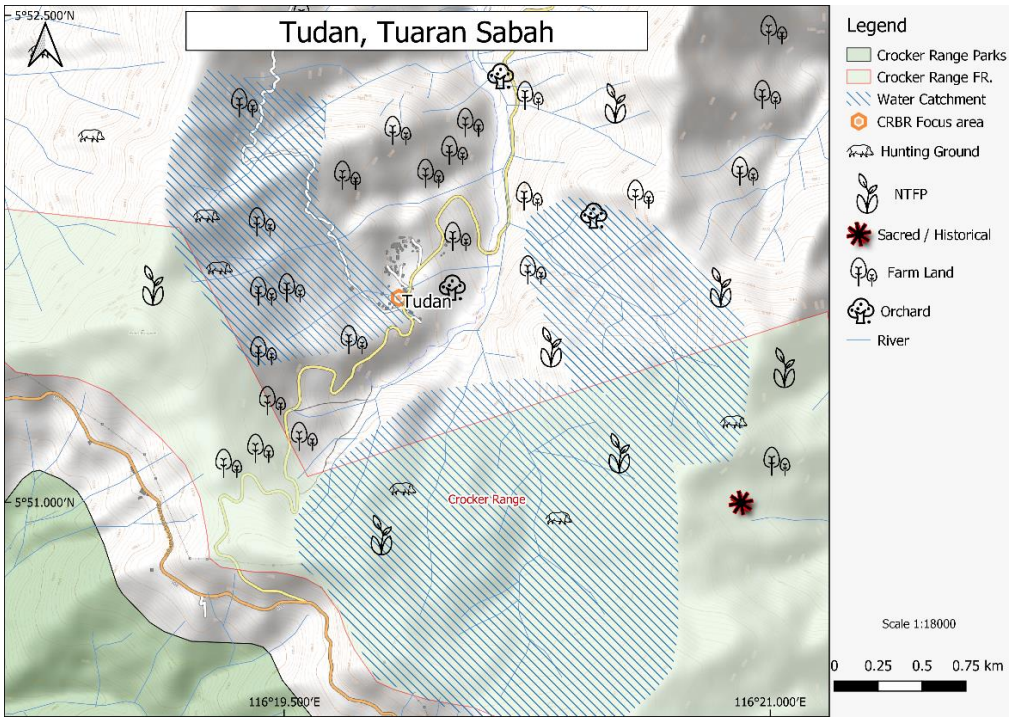


**Figure 10:** Map of land use in Kg. Tudan, Tuaran.

The landscape in Kg. Tudan, Tuaran is comprised of steep slopes and narrow river valleys. The community here is actually one of the producers of vegetables for the areas of Tambunan, Penampang and Tuaran and usually will sell their vegetables during the weekly tamu (market) in Tambunan and Donggongon Town. There are also outsiders who come to their village to buy in bulk. Besides planting vegetables such as *losun* (wild spring onion), they also plant sweet potato, tapioca, lemongrass, and fruits such as calamansi lime as well as mulberry which they process into jam, tea and wine. In terms of natural resources, they have rivers to irrigate their farms and where they fish and also practise *Tagal* to conserve riverine resources. The community also hunts game and gathers non-timber forest products, mainly in their water catchment area which also supplies the village with clean water through gravity fed water systems. However, historically the areas where they collect NTFP and hunt also include areas in the Crocker Range Forest Reserve as can be seen in **Figure 10**.

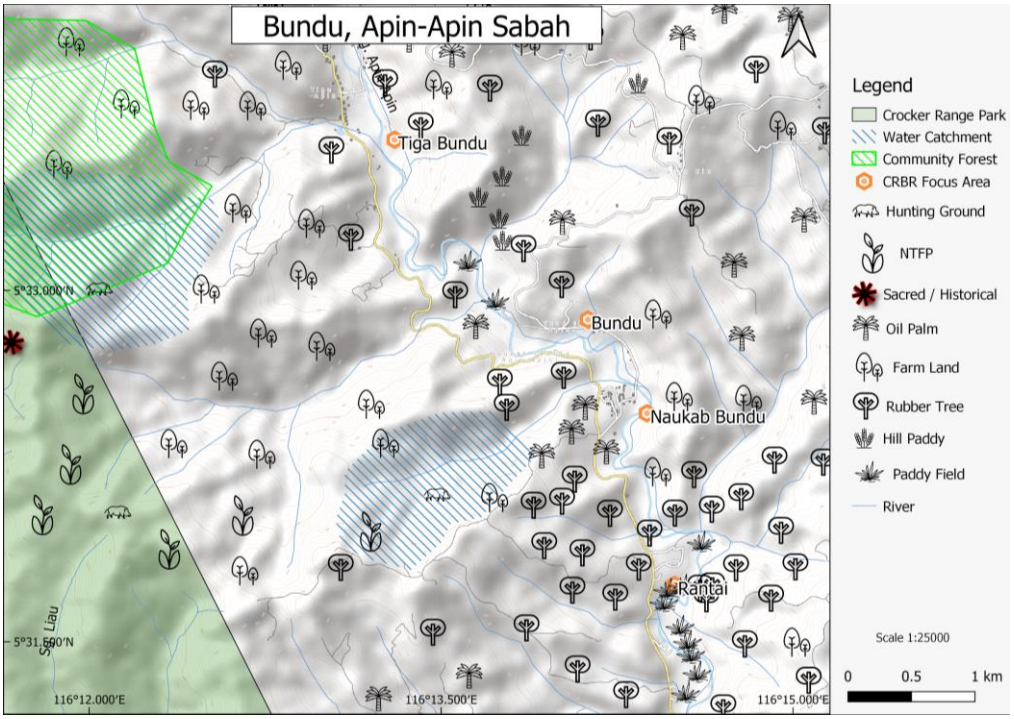


**Figure 11**: Map of land use in Bundu, Apin-Apin, Keningau.

In Kg. Rantai, the community mainly plant rubber (under LIGS scheme) and ginger for income and paddy, both hill and wet paddy for subsistence. They have also planted cinnamon in their community forest and water catchment area which provide a source of clean water to their community through a gravity fed water system. A few individuals in the community have also started to plant oil palm for income. Apart from agriculture, the community here also hunts and gathers non-timber forest in nearby forests. In places where *Tagal* is not in place to protect their river and use is restricted, the river also provides fish for food and irrigation to their farmland. The river *Tagal* is also a place of ecotourism for the community where they provide a place for visitors to picnic, camp and swim.

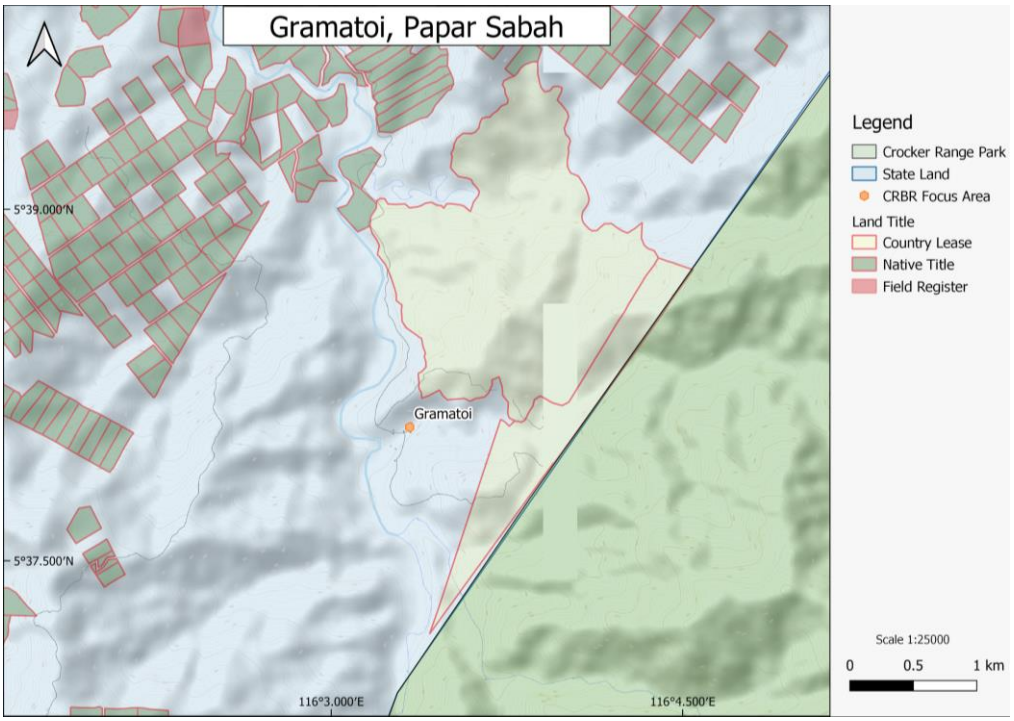


**Figure 12**: Map showing land status in Kg. Gramatoi, Papar.

In Kg. Gramatoi, villagers engage in agricultural activities in the village but mostly work outside the village and only come back during the weekends. The crops they plant are more to crops such as oil palm, rubber, durian, pineapple, tapioca and banana. They are also able to catch fish in the river but they also practice *Tagal* to manage the river and protect it from outsiders. In the figure above, we can see that surrounding Kg. Gramatoi and bordering Crocker Range Park are two big pieces of land under Country Lease. These two lands are not owned by the villagers and the one closest to the park has already been opened up and planted with Musang King Durian by a company.

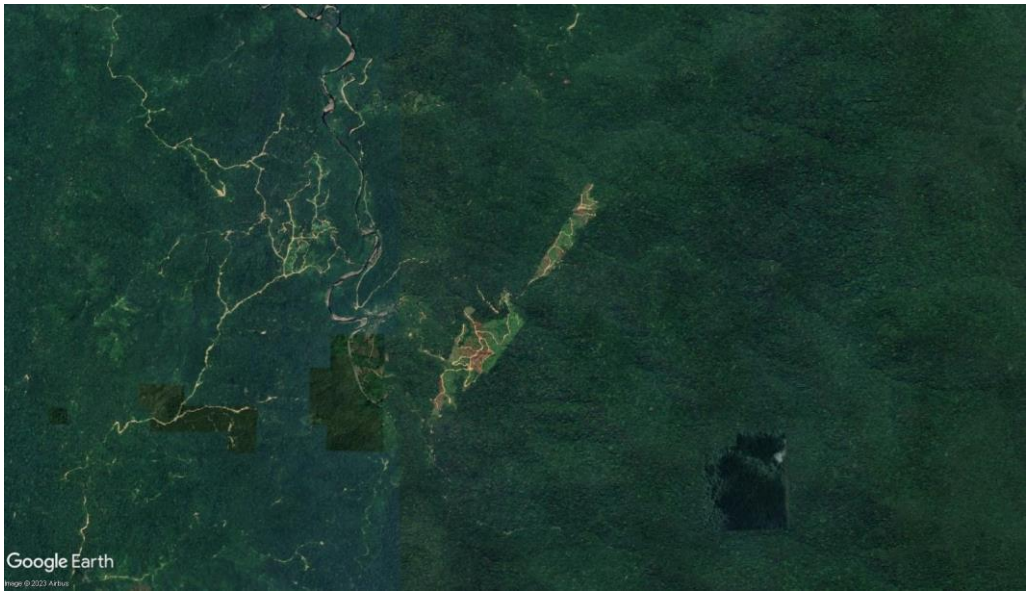


**Photo 10**: Aerial view of land opening along the Crocker Range Park boundary affecting the Gramatoi River. (Source: Google Earth)

### 1.2.5 Ethnic and Culture

As previously mentioned, overall in terms of demography in the Crocker Range Biosphere Reserve, there are an estimated 99,101 people from about 387 villages living in the three zones of the reserve. They are largely Kadazan-Dusun communities while the rest are Murut, Bajau, Malay and others. There are likely more Kadazan-Dusun and Murut communities as these ethnic groups tend to reside in mountainous areas.[20] In the four areas studied, the majority of community members come from the same native ethnic group of Dusun (or in terms of language, the Dusunic Family of Austronesian Languages) but from differing sub-ethnic groups, such as the Dusun Tagahas in Ulu Papar, Dusun Liwan in Tudan, Dusun Bundu in Bundu and the Dusun Malapi in Gramatoi/Ovai. Politically, Dusun is usually referred together with the Kadazan under the term Kadazan-Dusun, forming the largest ethnic group in Sabah which accounts for about 24.5% of the state population in 2010.[21] Historically, the term Dusun, which means orchard in Malay, was used during the pre-colonial period by the Bruneian Malays for the natives in Borneo who engaged in agriculture. The North Borneo Chartered Company later adopted it and created ethnic categories based on primary activities which then solidified the agricultural identity of the Dusun, especially as rice farmers while the hill Murut were known for

[20] Nais, J. & Jetony, G. (Eds.) (n.d.). *Crocker Range Biosphere Reserve Management Plan 2023-2029*.

[21] Population and housing census of Malaysia (2010). *Population distribution and basic demographic characteristics 2010*. Department of Statistics Malaysia.

hunting and gathering as well as shifting cultivation.[22] According to Pugh-Kitingan (2012) in Sintian (2013:120), the Dusun generally use "the environment they reside as agricultural land by traditionally planting various types of rice, fruits and vegetables". So in terms of culture, the Dusun are usually associated with agriculture, especially those living in the interior. This echoes in our baseline assessments in the four areas where each community generally engages in agriculture in the village for their livelihood in both subsistence and commodity. Other communities living around the Crocker Range Park have also been found to engage in agriculture. In their study of Dusun and Murut communities living periphery of Crocker Range Park in Tenom and Keningau; Ngidang, Abdullah and Noweg (2003) described them as both subsistence and smallholder farmers who are transitioning from heavily dependent on upland rice cultivation and forest resources to commodity-based economy.

Natural resources are sources of livelihood for indigenous communities so great care is taken to ensure that they are able to continue using them by ensuring they are utilized in a sustainable manner by only taking what they need, especially in hunting and gathering forest resources.[23] In some communities, rotational agriculture is still practised where they will rotate between pre-determined plots of land so that recently used land can rest for a period of time (fallow) to regenerate and regain its fertility. Minah (2013) mentions that the culture of conserving the environment of the Kadazan-Dusun can be seen through their beliefs and respect towards spirits or guardians in nature where any wrongdoing towards nature can invite disease or disaster.[24] These beliefs can be found among the Murut and other indigenous Communities in Sabah as well. One of the more known traditional practices that conserve resources is the *Tagal* system, also mentioned in several of the study areas. Tagal, a term meaning "don't" or prohibition, manages resources from overexploitation and pollution by prohibiting community members from extracting resources for a certain time at a certain area agreed upon mutually by the community and from conducting activities that will be detrimental to the resource. It is commonly practised in rivers with support from the Department of Fisheries (and also having been incorporated as a non-statutory regulation in the Sabah Inland Fisheries and Aquaculture Enactment 2003) but is also practised in forests by some communities. The communities not only manage the river and its resources from overfishing and pollution in *Tagal* but also protect the surrounding environment such as the rocks and trees which are important to aquatic life. There are an estimated 76 villages (or about 19% of villages in the CRBR) that are currently practising the *Tagal* system in their rivers in the Crocker Range Biosphere Reserve.[25] In agriculture, there are also beliefs and traditional knowledge that contribute to sustainability of the environment, including controlled felling of trees, management of crops, controlled use of fire, practices for prevention of erosion and use of compost and organic pesticides, which Minah et. al (2019) believes can complement science and technology knowledge in tackling ecosystem problems faced nowadays.[26]

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[22] Gimbad, E. (2020). *Cultivating Rice and Identity: An Ethnography of the Dusun People in Sabah, Malaysia*. Penrith, Australia: Western Sydney University.

[23] Tongkul, F. (2002). *Traditional systems of indigenous peoples of Sabah, Malaysia: Wisdom accumulated through generations.* Penampang: PACOS Trust.

[24] For more info, see Minah, S. (2013). *Kepercayaan dan amalan masyarakat Kadazandusun dalam pemeliharaan alam sekitar*. Prosiding Persidangan Intelektual Kebangsaan Malaysia, Fakulti Sains Kemanusiaan, Universiti Pendidikan Sultan Idris, Tanjong Malim.

[25] Nais, J. & Jetony, G. (Eds.) (n.d.). *Crocker Range Biosphere Reserve Management Plan 2023-2029*.

[26] For more info, see Minah, S., Norjietta, T., Rosliah, K., & Novi, S. K. I. (2019). Local wisdom in agriculture for environmental sustainability: A case study of the Dusun community. *International Journal of Innovation Creativity and Change*, *6*(8), 117-138.

### 1.2.6 Gender

Based on the discussions in the four areas, the knowledge, skills and experiences of women are relatively respected and acknowledged (with 3 being the lowest average score). According to Nais & Jetony (n.d.), there are no obvious gender differences in access and control over the use of resources among communities in the CRBR, except in hunting and fishing activities which are normally carried out by men. In general, Dusun and Murut communities and other traditional Austronesian societies in Sabah, are said to be gender balanced where women are respected and both husbands and wives cooperate in child rearing and socioeconomic activities.[27] Though women are usually in charge of household chores of cooking, cleaning and childrearing, they also take part in socioeconomic activities complementing the work of the men. In agriculture, men tend to do the work that require heavy-lifting but in all other areas of agricultural production both men and women share the work in clearing, ploughing, planting, tending, harvesting and processing if they are able. Women tend to focus more on subsistence activities for the household while the men will focus more on work that will bring income, be it through agricultural cash crops, wage work or business.

### 1.2.7 Ecological Linkages

In general, indigenous people have a close relationship with the land and the natural resources within it. From our discussion thus far, it can be seen that it is linked to their livelihood and health as well as their knowledge and culture. Separation from the natural resources, as seen in the migration of youths and villagers for education and work has shown to affect transmission and continuation of indigenous knowledge and practices related to these resources. All four of the studied areas rely on agriculture and forest resources. This is especially true for remote communities living in the CRBR with poor road access like the communities in Ulu Papar who have to rely on the resources around them for food, water, medicine, fuel and electricity, building materials and handicraft because of poor access and related high transportation costs. Owing to the healthy forests around them, communities are able to get water through gravity-fed water systems without needing to rely on public utilities. Healthy rivers also provide a source of electricity through micro-hydro systems to communities who are too far from the existing grids provided by the government.

### 1.2.8 Stakeholder Analysis

There are many stakeholders who play a role in the utilization and management of natural resources in the Crocker Range Biosphere Reserve apart from the indigenous and local communities living around the area such as government agencies, civil society organizations working on environment and socio-economic improvement, academic institutions, tourism industry actors and economic actors. Among the relevant stakeholders for supporting community initiatives and participatory management in the CRBR are:

i. **Sabah Parks**
   Sabah Parks is a conservation-based statutory body established in 1964 with the purpose of conserving the scenic, scientific and historic heritage of the state of Sabah. It is the management entity for the Crocker Range National Park. In 2014-2021, Sabah Parks embarked on the Kinabalu Ecolinc project to improve the ecological connectivity between Kinabalu Park

[27] Pugh-Kitingan, J. (2015). Cultural and religious diversity in Sabah and relationships with surrounding areas. *Islam and Cultural Diversity in Southeast Asia. Tokyo: ILCAA, Tokyo University of Foreign Studies*, 269-264.

and Crocker Range Park under the EU-REDD+ project funded by the European Union in cooperation with the Sabah Forestry Department, "Tackling Climate Change through Sustainable Forest Management and Community Development". It involved the establishment and restoration of Community Conserved Areas (CCAs) and development of sustainable agriculture and forest-related community tourism options to support forest management in a few selected communities to the north of the Crocker Range Biosphere Reserve. In the current CRBR Management Plan (2023-2029), there are plans for several areas in the CRBR including Kg. Tudan to be established as SBDEC pilot sites for sustainable development.

**ii. Sabah Forestry Department (SFD)**

The Sabah Forestry Department is a government agency tasked with managing forests and regulating all forestry activities in Sabah with a vision towards realizing sustainable forest management. The three forest reserves within the core zone of the Crocker Range Biosphere Reserve are under their purview. In terms of community engagement, they do have programmes on social forestry to integrate local communities in forest management to overcome forest management issues and improve community livelihoods through activities such as agroforestry, community development and infrastructure, forest restoration and conservation and joint forest management. In the EU-REDD+ project, besides the Kinabalu Ecolinc Project, they had two other demonstration sites outside the CRBR in Kinabatangan and Kota Marudu with the aim of improving Sabah's REDD+ readiness and implementation through activities to strengthen community engagement in forest protection and sustainable forest management.

**iii. District Office**

The district office is the chief coordinator in the planning and implementation of development activities at the district level and also acts as the local branch of the state secretariat and federal government.

**iv. Sabah Biodiversity Centre (SaBC)**

Established in 2008, the Sabah Biodiversity Centre is a government agency concerned with the control, management, protection, conservation and sustainable use of the biological resources of the state. They have provided support to communities in natural resource management through activities such as capacity building training, access and benefit sharing, community protocols, and traditional knowledge documentation concerning biological resources.

**v. Sabah Agriculture Department**

The Sabah Agriculture Department has been entrusted by the state government to develop the agro-food sector so that it is able to meet the needs of the people as well as contribute to the state's income. They provide agricultural resources, training and programmes for agricultural development, facilities to promote products, and expertise including on soil suitability and agronomy.

**vi. Rural Development Corporation (KPD)**

A government-funded agency under the Department of Agriculture that focuses primarily on contract farming projects. They provide support in terms of agricultural inputs (on credit), advice, training, transport, processing and marketing to farmers. When the KPD buys back the

produce and products from the farmers, the income the farmers earn is the surplus leftover after subtracting payment for the capital loan given on credit.

**vii. Sabah Tourism Board**

An agency of the state government operating under the purview of the Ministry of Tourism, Culture and Environment with the primary responsibility of marketing and promoting tourism for the State. One of their focuses is in community-based tourism that is sustainable and responsible and apart from promotion and marketing, they support development of tourism products and provide training to upskill tourism operators.

**viii. Department of Irrigation and Drainage (DID)**

The main function of this government agency is to oversee irrigation and drainage for agricultural areas and river conservation, hydrology, flood prevention and mitigation as well as manage state water resources, including rivers and water catchments. Together with Sabah Parks, SaBC and other state agencies under the Bornean Biodiversity and Ecosystems Conservation (BBEC) Programme, they are currently planning and implementing a River Environmental Education Programme (REEP participatory water monitoring and environmental education) which aims create awareness among students and communities on the importance of ecosystem services from the core to the buffer and transition area of the CRBR.[28]

**ix. Department of Fisheries (DOF)**

The Department of Fisheries is tasked with the management and development of the fisheries sector in the state, including programmes on rehabilitation, aquaculture development, and food processing. The establishment and practice of the resource management system, *Tagal*, on rivers by communities can be registered with this department and they will monitor its progress and provide technical and material assistance.

**x. Universiti Malaysia Sabah (UMS)**

UMS is a public academic institution that can provide technical expertise in various fields including forestry, conservation, agriculture, tourism, food science and business. From 2013-2017, UMS was involved in the Sustainable Development for Biodiversity and Ecosystem Conservation in Sabah Malaysia (SDBEC) project which was a technical cooperation project between the Sabah State Government, Japan International Cooperation Agency (JICA) and UMS. Implemented in Kg. Tudan and one other site, the objective of the programme was to enhance local communities' capacity and livelihood as well as improve their knowledge and awareness of the need to live in harmony with the environment, and included activities such as participatory three-dimensional modelling (P3DM), composting, mulberry planting and processing, and beekeeping.[29]

**xi. Forever Sabah (FS)**

Forever Sabah is a civil society entity interested in supporting Sabah's transition to a diversified, equitable, circular economy through catalyzing positive institutional change,

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[28] Nais, J. & Jetony, G. (Eds.) (n.d.). *Crocker Range Biosphere Reserve Management Plan 2023-2029*.

[29] Jetony, J. @ G. , Suleiman, M. , Husin, R. ., Abdul Aziz, N. A. , Mohd. Nordin, N. , Salleh, N. , & Saikim, F. H. (2022). Enhancing Community Commitment in Conservation through Participatory Approach. *Journal of Tropical Biology & Conservation (JTBC)*, *19*, 13–27. https://doi.org/10.51200/jtbc.v19i.3935

building capacity to sustainably manage natural resources, protecting and restoring natural habitats and enhancing social and ecological resilience. In terms of activities within the CRBR, they are conducting a pilot project on Payment for Ecosystem Services for water catchment conservation in the Babagon Catchment involving three villages in the northwest of the Crocker Range Biosphere Reserve. They are also part of a consortium with TONIBUNG, PACOS Trust and Green Empowerment working on the Sabah Renewable Energy Rural Electrification Roadmap (Sabah RE2) which lays out a strategy for rural electrification of communities distant from the state grid through renewable energy mini-grids. They are currently conducting pilot sites in four areas, including three villages in Ulu Papar where they not only support development of access to renewable energy but also in community socio-economic activities and capacity building that will sustain the mini-grid.

**xii. TONIBUNG**

*TObpinai NIngkokoton koBUruon KampuNG* (Friends of Village Development) is an indigenous-lead non-profit group that develops sustainable alternatives for rural electrification while advocating for native rights and supporting local entrepreneurship and innovation. In the Crocker Range Biosphere Reserve, they have developed several micro-hydropower systems for villages in the Ulu Papar region, namely Kg. Terian, Kg. Buayan, Kg. Tiku and Kg. Pongobonon.

**xiii. World Wide Fund for Nature (WWF) Malaysia**

WWF is an independent conservation organization working on halting the degradation of the natural environment and building a future where humans can live in harmony with nature through conservation of biological diversity, sustainable use of renewable natural resources and reduction of pollution and wasteful consumption. They see indigenous and local communities as key partners in environmental protection and provide support through outreach and awareness, capacity building, sustainable livelihood programmes, access and benefit sharing, partnerships and networks, and community participation in decision-making processes. WWF is one of the key supporters in the establishment of the Heart of Borneo (HoB) Initiative involving a voluntary trans-boundary cooperation between Malaysia, Indonesia and Brunei declared in 2007 to conserve the biodiversity of the island of Borneo through a network of protected areas, sustainably-managed forests and land use zones the size of 22 million hectares of which the Crocker Range is a part of.[30]

**xiv. Good Shepherd Services**

Good Shepherd Services (GSS) is a not-for-profit organisation that is focused on upholding the rights, worth and dignity of women and children in underserved communities and those experiencing sexual and gender-based violence. In the Crocker Range, they have experience in conducting livelihood projects with women to provide economic opportunities to improve their quality of life while at the same time empower them and tackle issues of gender equality. In these initiatives, they supported communities in transforming their existing agricultural products into market-oriented products which help the women increase their household income and quality of life.

[30] WWF (2020). Heart of Borneo: https://wwf.panda.org/discover/knowledge_hub/where_we_work/borneo_forests/

**xv. PACOS Trust**

Partners of Community Organizations (PACOS) Trust is an indigenous community-based organization that works with communities across issues of education, rights, livelihood, and environment, giving awareness and capacity building training. Throughout the years, they have trained and supported many community organizers and peoples' organization leaders, several of which are in the CRBR region, who help their partner communities document, analyze, strategize, and transform their lives. They also have 25 community learning centres that not only provide preschool and non-formal education but also ensure the survival and continuation of traditional knowledge and cultural identity. PACOS also hosts Kivatu Nature Farm, a teaching and training program for organic agriculture and marketing.

### 1.3 Strategy GEF-SGP PHASE-7 in Crocker Range Biosphere Reserve

From our overall observation and analysis of the study areas and secondary data, there are several key areas that could be focused on to improve community management of the Crocker Range Biosphere landscape:

Several villages in the CRBR such as Kg. Tudan and Kg. Gramatoi face issues of encroachment of their land and territories. The role of communities in the prevention of encroachment is also vital to be considered because they are like the first line of defence and the ones who will come across the encroachers first. Training and knowledge on how to handle encroachment could add to the protection of Biosphere Reserve so that the communities know what proper action to take that complements existing safeguard measures by authorities, in addition to considering aspects of personal safety while taking action. They could also benefit from setting up community protocols to ensure community management of the area with ground rules to be followed by the community and outsiders or even a land use management or organized development plan to regulate development and resource use in the village and surrounding resource areas. In Ulu Papar's case, they have community protocols but lack in enforcement, especially towards outsiders who may not feel that they should follow such rules. This highlights the need for institutional strengthening within the community and also advocacy to raise awareness and support for community natural resource governance systems.

Community protocols can also be used to engage with the Department of Irrigation and Drainage on forming a water conservation area for water catchment areas as it can demonstrate community management plans for the area. This strategy may be used in areas with high potential for management of water catchment areas such as Tudan, Bundu and Ulu Papar. Furthermore, we have also seen that protection of the water catchment areas are important to the communities not only for supply of clean water (as demonstrated by Kg. Tudan, Kg. Buayan and Kg. Rantai) but also for micro-hydro systems (as demonstrated by Buayan), both essential for fulfilling basic human needs. It would be crucial to encourage further conservation of these areas not only as water catchment areas but as forested land that provides other ecosystem services and livelihood resources. Ecotourism activities may further provide incentives for the communities to protect their forests and water catchment areas while providing socio-economic benefits to the communities. This also includes other areas managed by the community such as Tagal areas as well as historical/sacred sites though caution has to be observed so that there are rules or protocols that will mitigate possible negative impacts from tourism, including vulnerability to bio-piracy. For areas that have been degraded from encroachment and uncontrolled agricultural activities such as with Kg. Rantai and Kg. Gramatoi, the communities can be encouraged to conduct restoration and enrichment activities.

They can also engage and build relationships with Sabah Parks and Sabah Forestry Department on the management of the area. Both government agencies and the communities could benefit from working together to better manage the area and combat encroachment in the protected areas. Building their capacity in community-based monitoring and information systems (CBMIS) would be helpful in this case so they are able to monitor the state of the area and properly respond to transgressions and take action to protect the area in an organized and systematic manner.

In the map of Bundu (**Figure 8**), it can be seen that some areas used by communities overlap with Park boundaries. This could possibly be due to change in Park boundaries without the free, prior and informed consent (FPIC) of communities. The communities living there are aware of the boundaries because the initial demarcation was done and agreed upon by the communities together with Sabah Parks. After the finalization of the boundary, they started developing the land near the boundary which also served as a reminder to where the boundary between their land and Park boundaries are. Every village knows their own boundaries and there are no conflicts between them but this overlap resulting from redrawing of boundaries is bound to incite tension between the communities and Sabah Parks. Conflict resolution would be crucial in this case. If reversion to the original boundary is not possible, maybe establishing a community use zone (CUZ) would be a possible avenue to consider as with other areas that are in conflict due to overlap of customary territories and Sabah Park boundaries. Such as the case in Ulu Senagang-Mongool Baru located in the core zone of the Crocker Range Biosphere Reserve, where after several bouts of dialogues and negotiations with Sabah Parks, they were able to find agreement between both parties on co-management of the community forest area and on the CUZ area which was finally officially established in 2014.

Due to accessibility and cost issues, many communities in Ulu Papar still rely heavily on firewood for their cooking fuel which they mostly get from their rubber groves. This shows a potential to improve practices, especially in terms of energy efficient technology such as rocket stoves. Furthermore, the micro-hydro generator in Buayan is small (15kW) and shared with Tiku. Some villagers are still using other alternatives such as solar lighting and car batteries for their electrical supply. There is potential to upgrade the system as the watersheds in this area are quite well maintained and water flow is strong enough to maintain a bigger system.

Many villages consulted also mention a lack of documentation of traditional biodiversity-associated knowledge and related natural resource management practices, with youth increasingly disconnected from their culture and traditional practices. Documentation of their good practices, traditional knowledge and community protocols can provide guidance for their conservation and care of existing heritage and environment. These good practices and traditional knowledge can be made into a model for other communities and for future generations to understand and appreciate the efforts towards the protection and conservation of the natural resources. Since many living around the Crocker Range Biosphere Reserve engage in agriculture, attention can also be placed in improving agricultural practices, especially considering how agricultural land is becoming limited and the demand for food and income is increasing. Communities should look into ways to increase yield with low negative impact on land and the wider environment while also diversifying their livelihood sources for more security and sustainability.

In light of all these and with inputs from consultations with stakeholders, the sections following this outlines the landscape strategy and guidelines for its implementation in the Crocker Range Biosphere Reserve.

### 1.3.1 Strategy of Intervention

**GEF-SGP Project Objective:** To enable community organisations to take collective action for adaptive landscape management in building socio-ecological resilience in the Crocker Range Biosphere Reserve, Sabah for global environmental benefits and sustainable development

- ***Mandatory Indicator, GEF-7 Core Indicator 3:*** Area of land restored (300 hectares)
    - ***Sub Indicator 3.1:*** Area of degraded lands restored (200 hectares)
    - ***Sub Indicator 3.2:*** Area of forest and forest lands restored (100 hectares)
- ***Mandatory Indicator, GEF-7 Core Indicator 4:*** Area of landscapes under improved practices (excluding protected areas) (16,000 hectares)
    - ***Sub Indicator 4.1:*** Area of landscapes under improved management to benefit biodiversity (9,000 hectares)
    - ***Sub Indicator 4.3:*** Area of landscapes under sustainable land management in production systems (7,000 hectares)
- ***Mandatory Indicator, GEF-7 Core Indicator 6:*** Greenhouse gas emission mitigated (335,000 tCO2e carbon sequestered or emissions avoided in the sector of Agriculture, Forestry, and Other Land Use (AFOLU) and 6,500 CO2e avoided through Energy Efficiency and Renewable Energy)
- ***Mandatory Indicator, GEF-7 Core Indicator 11:*** Number of direct project beneficiaries disaggregated by gender as a co-benefit of GEF investment (~3,150 individuals)

**Component 1:** Resilient landscapes for sustainable development and global environmental protection.

- **Outcome 1.1:** Strengthened conservation of biodiversity and protection of ecosystem services through community collaborative management and sustainable livelihood interventions.
    - ***Indicator 5:*** Sustainable management of common resources, as indicated by the number of new partnerships between CBOs and enabling stakeholders (including with NGOs, protected area management entities, private sector enterprises, government departments, etc.) for participatory conservation and restoration initiatives, disaggregated by gender.
    - ***Indicator 6:*** Strengthening gender equality and women's empowerment in control of natural resources, as indicated by the number of projects that are contributing to equal access to and control of natural resources by women and men.
    - ***Indicator 7:*** Documentation of traditional knowledge related to biodiversity, as indicated by the number of systems developed or strengthened where traditional biodiversity knowledge is documented, stored and made available to local people (e.g., traditional knowledge recordings, resource classification systems, etc.).

- **Outcome 1.2:** Increased adoption of renewable energy and energy efficient technologies and mitigation solutions at community level.
    - ***Indicator 8:*** Livelihood co-benefits, as indicated by the number of households benefiting from alternative livelihoods supported by clean energy solutions.
    - ***Indicator 9:*** Strengthened resilience and increased energy security, as indicated by the number of community level renewable energy solutions (e.g., hydroelectric generators, off-grid solar PV systems, biomass gasification generator systems) operationalized.

**Component 2:** Durable landscape resilience through participatory governance, partnership building and knowledge management.

- **Outcome 2.1:** Strengthened community institutions for participatory governance to enhance socio- ecological resilience.
    - ***Indicator 10:*** Participatory landscape management, as indicated by the number of landscape strategies developed or strengthened through participatory consultation

and based on the socio-ecological resilience landscape baseline assessments endorsed by multi-stakeholder landscape platforms.
    - ***Indicator 11:*** Empowering women in natural resource governance, as indicated by the number of projects that improve the participation and decision-making of women in natural resource governance.
    - ***Indicator 12:*** Strengthening socioeconomic benefits for women, as indicated by the number of projects that target socioeconomic benefits and services for women.
    - ***Indicator 13:*** Landscape priority actions mainstreamed into local planning instruments, as indicated by the uptake priority actions outlined in the landscape strategies into local development plans.

- **Outcome 2.2:** Enabling environment for upscaling and replication strengthened through effective knowledge management of best practices and approaches.
    - ***Indicator 14:*** Mainstreaming gender equality and women's empowerment, number of women-led projects supported.
    - ***Indicator 15:*** Upscaling initiated, as indicated by the number of dialogues organised with government entities on upscaling best practices.
    - ***Indicator 16:*** Knowledge shared, as indicated by the number of project and portfolio experiences and lessons systematised and codified into case studies produced and disseminated, and cumulative number of views of the case studies from the SGP website, social media, or through direct dissemination.

**Component 3:** Monitoring and evaluation.

- **Outcome 3.1:** Sustainability of project results enhanced through participatory monitoring and evaluation.
    - ***Indicator:*** A system of facilitation, monitoring and evaluation is built to ensure active communication between grantees, support/host organizations and GEF SGP Malaysia
    - ***Indicator:*** Capacities of CBOs to conduct M&E, as indicated by number of CBOs who have received training and project M&E reports and findings shared with stakeholders

### 1.3.2 Preparation and Supervision Strategy of Lead Organisation

Monitoring and evaluation related to the implementation of the landscape strategy will be implemented on several levels:

- Monitoring and evaluation by the community project holder on their individual projects
- Monitoring and evaluation by support/host organization
- Monitoring and evaluation by the GEF SGP Malaysia

## 1.4 Potential Typology of Community-based Projects and Selection Criteria of Activities

### 1.4.1 Typology of Community-based Projects

The potential community projects to be supported by GEF SGP for the Crocker Range Biosphere Reserve based on the landscape strategy are as follows:

- ***Mandatory Indicator, GEF-7 Core Indicator 3:*** Area of land restored (300 hectares)
  Activities:
    - Vegetation restoration and reforestation: Plant native trees and fruit trees, shrubs or grasses that are adapted and suitable to the microclimate and soil condition of the degraded site; invasive species management
    - Erosion control and soil stabilisation: Contour bunding, vegetation/cover crop; soil improvement

- Physical intervention and enhancement: Create diverse habitats such as wildlife corridors, wildlife crossings, provide suitable breeding, nesting site and food source for both native and migratory wildlife
- Water management and restoration: Restore natural hydrology to regulate water flow and improve water quality; control soil erosion and sedimentation
- Land restoration through agroforestry, climate-resilient agriculture, regenerative agriculture or sustainable agriculture practices (include planting of cash crops, coffee, cacao, peanuts, peppers, moringa, sacha inchi, cinnamon, other vegetables, herbs, fruits, poultry for self-subsistence and/or socio-economic activities; planting rattan, bamboo for handicraft etc)
- Seed collection and plant/tree nursery for land restoration
- Syntropic farming and/or other effective crop management and harvesting approaches that are practical for communities, such as the 3T approach (tanam, tinggal, tuai) and/or TJT approach (tanam, jaga, tuai)
- Restore the forest ecosystem to re-establish wildlife habitat and conserve existing wildlife habitat
- Enhance of food source and habitat establishment for wildlife in degraded forest such as planting fruit trees or plants that can provide food sources to the wildlife to increase their population and re-establish their habitats
- Restore and reforest riparian reserves
- Establish Tagal areas (river and forest) for restoration

Potential area for Crocker Range:

- ❖ Northwestern Range: Kampung Buayan, Terian, Tiku, Longkogungan, Kalanggaan, Pongobonon, Tampasak, Togudon, Kibunut, Inobong, Madsiang, Kipouvo, Pogunon, Maang, Babagon, Moyog, Rugading, Sugud, Kolosunan
- ❖ Northeastern Range: Kampung Tudan, Tiong, Kirokot, Lokos, Patau
- ❖ Eastern Range: Kampung Bundu, Rantai, Tiga, Tikolod
- ❖ Western Range: Kampung Gramatoi, Ovai, Mandalipau, Kambizaan, Bolotikon, Kaiduan, Bisuang
- ❖ Southern Range: Kampung Senagang, Keritan Ulu
- ❖ Southwestern Range: Kampung Pangi, Halogilat

- ***Mandatory Indicator, GEF-7 Core Indicator 4:*** Area of landscapes under improved practices (excluding protected areas) (16,000 hectares)
  Activities:
  - Strengthen participatory conservation and restoration of forest ecosystems in partnership with Sabah Parks, Sabah Forestry Department and other partners, to benefit biodiversity in the CRBR landscape (and ecological connectivity with other protected areas such as Kinabalu Park/Ecolinc)
  - Build or strengthen cooperation and networks with stakeholders (other communities, government agencies, civil society organizations) to strengthen co-management of area, including through mutual learning exchanges
  - Improve management of forest and river ecosystems to benefit biodiversity and promote nature-based ecotourism options for local communities
  - Increase awareness for preservation and restoration among villagers, especially the youths, among others
  - Strengthen community natural resource management and build capacities for establishment of indigenous and community conserved areas (community forest, water catchment areas, Tagal river and forest areas, community use zones, water conservation areas)

- Establish community-based organizations or action committees for natural resource management (Tagal committee, community forest committee, etc.)
- Research on key intervention areas such as wildlife population study, resource inventory, soil content, crop suitability
- Undertake baseline biodiversity surveys to identify rare, threatened or endangered plants and wildlife to advocate for protection of remaining forested area
- Promote “gompi guno” (“use and conserve”) and other traditional knowledge and natural resource management practices, for instance, increasing the proportion of farmlands under fallow, establishing “no take”/”no go” zones or controlled harvesting areas (Tagal) in rivers and forests
- Map community areas and conservation priority areas (data collection, geographic mapping, asset mapping etc.) and develop land use management plan for improved landscape management
- Develop or strengthen community rules and protocols for area management, preservation and development planning
- Secure and strengthen legal protection over existing and proposed indigenous and community conserved areas
- Advocacy for recognition of indigenous and community conserved areas (ICCAs) and community natural resource management practices
- Maintain good rapport and cooperation with government agencies to officially declare land areas for sustainable agriculture practices and water catchment protection
- Promote sustainable agriculture for enhanced protection and participatory restoration of water catchment areas and other environmental sensitive sites in the CRBR
- Adopt sustainable waste management system and practices to reduce waste and pollution
- Sustainable utilization of NTFPs in buffer and transition zones of CRBR
- Develop sustainable agriculture and agroecological practices for livelihoods and enhanced land management and participatory restoration of degraded agricultural ecosystems such as regenerative agriculture, crop diversification, intercropping, mixed crop-livestock integration, soil management measures (fallow period, organic fertilization and composting), system of rice intensification (SRI), organic farming
- Promote agroforestry (e.g. rattan, durian, coffee, cacao, cinnamon, bamboo, bambangan, tarap, ginger, corn, seraya, lipasu, vanilla, pepper) as income generating activities
- Promote cultivation of indigenous/native plants (e.g. indigenous varieties of rice, figs, durian, ginger) and establishment of heritage or community garden, including documentation of varieties and seed storage, to preserve and maintain biodiversity
- Promote beekeeping as income generating activity, encouraging protection of forest ecosystem and biodiversity
- Protect and maintain riparian reserves by avoiding disturbances in the area and maintaining diversity of native vegetative cover (removing invasive species if present)
- Facilitate market access and farmer-market link through trainings, infrastructure, logistic improvement and supply chain establishment
- Promote non-perishable food products, especially in areas with poor market access
- Develop community-based monitoring and information systems such community forest monitoring against encroachment, logging and poaching; river quality monitoring
- Ecotourism/Edutourism: Forest reserve to preserve and combat the extinction of species found in the forests, biodiversity conservation, ecosystem services, promoting nature-based ecotourism options for local communities etc.
- Agrotourism: Use of sustainable agriculture practices and cultivation of native species conserve agrobiodiversity and ecosystem services while maintaining sustainable production and providing additional income through rural tourism

- Build basic facilities for community-based tourism activities such as trek, huts, toilet, with co-financing from the communities
- Develop or encourage Tagal system as part of river fish species recovery and conservation or forest conservation, the Tagal system area could be an important site for ecotourism activities
- Necessary marketing for the established community-based tourism to ensure the project sustainability
- Dialogues with the relevant stakeholders especially the state government agencies and companies on ideas that could generate long term benefits for community such as social forestry and involvement of community in forest co-management
- Establish payment for ecosystem services (PES) system or other financing options to provide sustainable funding for community conservation activities

Potential areas:

- ❖ Northwestern Range: Kampung Buayan, Terian, Tiku, Longkogungan, Kalanggaan, Pongobonon, Tampasak, Togudon, Kibunut, Inobong, Madsiang, Kipouvo, Pogunon, Maang, Babagon, Moyog, Rugading, Sugud, Kolosunan
- ❖ Northeastern Range: Kampung Tudan, Tiong, Kirokot, Lokos, Patau
- ❖ Eastern Range: Kampung Bundu, Rantai, Tiga, Tikolod
- ❖ Western Range: Kampung Gramatoi, Ovai, Mandalipau, Kambizaan, Bolotikon, Kaiduan, Bisuang
- ❖ Southern Range: Kampung Senagang, Keritan Ulu
- ❖ Southwestern Range: Kampung Pangi, Halogilat
- ❖ Kinabalu Ecolinc Area: Tiong, Wasai, Toboh Pahu, Toboh Lama, Lokos
- ❖ Historical trails (ecotourism): Salt Trail in Ulu Papar to Tikolod; Rapot Trail in Mandalipau to Bundu

- ***Mandatory Indicator, GEF-7 Core Indicator 6:*** Greenhouse gas emission mitigated (335,000 tCO2e carbon sequestered or emissions avoided in the sector of Agriculture, Forestry, and Other Land Use (AFOLU) and 6,500 CO2e avoided through Energy Efficiency and Renewable Energy)
  Activities:
  - Establish community conserved areas on existing primary or secondary forest site
  - Capacity building for community in agriculture and land restoration
  - Enrich degraded land and/or agriculture ecosystems by tree planting on grasslands, agroecology, agroforestry, permaculture, syntropic forestry, SRI, particularly methods that incorporate the use and generation of biochar, rehabilitation of degraded soils
  - Adopt agricultural waste management system and practices such as composting and bio-fuel production
  - Promote crop cultivation through nature-based approaches
  - Promote cultivation of carbon-sequestering plants like bamboo
  - Avoid deforestation and land degradation through multi-stakeholders' negotiation and dialogues
  - Promote fuel-efficient stoves (rocket stoves, brick stoves, etc.) that can reduce firewood consumption
  - Establish supply chain and improve logistics for more efficient transport of products to market
  - Development of low cost renewable and energy efficient technologies for production systems such as solar dryer, solar pump, gravity fed water system
  - Development of renewable energy systems such as micro-hydropower systems and solar energy that can reduce use of fossil fuel generators
  - Replacement of incandescent lamps and oil lamps with LED lights and solar lights

Potential areas:

- Feasibility study on the clean energy potential by (Forever Sabah, TONIBUNG, Green Empowerment and PACOS Trust) indicated that Kg. Buayan, Kg. Tiku and Kg. Terian require upgrading of their current energy system and are therefore a tentative recipient of a regular grant. There are also about 6 other villages in the CRBR identified by the study that have poor access to electricity, 3 of which (Kg. Longkogungan, Kg. Pongobonon and Kg. Kalanggaan in Penampang) are one of the four pilot sites in the Sabah RE2 rural electrification project with potential for upscaling. Of the other 3, 2 are also potential sites for renewable energy adoption: Kg. Timpayasa and Kg. Babagon Laut in Penampang. The remote villages in Ulu Papar are also potential sites for fuel-efficient cook stoves as some still rely on firewood for cooking, especially areas that can only be accessed by foot.

- ***Mandatory Indicator, GEF-7 Core Indicator 11:*** Number of direct project beneficiaries disaggregated by gender as a co-benefit of GEF investment (~3,150 individuals)
  Activities:
  - Community efforts in sustainably managing forest, river and land ecosystems
  - Upskilling of community capacities in managing forest and river ecosystems, agriculture land, socioeconomic activities
  - Alternative income generation from sustainable agriculture practices including agroforesty, agroecology, beekeeping; and community-based tourism
  - Sustainable harvesting of natural resources and enhancement planting for community resource uses
  - Women actively participate in socioeconomic benefits activities such as processing of agriculture raw material and effective marketing
  - Women empowerment in equal access and control of natural resources and participation in decision-making of natural resource governance.
  - Strengthening women socioeconomic benefits and services through capacity building in skill building and marketing

**Component 1:** Resilient landscapes for sustainable development and global environmental protection.

- **Outcome 1.1:** Strengthened conservation of biodiversity and protection of ecosystem services through community collaborative management and sustainable livelihood interventions
  - ***Indicator 5:*** Sustainable management of common resources, as indicated by the number of new partnerships between CBOs and enabling stakeholders (including with NGOs, protected area management entities, private sector enterprises, government departments, etc.) for participatory conservation and restoration initiatives, disaggregated by gender.
    Activities:
    - Identify CBOs that are interested in participatory conservation and restoration related projects
    - Provide capacity building in developing project proposal, project management and implementation, reporting and financial management
    - Build cooperation and networks with stakeholders (other communities, government agencies, civil society organizations, private sector enterprises) to strengthen management

  - ***Indicator 6:*** Strengthening gender equality and women's empowerment in control of natural resources, as indicated by the number of projects that are contributing to equal access to and control of natural resources by women and men.
    Activities:

- Capacity building for women understanding their role and participation in equal access to and control of natural resources, especially their participation in village committees and being able to hold positions in the committee for decision making related to access and control of natural resources
- Participation of women in restoration and management of natural resources and agricultural land including enhancement planting for handicraft material such as rattan and bamboo
- Capacity building for women on organic farming, agroecology and syntropic approach in managing their farmland
- Capacity building for women in alternative livelihood activities such as beekeeping, community-based tourism, NTFP products such as handicraft and slow foods; agriculture product processing and marketing

▪ ***Indicator 7:*** Documentation of traditional knowledge related to biodiversity, as indicated by the number of systems developed or strengthened where traditional biodiversity knowledge is documented, stored and made available to local people (e.g., traditional knowledge recordings, resource classification systems, etc.).
Activities:
- Documentation of traditional knowledge and practices related to natural resources including natural resource management practices, resource classification systems etc.
- Documentation of traditional use of trees, species name in local language, cultural and historical story about these species
- Documentation of traditional land resources, inventory of flora and fauna species based on community knowledge
- Development or documentation of community protocols in resource management, governance and uses
- Documentation of traditional medicine species, uses, properties and cultural belief
- Documentation of traditional food resources, how it's harvested and prepared, and customs
- Documentation of non-timber forest products such as handicraft materials, uses and customs
- Documentation of interesting stories and traditional beliefs related to biodiversity and natural resources that can be used as interpretation presentations for development of ecotourism, edutourism or rural tourism.
- Provide documentation training to the local communities on how to collect, record, verify, store and share including data security considerations on how traditional knowledge can be accessed and used within and outside the community
- Conduct cultural identity marker workshops to explore their customs and practices, and identify key knowledge to be preserved and documented
- Production of media on traditional knowledge to be used for communication, education and public awareness (CEPA), including teaching materials for children and educational posters, to build understanding on importance of protecting biodiversity and traditional knowledge, and promote knowledge transfer

● **Outcome 1.2:** Increased adoption of renewable energy and energy efficient technologies and mitigation solutions at community level.

- ***Indicator 8:*** Livelihood co-benefits, as indicated by the number of households benefiting from alternative livelihoods supported by clean energy solutions.
  Activities:
  - Fuel-efficient cook stoves
  - Micro- and pico- hydroelectric generators for off-grid communities
  - Solar PV for off-grid communities
  - Biogas (at community level) for cooking
  - Off-grid solar-powered combined cooling, heating and power (CCHP) systems
  - Gasification system & turbine generator producing both power and biochar (for use in agriculture)
  - Solar pump
  - Gravity fed water system for household use and irrigation

  Potential areas:
  - ❖ Upgrade existing system: Kg. Buayan (83 HH), Kg. Tiku (34HH) and Kg. Terian (47HH)
  - ❖ Adoption of renewable energy systems: Kg. Timpayasa (10HH), Kg. Babagon Laut (30 HH)
  - ❖ Adoption of fuel-efficient cook stoves: Kg. Longkogungan (20HH), Kg. Pongobonon (20HH), Kg. Kalanggaan (9HH), Kg. Buayan, Kg. Tiku, Kg. Terian, Kg. Timpayasa, Kg. Babagon Laut

- ***Indicator 9:*** Strengthened resilience and increased energy security, as indicated by the number of community level renewable energy solutions (e.g., hydroelectric generators, off-grid solar PV systems, biomass gasification generator systems) operationalized.
  Potential areas:
  - ❖ Kg. Buayan: it may be proposed to install a new system or update and relocate the existing one (potential hydro power is 18.2 kW)
  - ❖ Kg. Tiku: it may be proposed to install a new system or update and relocate the existing one (potential hydro power is 36.8 kW)
  - ❖ Kg. Terian: it may be proposed to upgrade the current system (potential hydro power is 20 kW)
  - ❖ Potential micro-hydropower systems (feasibility studies required): Kg. Timpayasa, Kg. Babagon Laut

**Component 2:** Durable landscape resilience through participatory governance, partnership building and knowledge management.

- **Outcome 2.1:** Strengthened community institutions for participatory governance to enhance socio- ecological resilience.
  - ***Indicator 10:*** Participatory landscape management, as indicated by the number of landscape strategies developed or strengthened through participatory consultation and based on the socio-ecological resilience landscape baseline assessments endorsed by multi-stakeholder landscape platforms.
    Activities:
    - Carry out baseline assessments and draft the strategy
    - Consultation on the draft strategy with stakeholders
    - Formation of multi-stakeholder landscape platform
    - Stakeholder engagement plan
    - Knowledge management and communication plan
    - Capacity building plan

- Advocacy and policy reform
- Upscale projects
- Project monitoring and evaluation

- ***Indicator 11:*** Empowering women in natural resource governance, as indicated by the number of projects that improve the participation and decision-making of women in natural resource governance.
  Activities:
  - Awareness raising and capacity building for women's group in natural resource management and their participation in the village committee
  - Active participation and decision-making of women (capacity building, training sessions, meetings etc.)
  - Engagement and consultation with women's group to understand their perspective on their participation on natural resource governance
  - Identify capacity needs of the women's group and tailor specific training for them
  - Identify possible livelihood activities related to handicraft, farming, collection of resources from the forest and food processing which would also improve participation and decision-making of women in natural resource governance
  - Identify challenges that hinder women's participation and decision-making in natural resource governance and find solutions

- ***Indicator 12:*** Strengthening socioeconomic benefits for women, as indicated by the number of projects that target socioeconomic benefits and services for women.
  Activities:
  - Consultation with women on potential projects to strengthen socio-economic benefits and services
  - Conduct assessment on the capacity of the women and their interest on socioeconomic related activities
  - Design specific training that will increase women's capacity in socioeconomic related activities
  - Improve market access for agriculture products or handicrafts for women's group
  - Capacity building in sales and marketing, quality control, partnership building
  - Capacity building on financial literacy and strengthening of socioeconomic benefits of women are incorporated into all regular grants as well as strategic grants

  Potential projects:
  - Sustainable agriculture of chilli, coffee, tapioca, tuhau, asam gelugor (*takob-akob*), bambangan, durian and other fruit trees, etc.
  - Enhancement planting rattan and bamboo for handicraft
  - Rearing of stingless bees (Trigona bees) in wooded regions so they can continue their important role in pollinating flowers in the forest and contribute to honey harvests
  - Handicraft making
  - Raw agriculture material processing, including fermented and slow foods, dried products which are easier to transport and store for longer periods of time
  - Develop tree and plant nursery or backyard nurseries for reforestation/enrichment planting efforts and for sale

- ***Indicator 13:*** Landscape priority actions mainstreamed into local planning instruments, as indicated by the uptake priority actions outlined in the landscape strategies into local development plans.
  Activities:
  - Engagement with local authority and seek opportunity to synergise the landscape project with local development plan
  - Invitation of local authorities agencies as member of the multi-stakeholder platform

- **Outcome 2.2:** Enabling environment for upscaling and replication strengthened through effective knowledge management of best practices and approaches.
  - ***Indicator 14:*** Mainstreaming gender equality and women's empowerment, number of women-led projects supported.
    Activities:
    - Provide capacity building in developing proposals and engagement of women in the project management and implementation
    - Identify women's interests in activities and challenges that may hinder their participation
    - Consult with women's organizations and groups on potential activities and possible partnerships

  - ***Indicator 15:*** Upscaling initiated, as indicated by the number of dialogues organised with government entities on upscaling best practices.
    Activities:
    - Compile best practices of successful interventions that have potential to be adopted and upscaled to be shared among government agencies
    - Encourage communities of successful interventions to share about their best practices and experiences to build partnerships and support

  - ***Indicator 16:*** Knowledge shared, as indicated by the number of project and portfolio experiences and lessons systematised and codified into case studies produced and disseminated, and cumulative number of views of the case studies from the SGP website, social media, or through direct dissemination.
    Activities:
    - Capacity building for CBOs on project documentation and effective dissemination
    - Each project required to incorporate knowledge management budget to document project information, lessons learnt, case study, manual, technics etc. in the form of brochure, photo stories, fact sheet, poster, booklet, guidebook etc. that can be shared in the website, social media or as print out

**Component 3:** Monitoring and evaluation.

- **Outcome 3.1:** Sustainability of project results enhanced through participatory monitoring and evaluation.
  - ***Indicator:*** A system of facilitation, monitoring and evaluation is built to ensure active communication between grantees, support/host organizations and GEF SGP Malaysia
    Activities:
    - Development of M&E tools and system to monitor projects
    - Capacity building for CBOs on project monitoring and evaluation, including use of M&E tools

        - Each project required to incorporate M&E budget to conduct monitoring and evaluation activities
    - ***Indicator:*** Capacities of CBOs to conduct M&E, as indicated by number of CBOs who have received training and project M&E reports and findings shared with stakeholders
      Activities:
        - Capacity building for CBOs on project monitoring and evaluation
        - Reports on project progress and lessons learnt prepared by CBOs

### 1.4.2 Criteria for Project Activities

**General Criteria for Project Selection**

It is recommended that the following criteria are considered when selecting a community project:

- Potential contribution to biodiversity conservation and protection of ecosystem services in the landscape to the community and surrounding areas, and to overcoming climate change issues
- Potential contribution to addressing poverty and improving community livelihood issues
- Potential contribution towards GEF SGP OP7 core indicators
- Sufficient information and understanding about the selected landscape (e.g., geography, people, economic activities, poverty, threats and biodiversity, livelihoods, governance)
- Community readiness to take action or capabilities to implement SGP projects
- Availability of NGO partners capable of providing capacity building and guidance to the local communities
- Sustainability of the proposed project
- Scope and number of beneficiaries
- Potential for replicability and scaling up of proposed project
- Social dimensions of conservation work, e.g., NGO presence, community awareness, involvement of women, youth and indigenous peoples

**NGO/CBO Selection Criteria**

It is recommended that the selection of non-governmental organizations (NGO) or community-based organizations (CBO) as partners in the project will consider the following criteria:

- Past experiences in working with community and conservation activities.
- Perception regarding the NGO/CBO within the local community.
- Ability to successfully complete the projects reasonably within the designated time frame.
- Due consideration of the profiles of the project team members in terms of their abilities, professionalism and social attitudes.
- Allow for periodic evaluations both with regard to their professional conduct and community acceptance.

## 1.5 Stakeholder Engagement Plan

**Stakeholder Roles**

- **Local CBOs**: developing and implementing project interventions.
- **CSOs/NGOs**: providing technical assistance in project development and management, delivering training and other capacity building support services. policy reform and advocacy.
- **Federal ministries**: advocating for policy reform regarding participatory conservation and low-emission development, e.g., community forest management.
- **PA management entities (including Sabah Parks and Sabah Forestry Department)**: cooperating on participatory conservation initiatives with local CBOs and communities.
- **Local government units**: facilitating community development and conservation initiatives, sustainable livelihood initiatives, solid waste management, gender mainstreaming, inclusion of

Indigenous Peoples, etc.

- **Academic institutes and government agencies**: providing technical assistance.
- **Private sector**: strengthening or establishing new partnerships with CBOs, e.g., eco-tourism operators, supermarkets.
- **UNDP**: advocating for policy reform regarding participatory conservation, facilitating knowledge management and replication through linkages with other projects and initiatives; sharing best practices, lessons learned, and innovative approaches.

### 1.6 Capacity Building Plan

Anticipating that many CBOs or community groups may not have the experience and knowledge in applying and implementing their own projects, capacity building training is necessary to assist with project implementation and administration. This includes:

- Proposal writing (proposal development, budgeting)
- Project management (planning, implementation, reporting, monitoring and evaluation)
- Financial management (budgeting, bookkeeping, reporting)
- Knowledge management (documentation, data safekeeping)

For the 10 microgrants provided under the strategic grant held by PACOS, training and mentoring sessions will be provided by PACOS as the host organization. For CBOs with their own grants under GEF SGP Malaysia, it is recommended that they include a budget for capacity building if they lack experience in implementing a project, especially with SGP and with the amount of funding.

Substantive support for activities requiring specific technical knowledge for activity implementation such as in conservation, restoration, and livelihood initiatives can be included in their respective SGP proposals according to their plans and priorities, and facilitated through linkages with strategic stakeholders and partners with the necessary skills and expertise. For the 10 microgrants, basic capacity building training will be provided in these topics, namely agroecological practices, participatory conservation and restoration techniques, renewable energy and energy efficient technologies, social enterprise and marketing, and documentation of traditional knowledge. However, a certain amount is required to be put aside in the proposed budget (about RM2,000-RM4,000) to attend the training by PACOS and/or SGP for logistical costs such as transport, accommodation and food during travel. The fund set aside can be also used to attend other training. The following is a tentative timeline for the trainings that will be provided by PACOS for the microgrants:

| **Activity** | **Tentative Timeline** |
|---|---|
| Proposal development workshops for community projects | Between January to February 2024 |
| Mentoring sessions for 10 selected community proposals | Between February to April 2024 |
| Capacity building on project management (2 series) | Between March to May 2024 & August to October 2024 |
| Capacity building on financial management | Between June to August 2024 |
| Capacity building on agroecological practices | Between May to July 2024 |
| Capacity building on participatory conservation and restoration techniques and renewable energy and energy efficient technologies | Between April to June 2024 |
| Capacity building on social enterprise and marketing (2 series) | Between May to August 2024 |
| Capacity building on documenting traditional biodiversity knowledge | Between July to October 2024 |

The role of GEF SGP and the host organization is to facilitate and support CBOs in achieving their proposed plans and priorities by providing guidance and resources for them to build their understanding and capacity so that they themselves will be able to plan and implement community collaborative management and sustainable livelihood interventions rather than just acting as mere beneficiaries which will be more sustainable in the long run.

### 1.7 Upscale Projects and Community Projects

Under the strategic grant, funding has been allocated for 10 community project proposals in 2024 and for at least 2 upscale projects in 2025. These upscale projects can include extension or co-financing for existing projects or continuity of previous projects such as projects under Sabah Parks and other organizations around the Crocker Range. The following table shows the action plan by PACOS for the implementation of these upscale and community projects:

| **Activity** | **Tentative Timeline** |
|---|---|
| **Community Projects** | |
| Proposal development workshop for community projects | Between January to February 2024 |
| Mentoring session for 10 selected community proposals | Between February to April 2024 |
| Implementation of community projects | May 2024 - April 2025 |
| **Upscale Projects** | |
| Outreach activities to promote community practices among government, research and technical support institutions, foundations, and NGOs; and facilitate CBOs/NGOs in identifying and fostering potential partnerships to upscale successful interventions. | Between October to December 2024 |
| Implementation of upscale projects | January - September 2025 |

**Potential projects for upscaling**

- Sabah Parks Kinabalu Ecolinc Project involving restoration of degraded landscapes, establishment of community-conserved areas and development of community livelihoods through sustainable agriculture and tourism encouraging forest management can be further built upon in the existing sites (6 in CRBR – Kg. Wassai, Kg. Toboh Pahu, Kg. Toboh Lama, Kg. Lokos, Kg. Tiong Simpodon, Kg. Kotunuan Lama) or replicated in other areas.
- Sabah Renewable Energy Rural Electrification Roadmap project (Sabah RE2): There is potential to fund renewable energy development to improve community access to energy and provide alternative livelihood options. Among the 9 villages identified that are in the vicinity of the Crocker Biosphere Reserve, 3 (Kg. Longkogungan, Kg. Pongobonon and Kg. Kalanggaan) are currently pilot site for electrification and related livelihood development while another 3 (Kg. Terian, Kg. Buayan and Kg. Tiku) have already been studied as feasible for the upgrade of micro-hydropower systems.
- Ginger entrepreneurship project conducted by Good Shepherd Services which used the method of utilizing available resources to improve household income and quality of life through transformation of raw materials into higher value products can be replicated in other villages.

### 1.8 Monitoring and Evaluation Plan

In developing their individual projects, each grantee will need to identify the specific landscape strategy outcome which they will be contributing to and the corresponding indicators they will need to monitor. Periodic project progress reports will inform on the progress towards achieving the outcomes. It is also suggested that each project will conduct a baseline assessment among beneficiary communities using the COMDEKS SEPLS resilience indicators in the beginning of their project (in the first 3 months of implementation) and the same indicators will be assessed again as part of the final project evaluation at the end of the project.

The following are the minimum standards that shall be applied for individual grant monitoring and evaluation:

- ***Ex-ante Visits:*** The project management team would undertake ex-ante visits on a regular basis to grant-requesting organizations upon grant approval by the SGP National Steering Committee (NSC) and prior to the signature of the MOA between the Implementing Partner and the grantee.
- ***Field Monitoring Visits:*** Every project should be visited at least twice in its lifetime, upon receipt of the first progress report from beneficiary organizations and during the following year. NSC members with relevant expertise in project-related technical areas may join the NC during these visits as appropriate.
- ***Progress Reports:*** Beneficiary organizations should submit half-yearly progress reports to the NC along with a financial report. A forecast of resources needed in the upcoming period should be submitted by the grantee to the NC as a requirement for disbursement of the next instalment.
- ***Final Project Evaluation Report:*** Beneficiary organizations should submit a final report summarizing global benefits and other results achieved, outputs produced, and lessons learned. The final report should also include a final financial statement.

Regular monitoring will be conducted by PACOS on the microgrant community projects and upscale projects under the strategic grant held by PACOS during the whole implementation period. This will be done through online communications and field visits every quarter to support the communities in monitoring and evaluating the results of their projects.

### 1.9 Knowledge Management Plan

The knowledge management approach involves assessing and sharing lessons learned and best practices from Crocker Range Biosphere Reserve Landscape based on evaluation of implementation results and their contributions to Global Environment Benefits (GEB), local development objectives and landscape level outcomes, including the development of social capital. Project activities will be documented and securely stored using electronic means in a database. For community projects under the strategic grant, training will be provided to CBOs/grantees on collecting, recording and documenting knowledge and experiences of community initiatives. Information will be extracted from the individual case studies produced by the grantees in the projects into consolidated knowledge products highlighting best practices on adaptive management for landscape resilience with at least one case study highlighting the role of women. This may include production of posters, booklets, videos, and short photo stories. A case study of the landscape planning and management experience in Crocker Range landscape will also be developed to highlight the processes of stakeholder participation, as well as the progress toward the targets selected during landscape planning, using the

Satoyama Resilience Indicators. The case study and other knowledge products will be disseminated among relevant stakeholder groups through appropriate communication techniques, including print media, social media and other local media outlets, stakeholder gatherings, exhibitions and other exchanges. The following is the tentative timeline of each activity under the knowledge management outcome of the strategic grant:

| **Activity** | **Tentative Timeline** |
|---|---|
| Training to CBOs on collecting, recording and documenting knowledge and experiences of community initiatives | At beginning and end of project implementation<br>(May 2024 & February 2025) |
| Production of knowledge products highlighting best practices | Between November 2024 to April 2025 |
| Development of case study of Crocker Range landscape planning and management experience | Between November 2024 to April 2025 |
| Dissemination of knowledge products and case studies among relevant stakeholders | Between May to December 2025 |

The knowledge obtained from project experiences and lessons learned will be socialized through SGP's well-established national network of stakeholders and SGP's global platform, and it will be used in replicating and upscaling successful initiatives to support sustainable socio-ecological production activities at the country, landscape, and community levels. With the case study and knowledge products, the SGP Country Programme will be able to inform and influence policy at the local, state and national levels by demonstrating already working models of community-based management of landscapes and natural resources.

For the same purpose, all CBOs (except for those with microgrants under the strategic grant) are required to allocate a certain amount of their proposed project budget for production of knowledge products (about RM5,000 to RM10,000 depending on the contents) as well as for the translation of their final report into English (about RM2,000) so that the knowledge obtained from project experiences and lessons learned can be shared. Knowledge sharing and replication will help ensure that the impacts of the project are sustained and expanded, generating additional environmental benefits over the longer-term.

### 1.10 Risk Management Plan

| Risks | Mitigation measures |
|---|---|
| Low number of project proposals submitted | 1) Ensure enough publicity and do legwork to pass information to communities<br>2) Proposal template has simple guidelines or simple format that is easy for CBOs to understand and use<br>3) Brief and guide interested CBOs through the proposal development process |
| CBOs lack technical and management capacity to effectively implement project | 1) Provide capacity building training to grantees<br>2) Encourage collaboration with technical partners that can assist and guide CBOs through the process<br>3) Conduct monitoring and support visits to provide assistance and guidance |

| | |
|---|---|
| CBOs lack capacity in documenting and reporting activities | 1) Provide capacity building training<br>2) Provide guidelines and simple format that is easy for CBOs to understand and use<br>3) Encourage youth involvement if illiteracy is a factor |
| Lack of women and youth participation due to family commitments and other priorities | 1) Talk to community leaders to encourage women and youth to participate<br>2) Provide support for women who have small children such as childcare |
| Planned activities delayed or cannot be implemented due to weather issues, farm work and social events in the community | 1) Planning must be culture and social sensitive<br>2) Planning must be flexible and include contingency plans in case activities cannot be implemented as planned |
| Unable to work with government agencies due to misconceptions and prior conflicts | 1) Engagement with related government bodies to build understanding, find common ground and seek cooperation and technical support |