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SGP TECHNICAL SERIES

HABITAT AND SPECIES MANAGEMENT:

Technical details on implementing reforestation, wetland management, and other habitat conservation strategies

Introduction

The diversity of species and ecosystems in the ASEAN region provides valuable services that are crucial to the overall development of the region. They are important not only to the booming economic activities at the national and regional levels; they are also central to the rich natural and cultural heritage of the ten ASEAN Member States (AMS).

Healthy and thriving ecosystems are necessary for the planet to sustain the needs of its inhabitants. In recent years, it also became apparent that maintaining the health and diversity of these ecosystems are vital in building resilience against climate and health crises. Thus in 2021, the United Nations Decade on Ecosystem Restoration was launched to call for the "protection and revival of ecosystems all around the world" (UNESCO, 2021). It urges member states to work together in halting the degradation of valuable ecosystems and restoring them in accordance with global goals.

Establishing well-managed protected areas to ensure the health of important habitats and ecosystems is among the tasks of the ASEAN Centre for Biodiversity (ACB). The ACB is the Secretariat of the ASEAN Heritage Parks (AHP) Programme, which was established to highlight the importance of a select group of protected areas in regional and global efforts in biodiversity conservation. It provides support to 57 recognised outstanding protected areas in the region. A vital component of the programme includes assisting surrounding communities in establishing sustainable livelihoods so that they can be active partners in effectively managing these protected areas.

The draft Regional Action Plan for ASEAN Heritage Parks (AHPs) (2023–2030)[1] recognises the AHPs' staggering contribution to significantly reduce the risk of extinction of critically endangered species. Understanding the threats to species and ecosystems through biodiversity research and monitoring enables the AHPs to develop sensible interventions, thus making it an important priority in management planning and implementation. This is likewise aligned with the 2030 Action Target 20 of the Kunming-Montreal Global Biodiversity Framework Targets[2] and Goal 4.4 of the Programme of Work on Protected Areas.

Meinmahla Kyun Wildlife Sanctuary (MKWS) is a refuge for resident and migratory water and shore birds

[1]The draft Regional Action Plan for ASEAN Heritage Parks (2023–2030) was developed to provide guidance in the development of well-governed, well-designed, and well-managed ASEAN Heritage Parks to ensure integration into the global network and contribution to globally agreed goals.

[2]The Kunming-Montreal Global Biodiversity Framework (KM GBF) or the Biodiversity Plan, which was adopted by 196 countries at the UN Biodiversity Conference (COP15) in December 2022, aims to halt and reverse nature loss amidst a dangerous decline in nature threatening the survival of one million species and impacting the lives of billions of people.

The Small Grants Programme by the ASEAN Centre for Biodiversity (SGP) and its contribution to biodiversity conservation

The Small Grants Programme by the ASEAN Centre for Biodiversity (SGP) was established to support two AHPs in Indonesia and four AHPs in Myanmar. This was made possible with a significant grant from the Federal Government of Germany through the KfW Development Bank (KfW). The SGP aims to improve biodiversity protection; improve the livelihood of the communities directly dependent on AHPs; and strengthen the role of the ACB in promoting biodiversity protection among AMS. The SGP particularly ensures that the livelihood support provided is in line with the needs and interests of the communities in the AHPs.

SGP I commenced in 2014 to support the implementation of the national component in Indonesia and Myanmar, and the regional components of the programme, with an overall grant amount of EUR 10 million. A range of interventions were implemented, including those that focused on habitat and species management.

The SGP has eight thematic areas, namely ecotourism, habitat and species management, community development, community outreach and conservation awareness, law enforcement, wildlife research and monitoring, general park management, and sector policy development.

Since 2014, SGP worked with various grantees from selected AHPs in Indonesia and Myanmar to improve biodiversity conservation through effective management, as well as bolster livelihood support for the communities within and around the protected areas.

In the Indawgyi Lake Wildlife Sanctuary (ILWS) in Myanmar, an SGP intervention helped collect crucial biodiversity information such as aquatic plant, vegetation, birds and habitat, and fishery for the scientific justification for zoning purposes. Using the results from the bird habitat and fishery surveys, the core zone was demarcated in the lake ecosystem.

Local communities in Meinmahla Kyun Wildlife Sanctuary actively participated in the SGP-supported mangrove restoration project

Meanwhile, in Meinmahla Kyun Wildlife Sanctuary (MKWS), also in Myanmar, the mangrove restoration project enrichment planting and gap planting activities were carried out to help in the restoration and regeneration efforts of the vital mangrove ecosystem. The project also aims to contribute to the mitigation of climate change by restoring the degraded mangrove forest of MKWS, which serves as a natural carbon sink. Mangrove conservation activities in the AHP also benefited tremendously from the active collaboration with the community, effectively combining the restoration project with efforts to uplift their livelihood and economic activities, which are also largely dependent on biodiversity.

In Indonesia's Gunung Leuser National Park (GLNP), various grantees such as Yayasan Orangutan Sumatera Lestari – Orangutan Information Centre (YOSL-OIC), Yayasan Pesona Tropis Alam Indonesia (PETAI), and Yayasan Ekosistem Lestari (YEL) endeavoured to create a wildlife corridor and extend wildlife habitat in conservation areas together with various stakeholders from the surrounding communities.

On the other hand, grantees such as Yayasan Konservasi Way Seputih (YKWS) and Yayasan Forum Rembug Desa Penyangga (FRDP) in Way Kambas National Park (WKNP) are faced with a different challenge of managing habitats and wildlife. Villages in the buffer zone areas of the national park are part of the elephant home range. The human-elephant conflict caused damage to settlements and agricultural lands, and in an isolated case, resulted in the death of a villager (YKWS, 2022). By establishing mitigation measures and standard operating procedures (SOPs) in managing elephants, putting in place early warning systems, and strengthening alternative livelihoods for the communities, the SGP grantees were able to manage and integrate the presence of elephants to their economic activities.

The Elephant Training Center (PLG) at Taman Nasional Way Kambas or Way Kambas National Park trains elephants so they can assist in educational and patrolling activities

Through rigorous monitoring and surveys, partners were able to gather voluminous data, including the presence of critical species such as the critically endangered Sumatran elephant *(Elephas maximus* ssp. *sumatranus),* Sumatran rhinoceros *(Dicerorhinus sumatrensis), Sumatran orangutan (Pongo abelii),* and Sumatran tiger *(Panthera tigris* ssp. *sumatrae),* to name a few. Identification of wildlife conflicts, land cover surveys and analysis, and identification of disaster vulnerabilities were also conducted in GLNP together with various conservation partners. In WKNP, maps and SOPs to mitigate the human-elephant conflicts were developed through rigorous collection and analysis of land cover and land use maps using the unmanned aerial vehicle method and complemented by a series of focus group discussions (FGDs) among the villagers. These data are crucial in the identification of conservation sites, as well as the threats that need to be addressed.

Best Practices

Habitat and species management is among the main priorities of SGP in Indonesia and Myanmar, which are home to some of the most iconic wildlife such as the Sumatran tiger, Sumatran elephant, and orangutan, among other species. Numerous efforts have been made to protect these species, restore and conserve their habitats, and mitigate conflicts with the human communities around the protected areas. AHP authorities, in collaboration with the community and other stakeholders, have been carrying out capacity building activities for human-wildlife conflict mitigation; and providing tools and structures such as enclosures to ensure the protection and survival of wildlife species. SGP-supported interventions further strengthened the efforts for wildlife research and monitoring by providing equipment such as drones that utilise GPS technology. These were particularly useful in monitoring surveys for the Sumatran rhino in WKNP and monitoring land cover for restoration areas in GLNP. Camera traps, binoculars, satellite phones, and artificial intelligence software were among the other tools provided for the national parks to aid in their wildlife research and monitoring activities (Penabulu Foundation, 2023).

Various forms of support for livelihood development among the communities are likewise deemed part of habitat and species management, as they ensure that local stakeholders have alternative sources of income that would not impact on the habitat and the wildlife species within.

One of the projects under SGP I is the restoration of degraded forests around the Sekoci Lepan Resort area in GLNP and the establishment of additional biodiversity corridors together with stakeholders.

Case study: Reducing pressures on AHPs by providing alternative sources of livelihood

Identifying options for livelihood support to encourage conservation of biological resources

In Myanmar's Alaungdaw Kathapa National Park (AKNP), targets for habitats and key wildlife species conservation were identified together with local stakeholders and were indicated in the five-year collaborative management plan (CMP) developed with SGP support. This co-management approach considered inputs from the park staff on how to address threats to these targets. They also consulted the local communities and other stakeholders for broader participation and effective implementation of the park management plan.

AHP staff at Alaungdaw Kathapa National Park worked with their partners in crafting the park's CMP

By strengthening collaboration among the various stakeholders, local communities who are directly dependent on the ecosystem services of the protected areas become important actors in the sustainable use of biodiversity. Socio-economic surveys and participatory land use planning process were conducted to identify livelihood development and capacity building to enhance collaboration with the communities.

Like AKNP, MKWS has rich biodiversity that provides the needs of the communities living around the protected area. Unfortunately, the unabated use of biological resources and their impact on habitats and wildlife are increasingly intensifying, hence the need for a comprehensive strategy on curbing these threats.

Restoring mangrove forests, or any other type of ecosystems should take into consideration the socio-economic conditions of the communities around them (Yong, 2015). Social and physical infrastructures that can help them reduce their dependence on biodiversity would also contribute to its conservation. Agricultural activities including cash crop or animal husbandry provides income for the household while the provision of simple technology such as bottle-based cooking fuel and solar-cookers can greatly reduce the pressure on forests to supply the energy needs of the community.

Other alternative livelihood or economic activities being implemented in AHPs include ecotourism, sustainable agriculture development, and sustainable fisheries.

Promoting sustainable industries

Indawgyi Lake supports the livelihood of many small-scale fishers in the community, most of whom are local indigenous people using only simple tools and equipment such as gill nets and prawn traps. However, the influx of migrants from outside of the Indawgyi area is causing pressure on the ecosystem, which leads to the depletion of fish stocks.

To help regulate fishing activities, buffer zones as well as fish conservation zones have been established to help the recovery and restoration of biodiversity.

Community-based fisheries management is among the strategies to manage fisheries

Fisherfolks at Indawgyi Lake Wildlife Sanctuary transform fresh catch from the sea into various products like fermented fish and shrimp paste

sustainably and in a participatory manner. In ILWS, the fishing communities, the Fisheries Department, and the ILWS management agreed on the fishing zones, as well as the fishing tools that will not harm or threaten the lake ecosystem.

To further augment the conservation efforts and livelihood enhancements, support for non-fisheries industries was also provided to help lessen the economic dependence on fishing. One of the most notable examples is the development of the fermented fish and shrimp paste industry. By training community members, particularly women, they can reduce the volume of fish catch and focus instead on value addition. The ACB and Friends of Wildlife (FoW) provided support such as machines and other equipment to increase productivity. It also serves as an additional income generation mechanism, as women provide shrimp grinding services to their neighbours at an affordable fee.

Another non-fishery livelihood industry that ILWS promotes is sustainable agriculture and value chain development. The sustainable agriculture being practised by the Indawgyi Natural Farming Association (INFA) is not only beneficial to the environment with its lack of use of harmful agricultural chemicals, it also has economic advantages. Production costs are lower without expensive chemical inputs and the organic production process adds a premium that can fetch better prices than the chemically grown products. Farmers from INFA are also practising the participatory guarantee system, a collaborative organic certification system that mobilises farmers and communities to inspect and ensure the organic quality of the product and assures the consumers of its safety as well.

Case study: Protecting and constructing ecological corridors for biodiversity conservation

The increasingly unsustainable use of biological and natural resources by the ballooning population has left the vital ecosystems and biodiversity degraded and fragmented. The Convention on Biological Diversity (CBD) has pointed out the "importance of strengthening ecological coherence and resilience" in ensuring biodiversity conservation and sustainable development (CBD, 2006). In particular, the CBD emphasises the crucial role of protected areas, and its comprehensive, effectively managed, and ecologically representative national and regional systems, such as the AHPs, in addressing biodiversity loss and ecosystem degradation.

Biodiversity corridors connect isolated patches of habitat and help conserve local species populations

YOSL-OIC conducted a series of surveys to identify various species in the Karo and Langkat Districts

Human populations will always be reliant on biodiversity for the ecosystem services it provides. Thus, measures to ensure its sustainable use are continuously sought and implemented to maintain the integrity of protected areas. By appointing "natural zones that function as a coherent, self-regulating whole" it can provide balance to the zones that are intensively used by the communities. These zones also aim to address habitat fragmentation that renders species vulnerable by "limiting opportunities for dispersal, migration, and genetic exchange" (CBD, 2006).

One way to promote ecological coherence is through the establishment of biodiversity corridors that connect 'isolated patches of habitat' and help conserve local species populations. The CBD describes biodiversity corridors as "human-managed connections" that can vary from tunnels for amphibians to intercontinental flyways for migratory birds.

Biodiversity corridors serve two main goals, which are (1) maintaining the efficient functioning of ecosystems as a means of facilitating the conservation of species and habitats and (2) promoting the sustainable use of natural resources to reduce the impacts of human activities on biodiversity and/or to increase the biodiversity value of managed landscapes (Bennett and Wit, 2001).

The biodiversity corridor in the Karo and Langkat Districts

In GLNP, SGP grantee YOSL-OIC worked towards increasing the protection of biodiversity through restoration activities that can help undo the damage to national park forests and extend the habitat of wildlife species such as the orangutan, elephant, and tiger. This kind of intervention also aims to contribute to the livelihood development of the community by providing alternative economic activities and additional income.

The creation of additional biodiversity corridors began with a series of surveys to identify the biodiversity in the area, as well as to determine the impact of the road development on the habitat and the species within. The road connecting Karo District and Langkat District cuts across the forest, fragmenting the wildlife habitat in that area of GLNP.

Monitoring stations were set up in the Karo and Langkat Districts to gather data for ecosystem restoration

To identify the potential location for the biodiversity corridors, the grantee conducted several assessment activities, which yielded information on the identification and inventory of wildlife species; and vegetation analysis.

In particular, the three biodiversity surveys conducted along the Karo-Langkat Road showed that there are:

- 178 bird species (11 are protected species)
- 12 amphibian species from five families
- 8 reptile species from five families
- 83 plant species (30 species are categorised as Least Concern species or LC, one species is Vulnerable or VU and one species is Data Deficient or DD)

Additionally, information on the orangutan population was also gathered, estimating the wildlife at 1.33 orangutan per square kilometre.

Two further assessment activities informed the GLNP authorities about the movement of wildlife on the Karo-Langkat Road. Orangutans, as well as other terrestrials such as golden cats, Sumatran serows, deer, and Sumatran tigers were recorded crossing the road through the canopy bridge. Human activities, particularly the movement of vehicles were also recorded to have a total of 7,890 vehicles passing the road each week, with 2,080 as the highest number of vehicles passing per day. On Sundays, the average number of passing vehicles is 1,043 vehicles per day or 70 vehicles per hour.

Through these assessments, the authorities were able to identify 11 potential additional locations for a natural canopy bridge for arboreal animals, while one location is recommended to be built as a terrestrial wildlife corridor or bridge. They were likewise essential in the restoration of degraded forests at Sekoci Lepan Resort in GLNP. Reports show that the orangutan and wildlife habitat increased by 50 hectares as the corridor was able to connect the primary forest area, thus ultimately contributing to the conservation of vital ecosystems and species.

The scientific data gathered from the surveys served as inputs to the Technical Guidelines that GLNP authorities used to implement mitigation approaches and as guidance in decision-making processes regarding biodiversity protection and management in the forest blocks along Karo-Langkat Road. Monitoring stations and learning centres that were re-established under the project likewise provided critical data for ecosystem restoration. Among the monitoring tools used in the corridors are camera traps and bioacoustic analysis tools.

Case study: Community-led reforestation and forest protection initiatives

One of the SGP's micro-grant programmes in GLNP aims to contribute to ecosystem restoration through education, awareness, and skills training among key stakeholders. By establishing the Conservation Field School, the community gains knowledge and understanding of the importance in keeping the forests intact, as well as providing livelihood opportunities that can allow them to avoid encroachment.

The Conservation Field School or "school without walls" teaches and demonstrates to the community members the value of using organic materials, which are abundantly found in the environment. These are used as organic fertilisers for their agricultural production and also help the farmers reduce their production costs as they would not need to buy expensive chemical agricultural inputs.

Having the understanding and participation of the community is vital to implementing broad reforestation efforts. In fact, due to the conservation partnership in the area, the project successfully planted 15,000 multi-purpose tree species (MPTS) seeds as part of their ecosystem restoration initiatives. Reports show an 80 per cent survival rate for the MPTS seeds. Maintaining these seedlings would require sustaining a robust partnership among stakeholders in the national park and the community.

Meanwhile, in ILWS, SGP grantee Indawgyi Environmental Conservation and Development Association (IECDA) addressed the challenges in the protected area by focusing on awareness-raising and patrolling, along with creating community-managed forests in buffer areas. IECDA supported the formation of community forest user groups (CFUGs) to help address concerns about forest degradation through the Community Forestry Development Project. Under this initiative, 160 acres of degraded forest land were restored with more than 80,000 seedlings and 27,000 direct sowing, while two acres of the communal land at Shwe Taung Pagoda and along the route from Ywar Thit Village to Manakhaw Village were afforested with 521 seedlings.

The Conservation Field School assists in educating people about reforestation

Members of community forest user groups helped restore degraded forest lands in Indawgyi Lake Wildlife Sanctuary

To ensure the sustainability of these initiatives, IECDA sought the support and participation of the community by conducting workshops and holding consultations regarding the community forest location, the kind of plant species to be grown, and the plans for the future of the project. This community collaboration is further complemented by awareness-raising on environmental conservation and providing capacity building and skills training for community empowerment.

Establishment of monitoring station and restoration of learning centre

The monitoring station in the Halaban restoration site in GLNP helped not only in the documentation of wildlife species and human activities in the forest area; but also in mitigating potential wildlife crimes such as illegal logging and poaching. Sometimes, patrol teams would seek shelter in the stations and their presence, along with the monitoring teams and GLNP officers, act as a deterrent to illegal loggers and encroachers, thus minimising the threats to wildlife. This arrangement also helps in monitoring the impact of restoration and conservation efforts, including the protection of 500 hectares of restored forests in the national park.

The station also served as a biodiversity and restoration learning centre, which contributed to the education and awareness-raising among different stakeholders who are keen to join in conservation activities. For instance, university students took part in training and monitoring activities, gaining further knowledge and understanding of biodiversity conservation.

The book Jenis-jenis Pohon Asli TNGL was published by Balai Besar Taman Nasional Gunung Leuser

Such a multi-stakeholder approach is made possible by using simple and popularised language for biodiversity survey methods and instruments. This also allows field staff from GLNP to carry out periodic monitoring and surveys independently.

The results from these surveys were taken into consideration in improving the restoration of the ecosystem in the conservation partnership area. Data and information that were yielded are then developed into knowledge materials such as *Jenis-jenis Pohon Asli TNGL,* a 124-page book presenting 113 native tree species in GLNP from 42 families. Two hundred fifty copies were produced and disseminated in both physical and online platforms. The biodiversity survey and monitoring results also served as critical inputs in scientific journals which intend to disseminate the results, findings, conclusions, and implications of the survey activities to the public. Field officers are credited as researchers in the publication, giving a sense of pride, fulfilment, and ownership that further inspire and motivate the monitoring team members.

Case study: Mobilising communities as agents of change

Collaboration with communities through community restoration group and participatory patrolling

Monitoring stations also contributed to boosting community collaboration. For instance, YOSL-OIC formed a monitoring team consisting of members of a local community group called the Leuser Protective Farmers Group (KETAPEL). Through the support of SGP, KETAPEL members who were previously skilled in conducting restoration activities, turned into monitoring teams, gaining additional knowledge and skills on identifying tree and wildlife species, monitoring with the use of camera traps, conducting orangutan surveys, and monitoring birds.

Through extensive communication and coordination with the local communities, GLNP management along with their non-governmental organisation partners were able to garner the support and cooperation of the stakeholders around the protected area. The change in the behaviour and attitude of the people in the Barak Induk area was positive — before they were closed off, suspicious, and resistant, now they have become one of the cornerstones of various restoration and conservation activities in GLNP. They participate in skills development training which includes topics on introduction to tree species, seedling production, tree planting, and maintenance. Four members were selected to form a restoration field team to help the restoration coordinator in the day-to-day activities such as nursery and seedling production, and tree planting and maintenance.

Another example of effective collaboration is the formation of community patrols, such as those of Kelompok Tani Hutan (KTH) Rabala One Jaya where community members actively join in patrolling along ± 7 kilometre areas, bordering PT Great Giant Pineapple and WKNP (Resort Rawa Bunder). This is also being done in ILWS in Myanmar, where forest department rangers, fisheries department staff, police, and local villagers are jointly patrolling around the AHP.

In WKNP, participatory community patrol activities are valuable components to habitat conservation and species protection. They help prevent wild forest fires, deter wildlife crimes and mitigate human-wildlife conflicts. For example, in Tegal Yoso (Wana Liman) Village, elephants are already reaching the human settlements, inadvertently causing damage to agricultural production areas. As a response, eight elephant patrol teams were formed to address the human-elephant conflicts in a more coordinated manner. An SOP serves as the community's guide in handling human-elephant conflicts, and the team deems it replicable for other villages or communities to utilise as well.

The increased effectiveness and efficiency in patrolling and mitigating the human-elephant conflict have, in fact, shown an impact in increasing community agricultural production by 20 per cent as damages to agricultural lands have been minimised.

The mahouts at the Tangkahan Special Animal Training Center take care of rescued elephants

Case study: Conservation of charismatic species

The Sumatran elephant, a keystone species, significantly impacts ecosystems by clearing forest areas, dispersing seeds, and creating water holes. Unfortunately, they face threats from poaching and human conflicts.

In Gunung Leuser, the Veterinary Society for Sumatran Wildlife Conservation or VESSWIC (formerly known as the Ganesha Aksara Sumatra Foundation) protects critically endangered Sumatran elephants, specifically the rescued elephants at Tangkahan Village in North Sumatra. Their project involves community groups directly in *ex-situ* elephant conservation.

The Tangkahan Conservation Response Unit (CRU) manages the Tangkahan Special Animal Training Center (PLSK), the community group that cares for elephants. With support from SGP, it provides the three-hectare grass garden that supplies food for 10 elephants at the PLSK. They also maintain the cleanliness of the rearing facility, as well as process elephant dung into compost for the grass garden. Regular deworming, tetanus vaccination, and vitamin administration are also conducted.

The Tangkahan Tourism Institute, another community partner, trains tour guides and mahouts (elephant trainers and caretakers) to promote ethical elephant tourism. VESSWIC also launched a guidebook on *Healthy Tourism with Elephants.*

The community recognises the economic value of elephants in Tangkahan. Their participation contributes to wildlife protection, habitat preservation, and community development. However, with the elephants in the national parks existing closely with the human communities, it cannot be helped that conflicts arise.

Most villages are near the national park, and with a mere 4-kilometre border, elephants inadvertently meander to human settlements and destroy the farms and gardens cultivated by the local farmers. In Tegal Yoso Village, elephants destroyed an entire plantation of corn and left three people dead including an Elephant Response Unit (ERU) member and a ranger who was accidentally trampled by an elephant.

YKWS estimates that every year, 174 hectares of various crops such as corn, cassava, and rice are being damaged by wildlife. These crops are being cultivated for family consumption and additional source of income. To address this challenge, SGP grantees established mitigation measures and early warning systems to manage the human-elephant conflict.

In Labuhan Ratu IX, the patrollers previously used fireworks to scare off the elephants and warn the communities. But the use of fireworks has since been disallowed as it can be hazardous. Yayasan Forum Rembug Desa Penyangga (FRDP) then coordinated with the Wildlife Conservation Society to establish an early warning system to alert the village of approaching elephants.

Pak Suyuti and Pak Parmin assist in human-elephant conflict cases at Labuhan Ratu IX in Way Kambas National Park

They also used infrastructure barriers such as concrete canals and riprap walls along the 4-kilometre national park border. Natural barriers such as lemongrass and *salak* (snake fruit with thorny trees), as well as honeybees were also utilised. FRDP installed bee logs in different locations so that honeybees will sting the elephants who disturb the bee hives. The honey bee system was devised to prevent elephants from leaving the forest and entering the village.

Community patrols from the village and the Masarakat Mitra Porhut or MMP (Forest Police) act as community forestry partners that jointly conduct patrols along the national park and the village borders. They conduct training to identify strategies that will deter the elephants from crossing to the village and damaging their crops. This collaboration, supported by the SGP has resulted in a more organised management of the human-elephant conflict. Pak Parmin, a member of FRDP, has high hopes for the sustainability of such collaborative innovations to ensure the harmonious coexistence of both humans and elephants.

In WKNP, the buffer village of Braja Luhur is another testament to the complex relationship between elephants and humans.

With support from SGP, KTH Trans Api is working to minimise the negative interactions between elephants and local communities. The group Trans Api has undertaken a comprehensive capacity building initiative. Forest farmers and community members have participated in training sessions covering *Introduction to Elephant Behavior and Handling Negative Interactions Between Elephants and Humans.* These practical workshops include simulations of managing such encounters through an early warning system.

To bolster mitigation efforts, Trans Api has established monitoring huts strategically placed at key entry and exit points for elephants. These huts address areas previously lacking proper surveillance. Additionally, the patrol teams now benefit from 40 packages of personal protective equipment, including boots, raincoats, and headlamps, enhancing their safety during patrols.

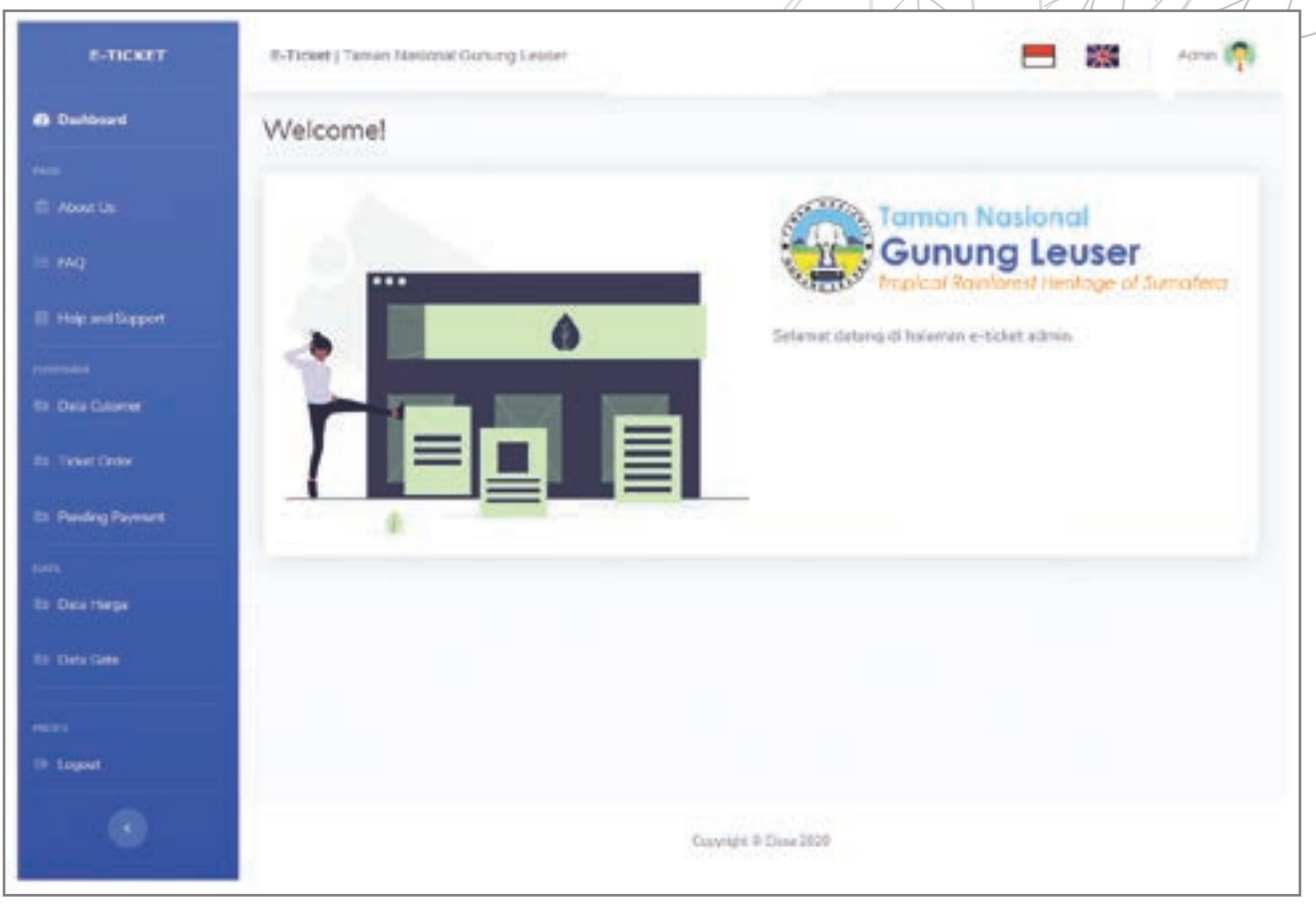
Members of the KTH Trans Api ventured into duck farming to help reduce pressures on Way Kambas National Park's forests

KTH Trans Api is also raising awareness among villagers about the importance of living harmoniously with wildlife. By educating them about elephant behaviour, habitat, and conservation, they empowered the community to take proactive steps.

Instead of resorting to illegal activities within WKNP, villagers shifted their focus to sustainable livelihoods. Duck farming and salted egg production became a viable alternative, reducing the need for encroachment into elephant habitats.

Currently, KTH Trans Api manages 250 ducks in a dedicated cage, with ongoing cultivation efforts. Looking ahead, the allocation of resources will be as follows: 10 per cent for mitigation activities, 30 per cent for community members, and 50 per cent for business development.

Duck eggs produced by KTH Trans Api are turned into salted eggs



The management of Gunung Leuser National Park uses an e-ticketing system across tourist sites

Case study: The use of technology to support efficient and integrated park management

The SGP grantee PETAI, together with various stakeholders from GLNP, developed web-based applications that aim to facilitate the management of data and information needed in planning, implementing, and monitoring the evaluation of GLNP management. An accessible and user-friendly electronic platform can help establish GLNP as a source of knowledge for Sumatran tropical rainforests, strengthen the park management, and ultimately conserve the rich biodiversity in the protected area.

These applications — the E-Pustaka, E-JaSa and E-Ticket — support the efficient and integrated GLNP management.

'E-library' or 'E-Pustaka' are used by the visitors to access a wide range of documents related to the biodiversity in the park. It collects and digitises documents such as reports; survey and research results; books; management plans and documents among others. E-JaSa is a platform that serves as a database of current and future GLNP partners, where potential partners can register. E-ticketing documents the process of selling tickets without having to physically issue documents or paper tickets. All information regarding the electronic ticketing is stored digitally on GLNP's computer system.

Park management and staff underwent skills training to ensure that these technologies are properly applied in information management for biodiversity conservation.

Stakeholders from various sectors played a key role in raising conservation awareness in Meinmahla Kyun Wildlife Sanctuary

Lessons Learned

Significance of community collaboration

Community collaboration is among the cornerstones of habitat and species management in the AHPs. Increased awareness on the value of biodiversity and the importance of its sustainable use is necessary for communities to become active stakeholders. With meaningful participation and regular consultations with park authorities and other actors, communities' ownership of the conservation and restoration process likewise increases, and their involvement becomes pivotal in conservation activities.

The local communities are not only a source of additional manpower or support for biodiversity conservation, monitoring, and law enforcement. Local communities **can also be an effective source of information on existing practices or any illegal activities that might be happening in and around the protected areas.**

In AKNP for instance, information on threats to the wildlife sanctuary were also collected from several interviews with different stakeholders and areas in the wildlife sanctuary. They noted the declining condition of ecosystems due to threats of illegal logging and illegal fishing within the natural sanctuaries. Park authorities realised that the community indeed relies on biodiversity for their livelihood and income generation, and by closely engaging with them and making them part of the discussion, they can agree on sustainable practices that will benefit both biodiversity and the community. Alternative livelihood opportunities for the communities were collectively discussed, and the ensuing recommendations were taken into consideration for the preparation of the draft CMP.

Community collaboration provides opportunities for diverse stakeholders such as students, and local community members to participate in biodiversity conservation. In AKNP, the Township Protected Area Management Committee ensures coordination among the protected area constituency: communities, relevant community departments, and the park authorities for the effective implementation of the management plan.

Women are crucial stakeholders in biodiversity conservation. They are particularly helpful in implementing economic activities, augmenting the family's income by venturing into alternative sources of livelihood. In the Barak Induk area near GLNP, a total of 15 women actively participated in the restoration activity, where they also were able to generate an average income of IDR 1,440,000 (USD 89). Besides reaping economic benefits, the involvement of local communities can also help to raise their support towards the conservation of GLNP. The involvement of women will also help to instil pride and willingness to protect the forest for the future of their children.

Capacity building among park officials and staff is necessary for habitat restoration and biodiversity conservation to flourish

Capacity building played an integral part in the wins documented across SGP pilot sites. Park staff benefitted from training on habitat restoration, the use of technology in biodiversity monitoring, community engagement, and management planning. To effectively engage communities and assist in the effective implementation of management plans, including habitat and species management, **the AHPs' frontliners must be well-trained in all aspects of protected area management.**

In Myanmar's AKNP, ILWS, MKNP, and Nat Ma Taung National Park, the SGP supported the analysis of competence gaps for protected area staff and the management effectiveness of protected areas, analysis of key species, and identification of threats to biodiversity. Detailed consultations were conducted among the park staff to obtain their inputs to the management plan. Meanwhile, public hearings were conducted to brief the general public and gather their feedback, as well.

Gaps and Challenges

Women have key roles in biodiversity conservation. Most of the sustainable livelihood activities that are being implemented under SGP I have in fact, provided women community members the opportunity not only to earn income for the household, but also contribute to the broader goals of reducing threats to ecosystems through sustainable economic activities.

While most of the projects have also largely benefitted the women in the communities – such as the accomplishment of YOSL-OIC in providing economic opportunities for women in the Barak Induk area – there can still be room for improvement in ensuring **women participation and gender considerations.** Projects can have a more programmatic approach to proactively involve women in restoration activities.

In GLNP, the biodiversity corridor established along the Karo-Langkat Road was initially planned for a different location. This was changed due to the dynamics and internal horizontal conflict in the area. **Challenges in the implementation due to encroachment and tenurial conflict** were observed making the community resistant, suspicious and unaccepting at first. Through intensive communication with key figures, as well as a social approach to the community, the Barak Induk community group eventually opened up and supported YOSL-OIC to carry out restoration activities.

Enabling policies are likewise necessary in the implementation of habitat restoration and species management. For instance, the preparation of the GLNP Short Term Management

Plan (RPJPn) heavily relied on the Long-Term Management Plan (RPJP) document which has not been ratified. The activities in RPJPn are crucial in guiding and carrying out the national park's multi-stakeholder management. SGP I grantee PETAI worked around this hurdle by preparing a draft RPJPn based on the substance in the draft RPJP. They conducted a series of FGDs following the RPJP public consultation to help substantiate the draft RPJPn.

Finally, restoring degraded ecosystems and conserving the remaining wildlife population would only be possible if threats to biodiversity are reduced or managed. **Illegal extractive activities such as large-scale mining** are detrimental to any restoration efforts and can cause a setback to collective activities pursued by the park authorities and the community. For instance, in ILWS in Myanmar, one of the main threats is illegal gold mining. Addressing this issue was not part of the project, but seeing how its impacts heavily affect biodiversity, the issue was raised at a state-level government meeting where plans for threats mitigation were discussed. Dialogue and workshops on the impact of illegal gold mining to the habitats and the solutions to address them, were conducted among relevant stakeholders.

Women members of the Green Garden Natural Green Tea Production Group grind tea leaves using equipment provided by the SGP

Recommendations

The experience from these AHPs shows that the data, analysis, and recommendations from the technical studies are useful in the effective and efficient management of the protected area, and ultimately in habitat conservation and ecosystem restoration.

The following are some of the recommendations to further improve habitat and species management in the AHPs.

Conduct on-the-ground research that will feed into policy-making

- Data collected from on-the-ground research including biodiversity surveys and monitoring stations produce valuable inputs to technical guidelines in mitigating negative impacts to wildlife and their habitats
- Technical inputs on the presence of wildlife; potential biodiversity corridors and expansion of protected areas; and the existing and potential threats make protected area management and policy- and decision-making more effective

Ensure sustainability of restoration and monitoring activities through cooperation and collaboration with other sectors

- Sustain the recommendations and further plans even after the grant has been concluded. Critical data such as species population in protected areas and threats to species and habitats should inform the authority on the strategy and next steps in conservation
- Craft a well-thought-out plan that integrates exit strategies as AHP-related grants conclude. This involves putting together a long-term financial plan which incorporates resource mobilisation and fund diversification strategies, as well as consolidating the community livelihoods formed with the assistance of such grants into community-based enterprises that take part in the whole supply and value chain
- Implement resource mobilisation and fund diversification to ensure sustainability of restoration activities
- Collaborate with universities or research groups to sustain the operations of the biodiversity monitoring and learning centres. Memorandum of Understanding between the national parks and universities can help attract students to conduct their field work practice in the monitoring stations and contribute to data gathering and analysis while also building their skills, capacity, and knowledge
- Foster cooperation with other organisations and farmers in the areas that are able to help in conservation activities. Farmers or other producers and sectors can also join the monitoring team at the biodiversity monitoring station and restoration learning centre and to learn more about conservation techniques

Strengthen conservation partnerships

- Strengthen and sustain existing conservation partnerships because they foster a greater sense of responsibility among the community and park management towards jointly conserving the park and recognising how essential the resources are as a source of livelihood, cultural heritage, and legacy that they have to continue sharing and passing on to future generations of the community and those who will eventually be in park management

Sustain the participation of local communities by establishing or strengthening targeted livelihood development programmes similar to those initiated under the SGP

- Establish livelihood development committees or groups within the AHPs, especially in buffer zones, which can serve as conduits for grants
- Use SGP livelihood success stories as models that can entice more donors to fund livelihood development programmes in AHPs
- Foster a people-centred approach on the ground by encouraging community members to become not just beneficiaries, but partners and active participants in their own development. When communities are involved as partners, they are more eager to engage in conservation and livelihood activities, and development tends to be more inclusive and resilient

Build robust networks of AHPs and former and current SGP grantees who can provide support for conservation activities

- Build a network of AHPs with an established system for knowledge-sharing such as the ASEAN Clearing-House Mechanism that will provide the AHPs a wealthy source of information on best practices, data, products, and success stories that they need to improve various park management interventions
- Establish communication and cooperation with previous SGP grantees to help with restoration activities in crucial areas. They can help in getting support from their members or their own networks in the communities
- Share and exchange lessons and experiences in habitat and species management among the grantees and cull out the best practices that are applicable in their specific context

In Gunung Leuser's Bukit Mas, Telagah, and Halaban Villages, women's groups have turned unproductive land into permaculture sites

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