



TH PLANTATIONS BERHAD

CONSERVATION OF COASTAL FOREST AND PEATLANDS IN GUNUNG ARONG FOREST RESERVE, JOHOR

ANNUAL REPORT (JANUARY – DECEMBER 2024)



PREPARED BY
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ANNUAL REPORT (JANUARY – DECEMBER 2024) CONSERVATION OF COASTAL FOREST AND PEATLANDS IN GUNUNG ARONG FOREST RESERVE, JOHOR

1.0 Introduction

Since 2021, the Global Environment Centre (GEC) and TH Plantations Berhad (THP) with full support from the Johor State Forest Department (JSFD) have been implementing a rehabilitation and conservation project for coastal forests and peatlands in the Gunung Arong Forest Reserve (GAFR), Johor. The project aims to rehabilitate degraded coastal forest areas and approximately 1,500 hectares of peat swamp forest within the 4,300-hectare northeastern portion of GAFR. It is funded by THP and involves collaboration between GEC, JSFD and local stakeholders, community with completion targeted for June 2029. The project emphasizes the protection and restoration of the northeastern portion of GAFR which includes lowland forests and peat swamp forests (see Figure 1). A field assessment conducted by GEC revealed that approximately 45% (\pm 685 ha) of the peat swamp forest has been degraded due to previous drainage, fires and activities such as road construction, logging, and plantation development within and near GAFR.

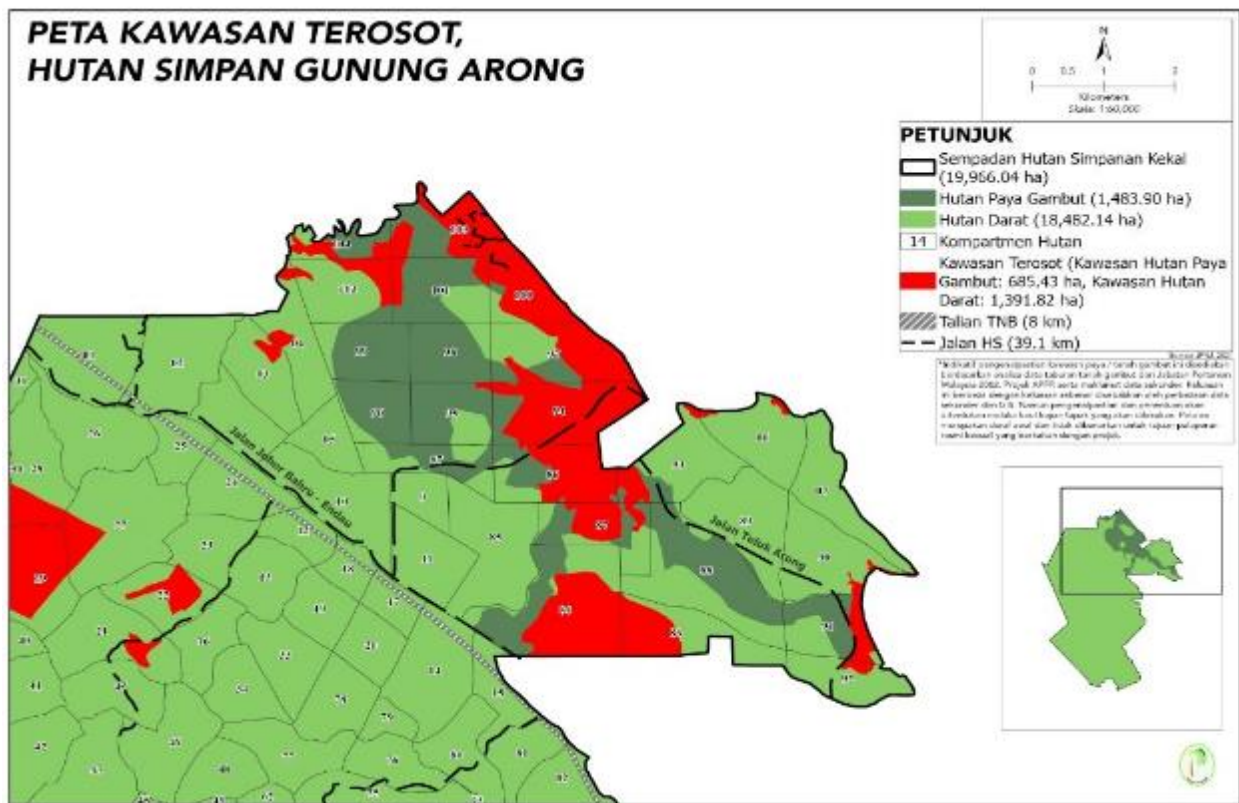


Figure 1. Map of the degraded forest area in GAFR, highlighted in red colour. While the dark green marked the area of peat swamp forest.

This annual report 2024 covers the activity progress implemented throughout the year 2024 encompassed a comprehensive range of rehabilitation activities including fire prevention measures, wildlife monitoring, community group establishment and capacity development initiatives, degraded forest restoration activity and outreach activity. These activities contributed in restoring ecological balance but also strengthened the connection between conservation goals and local communities. Throughout the year 2024 the emergence of a strong and active

collaboration among key stakeholders were established. Government agencies the private sector and non-governmental organizations worked hand in hand fostering a shared sense of responsibility and commitment to this long-term rehabilitation effort. This synergy between diverse entities has laid a solid foundation for continued progress in preserving the unique ecosystems of GAFFR in 2024.

2.0 Project goals and objectives

2.1. Project goal

To protect and rehabilitate forests and peatlands in the north-eastern portion of Gunung Arong Forest Reserve.

2.2. Project objectives

- i. To develop a rehabilitation and management strategy for the site using a landscape management approach and the participation of relevant stakeholders;
- ii. Rehabilitation of degraded areas through re-wetting, assisted natural regeneration and selected tree planting in priority sections of the site; and
- iii. Support the actions of local communities and other stakeholders on sustainable land management and fire prevention in targeted areas.

3.0 Project implementation planning and project activities

3.1 Project implementation

The project implementation in 2024 was guided by a comprehensive work plan that served as a framework to ensure progress and deliverables aligned with the project's goals. A work plan provided clear direction and acted as a tool to keep the project on track while addressing emerging challenges. It was essential for achieving the successful conservation and protection of coastal forests and peatlands in the GAFFR and adjacent areas in Mersing, Johor. The work plan focused on three key components, integrating conservation efforts, fostering community development, facilitating knowledge transfer and promoting collaborative sustainable management. These components were:

1. **Component 1:** Securing community support and commitment to engage in the conservation of coastal forests and peatlands in the Gunung Arong Forest Reserve;
2. **Component 2:** Rehabilitating and protecting degraded forest areas within the Gunung Arong Forest Reserve; and
3. **Component 3:** Enhancing Communication, Education, and Public Awareness (CEPA).

Table 1 presents the 2024 work plan for the Conservation of Coastal Forest and Peatlands in Gunung Arong Forest Reserve, Johor 2024 while Table 2 highlights the progress and accomplishments achieved during its implementation. Regular updates on the project's progress have been shared with the JSFD and the Johor Timur District Forestry Officer (DFO) to ensure two-way communication and keeping each party well-informed.

Table 1. Work plan for the Conservation of Coastal Forest and Peatlands in Gunung Arong Forest Reserve, Johor 2024

NO	PROJECT ACTIVITIES	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1	SECURING SUPPORT AND COMMITMENT FROM THE COMMUNITY TO ENGAGE WITH THE CONSERVATION PROJECT OF THE COASTAL FOREST AND PEATLANDS IN GUNUNG ARONG RESERVE FOREST, MERSING, JOHOR												
1.1	Identification of the potential community surround the Gunung Arong Forest Reserve to be part conservation project implementation:												
	a) Establish and formalise a Community-Based Organisation (CBO) by registering it with the Registrar of Societies (ROS)	X	X	X	X	X	X	X	X				
	b) Conduct regular meetings and follow-ups with the CBO to monitor and support the project implementation	X	X	X	X	X	X	X	X	X	X		
1.2	Empowered and enhance the new established CBO's capacity:												
	a) Identify a suitable forest nursery site and provide training to the newly formed community group on effective nursery management practices	X	X	X	X	X	X	X					
	b) Construct or establish a community nursery in the identified location	X	X	X	X	X	X	X					
	c) Produce 3,000 plantable trees such Tenggek burung (<i>Melicope lunu-ankenda</i>), Pulau (<i>Alstonia macrophylla</i>) and other pioneer species for planting programme in GAFR					X	X	X					
	d) Conduct training sessions on CBO management and organise a peer learning visit to well-established CBO such SHBPTS & SHGSU to facilitate knowledge exchange and enhance organisational skills			X					X				

NO	PROJECT ACTIVITIES	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2	REHABILITATION AND PROTECTION ON THE DEGRADED FOREST AREA IN GUNUNG ARONG FOREST RESERVE												
2.1	Patrolling and monitoring around the Gunung Arong Reserve Forest												
	a) Implement continuous monitoring on the water table by collecting data using the piezometers.	X	X	X	X	X	X	X	X	X	X	X	X
	b) Regular update on the FDRS signboards in the field and project stakeholder's community group.	X	X	X	X	X	X	X	X	X	X	X	X
	c) Implement continuous ongoing patrolling around the GAFR and adjacent areas for fire prevention and control.	X	X	X	X	X	X	X	X	X	X	X	X
	d) Implement continuous wildlife monitoring through methods such as camera traps and observation of roadkill incidents).	X	X	X	X	X	X	X	X	X	X	X	X
2.2	Tree planting activity												
	a) Organise a community-involved tree planting initiative targeting of 5 hectares of degraded site in the second part of the year (3,000 trees).							X	X	X	X	X	X
	b) Conduct maintenance activities at the planting site to ensure the health and growth of the trees.								X	X	X	X	X
	c) Implement regular monitoring to access the growth and survival rates of the tree planted trees.									X	X	X	X
2.3	Hydrology management												
	a) conduct an assessment to identify drainage canals that need to be managed for the mitigation plan of fire in the peatland area.	X	X	X									

NO	PROJECT ACTIVITIES	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
	b) construct an additional 10 canal blocks in FC 86, FC84 and FC 83 to enhance hydrology management.				X	X	X						
	c) Monitoring and maintenance on the installed canal blocks.						X	X	X	X	X	X	X
2.4	Update the map of peatland area in GAFR.				X	X	X						
2.5	Update the forecast on the potential of fire around the GAFR to the relevant WhatsApp group.	X	X	X	X	X	X	X	X	X	X	X	X
3	COMMUNICATION, EDUCATION AND PUBLIC AWARENESS												
3.1	Organise a fire prevention programme in collaboration with local communities and agencies including the Mersing District Office, East Johor Forestry District Office, Fire and Rescue Department and other relevant stakeholders.								X			X	
3.2	Organise a peatland forest awareness programme with the local community, stakeholder and students from school and other educational institution.					X			X			X	
3.3	Coordinate a tree planting activity involving students and relevant stakeholders.												

Notes: This work plan is subject to change based on local coordination, support, weather conditions, and other factors to ensure adaptability and implementation to dynamic circumstances.

- **X=** Marks the activities that have been carried out until this period.
- **Orange highlight =** Indicates the general proposed work period according to the timeline.

3.2 Project activities

Based on the project's 2024 workplan, this section details the progress and justification for each activity undertaken for the project implementation, along with a summary of progress and outcomes. The activities were strategically designed to align with the project's goals of conserving and rehabilitating GAFR's coastal forests and peatlands while fostering community engagement and sustainable management. Details of these activities and their results are presented in **Table 2**, which highlights the key milestones achieved from January to December 2024.

Table 2. The list of activities implemented from January to December 2024.

No.	Activities	Progress and accomplishment of the activities	Justification and summary of project outcomes
Component 1: Securing support and commitment from the community to engage with the conservation project of the coastal forest and peatlands in Gunung Arong Reserve Forest			
1.	Establish a Community-based Organisation (CBO) through an active engagement with the local community	<p>Throughout 2024, several engagement sessions and meetings were conducted to, promote active participation and raise awareness about the GAFR rehabilitation programme. These sessions served as a platform to share essential knowledge about the local environment, thereby improving the community's understanding of the sustainable practices driving the project. Details of the meetings are listed in Attachment 1.</p> <p>One of the key outcomes was the formation of Komuniti Pelindung Alam Sekitar Mersing (KOMPAS) comprising members from eight villages near GAFR including Kg. Sawah Dato, Kg. Tenglu Laut, Kg. Tenglu Batu 6, Kg. Air Papan, Kg. Penyabong, Kg. Triang, Kg. Semaloi, and Kg. Padang Endau in Mersing District.</p>	<p>i. The establishment of KOMPAS was an initiative by GEC in collaboration with the village head (Penghulu) and the Johor Timur District Forestry Office (PHDJT). KOMPAS was formed in early 2024 and is currently undergoing registration with the Registry of Societies Malaysia (ROS), with completion expected by 2025.</p> <p>ii. The community group is undergoing capacity-building initiatives, including a series of training sessions and discussions, to strengthen its foundation before its official registration with ROS.</p> <p>Progress Percentage: 80%</p>
2.	Empower and enhance the new established CBO's capacity	<p>i. Briefing on the nursery establishment: On 18th January 2024, a briefing conducted to introduce the initial steps of nursery establishment and management. A suitable site was identified and developed as a community-managed nursery. Regular monitoring and inspection of tree saplings were emphasized to ensure healthy growth and prevent diseases before field planting.</p>	<p>GEC has successfully conducted a series of meetings, training sessions, and engagement activities with the KOMPAS community aimed at fostering collaboration and advancing conservation efforts in the region. The primary objectives of these activities were:</p> <p>1. Guidance and Technical Support: GEC provided vital guidance and technical assistance to KOMPAS members to enhance their capacity in</p>

No.	Activities	Progress and accomplishment of the activities	Justification and summary of project outcomes
		<p>ii. Peer Learning Visits and Training for Mersing Community:</p> <p>Visit to Pulau Tanjung Surat (6th March 2024) KOMPAS members participated in a peer-learning visit to Pulau Tanjung Surat, gaining valuable insights into the conservation and rehabilitation efforts of SHBPTS. They were introduced to sustainable community-based organization (CBO) management practices and approaches, which they could adapt for their own projects and visit provided exposure to successful mangrove conservation efforts, inspiring the community to initiate similar projects in their local area.</p> <p>Peatland Conservation Training in Selangor (12th-13th August 2024) A two-day visit to Raja Musa Forest Reserve and Kuala Langat North Forest Reserve in Selangor offered hands-on learning opportunities for KOMPAS members. The training conducted by SHGSU and SGAT included practical sessions on tree planting, site preparation and nursery management for peat swamp forests. Success stories from Selangor demonstrated the potential for implementing similar conservation and rehabilitation measures in the local ecosystems of Mersing.</p> <p>iii. Agronomic Awareness Programme with TH Plantations Berhad</p> <p>On 3rd July 2024, an Agronomic Awareness Programme was organised in Mersing District, Johor focused on educating the local community and smallholders on best management practices (BMP) for oil palm cultivation on peat soil. Led by THP's Head of Agronomy, En. Ahmad Anuar Sairi, the training covered topics such as fertilization, plant</p>	<p>coastal forest and peatland conservation by sharing expertise on best practices for rehabilitation, ensuring community members are well-equipped to carry out effective conservation efforts.</p> <p>2. Strengthening Collaboration: A key focus of the engagement was to strengthen the communication and cooperation between KOMPAS, GEC the JPNJ, TH Plantations Berhad and other relevant stakeholders. This collaborative approach also involved government agencies, such as the Mersing District Office and JPS Mersing, as well as non-governmental organizations like Reef Check Malaysia and Tengah Island Conservation.</p> <p>These efforts have resulted in a more cohesive and proactive conservation community, with a shared commitment to the rehabilitation of the coastal forests and peatlands in the GAFR.</p> <p>Progress Percentage: 100%</p>

No.	Activities	Progress and accomplishment of the activities	Justification and summary of project outcomes
		diseases, and pest control. Participants actively engaged in the session, sought advice to improve their yield quality and management practices.	
3.	Community nursery establishment	<p>A community nursery was successfully established in Kg. Triang, located at the community house area, and is supervised by the community's Head of Nursery, Mr. Mohd Hafizuddin bin Abdul Latif. The nursery has the capacity to accommodate up to 3,000 trees at a time, with the community closely monitoring and caring for the plants.</p> <p>The tree species being raised in the nursery include Pulai (<i>Astonia scholaris</i>), Tembusu (<i>Cyrtophyllum fragans</i>), Kasai (<i>Pometia pinnata</i>), Bintangor Paya (<i>Colophyllum spp</i>), Tenggek Burung (<i>Melicope lunu-ankenda</i>), Keruing Neram (<i>Dipterocarpus oblongifolius</i>), and Merawan Siput Jantan (<i>Hopea odorata</i>).</p>	<p>The community nursery is essential for the long-term rehabilitation and biodiversity goals at GAFR. Established in January 2024 following an initial briefing, the nursery was built on land provided by KOMPAS members, following a consensus.</p> <p>The site was carefully chosen based on factors like accessibility and water supply. The nursery will support rehabilitation efforts from 2024 to 2029 by cultivating tree saplings. It serves as a key element for the community, fostering both plant growth and community engagement, while demonstrating KOMPAS members commitment to the project's success.</p> <p>Progress Percentage: 100%</p>
Component 2: Rehabilitation and protection on the degraded forest area in Gunung Arong Forest Reserve			
4.	Patrolling and monitoring around the Gunung Arong Reserve Forest	<p>i. Water table monitoring (11 units of piezometer)</p> <p>The selected patroller team from KOMPAS community conducted the peat water table monitoring by recording the underground water level through the installed piezometers at the adjacent and in the GAFR area that focusing on FC 84, 83, 103 and the oil palm plantation throughout the year.</p> <p>ii. Installation of the Enactment, FDRS, and Fire Risk Marker Signages</p> <p>A total of 5 Fire Danger Rating System (FDRS), 9 Enactment and 4 Fire Risk Marker Signages were installed in the GAFR and the adjacent area. The</p>	<p>Data Collection, analysis and Sharing</p> <p>Weekly water table data is recorded, analysed, and shared via WhatsApp, enabling timely precautionary actions when water levels drop below optimal thresholds. Daily Fire Danger Rating System (FDRS) forecast data from METMalaysia is disseminated through the WhatsApp group to keep stakeholders updated on daily conditions. The gathered data supports patroller teams in updating FDRS signages in the field, offering communities within and around GAFR critical information on potential fire risks.</p> <p>Fire Prevention and Forest Management</p>

No.	Activities	Progress and accomplishment of the activities	Justification and summary of project outcomes
		<p>total includes additional Enactment, FDRS and Fire Risk Marker signages that newly installed in the GAFR extension.</p> <p>iii. Forest fire patrolling and monitoring</p> <p>Fire monitoring and forest patrolling actively conducted throughout the year by patroller group. The patrollers shared on-site report with photos through a WhatsApp group to inform relevant agencies and stakeholders about current site conditions.</p>	<p>The installation of Enactment, FDRS, and Fire Risk Marker Signages enhances forestry law enforcement in GAFR, serving as a deterrent against forest encroachment and a precautionary measure to alert surrounding communities of potential fire hazards.</p> <p>Fire Detection and Response</p> <p>On March 13, 2024, a fire detected by community patrollers was promptly reported and effectively controlled. This success was achieved through collaboration between the patrolling team, local communities, and government agencies, ensuring minimal damage and swift containment.</p> <p>Progress Percentage: 100%</p>
5.	Field assessment and mapping	<p>For year 2024, GEC had carried out several field assessment and mapping:</p> <p>i. Wildlife monitoring activities continued in GAFR using camera traps to observe wildlife presence and record wildlife roadkill incidents along key roads within and around the GAFR. These include Jalan Teluk Arong – Kg. Sisek, Jalan Teluk Arong, Jalan Tanjung Resang, and the main road of Jalan Endau.</p> <p>ii. We provided technical assistance to the Forestry Department of Peninsular Malaysia (FDPM) and JSFD for the restoration project that conducted in the FC 94. This involved site assessments to evaluate the condition there focused on the identification of peat swamp, hydrology management and precaution step needed to low the potential risk of fire from happen.</p> <p>iii. An assessment was conducted based on a community report about mangrove degradation</p>	<p>In 2024, GEC carried out several field assessments and mapping activities to support conservation and restoration efforts at GAFR and surrounding areas:</p> <p>i. Wildlife Monitoring</p> <p>Continued monitoring using camera traps to observe wildlife presence and document wildlife roadkill incidents along key roads within and around the GAFR. A total of 17 species were recorded during wildlife monitoring, with 3 species categorized as endangered, and 46 roadkill incidents were documented. This data helps identify wildlife corridors and informs strategies to reduce human-wildlife conflicts.</p> <p>ii. Restoration Support for FC 94</p> <p>GEC provided technical assistance to FDPM and JSFD for the restoration project in FC 94. This involved site assessments to evaluate conditions, focusing on peat swamp forest identification, hydrology management, and fire preventing measures.</p>

No.	Activities	Progress and accomplishment of the activities	Justification and summary of project outcomes
		<p>in Kg Tenglu Batu 6. The findings were shared with community representatives, explaining the current condition. Recommendations included installing wave breakers to reduce wave speed and trap mud deposits, aiding mangrove recovery before tree planting activities</p>	<p>iii. Assessment of Degraded Mangrove Forest at Kg Tenglu Batu 6</p> <p>An assessment was conducted following a community report about mangrove degradation in Kg. Tenglu Batu 6. The recommendation to install wave breakers will help reduce wave speed, trap sediments, and restore the mangrove area before tree planting begins.</p> <p>Progress Percentage: 100%</p>
<p>6.</p>	<p>Tree Planting Initiative to Rehabilitate Forest Compartment 103, GAFR by KOMPAS</p>	<p>The KOMPAS community has begun to plant tree activity at FC 103 aiming to rehabilitate the area with the 3,000 trees.</p> <p>The tree species planted such the Merawan Siput Jantan (<i>Hopea odorata</i>), Bintangor Paya (<i>Callophyllum ferrugineum</i>), Kasai (<i>Pometia pinnata</i>) and Tenggek burung (<i>Melicope lunu-ankenda</i>). Inspired by their recent visit to Selangor, the community began planting activities following the guidance and knowledge gained from the visit.</p>	<p>As of the second quarter of 2024, 1,400 trees have been successfully planted despite delays due to prolonged rainy seasons.</p> <p>Challenges Encountered:</p> <ol style="list-style-type: none"> 1. Weather Conditions: The extended rainy season caused delays in planting activities due to unsuitable for planting conditions 2. Logistical Issues: Weather disrupted coordination of resources, transportation, and community availability. 3. Soil Preparation: Some areas required additional preparation due to degraded land conditions. <p>The next steps include planting the remaining 1,600 trees in early 2025 and an additional 2,400 trees (covering 4 hectares) later in the year.</p> <p>Progress Percentage: 60%</p>
<p>7.</p>	<p>Hydrology Management</p>	<p>Eight out of the ten planned canal blocks were completed by the third quarter of 2024 through collaboration between GEC, KOMPAS, and community workers.</p> <p>However, forest reserve boundary changes slowed the planning and construction of the remaining canal</p>	<p>A field assessment was conducted in the first quarter of 2024 to identify canals requiring immediate maintenance focusing on FC 86, FC 84, and FC 83 for fire prevention and groundwater management. Continuous monitoring is being carried out to ensure the canal blockings are functioning effectively through regular inspections of the structures and water flow.</p>

No.	Activities	Progress and accomplishment of the activities	Justification and summary of project outcomes
		blocks, requiring adjustments to the plans according to the new boundaries.	Progress Percentage: 90%
8.	<p>Meetings with Johor State Forestry Department (JSFD) and East Johor District Forestry Office (PHDJT)</p> <p>&</p> <p>TH Plantations Berhad, Forest Department of Malaysia (FDPM) visit to the rehabilitation site</p>	<p>Several coordination meetings were conducted with the District Forestry Officer (DFO) and JSFD to update on the rehabilitation progress in GAFR and coordinate activities such as signage installation, stakeholder visits, FDPM visits, and scientific expedition preparations. These meetings are crucial for aligning the project's goals with government policies and the state's vision. They provide a platform to share expertise and address potential challenges early.</p> <p>A coordination meeting with TH Plantations Berhad, FDPM representative En. Noradli@Mohd Adli bin Parsada, JSFD, PHDJT, and the community was held to synchronize efforts, monitor progress, and gain insights into ongoing activities in and around GAFR.</p> <p>A list of meetings held throughout 2024 can be found in Attachment 1.</p>	<p>Key meetings and visits:</p> <p>i. Meeting with JSFD and District Forestry Office This meeting focused on discussing locations for signage installation in and around GAFR. The progress of the project implementation was presented to ensure alignment with the 2024 work plan.</p> <p>ii. TH Plantations Berhad working Visit Two working visits were conducted the first visit was on 20th February 2024, involving JSFD and an FDPM representative and the second on 29th August 2024, with a representative from TH Plantations Berhad. These visits aimed to monitor the progress of rehabilitation work in GAFR and enhance understanding of the project at the ground level.</p> <p>iii. Meeting of District Forest Officers of Peninsular Malaysia 2024 and Site Visit to GAFR A meeting with the District Forest Officers of Peninsular Malaysia was held in GAFR on 12th November 2024.</p> <p>Progress Percentage: 100%</p>
9.	<p>Meeting with the relevant agencies:</p> <p>Mersing District Officer</p> <p>&</p> <p>Drainage and Irrigation Department (DID) of Mersing District.</p>	<p>On 17th January 2024, a meeting conducted with District Engineer, En Shaiful Bahri bin Madi, DID Mersing to seek for approval to build canal blocks at Parit Sembilan, Air Papan under their jurisdiction. The proposal for the construction was presented and followed up with the letter request for approval.</p> <p>An initiative taken by the DFO Johor Timur to introduce the GAFR rehabilitation project to The Mersing District Officer Tuan Haji Jamil Hasni bin Abdullah,. The meeting was conducted on 12th February 2024 to seek for support for the project</p>	<p>Key meeting Outcomes:</p> <p>i. Meeting with DFO and DID Mersing</p> <ul style="list-style-type: none"> • The proposed canal block construction presented to the District Engineer for his approval. • DID Mersing had given approval for the canal block construction in Parit Sembilan. • However, the canal block installation was postponed to 2025 considering the limitation on budget and the current weather condition.

No.	Activities	Progress and accomplishment of the activities	Justification and summary of project outcomes
		<p>implementation and to align with the Local Administration Plan which targets for sustainable development. The team also briefed the DO on the unique forest strata in Mersing that have potential as an ecotourism attraction for local and international tourists</p>	<p>ii. Meeting with DFO and Mersing District Officer</p> <ul style="list-style-type: none"> The GAFR's coastal forest and peatlands conservation project were explained to the District Officer (DO) for his better understanding on the implementation activity. From the meeting, DO expressed his interest, support in the project implementation and its potential contribution to the Mersing Sustainable Tourism plan. <p>Progress Percentage: 100%</p>
Component 3: Communication, Education and Public Awareness (CEPA)			
10.	<p>Forest Biodiversity Scientific Expedition at Gunung Arong Forest Reserve (17th-21st September 2024)</p>	<p>A scientific expedition was held at GAFR, co-organized by JSFD, FDP, TH Plantations and GEC. GEC played a crucial role in confirming the forest strata of GAFR, focusing on peat swamp, freshwater swamp and mangrove forests. The expedition, which was led by the JSFD and the FDP in collaboration with GEC, THP and other partner gathered biodiversity information, verified forest strata, and confirmed the presence of a quartz ridge in GAFR. The expedition, led by Dr. Ahmad Fitri Zohari with 137 researchers explored 17 trails and had 33 research scopes.</p>	<p>GEC employed various methods such as field observations, rapid flora census, water quality analysis, peat soil augering, rapid fish assessments (e.g., <i>Betta tomi</i>), fauna observations, and aerial drone surveys. Key discoveries included important species like Meranti Paya (<i>Shorea hemsleyana</i>), Nepenthes x hookeriana, Keruing Paya (<i>Dipterocarpus coriaceus</i>), and Ramin Melawis (<i>Gonystylus bancanus</i>) which are Critically Endangered. These efforts enriched biodiversity research in GAFR and established a strong foundation for future data collection, supporting conservation initiatives in Mersing, Johor.</p> <p>Progress Percentage: 100%</p>
11.	<p>Promoting Conservation and Fire Awareness</p>	<p>Throughout 2024, several conservation and fire prevention programmes were successfully conducted in collaboration with the local community, Mersing District Office, East Johor District Forestry Office, and the Fire and Rescue Department:</p> <p>i. On 12th May 2024, GEC delivered a presentation at Ocean Conservation and Marine Diversity Eco Workshop organized by the East Coast Economic Region Development Council (ECERDC) in Teluk Buih, Mersing.</p>	<p>GAFR conservation efforts promotions</p> <ul style="list-style-type: none"> Highlighted the importance of protecting and rehabilitating GAFR. Introduced the GAFR rehabilitation project, explaining its goals and objectives to enhance understanding of the unique local forest ecosystem. Promoted the 5Rs concept for peatland rehabilitation: Rewetting, Revegetation, Reduction of Fire, Revitalization, and Reporting & Monitoring.

No.	Activities	Progress and accomplishment of the activities	Justification and summary of project outcomes
		<p>ii. On 26th August 2024, GEC presented the GAFR conservation programme during an event in Kg Padang Endau and Kg Semaloi, at the invitation by the village heads.</p> <p>iii. From 7th – 8th November, 2024, GEC participated in the Mersing International Conservation Day exhibition at Mersing Harbour emphasizing environmental protection and sustainable practices for future generations.</p> <p>iv. On 23rd November 2024, GEC hosted an exhibition during the Gunung Arong Challenge 2024, focusing on forest ecosystem conservation. The event targeted young visitors, local communities, and other stakeholders, promoting awareness of the importance of preserving forest ecosystems.</p>	<ul style="list-style-type: none"> • Showcased community-led initiatives including nursery establishment, tree planting activities, and survey findings on flora and fauna. • Displayed FDRS and Fire Risk Marker signages along with a piezometer model to illustrate hydrology monitoring efforts. • Emphasized the forest protection role in achieving SDG 13 (Climate Action) and SDG 15 (Life on Land) goals for combating climate change and restore forest cover. <p>Progress Percentage: 100%</p>

4.0 Project progress summary based on the activity conducted in 2024

In 2024, a series of essential activities were undertaken to engage with the community, JSFD and other key stakeholders. These efforts aimed to strengthen collaboration and establish strategic partnerships, engaging a solid foundation for the successful implementation of the project. A comprehensive summary of the meetings, visits, and surveys conducted between January to December 2024 is presented below.

4.1. Engagement with the Johor State Forestry Department, TH Plantations Berhad and Komuniti Pelindung Alam Sekitar Mersing (KOMPAS)

Several important meetings and visits with the JSFD, East Johor Forestry Office (PHDJT), relevant agencies, stakeholders and KOMPAS members were held to discuss and monitor the implementation of the rehabilitation activities for year 2024 in GAFR. These meetings were essential to ensure the successful of the project implementation, facilitate the collaboration among stakeholders and to ensure all parties understand their role and responsibilities to ensure the project's objectives can be achieved.

Throughout the year 2024, a total of 45 meetings were held with 21 official meetings and discussions were conducted with PHDJT, JSFD and TH Plantations Berhad (THP) along with other relevant agencies such as Drainage and Irrigation Department (DID) Mersing District and Mersing District Office. Out of 21 meetings, THP directly participated in 2 meetings. To strengthen the foundation of community development, total of 24 meetings were conducted with KOMPAS for engagement process. Various aspect was discussed during these meetings, including the project progress updates, knowledge sharing, scientific expedition preparation and community capacity development. Further detail on the important key meetings held can be referred in **Table 3**.



Figure 2. The coordination meeting conducted with JSFD and the meeting conducted with TH Plantations representatives and DFO of East Johor.

Table 3. List of important meetings conducted with the stakeholders and community.

Date (2024)	Agency / Stakeholder	Results / Remarks
17 th January	Meeting with DID Mersing Drainage and Irrigation Department (DID) Mersing District, Chief Engineer, En Shaiful Bahri bin Madi DFO of East Johor, En. Mohd Saman bin Mohd Sanget	<ul style="list-style-type: none"> • A coordination meeting was held with DID Mersing District Chief Engineer to present on the current progress of the rehabilitation project in GAFR. • A proposal on the location to install the canal block was presented, followed by a question-and-answer session. • En Shaiful express his support for the project and requested GEC to prepare a proposal and an official letter for their record and future reference
12 th February	Meeting with District Officer DFO of East Johor, En. Mohd Saman bin Mohd Sanget	<ul style="list-style-type: none"> • In conjunction with the official visit of DO to forestry office, GEC was invited to join the the District Officer's visit to the forestry office for an introduction to the organization and on-going GAFR project. • En. Saman briefed Tuan Jamil on the PHDJT activities in 2023-2024 and highlighted the collaboration with

	Mersing District Officer, Tuan Jamil Hasni bin Abdullah	GEC and TH Plantations Berhad on the conservation project in GAFR. <ul style="list-style-type: none"> The DO showed interest with the project and invited GEC to present project progress at the Development Action Committee Meeting to present the project progress and the date will be informed later.
20 th February	Site Visits and Monitoring TH Plantations Forest Department of Peninsular Malaysia (FDPM) Johor State Forestry Department (JSFD) Head of Mukim Penyabong	<ul style="list-style-type: none"> The visit aimed to coordinate and monitor the rehabilitation site for their better understanding on the activities that had been implemented during this period. A briefing on the current progress had been briefed to TH Plantations representative, En. Shamsul Bahri bin Muhamad and En. Mohd Uzair bin Rozali also to the representative of FDPM, Encik Noradli@Mohd Adli bin Parsada, Chief Section (Wetlands Management). The representative from each agency visited the project site and met with the community for stakeholder engagement
22 nd February	Meetings with JSFD Johor State Forestry Department (JSFD)	<ul style="list-style-type: none"> A meeting was held with YBrs. Dato' Haji Salim bin Aman, the Director of Johor Forestry (JFSD) together with DFOs of JSFD. This meeting presented updates on the current TH Plantations rehabilitation project in GAFR.
14 th November	DFO of East Johor, En. Mohd Reydzuan bin Yong	<ul style="list-style-type: none"> Introductory meeting with the new DFO of Johor Timur included presentation of Coastal Forest and Peatlands in GAFR and current work progress Discussion of 2025 programme implementation plans involving relevant agencies and community Review of 2024 rehabilitation programme progress and planning for 2025 implementation Presentation of 2024 achievements according to MoU targets for rehabilitation works in Johor
15 th December	Project Progress Review 2024 and Planning 2025 Meeting Johor State Forestry Department (JSFD)	<ul style="list-style-type: none"> The meeting coordinated the 2024 GAFR rehabilitation programme progress and discussed the work implementation plan for 2025 Presented 2024 achievements in accordance with MoU targets for rehabilitation works in Johor.
Date (2024)	Community	Results / Remarks
11 th January	Komuniti Pelindung Alam Sekitar Mersing (KOMPAS)	<ul style="list-style-type: none"> Conducted coordination meeting with the community member to brief on the workplan for year 2024. Led discussion on nursery development and the selection for the community nursery site. Selected committee members to smoothen the engagement process between the community and GEC as part of the management training for the Community-based Organisation (CBO).
3 rd May		<ul style="list-style-type: none"> Organised Eidulfitri celebration with the community and discussed on their progression along the project implementation. Appointed a new community group leader to oversee the KOMPAS rehabilitation and other planned activities.

<p>13th November</p>		<ul style="list-style-type: none"> • Conducted discussion with the Mersing community to boost their motivation to maintain active participation in the rehabilitation activities. • Address organisational structure and to strengthened foundational aspect after facing establishment challenges throughout the year. • Restructured financial management to improve financial control for the KOMPAS.
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Figure 3. Meetings conducted with the KOMPAS representative

4.2. Continuation of the fauna monitoring in GAFR

Wildlife survey in GAFR continued using two methods by installing the camera traps in the GAFR and conducting patrolling and monitoring to record wildlife roadkill. For January to December 2024, a total of 17 species were recorded with 3 species categorized under endangered category which are the Asian Elephant (*Elephas maximus*), Southern pig-tailed macaque (*Macaca nemestrina*) and Long-tailed macaque (*Macaca fascicularis*). Two out of 17 species recorded from near threatened species namely Short-tailed mongoose (*Urva brachyura*) and Banded palm civet (*Hemigalus derbyanus*). Two vulnerable species recorded were Malayan sun bear (*Helarctos malayanus*) and Brown spiny rat (*Maxomys rajah*). The remaining fell under the least concern category, with details available in Table 4. Notably, compared to 2023 wildlife records, an increase in wild boar population was detected through regular camera trap captures.

An interesting finding was that the Malayan sun bear previously recorded once in FC 103, was observed twice in FC 86 during September and November 2024. Sun Bears typically inhabit densely forested areas with abundant food resources, making their observation challenging. Thus, this record indicates the forest in GAFR currently shows suitability for the wildlife for wildlife due to plentiful food resources. Malayan Sun Bears' daily movement ranges from 1.5 to 4.6 km, and their presence currently detected in two different forest compartments located approximately 4 km apart can be a positive sign that the regeneration of the forest ecosystem in GAFR is contributing to flourishing food supply for wildlife. Another interesting observation recorded on the appearance of the elephant. The elephant migration recorded actively in January to February and July to August showed that the migration happened during the longer dry spell season and return before the monsoon began.

2	Tragulidae	Lesser mouse-deer	<i>Tragulus kanchil</i>	0	1	3	1	5	LC
3	Hystricidae	Malayan porcupine	<i>Hystrix bracyura</i>	5	2	18		25	LC
4	Cercopithecidae	Southern pig-tailed macaque	<i>Macaca nemestrina</i>	2	3	8	1	14	EN
5	Herpestidae	Short – tailed mongoose	<i>Urva brachyura</i>	3	1	0	1	5	NT
6	Viverridae	Malayan civet	<i>Viverra zangalunga</i>	2	1	1	2	6	LC
7	Tupaiaidae	Common tree shrew	<i>Tupaia glis</i>	3	1	5	1	10	LC
8	Cercopithecidae	Long-tailed macaque	<i>Macaca fascicularis</i>	4	9	5	1	19	EN
9	Muridae	Rajah/Brown Spiny rat	<i>Maxomys rajah</i>	7	4	5	1	17	VU
10	Phasianidae	Red jungle fowl	<i>Gallus gallus</i>	0	1	0	0	1	LC
11	Columbidae	Common emerald dove	<i>Chalcophaps indica</i>	0	1	0	0	1	LC
12	Elephantidae	Asian elephant	<i>Elephas maximus</i>	3	0	9	0	12	EN
13	Suidae	Eurasian wild pig	<i>Sus scrofa</i>	0	0	4	0	4	LC
14	Varanidae	Asian monitor lizard	<i>Varanus salvator</i>	0	0	4	0	4	LC
15	Ursidae	Malayan sun bear	<i>Helarctos malayanus</i>	0	0	1	1	2	VU
16	Viverridae	Banded palm civet	<i>Hemigalus derbyanus</i>	0	0	1	0	1	NT
17	Cervidae	Southern Red Muntjac	<i>Muntiacus muntjak</i>	0	0	0	1	1	LC
Total individuals								155	

Note: LC – Least Concern; NT – Near Threatened, VU- Vulnerable; EN – Endangered

The roadkill monitoring for 2024 recorded a decrease in the number of species involved in roadkill accidents with 15 species compared to 22 species in the previous year. However, the total number of individuals increased slightly from 36 to 49. The recorded roadkill incidents included 4 reptiles, 7 mammals, and 4 bird species. Among the recorded species, three were listed as endangered included *Macaca nemestrina* (Southern pig-tailed macaque), *Macaca fascicularis* (Long-tailed macaque), and *Cuora amboinensis* (Malayan box terrapin). One species named *Herpestes brachyurus* (Short-tailed mongoose) was categorized as near threatened. Other species recorded were classified as least concern and a full list of the species can be found in **Table 5**.

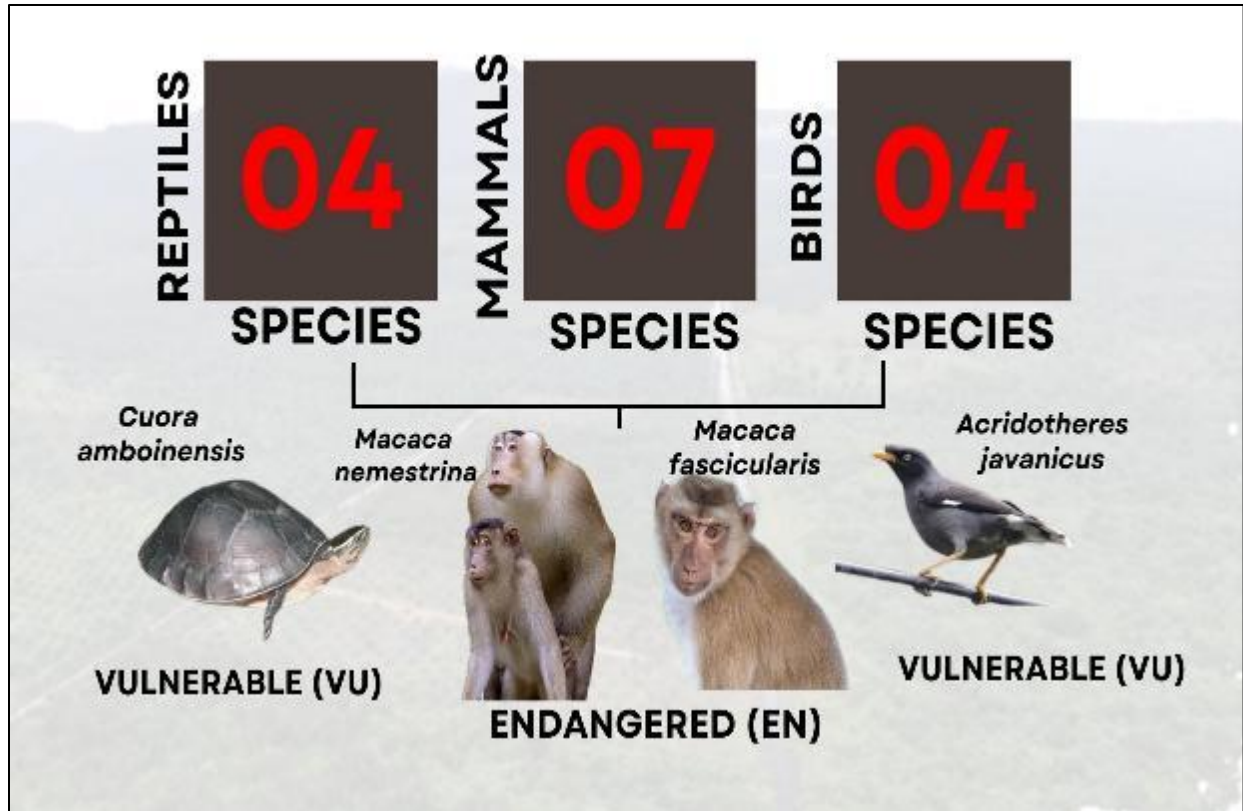


Figure 6: Summary of roadkill recorded in GAFR from January to December 2024

Table 5. The record of wildlife roadkill incidents from January to December 2024

No	Species	Common name	Local name	No. of individuals											
				Months				Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec				
Reptiles															
1	<i>Varanus salvator</i>	Asian water monitor lizard	Biawak air		1	1	4	4	1		1	1			2
2	<i>Python reticulatus</i>	Reticulated python	Ular Sawa batik	1											
3	<i>Naja sumatrana</i>	Spitting cobra	Ular senduk sembur							1	1				
4	<i>Cuora amboinensis</i>	Malayan Box Terrapin	Kura-kura Katup	1											
Mammals															
5	<i>Macaca nemestrina</i>	Southern pig-tailed macaque	Beruk	1								2		3	
6	<i>Macaca Fascicularis</i>	Long-tailed macaque	Kera ekor panjang	3	2		1		1						
7	<i>Callosciurus notatus</i>	Plantain squirrel	Tupai pinang		2			1	1						
8	<i>Viverra zangalunga</i>	Malayan civet	Musang tenggalung			1									

9	<i>Paradoxurus hermaphroditus</i>	Common palm civet	Musang pandan	1														
10	<i>Herpestes brachyurus</i>	Short-tailed Mongoose	Bambun Ekor Pendek					1										
11	<i>Prionailurus bengalensis</i>	Leopard cat	Kucing batu						1									
Birds																		
12	<i>Amaurornis phoenicurus</i>	White-breasted waterhen	Ruak-ruak		2	2												
13	<i>Ixobrychus sinensis</i>	Yellow Bittern	Pucong Merah	2														
14	<i>Hirundo rustica</i>	House swallow	Layang-layang rumah				2											
15	<i>Acridotheres javanicus</i>	Javan Myna	Tiong Jambul Jawa					1										
Total Incidents per month				9	7	4	7	7	4	1	2	3		3	2			
Total incidents recorded				49														

A detailed report on the field survey for the camera trap monitoring and wildlife roadkill record can be referred in **Attachment 2**.

4.3. Monitoring of water table reading in Gunung Arong Forest Reserve (using piezometers) from January to December 2024

Continuous water table monitoring through the installed piezometers is crucial to determine the underground water level remains at optimum levels to prevent the drying of peat soil. A decrease in water level indicates the presence of large amount of combustible material in the peat soil, which can initiate the fire spread. Water level observations enable precautionary steps to be taken to prepare for the fire risks and initiate mitigation measures. The information serves as an indicator for implementing effective water management strategies and contributes to the conservation and sustainable management of the ecosystem. The water level was recorded regularly, through 11 piezometers installed in and adjacent GAFR by the community patrollers team. The weekly average data is then shared through the WhatsApp group by the patrollers. **Table 6** and **Figure 7** below presented the average reading of all piezometers at GAFR recorded from January to December 2024.

Table 6. The average water table readings using piezometers from January to December 2024 at GAFR and adjacent areas

Average reading from January - December 2024													Location
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Pizometer													
PGA 01	1.0	-20.3	-7.0	-26.5	-28.3	-14.0	-12.0	-13.5	-9.5	-13.5	-4.3	2.8	Adjacent area of FC 83
PGA 02	-5.0	-22.7	-9.5	-26.3	-20.8	-15.0	-11.8	-15.3	-13.8	-15.3	-11.8	-5.3	
PGA 03	27.3	12.3	6.5	-20.5	-27.3	10.8	6.5	-1.3	5.3	-1.3	11.5	27.0	FC 103
PGA 04	19.8	11.0	-1.5	-26.3	-39.0	0.3	-1.3	-7.0	-2.5	-7.0	4.5	24.0	
PGA 05	41.3	24.7	8.0	-19.3	-29.5	1.5	4.0	6.8	9.8	6.8	18.5	21.8	Adjacent area of FC 84
PGA 06	-8.3	-44.0	-24.5	-58.3	-61.5	-19.5	-27.3	-33.0	-26.5	-33.0	-24.3	-18.3	
PGA 07	-3.5	-26.0	-16.8	-33.0	-10.5	-21.3	-14.8	-19.8	-14.5	-19.8	-15.3	-9.5	
PGA 08	1.3	-12.3	-11.8	-17.3	-16.8	0.8	1.3	0.0	3.5	0.0	3.0	4.5	Palm oil plantation area
PGA 11	6.3	2.3	0.0	-5.3	-11.0	-9.5	-5.5	-7.3	-1.3	-7.3	-1.8	1.3	
PGA 09	-9.5	-43.3	-26.3	-37.0	-37.3	-7.0	-25.0	-30.5	-27.5	-30.5	-23.0	-24.3	Palm oil plantation area
PGA 10	-14.3	-40.3	-33.8	-55.5	-53.5	-27.8	-33.0	-41.5	-34.5	-41.5	-21.8	-32.3	

Note: Negative symbol (-) shows that the water level is below the soil surface; PGA (Piezometer Gunung Arong) indicates the codes of piezometers installed in GAFR and adjacent areas.

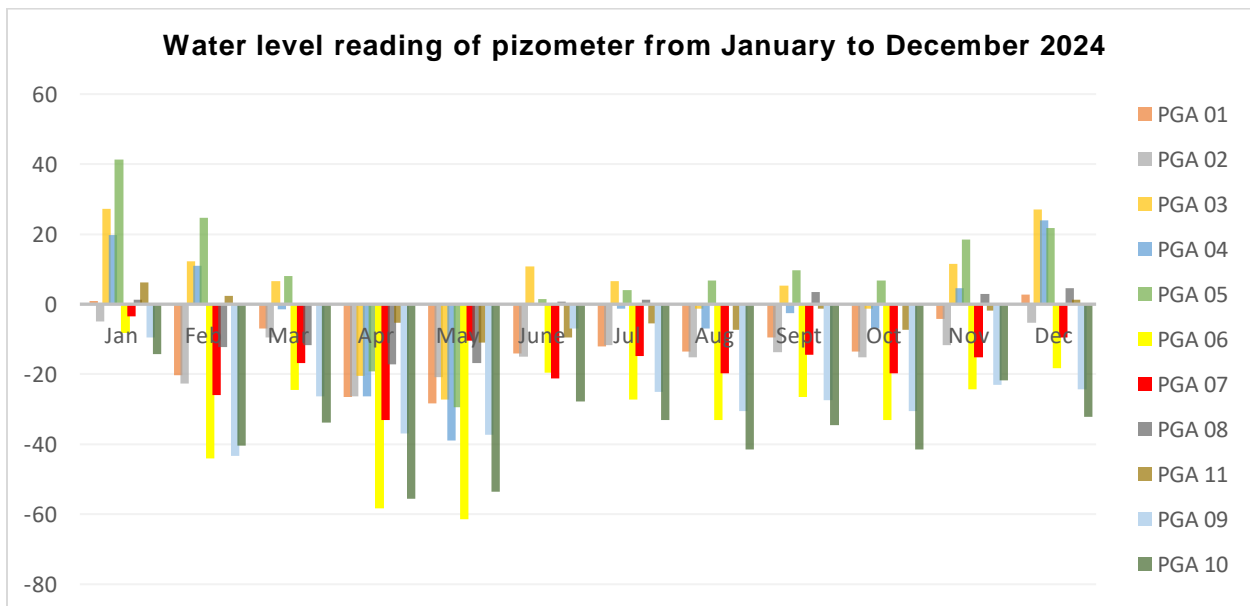


Figure 7. Average water level reading from each piezometer from January to December 2024

Analysis of 2024 Water Table Trends based on the Table 6 and Figure 7: The first half of 2024 showed the impact of the El Niño phenomenon, which, combined with the Southwest Monsoon starting from May 2024, caused decreased precipitation. The average daytime temperature from March to May 2024 reached 31°C to 33°C, with the highest temperature of 33°C recorded in May, notably higher than the 2023 peak of 32°C in the same month (source: Mersing May Weather, Average Temperature (Malaysia) - Weather Spark).

Due to these weather conditions, a declining trend in underground water levels was observed from January to May 2024, with the lowest average water level of -30.5 cm recorded in May,

posing an alarming fire risk. However, the 2024 average water level was slightly higher compared to 2023's average of -32.6 cm belowground. Specific improvements were noted:

- Adjacent to FC 83: from -28.9 cm (2023) to -13.22 cm (2024)
- Adjacent to FC 84: from -25.53 cm (2023) to -13.86 cm (2024)
- Oil palm plantation area: from -42.24 cm to -31.28 cm

These improvements indicate that the constructed canal blocks effectively helped control water overflow and maintain optimal underground water levels. However, regular monitoring of other potential location is on-going to increase and maintain the peatland forest as a natural water catchment zone and to prevent fire incidents.

The underground water levels began recovering from June onwards as the El Niño phenomenon weakened, as forecasted by the Malaysia Meteorological Department (METMalaysia). By late 2024, water levels increased with the onset of the Northeast monsoon's rainy season. Weather conditions improved, with average temperatures in Mersing dropping from 32°C in September to 29°C in December 2024. Cloud cover increased from 75-83% in early 2024 to 86-87% by year's end.

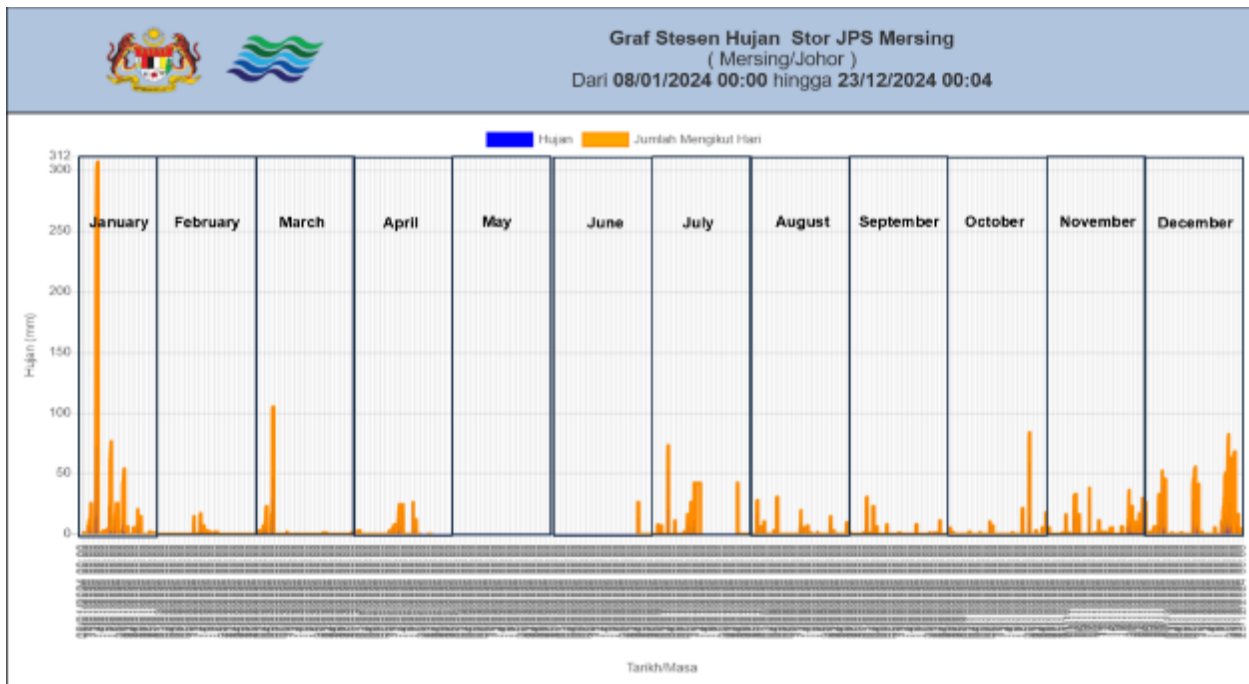


Figure 8. The rainfall distribution in Mersing, Johor for January to June 2024, retrieved from <https://publicinfobanjir.water.gov.my/>, Drainage and Irrigation Department of Malaysia.

The rainfall distribution in **Figure 8** begin to increase on the second part of year 2024 starting from the end of June to December indicating the *El-Niño* phenomenon getting weaker and with the beginning of the Northeast Monsoon season in October and possibly the La Nina phenomenon will start in between month of October to December. By the current weather, the peatland area had enough time to revive and restore it ecosystem function to store water and ready to face the next phase of hot season which forecasted to start in April to June with chances of temperature to increase than normal exceed more than 50% (source: *APEC Climate Center*).



Figure 9. Piezometer reading done by the community patroller

Seasonal Weather Forecast Report for Johor (Focus on Mersing) based on APEC Climate Center for 2025

Based on the seasonal weather forecast for 2025 provided by the APEC Climate Center and Climate Information Toolkit (CLIK), several proactive measures are planned to ensure preparedness and effective risk management in Mersing for the first half of 2025:

1. **Water Level Management:** Water levels will be monitored 2-3 times daily using the provided data to predict fluctuations. A minimum water level of 30-40 cm from the ground surface must be maintained. All pumping systems and water retention ponds will be activated to manage rising water levels, while water barriers and perimeter drains will be regularly inspected to prevent flooding risks.
2. **Monitoring and Control:** Patrols will increase in high-risk areas, especially those prone to flooding and fires. The APEC system will provide daily updates, including Fire Danger Rating System (FDRS) and hotspot data from the ASEAN Specialised Meteorological Centre (ASMC), to track potential hazards. Access to high-risk areas will be controlled, and emergency routes will be checked for accessibility.
3. **Equipment Readiness:** All firefighting equipment, water pumps, and generators will be checked and maintained to ensure they are ready for immediate use. Strategic locations will have sufficient water resources, and emergency communication systems will be tested to ensure effective information sharing using APEC data.
4. **Stakeholders Coordination:** Stakeholders, including government agencies and local communities, will be informed about the risk status and weather updates using CLIK and APEC platforms. Public awareness will be raised through briefings, campaigns, and the distribution of materials to ensure residents are prepared.
5. **Additional Preventive Measures:** Warning signs will be installed in high-risk areas, and a special Standard Operating Procedure (SOP) will be prepared based on CLIK and APEC recommendations. All actions will be documented for future reference.

These measures aim to reduce the impact of extreme weather events, ensure community safety, and support a faster recovery process in Mersing for 2025. Further details and the forecast from January to June 2025 can be found in **Attachment 3**.

4.4. Installation Enactment, FDRS and Fire Risk Marker Signages in GAFR

In 2024, an additional installation of the Fire Danger Rating System (FDRS), Forestry Enactment and Fire Risk Marker signages were completed. A total of 5 FDRS, 9 Forestry Enactment

signages and 4 Fire Risk Markers have been installed in the GAFR and the adjacent area. It's served as information delivery instruments to the public on the weather forecast and potential of fire to happen in their area. The signages were installed at the border of Gunung Arong (extension) Forest Reserve (GAEFR) which identified as the peat swamp forest in the Peat Swamp Forest Management Plan of Johor 2023-2032. The location was near to the plantation area with an active canal around GAEFR supplying the water for the plants. After discussion made with Johor Timur District Forestry Office (PHDJT), the decision was made to install the signages as part of the precautionary measures to alarm the plantation staff about the area's daily conditions. The updated location for the installed signages can be referred in the map (Figure 10) and the coordinates named FDRS 5, Enactment 9 and Fire Risk Warning 4 in **Table 7**.

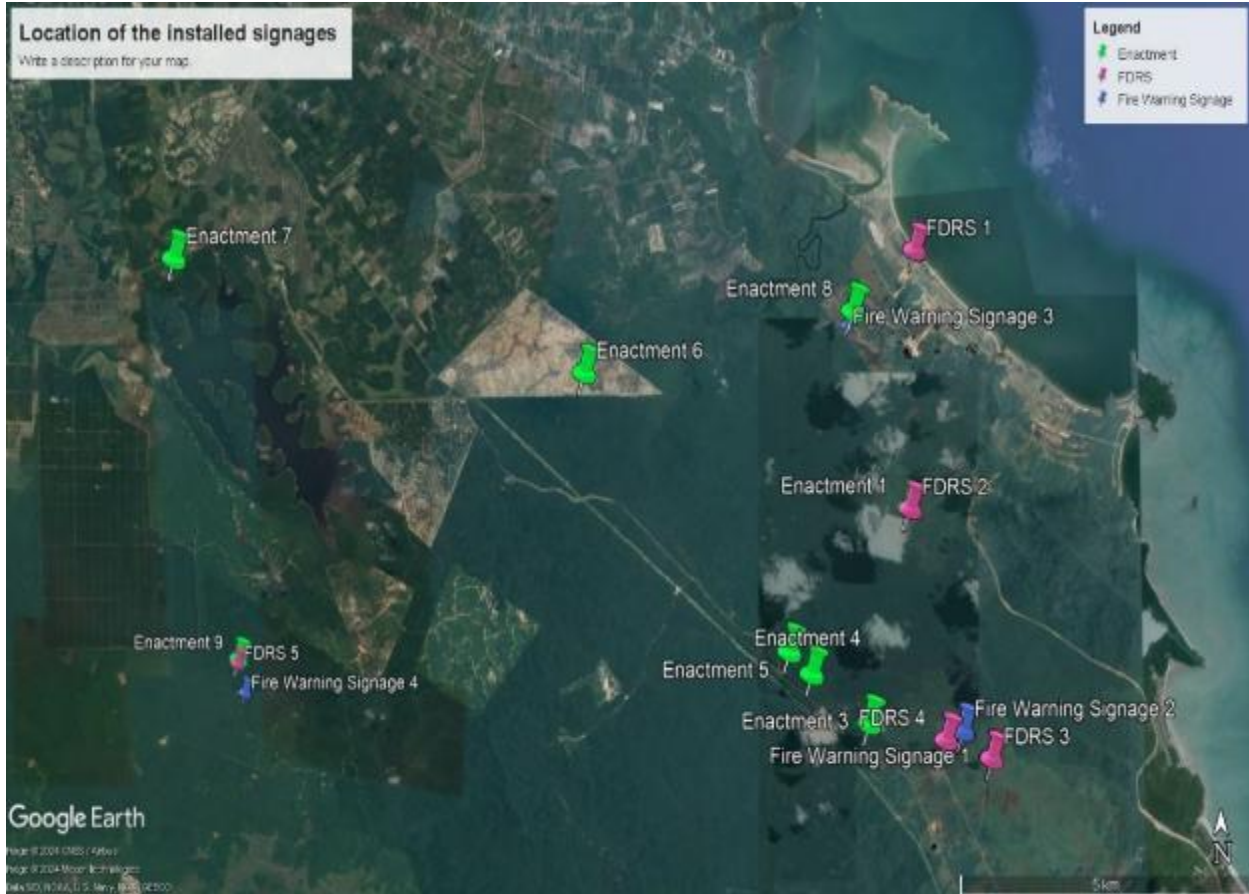


Figure 10. Location map and coordinate for the new location of the signages installed



Figure 11. Installed Fire Risk Marker, Fire Danger Rating System (FDRS) and Forestry Enactment signages.

Table 7. List coordinate of the installed signages in and adjacent of Gunung Arong Forest Reserve (GAFR).

NO	SIGNAGES	COORDINATES
FDRS SIGNAGES		
1	FDRS 1	N 2°35'50.13", E 103°46'57.28"
2	FDRS 2	N 2°33'49.63", E 103°46'54.83"
3	FDRS 3	N 2°31'53.45", E 103°47'39.86"
4	FDRS 4	N 2°32'02.08", E 103°47'14.68"
5	FDRS 5	N 2°32'42.68", E 103°40'44.03"
ENACTMENT SIGNAGES		
1	Enactment 1	N 2°33'49.47", E 103°46'54.65"
2	Enactment 2	N 2°32'06.52", E 103°47'23.99"
3	Enactment 3	N 2°32'10.01", E 103°46'32.10"
4	Enactment 4	N 2°32'32.90", E 103°46'00.43"
5	Enactment 5	N 2°32'43.31", E 103°45'48.11"
6	Enactment 6	N 2°34'53.08", E 103°43'54.41"
7	Enactment 7	N 2°35'46.40", E 103°40'6.96"
8	Enactment 8	N 2°35'21.87", E 103°46'23.35"
9	Enactment 9	N 2°32'42.77", E 103°40'44.00"
FIRE RISK WARNING SIGNAGES		
1	Fire Risk Warning 1	N 2°35'21.87", E 103°46'23.35"
2	Fire Risk Warning 2	N 2°35'21.87", E 103°46'23.35"
3	Fire Risk Warning 3	N 2°35'21.87", E 103°46'23.35"
4	Fire Risk Warning 4	N 2°32'29.02", E 103°40'48.14"

4.5. Community development programmes

An Agronomic Awareness programme was conducted together with TH Plantations Berhad on 3rd July 2024 focusing on disseminating information on the best management practice (BMP) for oil palm plantation on the peat soil. The programme benefited to the local community members which were the palm oil smallholder in Mersing district. The interactive engagement session and explanation on the measures needed to increase the quality of production through the selection

of tree saplings, fertilizers, pest control and pruning activities was held by THP's Head of Agronomy, En. Ahmad Anuar Sairi.



Figure 12. The Agronomic awareness programme with TH Plantations and visited the community nursery.

A series of peer learning visit was conducted this year to expose the community to conservation efforts implemented by other established community group in Pulau Tanjung Surat, Kota Tinggi, Johor and in Selangor at Raja Musa Forest Reserve and Kuala Langat North Forest Reserve. During the programme, the community underwent training designed to equip them with the necessary skills, knowledge and practical experience in sustainable nursery management, CBO management and to spark environmental stewardship spirit among them. The training conducted in Selangor on 12th to 13th August 2024 focused on the peatland conservation, providing participants with practical insights into effective forest management, fire prevention, forest patrolling by local community members, and nursery practices applicable to Gunung Arong Forest Reserve and surrounding areas. The visit also empowered the community by showcasing successful conservation projects and highlighting economic benefits from community-based activities. Detailed report for the peatland conservation training course conducted at Selangor can be referred in **Attachment 4**.



Figure 13. First peer learning visit conducted in Pulau Tanjung Surat by visiting Sahabat Hutan Bakau Pulau Tanjung Surat (SHBPTS) on 6th March 2024



Figure 14. Peer learning visit of KOMPAS to Selangor for the peatland conservation training course by visiting the Sahabat Hutan Gambut Selangor Utara (SHGSU) and Sahabat Gambut Asli Temuan (SGAT).

4.6. Tree planting activity by Komuniti Pelindung Alam Sekitar Mersing (KOMPAS)

From the early September until December 2024, the community planted 1,400 trees out of the planned 2,800 trees in the degraded forest area at FC 103, GAFR. Inspired by the visit to other established community groups, KOMPAS initiated the planting activity and applied the techniques of planting that they had learned. Despite their lack of experience and emerging challenge such as difficult terrain and weather conditions, they demonstrated commitment and hard work, manifesting their willingness to implement the rehabilitation work successfully. The first phase of tree planting was in early September until end of October, during which they planted 700 trees. Then completed the second phase in December by planting another 700 trees. Currently, 80% of the planted trees have survived under close monitoring. The planting activity will continue into 2025 to complete the remaining 1,400 trees. The extensive report for the tree planting activity can be referred in **Attachment 5**.



Figure 15. Tree planting activity executed by the KOMPAS community at FC 103, GAFR.

4.7. Visit from the FDPM, JSFD and TH Plantations Berhad to the rehabilitation site in GAFR

GEC facilitated and assisted for the visit to the GAFR rehabilitation site by the Forestry Department of Peninsular Malaysia (FDPM), JSFD and TH Plantations Berhad representatives. The series of visit begin in 20th February 2024 started with the TH Plantations Berhad working visit together with the representative from FDPM, En. Noradli@Mohd Adli bin Parsada. The visit was organised to monitor the project progress and enhance the understanding on the ground

implementation work. On 29th August 2024, TH Plantation Conservation Officer, En. Muhammad Syafiq Mat Nazari conducted a site visit to GAFR to gain a clearer understanding of the coastal forests and peatlands conservation implementation in GAFR. The latest visit undertaken by FDPM was in conjunction with the meeting of District Forest Officers (DFO) of Peninsular Malaysia and site visit to GAFR on 12th November 2024. The visit aimed to showcase key conservation activities in GAFR focusing on the Gunung Arong Conservation Programme funded by TH Plantations Berhad. During the visit, the peatland restoration efforts in FC 83 and 84 served as the main model for explaining initiative taken to rehabilitate the peat swamp forest ecosystem in GAFR. The 5R strategies were explained systematically to enhance the participant understanding, beginning with the peat soil characteristic and the water quality in the peat swamp forest, followed by the explanation on the installed canal block, FDRS and Fire Risk Marker signages and piezometer water level monitoring as part of the fire prevention activities. A detailed report on the DFO latest visit can be referred in **Attachment 6**.



Figure 16. District Forest Officers (DFO) of Peninsular Malaysia visited the rehabilitation site at adjacent of FC 83, GAFR.

4.8. Forest Biodiversity Scientific Expedition at Gunung Arong Forest Reserve

GEC and TH Plantations had played a crucial role in supporting JSFD for the organisation of Forest Biodiversity Scientific Expedition at Gunung Arong Forest Reserve (GAFR) from 17th to 21st September 2024. Officiated by YB Tuan Ling Tian Soon, Chairman of the Johor State Health and Environment Committee, the expedition attracted 137 researchers across Malaysia consisting of researchers from educational institutions, non-governmental organisations and government agencies. The expedition objectives were to gather and record biodiversity information at GAFR, verify the status of 5 forest strata; Lowland Dipterocarp, Heath (Kerangas), Peat Swamp, Freshwater Swamp, and Mangrove Forests, and to confirm the presence of quartz ridge within GAFR. GEC played a crucial role in confirming the peatland, freshwater swamp, and mangrove forest strata within GAFR. Their methods included field observations, rapid flora and fauna surveys, water quality analysis, peat soil augering, rapid fish assessments (*e.g., Betta tomii*),

fauna observations, and aerial drone surveys. Significant plant species discovered by GEC include Meranti Paya (*Shorea hemsleyana*), *Nepenthes x hookeriana*, Keruing Paya (*Dipterocarpus coriaceus*) and the critically endangered Ramin Melawis (*Gonystylus bancanus*). Further extension on the scientific expedition involving the participation of GEC can be referred in **Attachment 7**.



Figure 17. GEC team participated in the scientific expedition starting from 17th to 21st September 2024.

4.9. Communication, Education and Public Awareness

A total of 4 awareness sessions were conducted in year 2024. Beginning with a talk held in conjunction of the Ocean Conservation and Marine Diversity Eco Workshop organised by East Coast Economic Region Development Council (ECERDC) in Teluk Buih Mersing on 12th May 2024. Then continued with an exhibition during the celebration of Malaysia Independence Day on 26th August 2024 with the local community at Kampung Padang Endau. For month of November 2024, two exhibitions were held for the Mersing International Conservation Day at Mersing Harbour on 7th to 8th and during the Gunung Arong Challenge 2024 at Taman Eko Rimba, Mersing on 23rd November 2024. Overall, the talk and exhibition sessions aimed to disseminate information on the importance of protecting the forest while promoting the conservation project in GAFR and raising awareness among the public, especially the local community. Through the exhibition, the project progress and findings were shared directly to the attendees. An updated informative backdrop was showcased during the event to highlight the continuous conservation efforts done in GAFR Mersing (refer to **Attachment 8**).



Figure 18. Latest GAFR rehabilitation project exhibition take place during Gunung Arong Challenge 2024 at Taman Eko-Rimba, Mersing.

4.10. Supporting Johor State Forestry Department (JSFD) on the technical aspect in conservation and rehabilitation in and outside the forest reserve.

Conservation through collaboration is a crucial aspect that need to be strengthened to ensure the smooth implementation of the conservation activities. Throughout year 2024, GEC assisted JSFD in assessing degraded mangrove areas outside forest reserve to analyse the area condition. The issue arose among the Mersing community reflecting their concern to the active coastal erosion that was jeopardizing the coastline community. A site survey was conducted and showed that the area faced direct impact from strong waves and erosion. The results were explained to the community and recommendations were provided to the authorities, suggesting collaborative actions such as constructing wave breakers to slow down wave speed and energy, as well as trap muddy sediments for revitalizing the area using natural sources, which is more cost-efficient.



Figure 19. Site survey and recommendation presentation to the community representative regarding the degraded mangrove condition.

Next, GEC provided technical assistance to FDPM and JSFD for their restoration project in FC 94. In response to a fire incident in early of the year 2024, careful planning for the planting activities was undertaken for the FC 94, emphasizing hydrology management and the surrounding features. The aim was to ensure long-term sustainability of the restoration project. The assessment included the reviewing canal management to avoid any disruption to the hydrology system, evaluating access to the planting site and proposing fire mitigation strategies such as installation of canal blocks and active patrolling and monitoring.



Figure 20. Joint assessment of FC 94 by GEC, PHDJT, and FDPM.

5.0 Challenges and problems encountered during the project implementation for year 2024

i. Weather patterns and impacts on GAFR

Weather was the major challenge faced for the year 2024. The extreme hot weather and low precipitation in the first half of the year (February to May 2024) due to *El Niño* phenomenon forced postponement of tree planting activities to the third quarter of the year. GEC-Mersing office was equipped with a set of water pump equipment and the community patroller team was placed on high alert to monitor potential fire risks in in GAFR. A significant challenge in 2024 was the fire incident happened at FC 94. PHDJT, firefighters, GEC and community worked together for three days to extinguish and control the fire's spread. In response,. Although wetter weather occurred after the El Niño phenomenon from July, the weather uncertainty continued, affecting tree planting and monitoring activities. The Northeast monsoon presented another main challenge for the implementation of planting activities, with high precipitation rates in December and flooding in the Mersing district. High rainfall **caused** strong currents on site, **damaging** and flooding access trails to the planting site. The target to plant 2,800 trees this year **could not** be accomplished. Given current weather conditions, activities are expected to resume in early February 2025.



Figure 21: The high-water level and flooded condition in GAFR and its adjacent areas

ii. Community group establishment

KOMPAS members represent different villages. This diversity in member backgrounds and conflicting interests led to difficulties for the chairperson in managing the community group. After several internal issues, community members agreed to restructure their committee to improve group management and facilitate ground work implementation. Currently, only 12 members actively participate in rehabilitation activities, including monitoring and patrolling, nursery management, and tree planting. The reorganization showed positive results in ground work execution. However, the community group's foundation remains fragile, and registration with the Registrar of Society Malaysia (ROS) will be postponed until the team is well-trained and prepared for the next phase.

iii. Peatland fire

A significant challenge faced was a peatland fire at FC94, GAFR where the FDPM is conducting a restoration project. The fire which broke out in March 2024 and resulted in the loss of over ±50 hectares of peatland was first detected by the Kampung Tanjung Resang community. The fire



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was controlled after three days and ongoing monitoring by GEC and PHDJT ensured no further incidents. Due to this challenge, the team has now equipped the Mersing office with complete firefighting water pump equipment and has alerted the community patroller team to remain vigilant and on standby at all times for future firefighting and mitigation actions.

6.0 Project implementation planning for 2025

As we approach the end of 2024, implementation plans have been developed for an impactful year ahead. The 2025 implementation plan has been drafted and endorsed by the Johor State Forestry Department (JSFD) aiming to build on the achieved progress and assess the project's long-term effectiveness. Table 8 outlines the strategic activities approved for implementation, setting the stage for **the project's** continued growth and success.

Table 8: List of proposed activities for January to December 2025

BIL	ACTIVITY (2025)	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1	SECURING SUPPORT AND COMMITMENT FROM THE COMMUNITY TO ENGAGE WITH THE CONSERVATION PROJECT OF THE COASTAL FOREST AND PEATLANDS IN GUNUNG ARONG RESERVE FOREST, MERSING, JOHOR												
1.1	Identification of the potential community surround the Gunung Arong Forest Reserve to be part conservation project implementation:												
	a) Establish and authorize the Komuniti Pelindung Alam Sekitar Mersing (KOMPAS) by registering it with the Registrar of Societies (ROS) to ensure the recognition and continuity of the organization.												
	b) Enhance community involvement in conservation projects through Community-Based Organization (CBO) initiatives and development of strategic collaborative relationships with the Johor State Forestry Department (JSFD), TH Plantations Berhad (THP), and other relevant agencies.												
	c) Conduct regular meetings and follow-ups with the Community-Based Organisation (CBO) to monitor and support the project implementation and capacity building												
1.2	Empowered and enhance the new established Community-Based Organisation (CBO)'s capacity:												
	a) Conduct comprehensive training programmes to the KOMPAS group on effective nursery site management practices.												
	b) Carry out continuous maintenance and upkeep of community nursery sites, including monitor the health of saplings and maintain the developed nursery site infrastructure.												
	c) Produce 3,000 plantable trees such as Tenggek burung (<i>Melicope lunu-ankenda</i>), Pulai (<i>Alstonia macrophylla</i>)												

BIL	ACTIVITY (2025)	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	and other pioneer species for planting programme in GAFR in the year 2025.												
2	REHABILITATION AND PROTECTION ON THE DEGRADED FOREST AREA IN GUNUNG ARONG FOREST RESERVE												
2.1	Patrolling and monitoring around the Gunung Arong Reserve Forest (Buffer zone)												
	a) Implement continuous monitoring on the water table by collecting data using the piezometers.												
	b) Regular update on the FDRS signboards in the field and project stakeholder's community group.												
	c) Implement continuous ongoing patrolling around the GAFR and adjacent areas for fire prevention and control.												
	d) Implement continuous wildlife monitoring through methods such as camera traps and observation of roadkill incidents.												
2.2	Tree planting activity: Second Phase 2025												
	a) Organise a community-involved tree planting initiative targeting of 3 hectares of degraded site in the second part of the 2025 and contribute to the overall target of 4,600 trees planted in HSGA starting from 2024.												
	b) Complete the planting for the first phase and conduct maintenance activities at the planting site from the first phase involving 3,000 trees to ensure the health and growth of the trees.												
	c) Implement regular monitoring to access the growth and survival rates of the tree planted trees.												
2.3	Hydrology management												
	a) Conduct an assessment to identify on the possible canal that need to be managed for the mitigation plan of fire in the peatland area.												
	b) Construct an additional 5 canal blocks in FC 86, FC84 and FC 83 to enhance hydrology management.												
	c) Construct 2 canal blocks at Parit Sembilan, Kampung Air Papan with approval and collaboration from the Department of Irrigation and Drainage (DID).												

BIL	ACTIVITY (2025)	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	d) Monitor and maintenance on the installed canal blocks.												
2.4	Update the map of peatland area in GAFR												
2.5	Update the forecast on the potential of fire around the GAFR to the relevant WhatsApp group												
3	COMMUNICATION, EDUCATION AND PUBLIC AWARENESS												
3.1	Organise a fire prevention programme in collaboration with local communities and agencies including the Mersing District Office, East Johor Forestry District Office, Fire and Rescue Department and other relevant stakeholders.												
3.2	Organise a peatland forest awareness programme with the local community, stakeholder and students from school and other educational institution.												
3.3	Coordinate a tree planting activity involving TH Plantations Berhad volunteers, students and relevant stakeholders.												
4.	PROVISION OF OTHER NECESSARY TECHNICAL SERVICES WITH JSFD												
	a) Prepare a technical study report based on the Gunung Arong Forest Reserve Scientific Expedition 2024 and present it at the GAFR Scientific Expedition Seminar.												
	b) Contribute to the organization of the Gunung Arong Challenge 2025 to ensure the success of the programme.												
	c) Provide support for the development of TER in Teluk Arong, HSGA including contribute to carbon and climate change-related initiatives to ensure sustainable development in line with conservation objectives.												

Note: The proposed work plan is subject to changes from time to time based on the need for local coordination, the level of support and involvement of stakeholders, current weather and environmental conditions as well as other relevant factors to ensure flexibility in implementation within a dynamic environment while maintaining the achievement of the programme's main objectives.

7.0 Pictorial report of the activities implemented for period (January to December 2024)



Figure 22. Regular monitoring and inspections conducted on the camera traps installed in GAFR



Figure 23. Water table and fire patrolling and monitoring activities conducted by the community patrollers.



Figure 24. The coordination meeting with DFO Johor Timur at PHDJT



Figure 25. Coordination meeting held with JSFD to present the rehabilitation project progress.



Figure 26. Engagement meeting held with KOMPAS representatives to maintain their motivation to get involve in the rehabilitation project.



Figure 27. Tree planting activity conducted by the KOMPAS community at FC 103, GAFR.



Figure 28. An exhibition was held in conjunction with Mersing International Conservation Day 2024 at Mersing Harbour.



Figure 29. An exhibition was held in conjunction with Gunung Arong Challenge 2024 at Taman Eko Rimba.



Figure 30. Peer learning visit KOMPAS community to Selangor



Figure 31. GEC team participated in the scientific expedition covering the wetlands ecosystem to determine their existence by rapid survey of flora, fauna, water quality and peat depth



Figure 32. The DFOs of Peninsular Malaysia visit to the rehabilitation site funded by TH Plantations Berhad adjacent to FC 83, GAFR.

8.0 Conclusion

The project implementation aligned with the endorsed workplan for the progression of rehabilitation activities in year 2024. Several challenges faced due to human factors and the natural weather conditions that limited rehabilitation activity implementation. However, these challenges emerged did not discourage for the implementation work or achievement of the project objectives.

The conservation project in GAFR successfully implemented fire prevention activities through water table and fire risk area patrolling and monitoring. The constructed canal block demonstrated efficiency in the hydrological management, helping to retain water in the peatland forest and prevent excessive drying in fire hotspot areas during extreme weather conditions. Additionally, collaborative action in addressing fire incidents at GAFR demonstrated strong commitment from various agencies in forest protection.

Regarding community group establishment, progress was made despite internal challenges, and prompt action to restructure the committee maintained active group functioning. Training provided to the community improved practical knowledge and raised awareness about protecting their local environment, helping to instill a sense of ownership. Although the community group did not complete this year's tree planting activity, they demonstrated positive commitment and dedication to project implementation. Their lack of experience will not hinder future growth.

The rehabilitation project catalyzed the scientific expedition organization, benefiting both JSFD and increasing literature on GAFR for future reference. The expedition's success contributed to forestry department policy planning and may assist in GAFR law enforcement.

The project will be proceeded with planned activities for next year including:

- Establishment of an official Community-based Organisation (CBO)
- Construction of additional canal blocks
- Map development
- Regular monitoring of water table and wildlife

9.0 Acknowledgements

We express our sincere appreciation to the Johor Forestry Department (JSFD), TH Plantations Berhad., Johor Timur District Forest Office (PHDJT), Drainage and Irrigation Department of Mersing District (DID), Mersing District Office, Fire and Rescue Department, Komuniti Pelindung Alam Sekitar Mersing (KOMPAS) and the local communities of Kg. Tenglu Batu 6, Kg. Tenglu Laut, Kg. Sawah Dato'. Kg. Air Papan, Kg. Penyabong, Kg. Triang, Kg. Semaloi and Kg. Padang Endau. Your commitment has played a pivotal role in the success of our initiatives in 2024 and looking forward for the strong collaboration for sustainable forest conservation management in 2025.

List of attachments:

1. **Attachment 1:** List of meeting with JSFD and community groups and other stakeholders.
2. **Attachment 2-** Fauna monitoring in GAFR from January to December 2024
3. **Attachment 3-** Laporan Ramalan Cuaca Bermusim Untuk Johor (Tumpuan Di Mersing)
4. **Attachment 4** - Activity report on the Mersing Community peer-learning visit to Forest Reserve Raja Musa & Kuala Langat Utara, Selangor
5. **Attachment 5** - Tree Planting Activity Report at Gunung Arong Forest Reserve, Mersing, Johor for Second Half of the Year 2024
6. **Attachment 6** - Meeting of District Forest Officers of Peninsular Malaysia 2024 and Site Visit to Gunung Arong Forest Reserve
7. **Attachment 7** - Scientific Expedition at Gunung Arong Forest Reserve (GAFR) and its biodiversity towards the future research in Mersing, Johor
8. **Attachment 8** - Updated project exhibition backdrop highlighting the summary of the rehabilitation project implemented in GAFR (2022-2024).