

PAHANG AS AN INTEGRAL PART OF CENTRAL FOREST SPINE (CFS) IN PENINSULAR MALAYSIA

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Abstract

Malaysia has one of the most complex tropical rainforest ecosystems that are very rich in flora and fauna. Majority of these areas have been gazetted as Permanent Reserved Forest (PRFs) to be managed sustainably under Sustainable Forest Management (SFM) practices. These PRFs also constitutes the Central Forest Spine (CFS) which becomes Peninsular Malaysia's green lung that connects four major forest complexes and spread across eight states. The CFS concept was initiated to increase the integrity and connectivity between these four major forest complexes. The Forestry Department Peninsular Malaysia (FDPM) is very committed towards this concept through the rehabilitation and conservation of these CFS areas via collaboration with other agencies to carry out activities based on the CFS Master Plan (CFSMP). These activities mainly focus on the rehabilitation of the poor CFS complexes, gazettelement of Non-PRFs CFS complexes to PRFs, enforcement towards forestry and wildlife crime, building of infrastructure such as eco-viaduct. This paper highlights efforts that had been taken by FDPM with the help from States Forestry Department and other agencies. It also addresses the major challenges faced by FDPM in conducting CFS in Peninsular Malaysia where it is costly. Hence, by developing Sustainable Financing Plan for CFS Landscape Management in the state of Pahang to set up sustainable financing mechanisms for the conservation of the CFS would become the model for other state as a way forward to turn CFS into realisation.

Keywords: Permanent Reserved Forest, Central Forest Spine, Conservation

1.0 INTRODUCTION

Based on Central Forest Spine Master Plan (CFSMP) 2021, CFS is a combination of Permanent Reserved Forest (PRFs), state land, national park, state park, wildlife reserve and agriculture land which became the backbone of Environmentally Sensitive Area Network. With the area around 6.71 million hectares, CFS has high ecosystem value as well as becoming a main habitat for five main big mammals which are elephant, tigers, tapir, panther and sun bear. CFS of Peninsular Malaysia have around 500 PRFs which covered around 4.79 million hectares and a combination of eight forest complexes that across eight state in Peninsular Malaysia and also involving 58 districts across the country. The eight states that involves in CFS are Kedah, Perak, Kelantan, Terengganu, Pahang, Johor, Negeri Sembilan and Selangor. The purpose of these efforts is to establish the balance between development and conservation in addition to provide benefits to local community. Ecological corridors that have been established would become a backbone of Environmentally Sensitive Area Network as stated in National Physical Plan (NPP) Policy 19, "A Central Forest Spine (CFS) shall be established to form the backbone of the Environmental Sensitive Area Network".

Ecological corridor would function as wildlife corridors, which may take a variety of forms, such as artificially replanted (purpose-built) forests, riparian strips along watercourses, mosaics of mixed land-use such as traditional kampung and dusun areas, road and railway reserves and secondary growth on abandoned land. The effectiveness of such links depends on the wildlife species involved. For example, whereas small animals may move along road reserves, these are unlikely to be suitable for large species which is lead to the need to understand the CFS concepts. The concepts have been introduced since CFSMP 2010 and are enhance in CFSMP 2021. The concept of CFS was introduced during the Second National Physical Plan at August 2010. Basically CFS itself is consists of Primary Linkages (PL) and Secondary Linkages (SL). From CFSMP 2010, there are 37 ecological corridors, 17 are the primary linkages (PL) and 20 are the secondary linkages (SL). In addition to that, from the final report for CFSMP 2021, there are 39 ecological corridors which are 19 from it is PL and number of SL is remaining as 20. Based on the latest report, forest complexes that involves in this connectivity are Kedah Singgora, Bintang Hijau, Banjaran Utama, Greater Taman Negara, Benom, Chini – Bera, Pahang Tenggara, and Endau Rompin – Sedili.

To make sure the planning, execution and monitoring CFS projects is more effective, an orderly institution work plan has been made at the federal and state level namely Jawatankuasa Pemandu Nasional Pelaksanaan Central Forest Spine (JPNP-CFS), Jawatankuasa Teknikal Nasional Pelaksanaan Central Forest Spine (JTNP-CFS) and also Jawatankuasa Kerja Teknikal Pelaksanaan Central Forest Spine (JKTNP-CFS). The achievements and success of CFS were realised through concerted efforts by FDPM together in collaboration with every SFD particularly in the gazettelement of CFS ecological corridor as Permanent Reserve Forest (PRFs), establishment and restoration of wildlife habitats, building of infrastructure and encouraging financial performance within 10th and 11th Malaysia Plan from 2010 until 2020.

2.0 SUPPORT PROJECTS THROUGH NON-GOVERNMENT FUNDS

2.1 Project of Improving Connectivity in Central Forest Spine (IC-CFS) by United Nations Development Programme (UNDP)

The IC-CFS Project is currently on going in three states, Pahang, Perak and Johor that aimed at improving the connectivity of the forested area within the ecological corridors and integrated forest management area. At Pahang, this project is focused at C-PL 1: HS Tanum – HS Sg. Yu. This project was funded by Global Environment Facilities (GEF) and United Nation Development Programme (UNDP) was the GEF Implementing Agencies with its total is US\$ 10,860,000. Meanwhile, the executing agency is the

KeTSA while the collaborating agencies includes FDPM, Department of Wildlife and National Parks (DWNP) and Forest Research Institute Malaysia (FRIM). The project has started since 18 March 2014 and would continue until 18 December 2023.

The IC-CFS project focuses mainly on three main components. Component one includes planning, compliance monitoring and enforcement framework for integrated forest landscape management. Component two is sustainable forest landscape management of three priority forest landscapes within Central Forest Spine (CFS) and component three detailed out diversification of financing resources for conservation. Each component has its own specific outcomes or key milestones that have to be achieved each year until 2023. For example, in 2021, the key milestone that has to be achieved was Project Implementation Review (PIR) which was rated as Moderately Satisfactory (MS) or higher. During the Mid-term Review, the key milestone was rated as Moderately Satisfactory (MS) or higher overall with sustainability rated as Moderately Low (ML) or higher. Other notable achievement including Monitoring tool for biodiversity developed, ecosystem services and carbon stocks developed, integrated SMART patrolling initiative piloted in one State (Perak), management plan for Johor (Panti-Ulu Sedili) ecological corridor developed and CFS sustainable finance plan for one state drafted (Pahang).

2.2 Project of Ecosystem Services in the Central Forest Spine by South East Asia Rainforest Research Partnership (SEARRP)

The project of Ecosystem Services in the Central Forest Spine was a collaboration between FDPM, South East Asia Rainforest Research Partnership (SEARRP) and Yayasan Hasanah. The aim of this project is to conduct and capacity building among the forestry officers and other stakeholders on ecosystem service in the Central Forest Spine (CFS): Enabling Key Actors to Identify and Assess Natural Capital and Conservation Value Through the Use Of TESSA. Other than that, key stakeholders for CFS have a comprehensive understanding and skills to identify, assess and monitor the ecological value of forests and ecosystem services using TESSA and also improving the protection of critical areas that support ecosystem services in CFS.

TESSA is a toolkit that includes guidelines, applications and services to provide ecosystem assessment in a selected location and is very useful to assist management in decision making. The timeframe for this project is three (3) years, Jun 2020 until May 2023. This project was involved eight (8) CFS states which are Pahang, Perak, Johor, Terengganu, Kelantan, Kedah, Selangor and Negeri Sembilan. This project was fully funded by Yayasan Hasanah and the total funding for this project is RM 1.8 Million. The main outputs for this project are; 1. Eight (8) study sites for TESSA in each state's ecological corridors; 2. The project leader for each study site for TESSA evaluation; 3. Training course for TESSA; 4. Ecosystem services data from TESSA application; 5. Research sharing session through National Forum; 6. Case study for this study can be booked. For state of Pahang, the study site is at C-SL3 (HS Chini – HS Lepar) and ecosystem services that have been evaluated are environmental based services and ecotourism water-based services.

3.0 CENTRAL FOREST SPINE (CFS) AT PAHANG

3.1 Ecological Corridor of Central Forest Spine (CFS) at Pahang

At Pahang, there are nine CFS ecological corridor which is the total area is approximately 122,704 hectares to reconnect the forest complexes. The forest complexes involved includes Banjaran Utama, Greater Taman Negara and Endau Rompin – Sedili. The nine CFS corridor ecology at Pahang is as listed below:

- i. C-PL 1: Tanum FR (Greater Taman Negara) – Sungai Yu FR (Banjaran Utama)
- ii. C-PL 2: Ulu Jelai FR – Bukit Bujang FR – Hulu Lemoi FR
- iii. C-PL 3: Lesong FR – Resak FR
- iv. C-PL 4: Bukit Ibam FR – Sungai Marong FR and Lesong FR
- v. C-PL 5: Ibam FR (Rompin) – Kedondong FR, Pekan FR and Nenasi FR
- vi. C-PL 6: Ramsar Reserve, Bera – Ibam FR
- vii. C-SL 1: Wildlife Reserve Krau – Benchah FR – Som FR – Yong FR
- viii. C-SL 2: Lepar FR – Berkelah FR
- ix. C-SL 3: Chini FR – Lepar FR

3.2 Case Study : C-PL 1: Tanum FR – Sg. Yu FR, Lipis

3.2.1 Gazettement of CFS Ecological Corridor as Permanent Reserve Forest (PRFs)

Approximately 28,132 hectares of areas in Perak, Kedah and Pahang have been gazetted as PRFs within 10-year period of CFSMP implementation. These areas consisted of forest land other than PRFs that include state land that has no commitment or planning for development and also has potential to be gazetted to become PRFs.

In Pahang, there are five CFS ecological corridors that have been approved for gazettement. The details as table below:

No.	Name	Location	Area (ha)
1.	C-PL 2	Ulu Jelai FR – Bukit Bujang FR – Hulu Lemoi FR	2,258.53
2.	C-SL 1	Krau Wildlife Reserve – HS Benchah FR – Som FR – Yong FR	548.78
3.	C-SL 2	Lepar FR – Berkelah FR	323.50
4.	C-PL 1	Tanum FR – Sungai Yu FR	127.89

The gazettement of CFS Ecological Corridor as PRFs is a huge success which show that the Pahang State Government taking responsibility towards the achievement of CFS implementation in Pahang. As recent gazettement, Pahang Forestry Department has success to gazette 127.89 ha of state land to PRFs. Majlis Mesyuarat Kerajaan Negeri (MMKN) Pahang chair by Menteri Besar Pahang, YAB Dato' Sri Wan Rosdy bin Wan Ismail have approved its gazettement at 2019. After the Government of Pahang gazette is published for C-PL1, YAB MB has announced it in International Day of Forests in the National Level which has been held on 26th March 2022 at C-PL 1. The event was officiated by the Regent of Pahang, Tengku Hassanal Ibrahim Alam Shah Al-Sultan Abdullah Ri'ayatuddin Al-Mustafa Billah Shah. This event was

successful to gather all the level of stakeholders such as agencies, communities and NGO.

As mention in Menteri Besar speech, there are about 800 ha has been suggested will be gazetted as a forest reserve based on the stakeholder workshop that has been held in 2021 under the IC-CFS project. This stakeholder workshop for recommendation forest gazettement will be adapting to the others CFS ecological corridor in Pahang.

3.2.2 Establishment and Restoration for Wildlife Habitat

The establishment and restoration of wildlife habitats at ecological corridor was one of the main components in CFSMP implementation. For the 10 years of CFS implementation, about 839 hectares of wildlife habitat in Perak, Pahang, Kedah, Selangor, Johor, Terengganu and Kelantan were planted with various local timber species saplings that totalled 279,387. The efforts also aim to connect the forest complexes physically so that the continuity between forest complexes is visible to the public eye.

Restoration activities are continuing to make sure the ecological corridor rich with the various species (timber and fruit trees). In 2019, 90 ha of the degraded area were planted funded under the development fund, Ministry of Energy and Natural Resources Malaysia (KeTSA). Furthermore, in 2022 there are two projects under IC-CFS where been held within the ecological area which are replanting programme in 3 ha area in conjunction with International Forest Day Celebration at National Level and under Universiti Putra Malaysia consultation project which is replanting in 1 ha degraded area. The way forward with this establishment of restoration is to perform the habitat treatment activities to make sure all the plants were high survival rate.

3.2.3 Infrastructure

There are a few types' of infrastructures that have been built in CFS ecological corridor to support CFSMP such as eco-viaduct, billboard, lookout tower, and also signboard. Within CFS ecological corridor there is an eco-viaduct and a lookout tower at one of the ecological corridor in Perak. Other than that, 17 billboards and 26 signboards are also been built within the CFS ecological corridor. These infrastructures have their own purposes and roles towards the succession of CFS implementation in Peninsular Malaysia such as to promote CFS to public and also as a reminder to the public road user that they are crossing CFS ecological corridor and there is possibility for animal crossing would happen while they are using the road. Eco-viaduct was solely built at CFS ecological corridor to be wildlife crossing trails to save them from road-kill incidents.

Most of the allocation under the infrastructure was come under the federal government and state government. Pahang State Forestry Department had spent RM122,850.00 under Kumpulan Wang Pembangunan Hutan (KWPH). In addition, this spending was used to produce CFS billboard at C-PL1 (HS Sg Yu – HS Tanum) and C-PL2 (HS Ulu Jelai – HS Bukit Bujang – HS Ulu Lemoi).

3.2.4 Allocation and Expenditure on Central Forest Spine (CFS)

The allocation for activities at CFS ecological corridors is important to make sure the projects and activities in term of implementation of strategies and actions based on the CFSMP. The allocation on Central Forest Spine was started in RMK-10 (2012-2015) with an amount of RM 43,068,530.00 for the eight (8) states. The actual spending for this RMK-10 is RM 40,125,334.82 (93.17%). Meanwhile, during the RMK-11, RM40,054,000.00 allocation was received with adjustment (return = RM18,427,314.00) making an amendment to the allocation of RM21,626,686.00 since the global outbreak of COVID-19 that also affect the allocation and spending for the RMK-11. The allocation is continuing in RMK-12 (2021 – 2024) with an allocation of RM 25,820,792.86

As for Pahang, total allocation during RMK-10 (2012-2015) is RM 320,480.00 which covers the scope for mainly for rehabilitation and signboard. However, for RMK-11 (2016-2020), Pahang has been given total allocation RM 1,963,689.00 to conduct eight activities mainly for flora inventory, research of wildlife distribution and small vertebrates, rehabilitation, habitat's treatment, Measurement for PRFs boundary, build of billboard, signboard and warning sign.

4.0 PAHANG'S COMMITMENT TOWARDS CENTRAL FOREST SPINE (CFS)

4.1 Sempadan Hijau

Regent of Pahang is concern about environmental issues that currently happened in Pahang. Since Pahang located at the East Coast of Peninsular Malaysia, as the biggest states in Peninsular Malaysia with total land area is 35,965 kilometre squares which are equivalent to 3.596 million, is neighbouring to other six states namely Terengganu, Kelantan, Perak, Selangor, Johor and Negeri Sembilan. Therefore, Pahang State Government is required to research the Sempadan Hijau initiatives that cover around 1,087 kilometres long and with 500 meters width would include areas around 54,350 hectares.

The purpose of establishment of Sempadan Hijau in Pahang is act like a buffer zone which lead to preserve Pahang's state border so that there is no encroachment happened at state land or unplanned development planning. Other than that, it is to increase the green area at Pahang which indirectly would benefit to Pahang Forestry Department since those identified green area probably would be gazetted as PRFs. This effort would give added value to State Government because concerned towards the preservation and conservation of green areas and PRFs. From Sempadan Hijau, it would lead to the establishment of Wilayah CEKAL that involves other two states apart from Pahang, which are Kelantan and Perak.

4.2 Malayan Tiger

For conservation of wildlife in Pahang, based on the 49th of 2020 MMKN Pahang, the committee has agreed to the inauguration of His Majesty the Regent of Pahang as the Patron of Wildlife Protection of State of Pahang. Therefore it would strengthen the effort for wildlife protection and conservation in Pahang. For the protection purposes for endangered Malayan Tiger in Malaysia, National Tiger Conservation Action Plan (NTCAP) was adopted through Majlis Biodiversiti – Bioteknologi Negara (MBBN6) on 4

November 2009. This project has been led by Department of Wildlife and National Park (DWNP). Based on the 1st National Survey, it shows that states have high population of Malayan tiger are Pahang, Kelantan and Perak. However, the latest finding from DWNP based on survey conducted during RMK-11, there is only below than 200 Malayan tigers remain in Peninsular Malaysia and it is expected the number of Malayan tigers in Pahang would very much lower than that.

Hopefully with the involvement from His Majesty, the Malayan tiger especially at Pahang can be protected from any threats such as illegal wildlife trade, forest fragmentation because of land development projects and so on. Other than that, cooperation from Non-government Organisation (NGO) such as Worldwide Fund for Nature (WWF), WCS Malaysia, PELINDUNG and RIMBA is definitely helps FDPM and DWNP in controlling poaching at PRFs and especially at CFS ecological corridor.

5.0 ISSUES AND CHALLENGES

5.1 Land Use Change

The country's development has been the onus of the nation Economic Policy since independent. Along the way, more forested land was opened up to give way for agriculture, farming, mining, factories and etc. This posed great challenge especially in balancing development and environmental conservation, (JPNS 2020) have listed that land use change as the main issue in managing the CFS area in Selangor. The approach was to engage closely with land owner to educate them about the important of support and conserve this area. Furthermore, there are no fix legislation or law for the CFS area. There is a need to study an applicable legislation other than Forestry Act 1984 and Wildlife Conservation Act 2010. The legislation of CFS is needed to strengthen the formation and implementation of the ecological corridor. There is a also an urgent need to have an integrated land use database to make sure it can help policy makers in formulating strategies and implementation plans that have need to be taken to realise the ecological corridor.

5.2 Financial implications

The financial implication is a vital issue that will affect the implementation of strategies and actions as stated in the CFSMP especially for Pahang. Based on the measurement, the estimate expenses for the implementation cost that includes five main objectives in the CFS Master Plan were RM 3.14 billion. It is a huge budget to maintain the connectivity of the ecological corridor. Allocations from the federal and state government are insufficient to support all the activities and actions that have been listed in the CFSMP that involve 39 ecological corridors in eight states. So, it is important to have the sustainable financing plan for each state to make sure the issue of the financial implication can be resolve accordingly.

5.3 Conservation and Preservation Efforts

As stated before, CFS areas are mainly consists of PRFs and also other land status like alienated land, wildlife reserve and state land. Hence, there is more likely the land cover of these areas not necessarily covered with trees and plant. Therefore, it is the forestry department job to make sure as many as possible stranded land or degraded forest will be rehabilitate through enrichment planting.

Based on the Pahang Forestry Department Annual Report 2021, the non-forested area in Pahang is 1.587 million hectares which indicate non-PRFs area in Pahang and it represents around 43% of the total area of Pahang. Although, there is no exact total area of degraded and stranded land recorded in Pahang, through the total of non-forested areas shown that the conservation and preservation action need to be intensified. Among the challenges that faced by Pahang Forestry Department is lack of commitment from other agencies in the action for preserved and conserved the CFS ecological corridor at Pahang. Other than that, the lack of funding or allocated fund to conduct the programmes or activities at these particular areas for the environment could be another reason of the lack of action and participation from other agencies.

5.4 Human-Wildlife Conflict and Road-kill

PRFs in Peninsular Malaysia are under increasing pressure from rapid exploitation of natural resources in order to meet human needs. This has resulted in wildlife and people competing for the same natural resources such as land, water and forests. This competition brings both human and animals in close contact with each other with negative impacts for both. In Malaysia, conversion of forest into agriculture areas, especially palm oil monoculture, or infrastructure leads to conflicts with wildlife, such as elephants and Malayan tiger. Some of these animals are considered endangered and are totally protected in Malaysia, according to IUCN Red List of Threatened Species (International Union for Conservation of Nature). Moreover, mammals which are more exposed to conflicts are threatened with extinction (Ogada, 1999). In Peninsular Malaysia, habitat loss and forest fragmentation lead to intense conflicts between farmers and tigers and elephants which stray into cultivated area destroying crops and attacking livestock, and in extreme cases killing humans, resulting in illegal killing by farmers in defence of their livelihood and their own safety (Sharma et al, 2005).

6.0 WAY FORWARD

6.1 Sustainable Financing Plan CFS for Pahang state

The plan is still on-going under the IC-CFS project which is component three (3), diversification of financing resources for conservation. The main objective of this sustainable finance plan is helping the state government of Pahang to find out new alternative funding to the state for a long period such as eco-tourism, carbon, water and biodiversity. This plan has been produced by the consultant that has been appointed by Forestry Department of Peninsular Malaysia (FDPM).

6.2 Pilot and Institutionalize the SMART Patrol in Enforcement Division

The SMART Patrol is still on going in the three states which are Pahang, Perak and Johor under the IC-CFS Project. Recently, this SMART Patrol is use by Department Wildlife and National Park (DWNP) in their enforcement daily task. The use of this software usually to enhance the patrolling among the state forestry department especially that involving the ecological corridor area.

7 CONCLUSIONS

CFS ecological corridors play a significant role in preservation and conservation for flora and fauna in Peninsular Malaysia. In addition to that, CFS ecological corridors at Pahang are quite important since the ecological corridors are the continuity of forest to other states which are Perak, Kelantan, Terengganu, Johor and Negeri Sembilan. One of the main challenge that have been facing by federal and state government to implement CFS is lack of funding to the government for a long period such as eco-tourism, carbon, water and biodiversity. Hence, by Pahang becoming the pilot project for Sustainable Financing Plan for CFS, which to find out the alternative funding to the state, would help other states to gain the monetary value from the ecosystem services provided from our natural resources. Other issues and challenges that we have encountered by becoming the main stakeholder and the coordinator for CFS's strategies contained in CFSMP 2010 and 2021, shows that it require intense participation from other agencies and also public involvement especially in the management of land development, rehabilitation and sustainable use of CFS ecological corridor. It is also important that the policy makers should understand and acknowledge the importance of CFS ecological corridor and its role for the reassurance of flora and fauna in Peninsular Malaysia. Therefore, it is essential to enhance to collaboration between governmental agencies, non-governmental agencies and local community to increase their awareness on the significant of CFS ecological corridor for the ecosystem.

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