

The Potentials and Perils of Ecotourism in Belum Temengor Forest Complex

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Abstract: Ecotourism is a becoming the hype word in tourism industry nowadays. It gains its popularity due to two of its main prongs: economic incentives and conservation benefits, both to the locals and the destination. Ecotourism greatly depends on the wealth of its natural heritage to lure in tourists. Through the National Ecotourism Plan developed in 1996, the Belum Temengor Forest Complex (BTFC) was identified as one of the areas possessing great potentials for ecotourism development. The rich biodiversity of flora and fauna and the unique culture of indigenous peoples living in the area are among the most important elements of attractions apart from the beautiful landscapes and lush sceneries. However, the rampant poaching, uncontrolled logging activities and mismanagement issues are some of the perils that could destroy the potentials of this promising area from further developing into a worldwide ecotourism destination in Malaysia. This paper examines some of these threats and provides suggestions and recommendations for the improvement of ecotourism in the study area.

Key words: Ecotourism • Protected area • Biodiversity • Conservation • Management

INTRODUCTION

Ecotourism has received great deal of interest from many countries as it is seen as a tool to stimulate economic growth and promote conservation of the treasure it holds. Grounded by three core principles which are nature-based, environmentally educative and sustainably managed [1], ecotourism is defined by Ceballos-Lascuráin [2] as “environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features- both past and present) that promotes conservation, has low negative impact and provides for beneficially active socio-economic involvement of local populations”. This definition was also adopted by the Malaysian government in the National Ecotourism Plan published in 1996. Usually set in rich natural areas, this ecological form of tourism depends heavily on its natural heritage and unique cultures to lure in tourists to ecotourism destinations [3-5].

Malaysia is endowed with vast amount of biological diversity, beautiful landscapes, unique cultures and lush ecosystems. Located on the green belt, this country is

blessed with rich tropical ecosystems teeming with many natural wonders that have yet to be explored. Malaysia is one of the 17 megadiverse countries that houses many endemic species and together with other 17 countries, Malaysia encompasses more than 70 percent of the earth's species [6]. According to the Malaysian Ministry of Natural Resources and Environment (NRE) [7], there are an estimated 15,000 species of vascular plants, 229 species of mammals, 742 species of birds, 242 species of amphibians, 567 species of reptiles, over 290 species of freshwater fish and over 500 species of marine living in Malaysia. Acknowledging the natural wealth of this country, the National Ecotourism Plan was published in 1996 to boost the ecotourism sector. In this National Ecotourism Plan [8], Belum Temengor forest was chosen as one of the potential ecotourism sites to be fully developed. Important natural assets both flora and fauna with the beautiful natural landscapes must be kept thriving and in healthy numbers in order to ensure the plan be realized. However, there are some perils in maintaining the integrity of these precious ecosystems. The rampant poaching, uncontrolled logging activities and mismanagement issues are among some of the threats that could destroy the potentials of this area from

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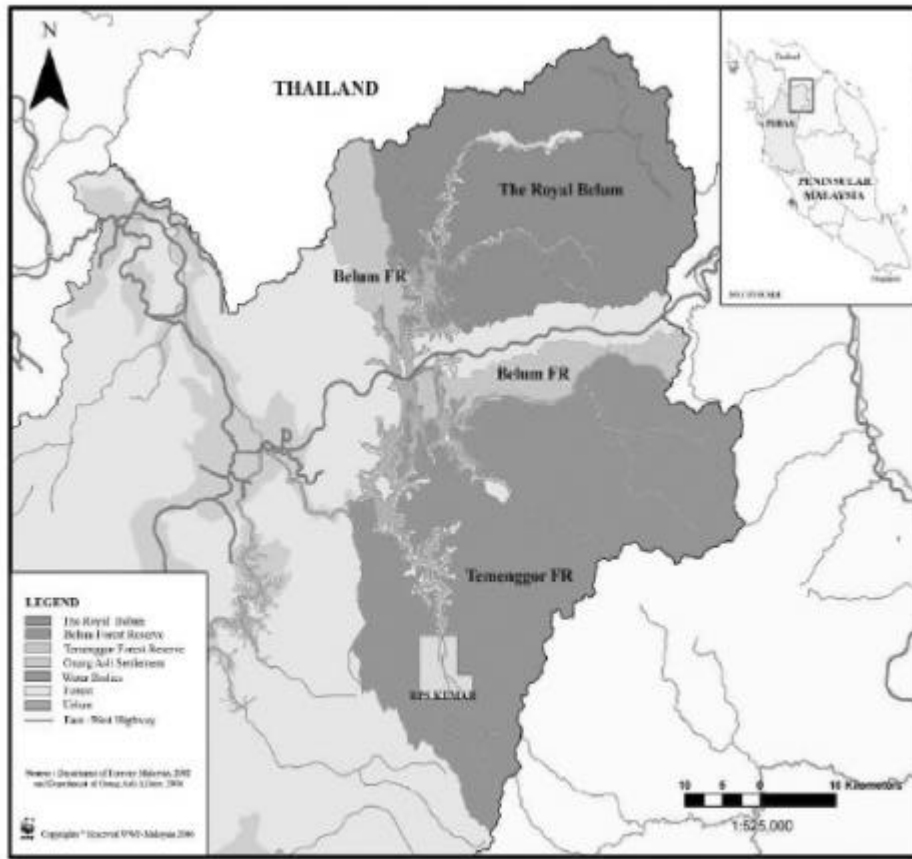


Fig. 1: Location of BTFC (Source: WWF Malaysia website).

becoming one of the internationally-known ecotourism destinations in Malaysia. This paper examines some of these threats and provides suggestions and recommendations in keeping the natural heritage in the BTFC sustainable.

BTFC and Its Natural Heritage: BTFC (Figure 1) is situated at the far north of Perak, bordering Halabala National Park, Thailand on the north, Kelantan forest on the east and Ulu Muda forest reserve, Kedah on the west. It is second largest remaining continuous tract of protected area in Peninsular Malaysia after Taman Negara National Park Pahang. The area expands for around 300,000 hectares and comprises of these main areas; lower Belum forest reserve, Temenggor forest reserve and Royal Belum State Park. The Royal Belum State Park (117,500 hectares) is the only area royally protected in BTFC since 17 April 2007 after the Perak Royalties adopt this area as Perak's state park. Other areas remain as protected forest and activities such as logging and hunting are allowed here (with permits). Identified as Environmentally Sensitive Area under Malaysia's National Physical Plan

2005, BTFC is a reservoir of rich wonders both flora and fauna, not excluding the unique landscapes such as the green mountainous terrain, waterfalls, limestone formations, caves and unique riverine systems.

The landscape of BTFC is majorly submerged under the man-made Temenggor Lake expanding 15,200 hectares due to damming of several rivers in 1970s for power generation [9]. The damnation process has created a beautiful serene landscape, added with picturesque dead woods protruding from the blue-green waters, is a welcoming appeal for visitors. According to WWF Malaysia [10], the result from the survey conducted at the area shows that majority of 68 percent of the tourists regarded this dendritic lake as one of the major attractions apart from the natural wonders. The main source of water comes from the Temenggor River, one of the Perak River tributaries. From a survey done along Sungai Perak by Zainudin [11], the findings show that there are a total of 92 species comprising 12 orders, 33 families and 63 genres from 4733 specimens. However, Zakaria-Ismail and Lim [12] revealed that Temenggor lake managed to support only 23 freshwater species but with healthy fish populations

for sport fishing. They (1995) further depict their finding as only specialized fishes can survive in the rapid streams and rivers. The most common fish in this lake are sebarau (*Hampala macrolepidota*), toman (*Channa micropeltes*), terbol (*Osteochilus hasseltii*), Queen Danio (*Danio regina*) and kelah (*Tor tambroides*). The blue-green freshwater is also suitable for commercial tilapia breeding. Through cooperation with Norway, it is expected to yield supply of 40,000 tonnes metric tilapia a year from cage breeding activities by 2013 [13].

The rainforests in BTFC support high botanical diversity. Since the first expedition conducted by Malaysian Nature Society (MNS) which only concentrates around base camp- Sungai Halong at Hulu Temengor, a total of 269 species of flowering plants in 96 genera and 76 families had been collected and observed [14]. In this expedition, ten rare species were also found including *Rafflesia* of similar characteristics to *R. hasseltii* of Sumatera. Later, it is documented as a new species and named after the Sultan of Perak Sultan Azlan Shah as *Rafflesia azlanii* [15]. Overall, BTFC supports four types of well-known biggest parasite flower in the world- *Rafflesia cantleyii*, *R. kerrii*, *R. hasseltii* and the new *R. azlanii*. These unique foul-odour flowers have become one of the key floral attractions for visitors to see when visiting this area. New discoveries were also made with the findings of first epiphytic orchid *Cleisostoma complicatum* in Peninsular Malaysia, red-leaved maranta species *Phyrynium terminale* [16], rare and endangered species *Homalium undulatum* and *Impatiens albo-flava* [17] and a new species of *Didymocarpus* from Gesneriaceae family [18]. There are also 37 species of wild ginger from Zingiberaceae family [19, 20] and 32 species of edible fruit trees [21].

BTFC is a large piece of land with wide selection of trees suitable enough to support free roaming birds to rest, feed and nest. One of the prominent large bird species in this area is the hornbill. Malaysia is home to 10 hornbill species from 54 species of hornbills known in the world. It is astonishing that BTFC alone supports all the ten species of hornbills that can be found throughout Malaysia compared to seven species sighted in Endau Rompin National Park [22] and eight species in Gunung Mulu National Park [23]. Davison [24] recorded that mass flights of hornbills can be seen in a day with up to 2,421 hornbills in a flight. Due to the rich avifauna in this northern region, this area is chosen to be classified as Important Bird Areas (IBA) by BirdLife International. This place is also important area for habitat conservation.

As the second largest protected area after Taman Negara National park, BTFC offers crucial ecosystem services such as maintaining the hydrological cycle, providing clean water and recently a newly recognized role as a carbon sink. These services are estimated by MNS to worth between RM150-350 million annually, while its carbon sink value is worth a staggering RM1-1.2 billion [25]. With the abundant invaluable assets that could never be traded with monetary rewards, BTFC is a blessing for this country and its people. Hence, any form of perils or threats to this area must be kept at bay or even be eliminated in order to ensure the continuity of the resources for the next generation to admire and appreciate, apart from the high recreational value it holds.

Threats to BTFC

Poaching: The East-West Highway (also known as the Gerik-Jeli Highway) was officially opened for public in 1982 with the purpose to shorten the journey from Grik in Perak to Jeli in Kelantan. Historically, in 1970 during the communist insurgency in Malaya, the highway served as a defence mechanism to deflect communist soldiers from escaping to Thailand. Measuring 80 kilometres long, this highway has led to increasing economic growth at the east coast and encouraged economic exchange between east coast and west coast regions. However, in the process of linking these two areas, the highway also acted like a sword dissecting the dense complex and along the way, exposing the vulnerable treasures within. The highway has created a much easier route for “unwanted tourists” to enter BTFC along the highway and hunt the treasures in much faster way. There have been least 37 entry points along the highway spotted by WWF Wildlife Protection Unit (WPU) in 2009 [26]. This unit which was created in December 2009 serves as patrol guard in the area and conducts anti-poaching patrols in the Royal Belum State Park and along the East-West Highway. Since its establishment until January 2009, the unit has removed 102 snares set by illegal hunters and aided the authorities in arresting 10 illegal hunters and traders [27].

Among the most wanted treasures the poachers seek include the expansive agarwood (known to locals as *gaharu*), tiger parts, elephant tusks, rhinoceros horns, pangolins, sambar and barking deer. Agarwood is usually sought after for its aromatic and medicinal properties and religious purposes. It is considered as one of the most expensive woods in the world as the price of high quality agarwood can reach up to RM 1 million per kilo [28]. Chua [29] notes that this high-priced tree has enticed poachers to carry out unsustainable ways of harvesting the tree

either through fatal harvest (logging) and sub-lethal harvest (chipping or cutting the infected part of the tree). These activities pose serious threats to the extinction of this high valued tree. Most of the local communities in Peninsular Malaysia including BTFC adopt sub-lethal harvest on 2-3 months rotation basis as it allows the trees to survive for up to 15 years of chopping [29]. Acting on the fact that the number of agarwood trees is fast depleting globally, the Convention for the International Trade of Endangered Species (CITES) has classified this tree as Appendix II, which states that agarwood cannot be traded internationally without a CITES permit. However, Chua [29] laments that trading on the black market has provided an alternative to counter this and usually the profits garnered there worth more than the value CITES permit.

Tiger parts are also another valuable item sought by the poachers in the BTFC jungle. Traditionally, Chinese believe tiger parts have medicinal value and some consider the meat an exquisite cuisine. The demand for tiger parts is very high and the rampant poaching has put pressure on protecting the majestic animal in their natural habitat. According to WWF, parts from a single tiger could fetch up to as much as USD\$50,000 on the black market, making hunting these magnificent creatures very beguiling to poachers. In Asia, over 1000 tigers have been killed in the past 10 years to meet consumer demand. The Wildlife Trade Monitoring Network (TRAFFIC) reported that Malaysia alone has lost 55 tigers to poaching activity over the past decade [30]. The Department of Wildlife and National Parks Peninsular Malaysia [31] believes the numbers are declining rapidly to be as low as 500 tigers in the wild and considers BTFC as main stronghold for the tiger population in the Main Range. However, the exact numbers of tiger population in BTFC is still unknown.

Elephants are also hunted for their tusks, while Sumatran rhinoceros are hunted for their horns. In black market, the price of ivory and rhinoceros horns can reach up to more than USD\$700 and USD\$30,000 per kilogram respectively. Elephant live in large herds and hunting these animals can be hard. Inventory and monitoring programmes from 2000 to 2002 done by DWNP estimated that elephant population in Peninsular Malaysia was around 1,220 - 1,460. On the other hand, rhinoceros are solitary species and highly sensitive towards human presence. The rhinoceros is listed as 'critically endangered' by the IUCN and fully protected under the Malaysian Wildlife Protection Act of 1976. This shy animal is nearly extinct with the estimated population of only 20, a sharp decreased from estimated numbers of 50 to 75 back in 1984 [32].

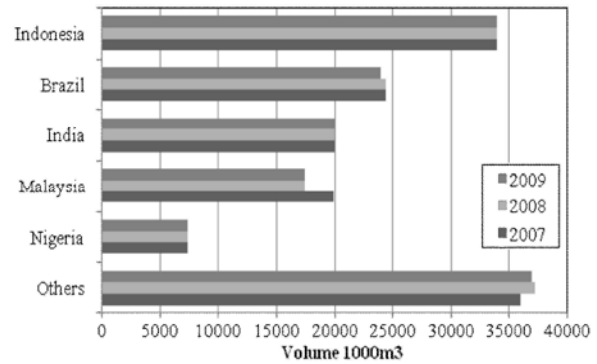


Fig. 2: Major tropical timber producers [Source: 35]

Pangolin is yet another wild animal widely being poached in BTFC. It is sought after for its purported properties to alleviate rheumatic pains and aphrodisiac properties. This critter can fetch as much as RM150 per kg or RM500 per animal on the black market. Apart from that, sambar and barking deer are also being hunt down by the poachers and even some tourists although the economic value is less compared to other majestic animals such as tigers, elephants and rhinoceros. Unknown to them, illegal hunting of these animals adversely affects the ecosystem stability. As the numbers of sambar and barking deer drops, so will the numbers of tigers as their food supply become scarce.

Logging: BTFC produces high-quality timbers which are much sought after by the market. Currently, Malaysia is one of the five International Tropical Timber Organisation (ITTO) major tropical log producers for 2007-2009 (Figure 2). According to Salleh, Yee-Hwai, and Saad [33], the presence of *Shorea lumutensis*, *Johannesteijmannia perakensis*, *Rafflesia* spp, salt lick and pre-historic archeology site adds value to the forest. Furthermore, eventhough BTFC seems safe from illegal logging activities due to its protected area status, actually only the Royal Belum is fully protected and no logging activities are allowed here. In other areas, logging are still being carried out although the Perak state government pledged that logging activities in areas surrounding Temenggor lake and Banding island would be banned from 2008 [34]. It appears that this resolution would have saved the area from detrimental effects of logging activities but sadly logging activities are still being carried out in BTFC.

Legal logging activities aim to help finance the state government. In reality however, legal logging creates a problem on its own. It contributes to deforestation and change in the landscape. In addition to this, illegal logging is even worse as it operates in unsustainable

manner. It could mercilessly destroy wildlife habitats along with the abundant biodiversity that seek shelter in the trees specifically and the area generally. It will reduce the forest size, lead to habitat fragmentation and eventually reduce the lake water quality by increasing turbidity from sediment resuspension when the heavy rains hit the bare soil. Moreover, Moore and McCarl [36] reveals sedimentation from logging activities can affect both reservoir storage capacity and hydroelectric power generation. Take logging activities in Sarawak for example which took the nation by shock when the longest river in Malaysia was flooded with tons of timber debris stretching 250 kilometres long after heavy rain hitting the Balleh and Balui river basins. Due to unchecked logging activities, this havoc has disrupted transportation facilities for the locals living alongside the river and posed major ecological damage there. The degraded water quality resulted in many fish to suffocate and die. Without doubt, tourism activities were also heavily affected as the tragedy ruined the serene scenery and water-based recreational value of the river. Hence, logging activities either legal or illegal must be stopped at all cost in order to ensure the natural heritage of BTFC will be protected and encourage continuous visitation of tourists.

Management Issues: Located on the central forest spine (CFS) of Malaysia, BTFC is considered High Conservation Value Forest (HCVF) due to its high environmental, biodiversity, socio-economic and landscape values. BTFC is also recognised in the National Physical Plan Malaysia (NPP) as an Environmentally Sensitive Area (ESA) Rank 1. This category indicates that those areas classified should not be subjected to development, agricultural or logging activities and only low impact nature-based tourism, educational and research activities are allowed. Sadly, the Perak state government categorised Temengor Forest as ESA Rank II which indicates sustainable logging could be carried out in the forest [37]. This shows that there are no coherent policies and guidelines from the federal and state government, thus creating conflicts in implementation process.

Temengor lake provides alluring attraction for sport-fishing and avid anglers. However, complaints were received revolving around the declining population of freshwater fish. This might be due to overfishing, aquaculture industry and improper usage of tools in fishing such as by using dynamite and *rawai* (a long line with hooks attached to a rope). Avid anglers come to BTFC as tourists to fish and there is no limitation of

number of fishes they are allowed to catch per day fish. Plus, there is even no limitation on numbers of tourists entering BTFC (excluding Royal Belum which allows 30 persons per entry). Another threat is the blooming aquaculture industry breeding tilapia fish. Tilapia is originally a non-indigenous, invasive fish to the Temengor lake and the escaped tilapia (from cages) might be hazardous to the indigenous fish species there. According to Mooney and Cleland [38], the invasive species pose risks to native species through competition for food, niche displacement, hybridization, introgression, predation and eventually lead to local species extinction. The improper usage of fishing gear to catch fish and landing the bait at sensitive areas such as fish breeding ground at river mouths also pose risk to the fish populations in Temengor lake [39]. In addition to this, Temengor lake might suffer the same fate as Kenyir lake with the invasion of *Escherichia coli* (*E. coli*) bacteria if no proper water management being practised in BTFC. Recently, a research team from Universiti Malaysia Terengganu reported the presence of high levels of the *Escherichia coli* (*E. coli*) bacteria in Kenyir lake [40]. It is resulted from the high numbers of aquaculture projects and untreated sewage discharges from houseboats in Kenyir lake. *E. coli* can cause serious food poisoning in humans and serves as an indicator of water contamination.

Another star attraction to BTFC apart from the majestic wildlife there is the saltlick (known as *sira* or *jenut* in Malay). According to the Protection of Wild Life Act 1972 (Act 76), saltlick is defined as “any mineral spring or ground containing or bearing salt or any other mineral (whether of the same genus or not), the consumption of which is conducive to the health or well being of wild animals”. In other words, it is a place where wild animals gather to get minerals to supplement their diet especially in the case of herbivorous mammals. Apart from that, saltlick also acts as an indicator to monitor the healthiness of an ecosystem. For example, camera traps positioned in saltlick areas in Taman Negara National Park, Peninsular Malaysia, captured glimpses of tiger preys such as wild boar, sambar deer, mouse deer, sun bear and pangolin, visiting the area of saltlick apart from large mammals such as the elephant, tiger, tapir and leopard [41]. Clearly, saltlicks is a meeting point where most of all animals in the jungle come to get their nutrients and monitoring this area is essential to keep the forest ecosystem intact. The Perak Tourism website reported that there are an estimated 60 salt lick locations in Royal Belum and the famous ones are in Jenut Rambai, Kejar, Atap, Batu, Papan dan Kuak. The gathering of wild

animals at these saltlicks has lured tourists to visit the area hoping to catch a closer glimpse of these animals in their natural habitat. Although the Protection of Wild Life Act 1972 (Peninsular Malaysia) provide laws for the protection of saltlicks in Malaysia, however, Chong, Tang and Suksuwan [42] state their concern about the threats posed by poaching and unregulated tourism activities to the vulnerable animals frequenting these saltlick areas. Knowing that most wildlife visit saltlicks, poachers take this opportunity to easily set traps around saltlicks for easy prey. Currently, tourists visiting BTFC particularly Royal Belum are not briefed on how to behave when they are around this sensitive area.

Suggestions and Recommendations: Poaching and illegal logging are the most common threats that pose serious problems to the natural resources in protected areas [43]. As the ecotourism activities in BTFC heavily depend on its flora and fauna to lure tourists, it is in dire need to stop or eliminate these illegal activities from depleting the natural treasure. There is no single way to solve these problems; however, we believe these suggestions and recommendations could perhaps keep these threats at bay.

Firstly, more stringent penalty should be posed to those found guilty of practising these illegal activities. According to Protection of Wild Life Act 1972 (Act 76), any person who unlawfully shoots or kills a totally protected wild animal will only be fined a total of not exceeding RM5000 or sentenced to a term of imprisonment not exceeding three years or both. This is merely trivial if compared to what they will get from selling the animals to the black market, thus making the ruling a less effective deterrent. Amendments to the act by adopting a more stringent penalty should be imposed to encourage poachers to think twice before even considering entering BTFC.

Secondly, increasing the numbers of rangers for anti-poaching and illegal logging is crucial to effectively guard the area and enforcing the laws. To counter the lack of man-power problem, the management of the park should open up more applications to the public especially to the locals, tour guides and tourists. This is also known as an alternative way of tourism called volunteer tourism where the tourists entering the park act as the eyes and ears of the park law enforcement by informing the authorities of any poaching or illegal logging activities. At the same time, they will have an opportunity to safeguard BTFC, contribute to conservation and enjoy nature. The management authorities could conduct short classes on how to deactivate simple animal traps and snares, to those

enrolled in the programme before letting them enter BTFC. However, they should not take actions into their own hands as the poachers can be dangerous or armed with weapons.

Thirdly, international cooperation with the neighbouring countries to seize these illegal activities is important as not all poachers are from Malaysia. The Malaysian Nature Society (MNS) has proposed to establish a transboundary protected areas between BTFC with Hala Bala Wildlife Sanctuary and Bang Lang National Park in the Southernmost Thailand dedicated to conserve animals, trees and natural landscapes within. If this proposal is successful, it will be an excellent accomplishment in conserving one of the world's natural heritage, provided all three protected areas and these two countries work hand-in-hand in combating illegal activities in these areas. This intergovernmental effort to combat illegal activities is also an added star attraction to lure international tourists that seek true ecotourism experience. Apart from that, this transboundary protected areas also will form a large space for large animals and birds such as the hornbill to roam great distances and increase the population.

Finally, mapping the trees (agarwood) and tagging the wild animals using Geographical Information System (GIS) will make it easier for the rangers to conduct patrols and monitor the distribution and movement of the animals. This technology has long been used by many protected areas management authorities in wildlife conservation and management but its application in the local ecotourism scene has yet to be seen.

Every state in this country has its own legislative powers on land, local government, land, forests, fishery and agriculture. Therefore, the state has the authority to categorise their plots of lands according to the state's wish and give logging concessions to any logging concessionaire they desire. In addition, there is no single legislation that covers protected areas and its management completely. For example, The Protection of Wildlife Act 1972 mainly deals with the protection of wildlife, while the National Forestry Act 1984 handles the administration, management and conservation of forests and forestry development, the Water Act 1920 only covers of rivers and streams, while the Fisheries Act 1985 covers the conservation and management of fish resources. In this case, there is no easy way out. These overlapping jurisdictions over resources create much confusion and restrictions in effective management as there is lack of integrative cooperation among the governmental agencies. To overcome this, the state and federal must sit down together in developing policies and

create a specialized body to formulate policies and implement them, with the help of other related government organizations. This is to ensure coherent policies can be made especially in protected area matters and management, resulting in uniform execution of policies.

The need to curb overexploitation of fish resources through overfishing of fish resources in Temengor lake is essential to maintain the sustainability of the lake in ecotourism industry. Many tourists come to Temengor lake to sport-fish but if the fish population decrease, it can be detrimental to the health of the lake and affect the ecotourism industry as well. There must be proper regulations in place, strict penalty and effective enforcement in order to keep the lake's charm. One is to restrict the numbers fish landings in a day, only mature fish of certain length are allowed to be consumed and the anglers must adopt catch and release method. Tour guides also need to be informed about off-limit or sensitive areas (spawning or breeding grounds and nursery) set by the Perak Fisheries Department in the Temengor Lake Management Plan. Information about catch and release concept and other regulations must be spread to anglers, tourists, tour operators and tour guides through talks before they enter BTFC. Furthermore, regular patrols and checks by the marine police/ are needed to ascertain these rules are followed.

Tilapia is economically important food fish, but the blooming growth of this industry threatens the indigenous fish. An option to reduce the threats posed by tilapia is to encourage locals to breed and commercialize indigenous fish. To mitigate *E. coli* contamination in the lake, only boathouses with proper sewerage system must be allowed to operate in the waters.

Saltlick holds high ecotourism potential due to its high probability of catching glimpses of wildlife in the wild. The management authority must set strict rules and assign rangers to regularly patrol the areas. Chong *et al.* [42] recommends creating buffer zone with hefty radius to minimize disturbance, only very low-impact tourism activities can be undertaken here and make-shift observation hides with five meters of height are allowed in the zone. Tourists too must be informed about the rules when visiting these areas such as to remain silent and if they disobey the rules, they must be - given strict warning. Regular patrols by the rangers are a must in curbing poaching activities. More stringent amendments on penalty of fine are necessary in order to hinder illegal activities in this sensitive area. Above all, strict enforcement is necessary as this meeting spot is very sensitive to any kind of human intervention.

CONCLUSION

Ecotourism in BTFC largely depends on the rich natural heritage to lure in tourists. This paper has highlighted the vast potentials of BTFC to be an internationally known ecotourism site. However, the perils and threats posed by poaching, uncontrolled logging and mis-management issues (incoherent policies between state and federal government, inadequate numbers of rangers to guard and patrol BTFC, overfishing, invasive species, water contamination and improper saltlick management) are the drawbacks from moving towards sustainable development of ecotourism in BTFC. Cooperation between the stakeholders, serious law enforcement, regular patrols and educating the public on the importance of preserving the natural heritage are among the important elements to protect and conserve BTFC. Inevitably, both public pressure and political are much needed to keep BTFC thrive both as a sanctuary for wildlife and ecotourism destination. Overall, ecotourism in BTFC promises much potential to prosper into a world renowned ecotourism destination but steps must be taken to eradicate threats which hinders it from turning into reality.

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