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IS THERE A SUSTAINABLE FUTURE FOR WILDLIFE IN OIL PALM PLANTATIONS IN MALAYSIA?

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ABSTRACT

The oil palm scene is often highly debated and has been at the centre of controversy in the past decade. Dubbed the 'cash crop', many Third World tropical countries have seized the opportunity to mobilise oil palm at landscape levels to fuel the economy. However, many of these tropical countries are also rich in biodiversity and are home to many endemics and species of conservation importance. While it tackles economic issues like poverty alleviation, it comes at the cost of environmental destruction. Here we take a look at the potential values of forest fragments and wildlife-friendly practices in oil palm landscapes and their roles in conservation in Malaysia. As the demand for oil palm and its products are most likely to continue to grow, there is a need to look at how the relevant stakeholders will sustainably manage the increasing demand while improving biodiversity management.

Keywords: biodiversity, conservation, oil palm, policy, wildlife.

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INTRODUCTION

Malaysia is the second largest exporter of palm oil globally and the planted areas cover approximately 5.8 million hectares; approximately 17.57% of the total land area in Malaysia (FAO, 2011; MPOB, 2018). Agricultural landscapes are often lacking in biodiversity due to scarcity of resources (*e.g.*, food and shelter) that would usually occur in natural environments (Chazdon *et al.*, 2009). Therefore, not many native species, especially forest specialists, are able to thrive within the monoculture (Edwards *et al.*, 2010; Maddox, 2007; Yap *et al.*, 2010). As such, many recent publications comparing forest species and remnant species in monocultures only provide the extent of species and ecosystem function deficits due to this conversion.

The European Union's introduction of a palm oil biofuel ban, while designed to protect the future of biodiversity and aimed to thwart deforestation of rainforests in the tropics, may instead have dire implications. The ban's effectiveness has also been questioned by the International Union for the Conservation of Nature (IUCN, 2018), as the move will only increase production of other land-inefficient oil crops to compensate for the loss of market share and maintain existing oil palm plantations, which acts as a displacement rather than a prevention of global biodiversity losses resulting from oil palm. Palm oil-producing countries will find alternative markets and even compensate profit loss by increasing sales to importers such as China, India, and other countries which are not as committed as the European Union to sustainable sourcing. This, in turn, may weaken the implementation of palm oil sustainability certification programmes.

On the 10 June 2019, the Delegated Act was passed by the European Union Parliament to ban and restrict palm oil biofuel imports by 2030 (Ching, 2019). The passing of the Delegated Act disregards the commitments of certification schemes such as the Roundtable for Sustainable Palm Oil (RSPO) and the Malaysian Sustainable Palm Oil (MSPO) and hampers efforts to ensure that the production of oil palm is as environmentally sustainable as possible. The key issue for biodiversity loss is deforestation, which has now been addressed

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within the certification scheme of RSPO (zero-deforestation pledge), while MSPO prohibits planting on highly biodiverse lands. The RSPO certification programme also lists the protection of forest fragments within oil palm plantations as part of its principles and criteria (RSPO, 2018). However, the effectiveness of these forest remnants in terms of biodiversity conservation has been given little evaluation (Bernard *et al.,* 2014; Edwards *et al.,* 2010).

MSPO was first launched in 2015 by the Malaysian government as a national standard in its commitment to fulfilling sustainability requirements. MSPO is strongly aligned with the existing national legal and regulatory requirements which proved the general principles for the establishment, implementation and improvement of sustainable practices in Malaysia (McInnes, 2017). MSPO is mandatory requirement for all Malaysian oil palm industry by 31 December 2019 (Sivanandam, 2017) providing traceability up to the plantation level.

Checks and balances in the form of strict regulation, auditing and ambiguity need to be addressed. The Malaysian government has recently given the extent for RSPO to publish maps of palm oil concessions, promoting better accountability and transparency within the supply chain and help curb deforestation and forest fires (Reuters, 2019).

ASSOCIATED BIODIVERSITY PATTERNS INSIDE OIL PALM PLANTATIONS

There is a great ecological disparity between natural forests compared to the oil palm monoculture as plantations are typically simplistic in structure; lower canopy height, little to no undergrowth, typically uniform in oil palm age composition, more prone to climatic fluctuations and have greater human disturbances (Corley and Tinker, 2008; Turner and Foster, 2006). Various studies have proven the monoculture landscape to be a poor habitat for most species (Fayle *et al.*, 2010; Maddox, 2007; Mandal and Raman, 2016; Srinivas and Koh, 2016; Tscharntke *et al.,* 2005). However, depending on the plantation's structural attributes (*e.g.* understory vegetation, epiphyte prevalence and presence of other crops), it may support local wildlife by providing additional resources such as food or shelter (Aratrakorn *et al.,* 2006; Azhar *et al.,* 2014; 2015a; Jambari *et al.,* 2012; Nájera and Simonetti, 2010; Yahya *et al.,* 2017). Proximity to forest patches have also been found to influence species richness within the oil palm landscape (Azhar *et al.,* 2011; Edwards *et al.,* 2010; Knowlton *et al*., 2019; Koh, 2008a; Lucey *et al*., 2014; Pardo *et al.,* 2019).

The Potential Values of Forest Fragments in the Oil Palm Landscape

Forest fragments within the oil palm landscape are the last bastions of refuge for biodiversity within the oil palm landscape and should not be regarded as 'low value' for conservation (Mohd-Azlan *et al.,* 2019a) (*Figure 1*). Studies on forest fragments within oil palm plantations have shown that fragments support subsets of species richness from contiguous forest and are to a certain extent comparable to some fragmented and isolated protected areas, *e.g*. Mohd-Azlan *et al.* (2019a, 2019b) recorded 42 species of birds, 15 species of bats and 10 species of small mammals in a high conservation value (HCV) forest patch (116 ha) in an oil palm plantation in Miri, Sarawak, Malaysia compared to 62 species of birds recorded by Arif and Mohd-Azlan (2014) in Gunung Gading National Park (4100 ha), 15 species of bats in Similajau National Park (8996 ha) (Kumaran *et al.,* 2011), 17 species of small mammals in Lambir Hills National Park (6952 ha), 29 in Mulu National Park (52 864 ha) and 19 in Niah National Park (3140 ha) (Shazali *et al.,* 2016). A study by Struebig *et al*. (2008) in the Krau landscape, Peninsular Malaysia found that forest fragments of >300 ha supported a considerable amount of bat diversity and that species assemblages in larger fragments resemble those in contiguous forests despite being surrounded by agriculture. Studies in Sabah, Malaysia by Benedick *et al*. (2006); Brühl *et al*. (2003); Edwards *et al*. (2010) and Lucey *et al*. (2014), also highlighted the importance of forest fragments in their ability to support substantial amount of forest species and should not be neglected. Arthropods (Denan *et al*., 2019), birds (Koh, 2008b; Maas *et al*., 2013), bats (Maas *et al*., 2013; Phommexay *et al*., 2011; Williams-Guillén *et al*., 2008) and mammals (Chua *et al*., 2016; Holzner *et al*., 2019) have demonstrated functional roles as biological control agents that may benefit plantation managements. Thus, protecting forest patches within and surrounding plantations can contribute to both biological conservation and plantation sustainability.

Restricted access to oil palm plantation from extrusion and excision may benefit some of the heavily hunted species. Forest fragments have also been shown to support or facilitate movement of megafauna species such as the Malayan Tiger, Asiatic Tapir and Malayan Sun Bear (Azhar *et al.,* 2013; Bernard *et al.,* 2014; Guharajan *et al.,* 2018) which are also transient in nature to the oil palm matrix.

Studies on biodiversity reconcilement remain divided between land sharing (Fitzherbert *et al.,* 2008; Koh, 2008a; Mohd-Azlan *et al.,* 2019a; 2019b; Pardo *et al.,* 2019; Tawatao *et al.,* 2014) and land sparing (Bernard *et al.,* 2014; Edwards *et al.,* 2010;

Phalan *et al.*, 2011; Wearn *et al.*, 2017; Yue *et al.*, 2015) approaches. However, these should not be mutually exclusive, and a combination may allow a balance to be achieved between the multifunctionality of monoculture landscape and management needs (Fischer *et al.*, 2006; Grass *et al.*, 2019; Matson and Vitousek, 2006). This, in turn may reduce production area which many small-scale plantations may not see this as a favourable option.

All types of forest fragments harbour some level of biological value (*Figure 2*), but the proportions depend on factors such as isolation, the encompassed vegetation matrix and patch size (Edwards *et al.*, 2011), which in turn may influence the edge effect and species spill over. Existing oil palm plantations can never be restored to their original forested state once their rich biodiversity has already been lost. Stakeholders need to constantly embrace new environmental challenges and advances and continue to provide resources to support and facilitate the rehabilitation and enhancements of forest fragments within their care. Mitigation initiatives during replanting, such as leaving some old oil palm patches embedded with reforestation programmes, could create wilderness areas over time. This, in turn, can create wildlife corridors between existing forest patches to enable wildlife migration that may encourage gene flow between populations (Falcy and Estades, 2007; Koh, 2008a). The oil palm industry must be ready to contribute some of these production areas to reforestation, especially those that are close to forest patches or that provide critical connectivity among forest patches.

Figure 1. In silhouette against the evening sky, a forest fragment in an oil palm matrix that should not be regarded as low value for conservation.

Figure 2. High conservation values forest (HCVF) (background) adjacent to the oil palm landscape may harbour some of the remnant species.

There is also great potential in considering some HCV in oil palm plantation as Other Effective-based Conservation Measures (OECM) as part of the general conservation not only within the oil palm landscapes but externally as well. Potential OECM should be identified and reported by the relevant stakeholders as they can contribute to achieving the Aichi Biodiversity target (Target 11):

"By 2020, at least 17% of terrestrial and inland waters and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes" (Convention of Biological Diversity, 2018) and the national target (Target 6) (Ministry of Natural Resources and Environment, 2016), as their recognition can provide additional incentives for the stakeholders to provide and enact better protective measures for conservation.

These OECM are advantageous and recognised for promoting biodiversity conservation to the oil palm industry in a way as they can be potential corridors between protected areas wherever relevant, maintain and secure ecosystem services and support the recovery of threatened species (IUCN-WCPA Task Force on OECM, 2019).

CONCLUSION

By 2050, oil palm demand is expected to reach 120-156 million tonnes (RSPO, 2015). Malaysia direly needs to achieve a balance between economic growth and environmental sustainability. With non-exhaustive literature suggesting the negative impact of monoculture, government policies should ensure that no more forested land, including degraded secondary forest to be converted to supply the demand. Expansions can consider replacing of other non-economically viable agriculture. Future oil palm replantings need to be carefully and strategically designed to provide buffers around forests to facilitate connectivity (Scriven *et al.,* 2019) as these areas are critical for biodiversity and ecosystem services. Additionally, to complement forested areas, the oil palm areas can be enhanced and made to be more hospitable to biodiversity by applying landscape management practices such as replacing chemical herbicides with integrating livestock (*e.g.* cattle) for undergrowth management (Tohiran *et al.,* 2017; 2019), improve landscape heterogeneity and habitat complexity by implementing polyculture (Ashraf *et al.,* 2018; Atiqah *et al.,* 2019; Azhar *et al.,* 2014; Ghazali *et al.,* 2016) and reconfiguring patches of oil palm stands of different ages (Azhar *et al.,* 2015b).

Therefore, instead of launching a ban, what we need the most right now is solidarity and collaboration at the global scale to tackle challenges together. A culture of sharing pioneering knowledge between researchers and industrial players is critical for formulating best practices across the industry for the sustainable management of oil palm plantation in our biodiversity-rich nation. By understanding the biological carrying capacity of forest fragments in oil palm plantations, we can suggest to managers different types of adaptive strategies that cater to improve the general biodiversity or species-specific actions to allow for a friendlier environment to biodiversity and subsequently support oil palm plantations to be more ecologically sustainable.

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