# SUSTAINABILITY PRACTICES OF THE MALAYSIAN OIL PALM INDUSTRY with a focus on BIODIVERSITY

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# SUSTAINABILITY

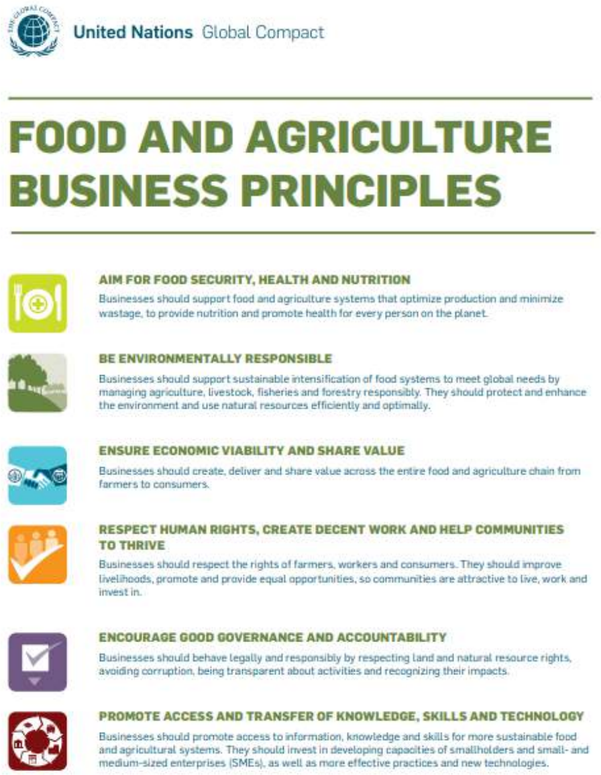
## Triple bottom pillar of sustainability

People

Planet


Profitability

## UN Global Compact
## Sustainable Food & Agriculture Business Principles
## 6 PRINCIPLES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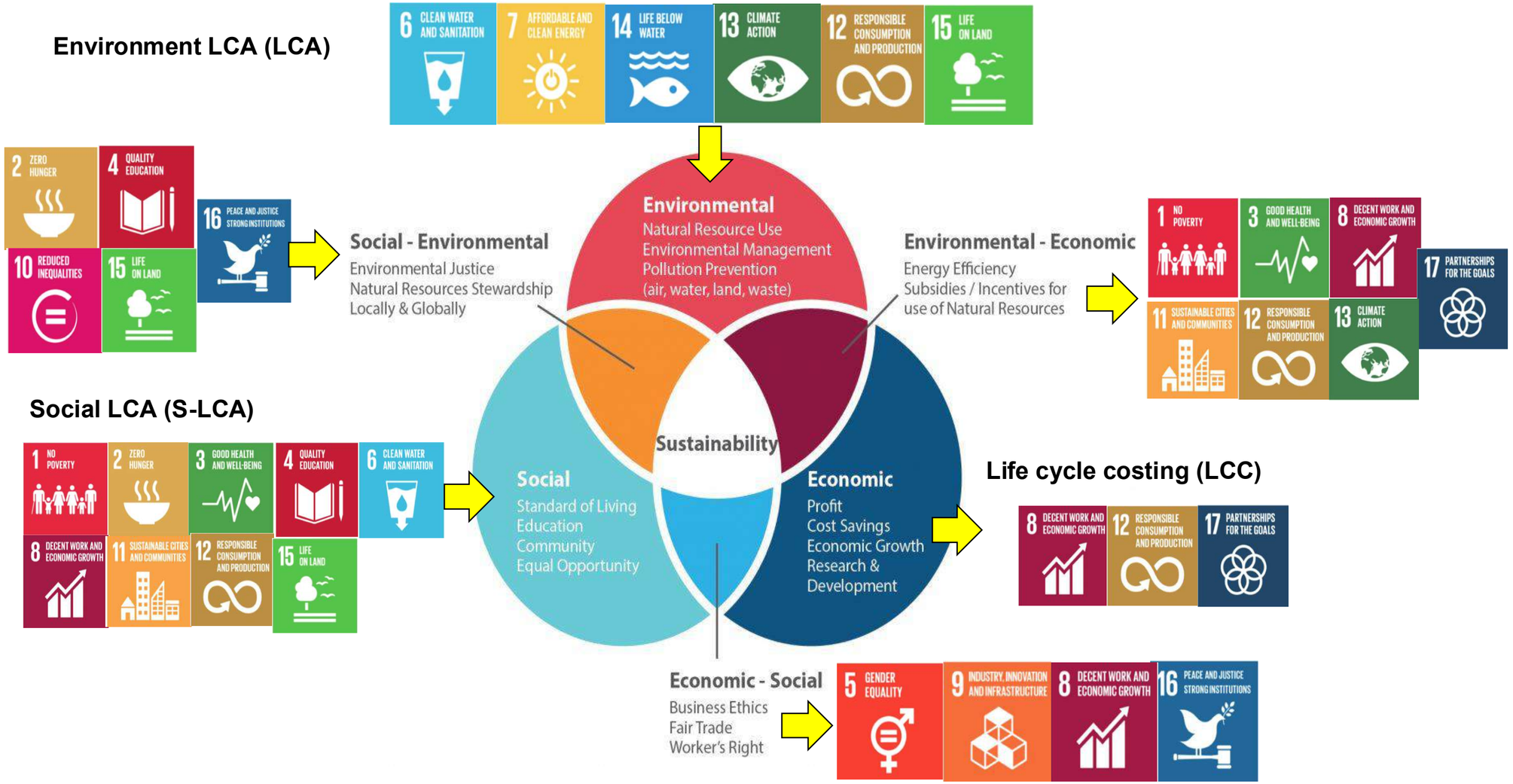
# LIFE CYCLE SUSTAINABILITY ASSESSMENT (LCSA)

## LIFE CYCLE SUSTINABILITY ASSESSMENT (LCSA) TOWARDS SUSTAINABLE DEVELOPMENT GOALS (SDG)

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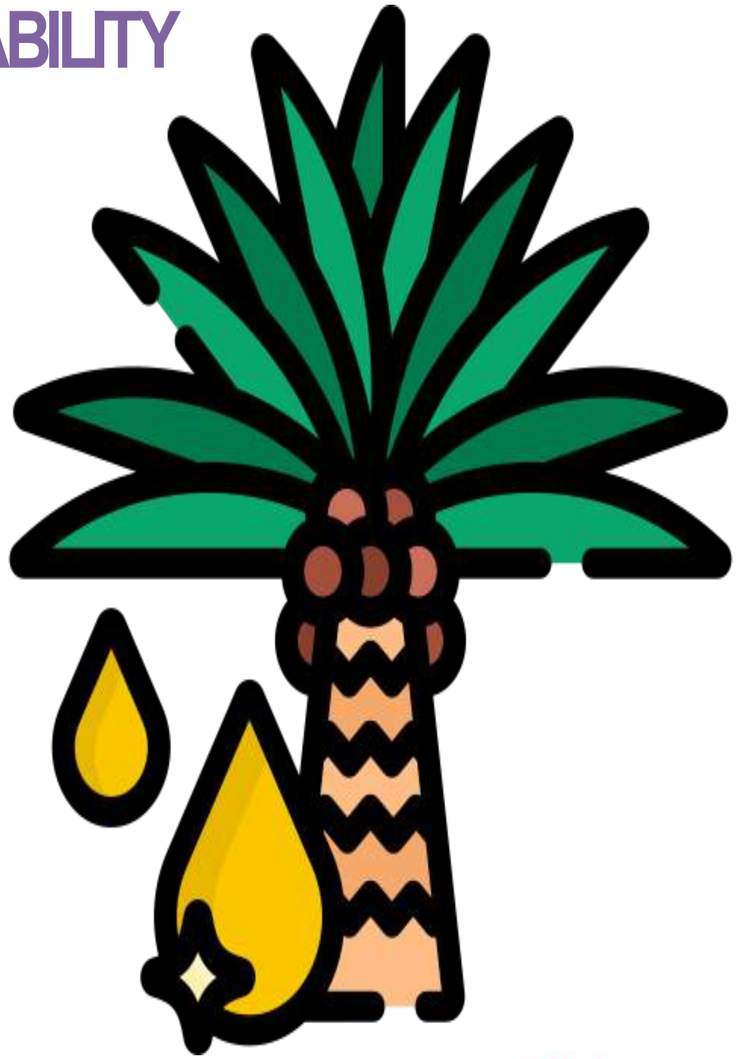
# ADDRESSING SUSTAINABLE PRACTICES

## MALAYSIA'S COMMITMENT TOWARDS SUSTAINABILITY

Malaysia voluntarily agrees to cut the GHG emission intensity by 45% by 2030 relative to emission intensity GDP in 2005 as part of its commitment to COP21.

Malaysia, as a world leader in sustainable palm oil production, has put in place various environmental measures while successfully uplifting the lives of rural communities through palm oil cultivation. This has proved that oil palm industry certainly contributes to achieving the United Nations Sustainable Development Goals.

The Malaysian oil palm industry in now focusing on improving productivity and yield, rather than expanding land. Malaysia reiterates its commitment made at the Rio Summit in 1992 to retain at least 50% of the land area under forest cover.



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# POLICIES TOWARDS SUSTAINABLE OIL PALM CULTIVATION

**To cap total oil palm cultivated area to 6.5 million hectares**


**No more planting of oil palm in peatland areas** and to further **strengthen regulations** with regard to existing oil palm cultivation on peat

To **ban the conversion of forest reserve areas** for oil palm cultivation

To make available **oil palm plantation maps for public access**

**The Cabinet of Malaysia on 22 March 2019 had endorsed the following policies toward sustainable oil palm cultivation.**
**DAKN 2021**


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# MALAYSIAN SUSTAINABLE PALM OIL (MSPO)

**Content of MS2530:2013**

1) Management commitment & responsibility
2) Transparency
3) Compliance to legal requirements
4) Social responsibility, health, safety and employment condition
5) Environment, natural resources, biodiversity and ecosystem
6) Best practices
7) Development of new planting

## MSPO TIMELINE

**2020:** Mandatory implementation of MSPO started

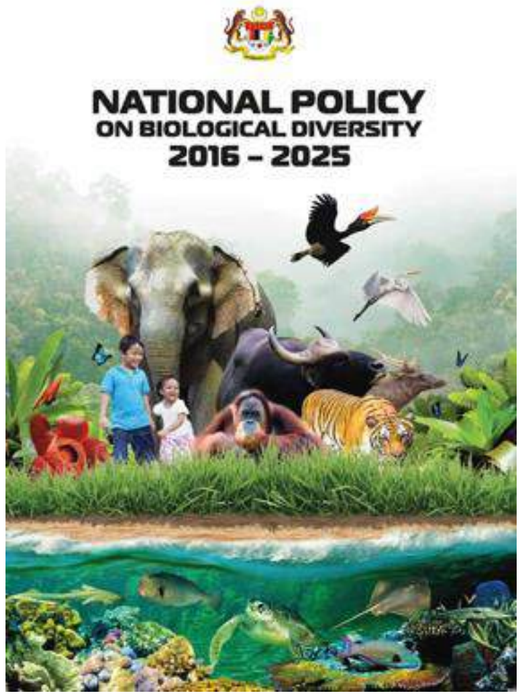
**2017:** Mandatory implementation of MSPO was announced

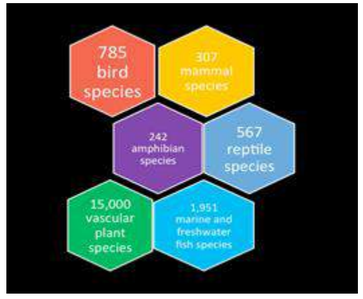
**2015:** Voluntarily implementation of MSPO certification scheme

**2013:** MSPO standard was launched

# NATIONAL POLICY ON BIOLOGICAL DIVERSITY

- The first National Policy On Biological Diversity was formulated in 1998.
- Revised policy will be used as guide to biodiversity management over the next 10 years (2016 – 2025).
- Provides the direction and framework in conserving the nation's biodiversity and use it sustainably in the face of increasing challenges.
- This revised policy complements Malaysia's obligations under the United Nations Convention on Biological Diversity (CBD) and to implementing the Sustainable Development Goals (SDG).



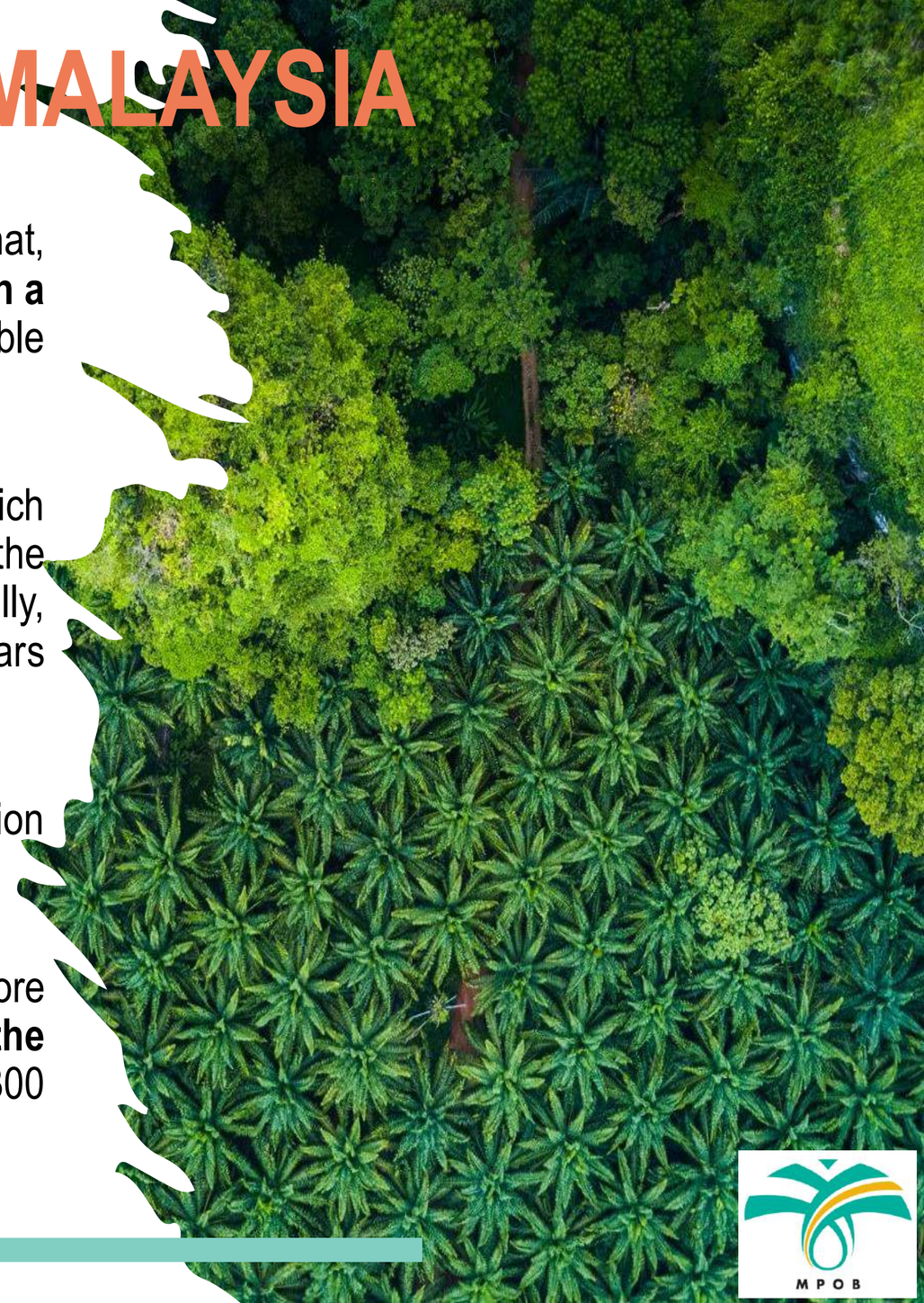

# DEFORESTATION RATE IN MALAYSIA

- In 2021, the Global Forest Review of the World Resources Institute reported that, in 2020, "**Primary forest loss also declined in Malaysia for the fourth year in a row**" . (World Resources Institute, Global Forest Review, Forest Pulse, available at https://research.wri.org/gfr/forest-pulse.

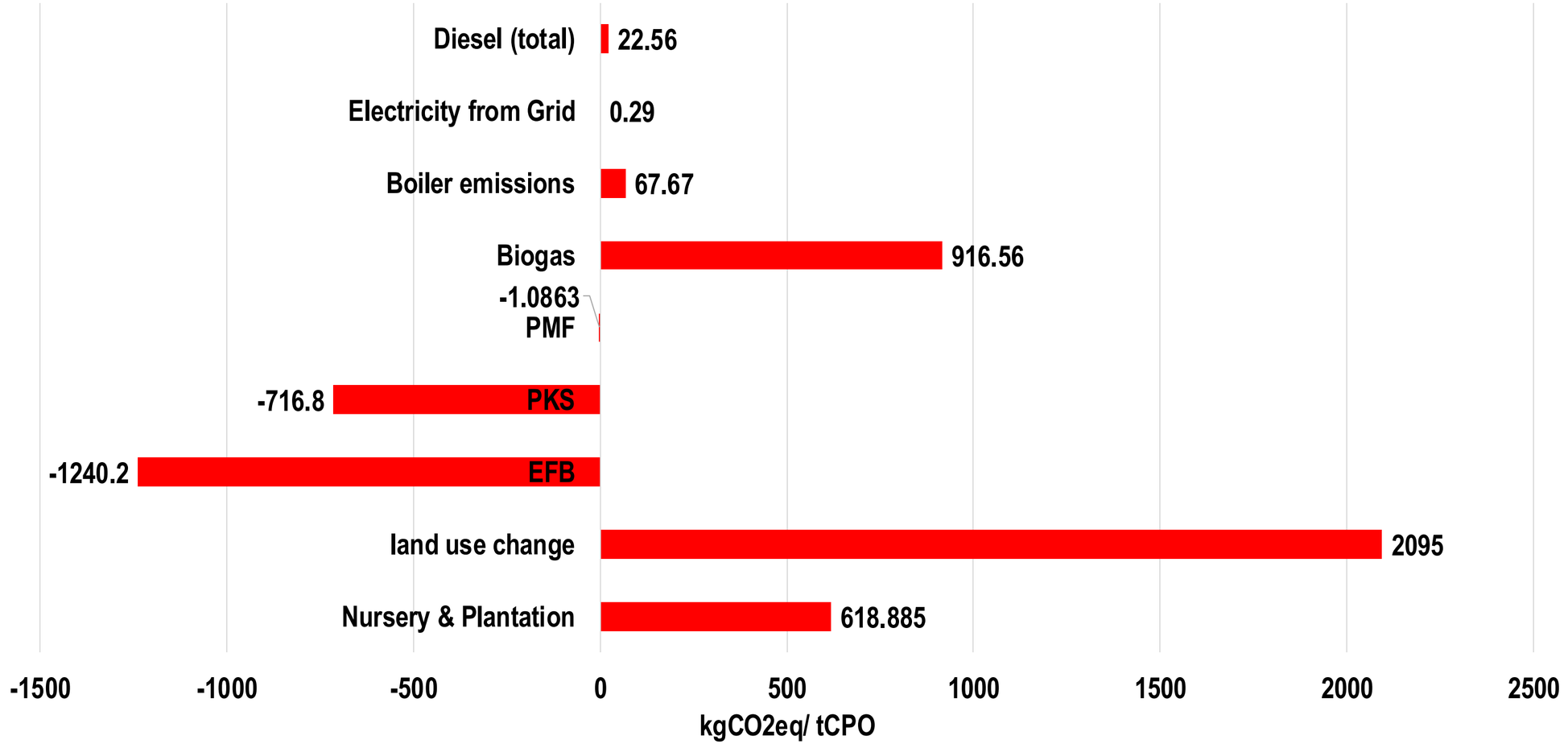
- For the period from 1991 to 2000, the deforestation rate was at 0.27%, which **decreased to 0.09% for the period from 2001 to 2010**. From 2010 to 2015, the **forested area actually increased by 2%** to 18.25 million ha. More specifically, during the period from 2008 to 2018, except for 2016 and 2018, all other years recorded a net gain in forest area.

- There are many drivers of deforestation and studies show that **oil palm** cultivation is **not the major cause of deforestation**.

- Recent reports indicate that livestock, soya, and wood products cause more deforestation than oil palm cultivation. More specifically, **livestock is the dominant driver of deforestation**, as **land area occupied** by livestock is 300 times more than that used for oil palm cultivation.



# GHG EMISSIONS & SAVINGS – LUC PATHWAY




Source: Subramaniam, V., Loh, S. K., & Aziz, A. A. (2021). GHG analysis of the production of crude palm oil considering the conversion of agricultural wastes to by-products. Sustainable Production and Consumption, 28, 1552–1564. https://doi.org/10.1016/j.spc.2021.09.004

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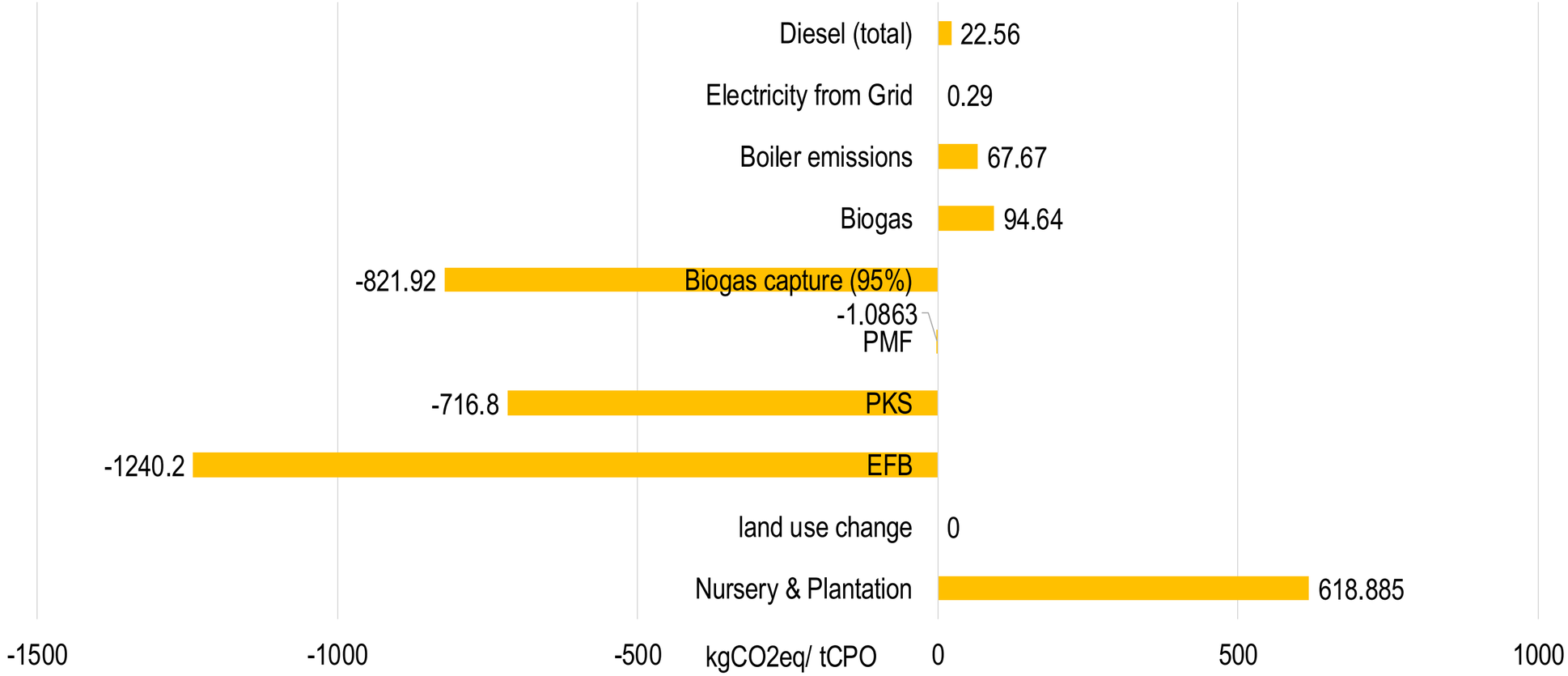
# GHG EMISSIONS & SAVINGS - BEST PRACTICES PATHWAY

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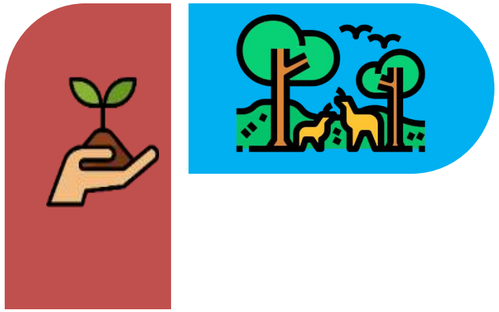
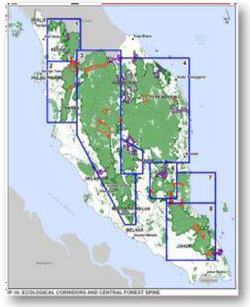
# ON-GOING EFFORTS

To plant **1 million forest tree species** within the next 10 years (sponsored primarily by the oil palm industry members)



The Malaysian oil palm industry is **proactive in wildlife conservation efforts**, working together with organization such as Sabah Wildlife Department to support wildlife rescue and conservation efforts

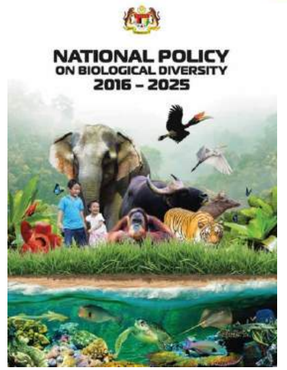


**Central Forest Spine (CFS)** - linking 4 main forest complexes which form the central mountain range in Peninsular Malaysia. CFS will be crucial in creating ecological connectivity for Peninsular Malaysia and will ensure species survival

**Heart of Borneo (HoB)** - Malaysia participates with Indonesia and Brunei in the "Heart of Borneo" Initiative to conserve approximately 20 million hectares of ecologically interconnected rainforest, with about 30% of the area are in Malaysia.



Establishment of **the Malaysian Palm Oil Green Conservation Foundation (MPOGCF)**. The aim of this foundation is to fund conservation activities for the oil palm industry so that it could be carried out more effectively.




The **National Policy on Biological Diversity** complements Malaysia's obligations under the United Nations Convention on Biological Diversity (CBD) and to implementing the Sustainable Development Goals (SDGs).

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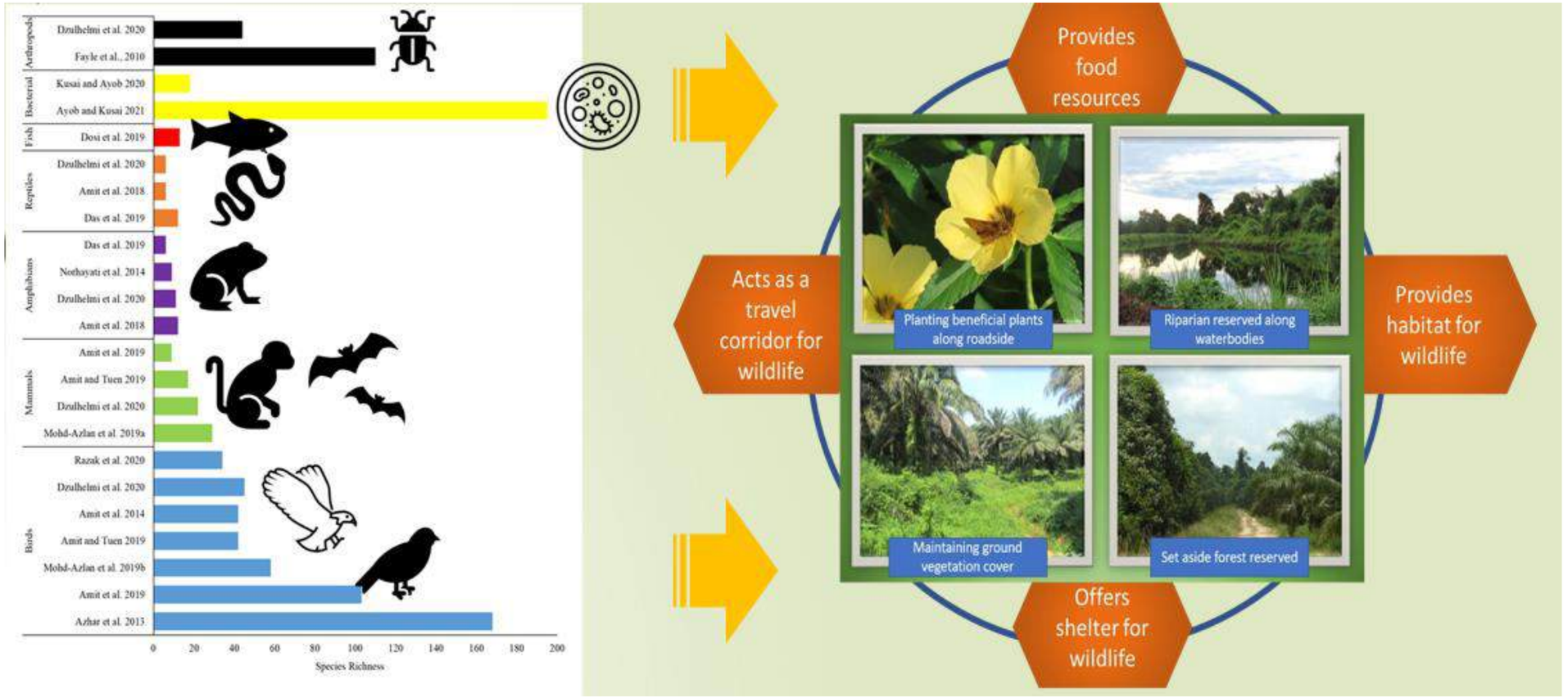
# SUSTAINABILITY-RELATED RESEARCH

## UPSTREAM: HARMONIZATION OF OIL PALM WITH NATURE

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# ENHANCEMENT OF BIODIVERSITY IN OIL PALM ECOSYSTEM

Many plantation companies have in place Environment and Biodiversity policies. Being committed to sustainable development, sustaining the environmental and biodiversity has become a prime consideration in all aspects of the Malaysian oil palm plantation operation.

# ZERO BURNING

*This approach of ecosystem services is through supporting services (services that maintain the conditions for life on earth) which is crucial for biodiversity enhancement.*

- Cleaner environment
- Soil organic matter& soil physical properties
- Soil microbial population and fertility are also enhanced;
- nutrient cycling from previous crop biomass at time of replanting -reduce chemical fertilizer inputs and also can conserve if not improve soil biodiversity

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# VEGETATION & GROUND COVER

Manipulation of ground cover vegetation - Reduce insect pest incidence through increasing abundance and efficiency of predators and parasitoids of pest species

Growing beneficial plants of *Euphorbia heterophylla* in strips around oil palm plantations could bring about natural suppression of bagworm damage to oil palm.

Other studies indicated that beneficial plants like *Cassia cobanensis, crotalaria usaramoensis* and even the weed *Asystasia intrusa* could be used for the same purpose.

Biodiversity of oil palm plantations can be increased by vegetation characteristics at the local level (e.g. epiphyte prevalence) and by natural forest cover at the landscape level (e.g. old-growth forests surrounding oil palm estates)

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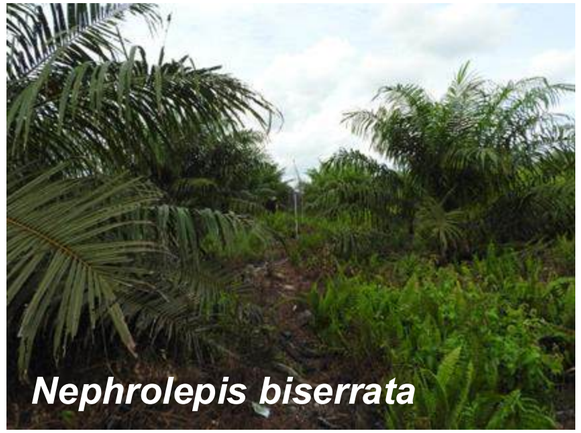
# PLANTING OF LEGUMINOUS COVER CROP AND NATURAL COVERS





LEGUMINOUS CROP & FERNS TO ENHANCE SOIL FERTILITY TO PREVENT SOIL EROSION AND DESICCATION.

LEGUME GROUND COVERS PROVIDE NITROGEN SUPPLEMENT -REDUCE THE APPLICATION OF INORGANIC NITROGENOUS FERTILIZERS

MAINTAIN SHADE TOLERANT WEEDS OF VARIOUS SOFT GRASSES AND FERNS ALONG THE INTER-ROWS AND TERRACE SLOPES. NATURAL WEEDS (E.G. ASYSTASIA GANGETICA L.) WERE NORMALLY REMOVED TO REDUCE COMPETITION WITH PALM TREES FOR SOIL NUTRIENTS.

THE PRESENCE OF EPIPHYTES (E.G. *ASPLENIUM NIDUS* L.) THAT GROW NATURALLY ON THE TRUNKS OF PALM TREES, AND THE EXTENT AND NATURE OF GROUND VEGETATION ARE VARIABLES THAT COULD BOTH POTENTIALLY AFFECT BUTTERFLY AND BIRD DIVERSITY.

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# PLANTING OF BENEFICIAL PLANTS AND INTEGRATED PEST MANAGEMENT (IPM) THROUGH BIOLOGICAL CONTROL




Beneficial plants are planted to attract the environmentally-friendly insect predators and parasitoids of Lepidopteran pests of oil palm (e.g. *Metisa plana*) natural suppression of bagworm damage to oil palm.

- *Euphorbia heterophylla*
- *Cassia cobanensis*
- *Crotalaria usaramoensis*
- *Asystasia intrusa*
- *Turnera subulata*

Acts as biological corridor for harbouring and supporting beneficial arthropods that aid in suppressing crop pest population.

Parasitoids and predators among the arthropods like *Dolichogenidea metesae, Goryphus bunoh, Pediobius anomalus, Sycanus dichotomus,* etc as natural enemies of oil palm pests like *Metisa plana, Mahasena corbettii, Darna trima, Pteroma pendula and Setora nitens*

The entomopathogens baculovirus of *Orytes* and *Metarhizium anisopliae* have also been used to control the rhinocerous beetle *Orytes rhinoceros* in oil palm

The raptor to be able to provide long term suppression of rat damage to oil palm to below consequential levels without need for chemical intervention e.g Barn Owl.

Less use of chemicals lower GHG emissions in plantation is expected thus reducing global warming.

# INTERCROPPING OIL PALM WITH OTHER CROPS AND LIVESTOCK INTEGRATION

Oil palm plantations intercropping with other crops or mixed plant species will usually **support more biodiversity** than monocultures . This can be conducted during the early planting of palms or at immature stage with crop diversification e.g., cash crops such as banana, tapioca, sweet potato etc. that can be planted in the double- avenue rows.

Integrate with livestock such as goat and sheep-control herbicide use

*Avoid overgrazing by leaving sufficient undergrowth.*

*A group of sheep grazing in an electric fenced-off paddock (left), and adult sheep grazing on soft undergrowth (right).*

*Two months after planting (upper) and three months after planting (lower) sweet potato as an intercrop in oil palm in double-row avenue planting.*

# INTERCROPPING OIL PALM WITH OTHER CROPS AND LIVESTOCK INTEGRATION

## LOW CARBON OIL

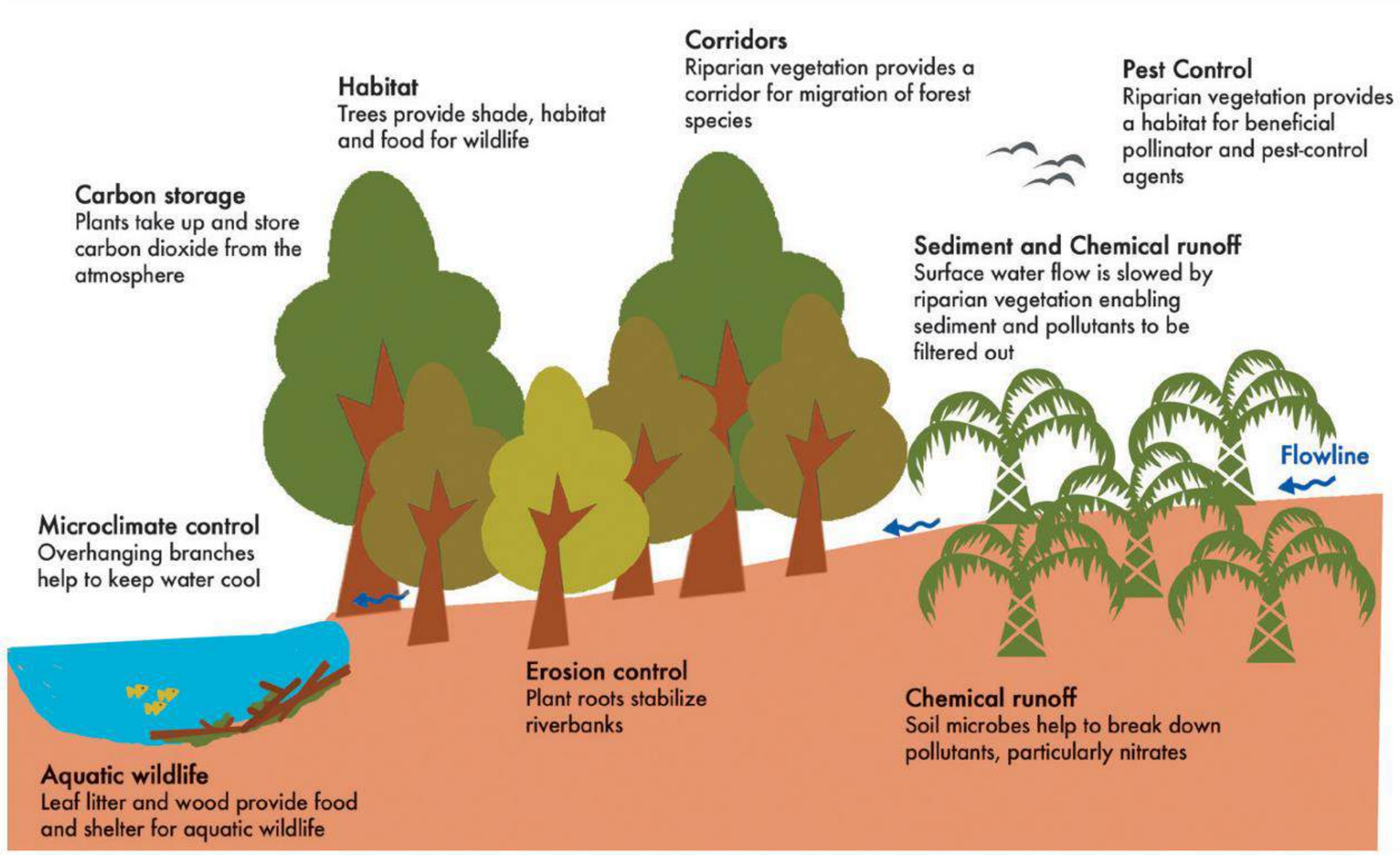
- Increased production / ha
- Reduced chemical fertilisers & pesticides
- Reduced GHG emissions
- Reduced soil erosion
- Increased Biodiversity
- Increased soil biodiversity & fertility

*Avoid overgrazing by leaving sufficient undergrowth.*

*A group of sheep grazing in an electric fenced-off paddock (left), and adult sheep grazing on soft undergrowth (right).*

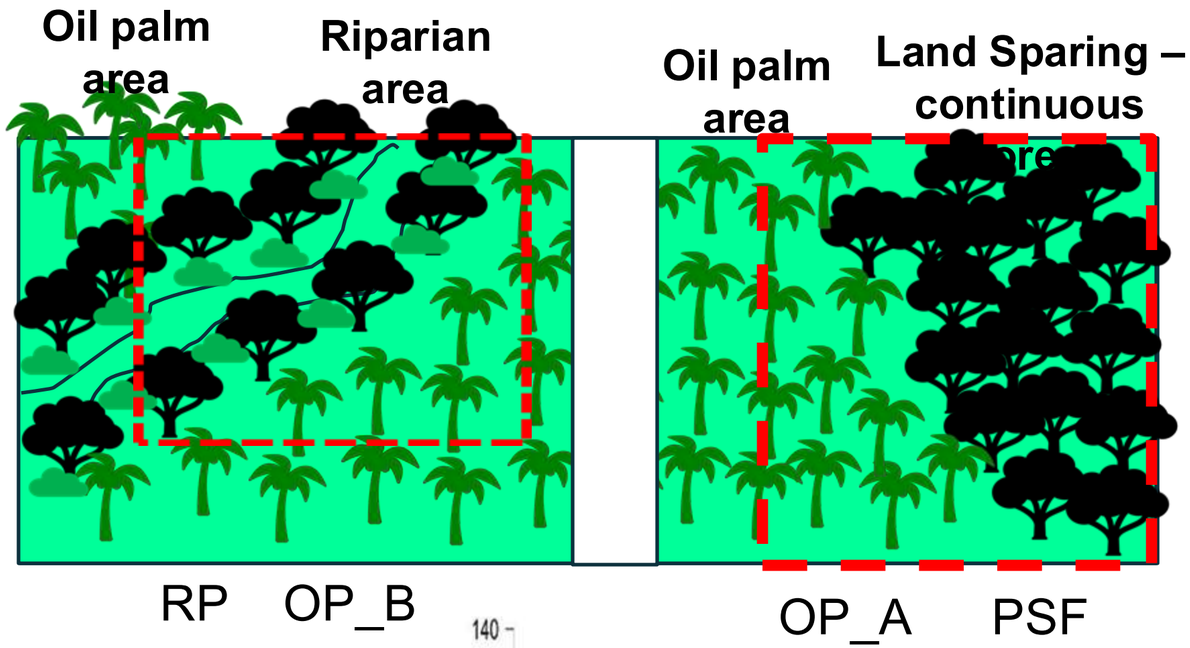
*Two months after planting (upper) and three months after planting (lower) sweet potato as an intercrop in oil palm in double-row avenue planting.*

# IMPORTANCE OF *STRIPS OF FOREST ADJACENT TO RIVERS (RIPARIAN BORDERS)*



# MEASURING THE IMPORTANCE OF FOREST PATCHES AND RIPARIAN IN BIRD BIODIVERSITY CONSERVATION IN OIL PALM DOMINATED LANDSCAPE

- Peat swamp forest (PSF) & riparian (RP) showed high number of bird species but less abundance
- Oil palm areas showed more abundance but less number of species
- Overall oil palm with various landscapes: 100 species of bird have been recorded.




In collaboration with:

van hall larenstein
university of applied sciences

SARAWAK OIL PALMS

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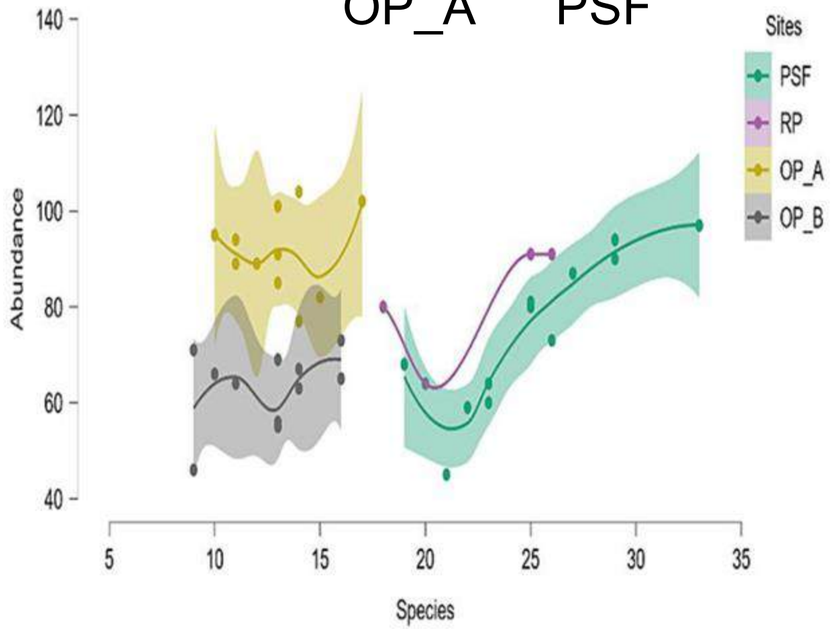


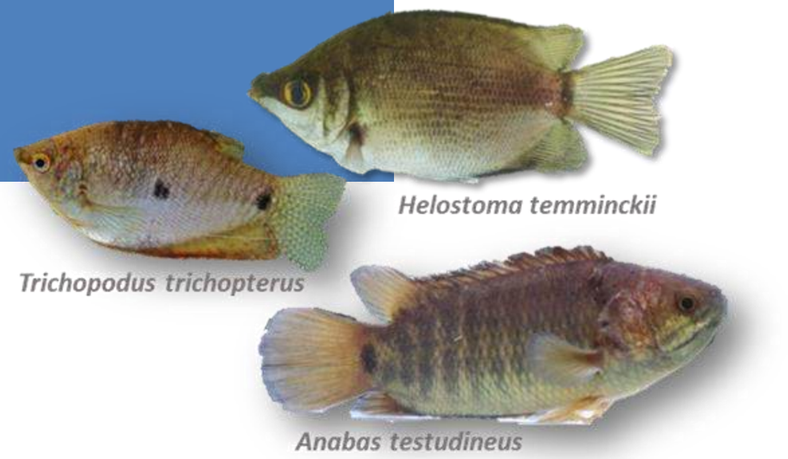

Source: Amit et al. 2022. The Effects of Peat Swamp Forest Patches and Riparian Areas Within Large Scale Oil Palm Plantations on Bird Species Richness. Tropical Life Science. (early view)

# CONSERVATION VALUE OF RIPARIAN ON FISH FAUNA IN OIL PALM DOMINATED LANDSCAPE

*Desmopuntius pentazona*
Five Banded Barb

*Trigonopoma pauciperforatum*
Redstripe Rasbora

*Rasbora calliura*




- In rivers with the riparian buffer zone, rich fish composition comprises of a combination of species from the riverine fish fauna and introduced/invasive species.
- Composition of fish species in streams/river without riparian buffer zone is limited to introduced/invasive species that can adapt well in harsh environment.

Figure 2. General condition of Sungai Kulak which through the Tinbarap Conservation Ar

# FOREST RESERVES IN OR NEAR OIL PALM PLANTATION

- Nature reserves in oil palm plantations also play important roles in **conserving and encouraging and maximizing biodiversity.**

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- Oil palm growers and local governments should work together to preserve as much of the remaining natural forests as possible by, for example, creating forested buffer zones around oil palm plantation or protecting remnant forest patches in the landscape.

- The oil palm plantations need to keep as many patches of the original forest as possible, perhaps on marginal land or steep hills be set aside and protected from all forms of destructive disturbance that will give valuable conservation of biodiversity.

# *PROTECTION OF NATURAL WATERWAYS, WATER CATCHMENT AREAS AND WATER BODIES*

- Protect forest from land conversion or degradation in key watersheds to slow soil erosion, protect water resources, and conserve biodiversity.
- There are many natural tributaries in the plantation and these tributaries leads to the water reservoir for the storage of water for the needs of plantation operation.
- The tributaries are considered as natural resources of water and can be considered as high conservation value (HCV) areas to provide basic services of nature in critical situation.

# CONCLUSIONS

- **Oil palm is the most productive crop providing food and energy for the global population and source of employment and economic resource for developing countries.**

- **On-going studies to enhance and enrich biodiversity in oil palm plantations through the implementation of good agricultural practices and the creation of biodiversity hotspots and riparian areas in the oil palm environment needs to be implemented/ improved.**

- **Integration of oil palm development with integration & intercropping increases biodiversity conservation and nature-based solutions towards achieving sustainability.**

- **Ultimately bring towards having high yields of products per ha**

- **Low carbon oils/ products**

# THANK YOU


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