

PalmSphere

FEBRUARY 2026 VOL:14



Malaysian Palm Oil Council

THE REGENERATION
GENERATION

MALAYSIAN PALM OIL:
READINESS FOR A NEW
SUSTAINABILITY ECONOMY

FROM MILLS TO MARKETS: UNLOCKING
CARBON CREDITS POTENTIAL IN THE
MALAYSIAN PALM OIL INDUSTRY

MALAYSIA'S PROACTIVE PATH IN SUSTAINABLE PALM OIL

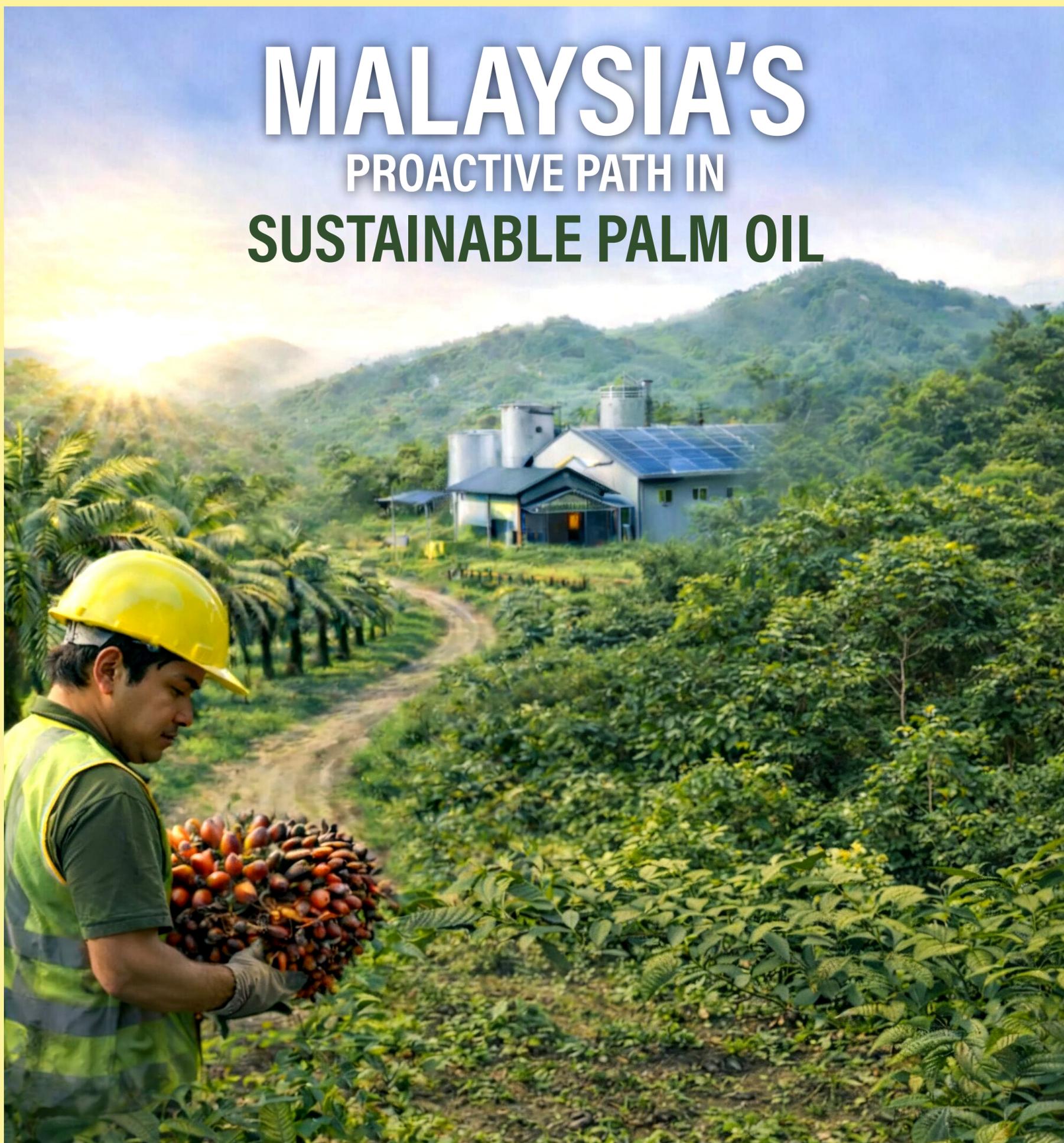


TABLE OF CONTENTS

03

Message from the CEO

04

Beyond Compliance: Malaysia's Proactive Path in Sustainable Palm Oil

11

The Regeneration Generation

19

Malaysian Palm Oil: Readiness for a New Sustainability Economy

23

From Mills to Markets: Unlocking Carbon Credits Potential in the Malaysian Palm Oil Industry

26

Frequently Asked Questions (FAQ)



MESSAGE FROM THE CEO



Dear Readers,

Welcome to the first 2026 edition of PalmSphere.

As global sustainability expectations continue to evolve, Malaysian palm oil enters the year on a firm footing. Across markets, stakeholders are placing greater value on evidence, traceability, and responsible production. This edition reflects how these elements are already embedded in the Malaysian palm oil ecosystem and continue to be strengthened through coordinated industry efforts.

Our cover story, *Beyond Compliance: Malaysia's Proactive Path in Sustainable Palm Oil*, highlights how established systems and structured industry practices continue to support market confidence. Rather than positioning sustainability as an aspiration, the focus remains on demonstrating consistency, accountability, and measurable progress. In *The Regeneration Generation*, we feature a second-generation smallholder couple whose regenerative approach reflects how stewardship and productivity are advancing together. Their story underscores how sustainable practices are being sustained across generations and communities.

This edition also explores developments within the emerging sustainability economy, including circular approaches and carbon-related assessments undertaken in collaboration with academic partners. These initiatives reflect careful, data-informed evaluation as markets evolve. As we begin 2026, Malaysian Palm Oil Council (MPOC) remains focused on strengthening global understanding of sustainable Malaysian palm oil, supporting market growth and diversification, as well as ensuring that the industry's progress is communicated with clarity and credibility.



The picture shows a clearly defined boundary between oil palm cultivation and the adjacent forest area, reflecting established land-use planning and conservation buffers within plantation landscapes.

BEYOND COMPLIANCE: MALAYSIA'S PROACTIVE PATH IN SUSTAINABLE PALM OIL

Malaysia is doubling down on sustainable palm oil, driven by national standards and climate accountability.

GLOBAL expectations for agricultural commodities continue to evolve. Buyers increasingly demand traceability, emissions data, and clear evidence of responsible land management. Regulatory developments in major markets, including the European Union Deforestation Regulation (EUDR), have added further complexity to international trade.

For Malaysia's palm oil industry, these developments do not define its direction. Sustainability reforms have been underway for years, anchored in national policy, mandatory certification, and structured industry transformation.

While external regulations may shift or be debated, Malaysia's sustainability framework remains consistent. The focus is on strengthening domestic systems, expanding certification coverage, and improving measurable climate performance across the supply chain.

Rather than reacting to individual regulatory frameworks, the industry is advancing a long-term strategy built on national standards, operational efficiency and verifiable performance.

This approach reflects a broader principle: sustainability leadership must be internally driven and structurally embedded, not externally prescribed.

Malaysia's Sustainability Coverage at a Glance

- More than 90% of the oil palm planted area is MSPO-certified
- 27% of the planted area managed by smallholders
- Nationwide traceability readiness through the National Traceability System (Sistem Kebolehejakan Nasional (SKN))
- Growing adoption of methane capture and renewable energy

Malaysia's sustainability framework operates within a nationally implemented certification structure that applies across the palm oil supply chain.

The Malaysian Sustainable Palm Oil (MSPO) certification scheme is implemented nationwide, creating a consistent set of environmental, legal, and operational requirements across estates, mills, and smallholder farms.

Smallholders account for approximately 27% of Malaysia's planted oil palm areas and are integrated into the certification system through coordinated training, group certification models, and mapping systems to support traceability and compliance at scale.

Today, more than 90% of Malaysia's oil planted area is MSPO-certified. This broad coverage creates a consistent baseline across estates, mills, and smallholder farms.

The value of this structure lies in its reach. When sustainability requirements extend across the supply base, improvements in environmental management, documentation, and monitoring become operational practice rather than isolated initiatives.

This foundation allows producers to focus on measurable performance improvements in emissions, efficiency, and transparency.

Strengthening Traceability and Transparency

Traceability is now a baseline expectation in sustainable commodity trade. Malaysia has invested in digital systems that enable palm oil to be traced to the plantation level through geospatial mapping and integrated supply chain records. These systems support transparency, accountability and verification against deforestation risks.

With traceability implemented nationwide, Malaysia's palm oil supply chain operates under structured documentation and due diligence processes. As regulatory frameworks evolve across markets, producers continue to maintain consistent reporting and verification practices. This continuity provides buyers with assurance that Malaysian palm oil meets prevailing market requirements, independent of shifting policy timelines.

Advancing Climate Performance Through Measurable Action

With traceability and certification frameworks established, attention is increasingly focused on reducing life-cycle emissions and improving operational efficiency across the value chain.

As the Malaysian palm oil industry advances its net-zero ambition, the reduction of greenhouse gas (GHG) emissions has become a central operational priority across plantations and mills. Achieving net zero requires a clear understanding of emission sources throughout the value chain from field activities to processing operations. Analytical tools, including life cycle assessments (LCA), support this effort by helping producers quantify emissions hotspots such as methane from palm oil mill effluent (POME), diesel use in field operations, and fertiliser-related nitrous oxide emissions.

Traditionally a significant source of methane emissions, POME is now increasingly managed through biogas capture systems that convert waste into renewable energy. Studies have shown that these technologies can reduce mill-level emissions by up to **50%** while contributing to energy self-sufficiency.

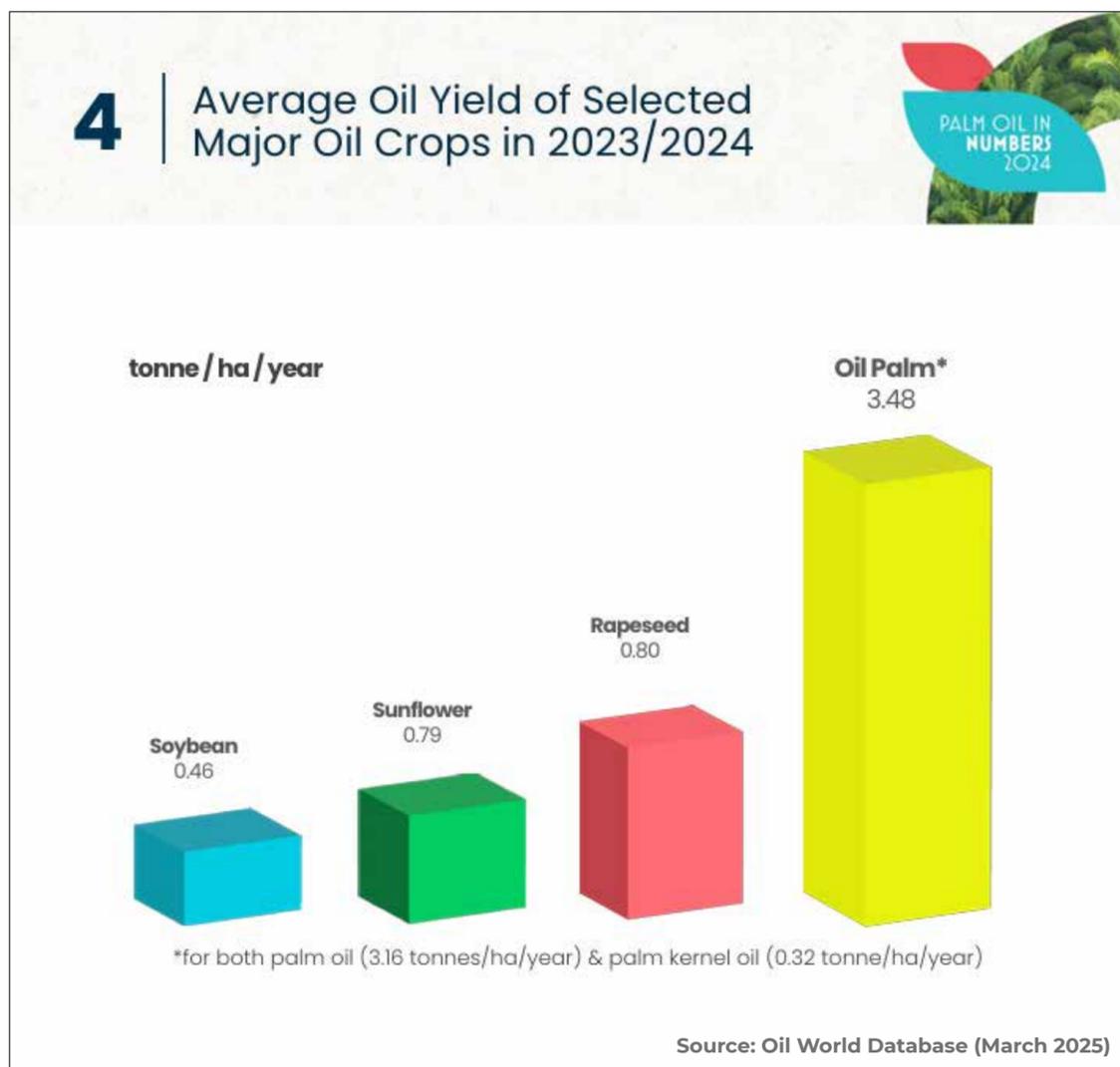
MALAYSIAN PALM OIL PRODUCERS: MEASURABLE CLIMATE MANAGEMENT ACROSS THE INDUSTRY

Malaysian palm oil producers are reporting quantified emissions data, methane capture implementation and renewable energy integration in their latest sustainability disclosures.

United Plantations Berhad	SD Guthrie Berhad	Kuala Lumpur Kepong Berhad (KLK)
<p>Reports long-term emissions reduction with defined targets and methane capture systems in place.</p> <p>60% emissions reduction since 2004</p> <ul style="list-style-type: none"> • 1.47 kg CO₂e per kg NBD oil (2024) • Target: 66% reduction by 2030 • Biogas plants operational since 2006 <p>Source: Sustainability Report 2024</p>	<p>Full emissions inventories with third-party review, strengthening transparency for international markets.</p> <p>18.6 million tCO₂e total emissions disclosed (FY2024)</p> <ul style="list-style-type: none"> • Scope 1 & 2 intensity: 1.613 tCO₂e per tonne CPO • Scope 1, 2 and 3 emissions reported • Data independently assured <p>Source: Sustainability Report 2024</p>	<p>Operational methane management and structured emissions reduction planning at plantation level.</p> <p>0.40 tCO₂e per tonne CPO (FY2024)</p> <ul style="list-style-type: none"> • 21% reduction from FY2019 baseline • 208,937 tCO₂e avoided via biogas • 74 emissions reduction initiatives identified <p>Source: Sustainability Report 2024</p>
IOI Corporation Berhad (Plantation Division)	Johor Plantations Group Berhad	Hap Seng Plantations Holdings
<p>Methane capture and renewable energy investments linked to long-term decarbonisation commitments.</p> <p>46% emissions intensity reduction since 2015</p> <ul style="list-style-type: none"> • Scope 1 & 2 emissions: 2.38 million tCO₂e • Net zero target: 2040 • 47% reduction in POME-related emissions <p>Source: Sustainability Report 2025</p>	<p>Mill-level methane capture delivering measurable avoided emissions with partial external verification.</p> <p>166,387 tCO₂e avoided emissions (2024)</p> <ul style="list-style-type: none"> • Emissions intensity: 0.89 tCO₂e per tonne output • 5 mills operating methane capture systems • Data subject to limited external assurance <p>Source: Sustainability Report 2024</p>	<p>High renewable energy integration across mill operations and year-on-year emissions improvement.</p> <p>85% of energy consumption from renewable sources</p> <ul style="list-style-type: none"> • 7% reduction in carbon per tonne CPO (FY2024) • Biogas plants powering mills and facilities • 1.907 billion MJ total energy use reported <p>Source: Sustainability Report 2024</p>
Sarawak Oil Palms Berhad	TDM Berhad	TSH Resources Berhad
<p>Quantified emissions intensity supported by renewable energy generation and methane capture expansion.</p> <p>720,530 tCO₂e Scope 1 & 2 emissions (2024)</p> <ul style="list-style-type: none"> • Emissions intensity: 0.58 tCO₂e per tonne FFB • Over 20 million kWh renewable energy generated • Methane capture facilities expanded <p>Source: Annual Report 2024</p>	<p>Defined carbon reduction pathway with operational emissions monitoring across estates and mills.</p> <p>30% carbon intensity reduction target by 2030</p> <ul style="list-style-type: none"> • Scope 1 & 2 emissions disclosed • Plantation intensity measured per tonne FFB • Mill and estate emissions reported <p>Source: Integrated Annual Report 2024</p>	<p>Operational methane management integrated into structured sustainability reporting.</p> <p>Methane capture and renewable energy initiatives implemented</p> <ul style="list-style-type: none"> • Emissions disclosed in Annual Report 2024 • Mill-level methane management systems • Sustainability reporting aligned to recognised frameworks <p>Source: Annual Report 2024</p>

The disclosures presented here illustrate how Malaysian palm oil producers are integrating quantified climate indicators into formal reporting. Emissions intensity, methane capture and renewable energy generation are documented at plantation and mill level, providing greater visibility into how the sector manages life-cycle emissions.

Operational initiatives such as fertiliser optimisation, biomass utilisation and renewable energy integration continue to reinforce emissions management across the sector.



Oil palm is the most productive vegetable oil

Ensuring Inclusive and Equitable Sustainability

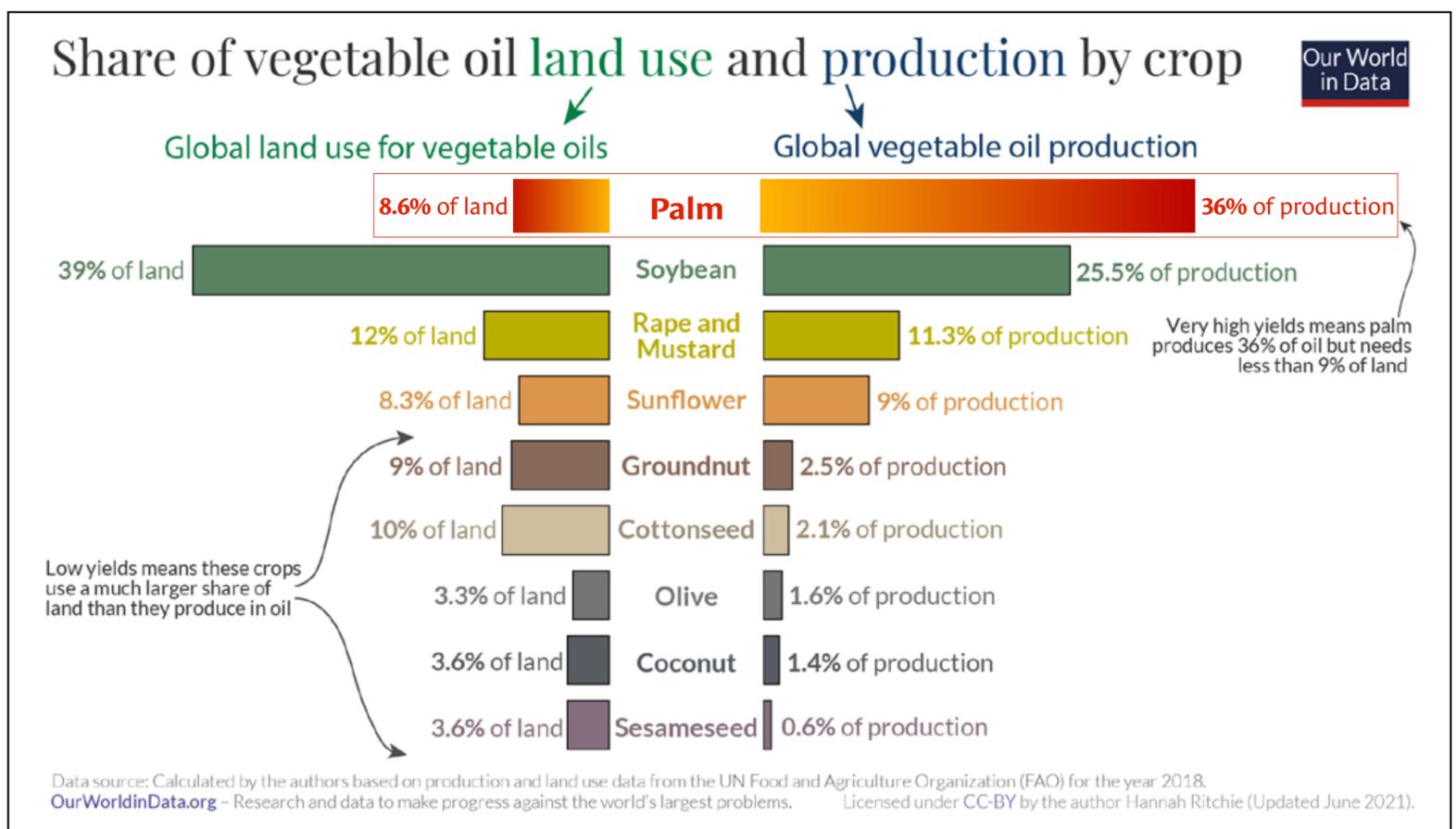
Smallholders remain central to Malaysia's palm oil landscape, and their inclusion is essential to achieving nationwide sustainability. Recognising the challenges small farmers face in meeting complex technical requirements, Malaysia has prioritised capacity building and support mechanisms. These include group certification models, training programmes, digital mapping tools and targeted financial assistance.

These initiatives have helped smallholders understand both the requirements and benefits of sustainable practices. Better farm management, higher yields and access to premium markets demonstrate that sustainability can enhance livelihoods rather than diminish them. By involving smallholders in the equation, Malaysia strengthens both social outcomes and supply chain integrity.

Positioning Malaysian Palm Oil for the Future

Malaysia’s sustainability strategy depends on three interconnected pillars: climate innovation, smallholder inclusion and active global engagement. These components work together to strengthen the country’s role as a responsible palm oil producer and a constructive partner in global sustainability efforts.

As markets increasingly prioritise transparency, low-carbon supply chains, and social responsibility, Malaysia’s proactive approach provides a compelling value proposition.



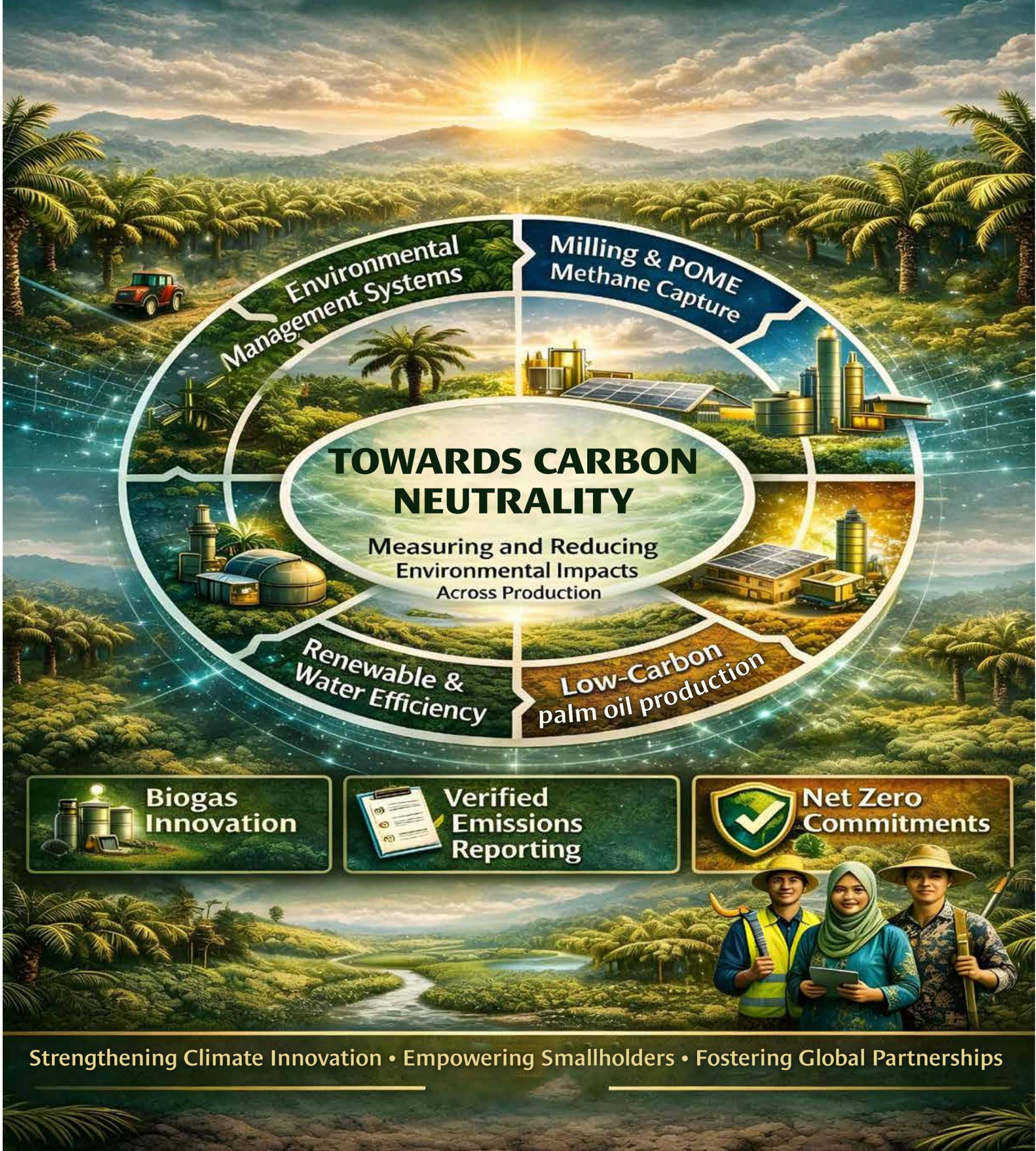
Source: <https://ourworldindata.org/palm-oil>

By surpassing compliance standards and consistently raising them, the Malaysian palm oil industry proves that palm oil can be an integral part of sustainable development and global food security.



BEYOND COMPLIANCE:

Driving Climate Performance in Sustainable Malaysian Palm Oil



Strengthening Climate Innovation • Empowering Smallholders • Fostering Global Partnerships

Sources:

1. <https://tinyurl.com/unfcccpdf>
2. <https://unfccc.int/documents/638313>
3. <https://www.globalforestwatch.org/dashboards/country/MYS%3F>
4. <https://satelligence.com/deforestation-in-the-tropics-malysias-success-and-indonesias-ongoing-journey/>
5. <https://mpob.gov.my/>
6. <https://mspo.org.my/>
7. https://mficord.sarawak.gov.my/web/subpage/news_view/1544



Copyright @Wild Asia 2026

THE REGENERATION GENERATION

Millennial, climate-conscious, and digitally connected, this couple represents a new wave of farmers who are redefining Malaysia's palm oil story through regenerative practices.

LAUGHTER and music ripple through the school lab. Four students stand at the front, bottles of liquid in hand, shaking them to the beat of a catchy tune. Their classmates and teachers clap and cheer, voices rising above the music, "may the best dancer win!"

What seems like a fun contest is, in fact, a lesson in sustainability.

Inside those bottles are liquid enzyme fertilisers, freshly concocted from vegetable scraps, fruit peels, molasses and rainwater. The activity is part of a BIO Juice Tutorial workshop led by Prissentiazie Juhan, a teacher at **SMK Beluran** in Sabah.

Alongside her students and fellow teachers, she demonstrates how everyday food waste can be transformed into a natural fertiliser that nourishes plants, restores soils and reduces chemical use. It is hands-on education designed to connect the dots between food, farming and land stewardship.

“By learning through doing, the next generation will understand how healthy, living soils sustain life – and those who live off the land,” says Prissentiazie, 36, who also advises SMK Beluran’s Eco Club. For this workshop, she invited students from neighbouring schools to join, spreading the message beyond her classroom walls.

She and her husband, Ferrigno Marudin, are second-generation oil palm smallholders who know first-hand what it means to live off the land. Unlike their parents’ generation, however, they place equal weight on social, environmental, and economic success.

This millennial couple embodies the Regeneration Generation – hands-on farmers reshaping the palm oil narrative from the ground up through regenerative farming practices, knowledge-sharing and community action.

The Long and Winding Road

Raised in villages just 30 km apart in Beluran District, Prissentiazie and Ferrigno’s lives unfolded along parallel lines. Both grew up in smallholder families, dipped their toes into farming from a young age, walked the same school corridors and inherited land.



Copyright ©Wild Asia 2026

**Second-generation oil palm smallholders,
Prissentiazie and Ferrigno.**

Today, she manages a 3.89-ha oil palm plot in Kampung Kuala Sapi, while he owns 3.11-ha in Kampung Manduring. Both farms received MSPO (**Malaysian Sustainable Palm Oil**) certification in 2023 and international sustainability certification in 2025. Despite their full-time jobs, Ferrigno is a firefighter at the Beluran Fire and Rescue Department and raising three children, they remain closely involved with their farms.

Beyond hiring contract workers to do the heavy lifting, like harvesting and collecting fresh fruit bunches (FFB), they handle weeding, fertilising and monitoring tree health. Ferrigno also set aside an acre of his land to grow jackfruit, *rambutan*, *longan*, and *durian merah* (*Durio kutejensis*) to supplement their family income.

“Farming figured so largely in my childhood that it has become second nature,” Prissentiazie explains. Her father passed away in 1997 when she was eight, leaving her mother to become the sole breadwinner. Oil palm was their family’s lifeline.

Then her two oldest siblings joined the rural exodus, leaving Prissentiazie, the second-youngest of 12 children and her other siblings to help out on their family farm.



Students at SMK Beluran, Sabah learn sustainability through a hands-on BIO juice workshop.

Copyright @Wild Asia 2026

“I still have vivid memories of painful jabs from palm thorns when collecting loose fruits or swinging a heavy *parang* (machete) to manage weeds because we couldn’t afford herbicide,” says Prissentiazie, smiling.

Their family home was more a *pondok* (hut) than an actual house, she added. Monthly earnings from oil palm were less than RM1,000 during the late 1990s. But they were never hungry. They grew vegetables, fished and hunted for meat. And every child had the chance to go to school.

“My late mum always said, ‘Study hard or your life will be as tough as mine.’ That made me see education as the key to a better life – and it became my greatest motivation,” Prissentiazie recalls. Her mum was illiterate and got married at 13. Prissentiazie is the only member of her family to have graduated from university.

Like his wife, Ferrigno started helping out on the farm when he was seven. His father was a civil servant and oil palm provided vital extra income.



Copyright ©Wild Asia 2026

One of the many activities during the BIO Juice Tutorial workshop led by Prissentiazie Juhan.

“We struggled financially, but we always had the basics: food, a roof over our heads, and an education,” says Ferrigno, the fifth of eight children. After Sixth Form, he trained in oil palm plantation management under the **Malaysian Skills Certificate** (*Sijil Kemahiran Malaysia*) programme and later worked as an estate supervisor for a Sabah-based plantation for five years.

“That job really taught me a lot about oil palm – the know-hows, the struggles, and showed how palm oil can transform livelihoods,” says Ferrigno, 36. “It’s tiring juggling a full-time job and farming, but quitting never crossed my mind. I’m used to the hard work and the motivation to maximise yields keeps me going.”

Farming with Nature

The couple plays by the book when it comes to standard oil palm **good management practices**. And it shows. Prissentiazie’s average FFB yields range from 10 to 15 tonnes (per 9.6 acres), raking in an average monthly revenue of RM6,000. Apart from judicious use of chemical fertiliser, they apply chicken manure and decanter cake to nourish the trees and soil.

But they are always trying to do better. When Prissentiazie got wind of **Wild Asia’s WAGS BIO** programme from a former university mate, she and Ferrigno leapt at the opportunity to acquire new insights and skills.

Launched in 2019, WAGS BIO is a production system designed to help oil palm farmers transition from conventional to regenerative agriculture practices.

The regenerative farming approach focuses on soil health, organic matter and reducing synthetic inputs such as pesticides and chemical fertiliser. In short, healthy soil is key to thriving, resilient crops.

Through hands-on workshops, BIO farmers participants learn composting, making fruit enzymes, and fish fertiliser to create microbe-rich soil. They also uncover the benefits of multicropping, agroforestry, and integrated pest management to improve farm biodiversity.



The home garden and farms are playgrounds for their kids.

“Before this, all I knew (from the estate experience) was conventional farming, monocropping, as well as heavy use of fertilisers and pesticides,” Ferrigno admits. “I never really thought about what that does to the soil. After learning about regenerative practices, it hit me – all those chemicals strip away the nutrients and organic matter, degrade the soil, and dry it out. If we keep farming like that, the land will be depleted in the long run.”

Since carving out BIO plots (chemical-free plots) on their farms in August 2024, their production costs have dropped by 30% after switching to manual weeding (using a grass cutter) and DIY fertilisers. While the yields are too early to measure, they’ve already noticed more earthworms, an indicator of a healthy soil with organic matter and sufficient moisture.

For Prissentiazie, it seems the stars have finally aligned. She has been tending an organic home garden since 2018, growing a variety of leafy vegetables, herbs and fruit trees, including guava, papaya and lemon.

“When it comes to feeding my family, I’ve always insisted on no chemicals.

Organically grown food also delivers spin-off environmental and social benefits,” she asserts. Prior to joining BIO, Prissentiazie trawled the internet for DIY tips on natural fertilisers and pest control methods.

“Of course, I watched YouTube tutorials, but nothing beats hands-on learning through practical workshops.”

Their next step is to trial biochar for soil enrichment and carbon sequestration. But lack a lack of time and high labour costs are their biggest hurdles.

“With full-time jobs, we rely on hired help and navigate our schedules to attend BIO workshops. But we do our best, given the circumstances.”

The Ripple Effect

Which brings us back to the BIO juice workshop at school, one of the many spillover effects from Prissentiazie’s WAGS BIO journey.

“Environmental consciousness has to be shaped early in life, at school and at home,” says the educator with over a decade of experience. “My students will become the next generation who care about environmental conservation and safeguard the planet.”

In April 2025, Prissentiazie invited Wild Asia staff to run a BIO juice workshop for her Eco Club members. Her students didn’t just learn; they went on to create BajaX Transformation Sub (BTS): a student-led hub to spread eco-awareness and produce organic fertilisers to share with the local farming community. Recently, the Eco Club members, under her guidance, ran a BIO juice workshop for rice and oil palm farmers to further spread their soil-saving solutions.

The BajaX project has since clinched the Gold Award at the Sabah-based Limbanak International STEM Carnival 2025, a contest that empowers students to develop innovative, eco-friendly solutions for real-world challenges. BajaX also secured a top-10 finish, placing 7th at the 2025 SERASI Environmental Awards organised by Sabah’s Department of Environment.

Health Benefits of Palm Oil

As an educator and an oil palm smallholder, Prissentiazie also passes on the knowledge about palm oil's **nutritional** values to her students. At home, she uses palm oil for everyday cooking, especially for deep-frying and stir-frying.

"We know that palm oil is rich in Vitamin E (tocotrienols), which has proven benefits in supporting heart health and the immune system," she adds. "Besides, dishes cooked with palm oil taste delicious and retain their original flavours!"

Over the years, various studies have shown the health benefits of palm oil.

A **study** by researchers at **Universiti Malaysia Sabah** revealed that when consumed as part of a healthy diet, refined palm oil and palm olein (cooking oil) provide health benefits, including cardioprotective, antidiabetic, anti-inflammatory and antithrombotic effects.

Regenerating Young Minds

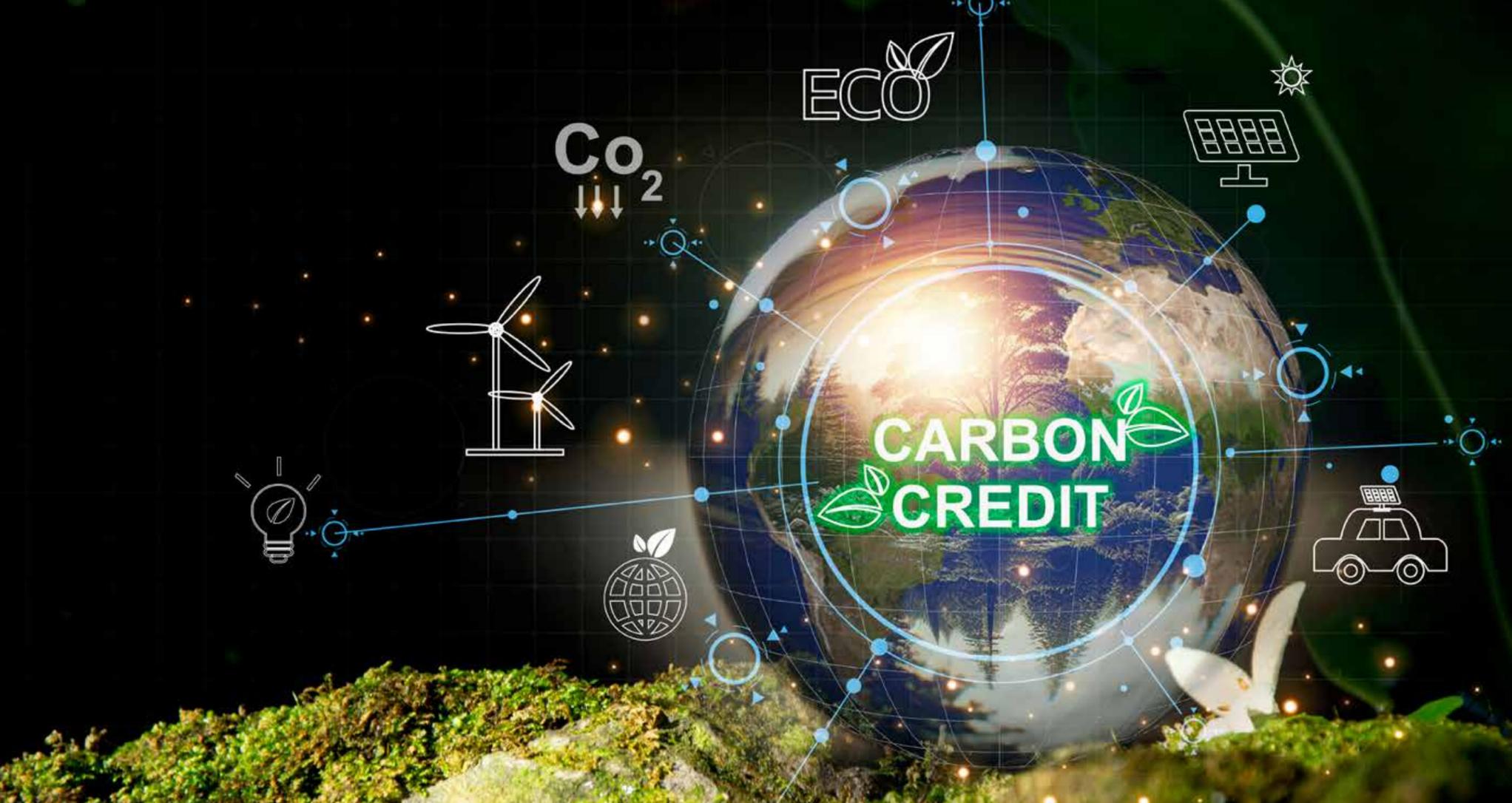
At home, farming doubles as family bonding time.

"Since our schedules are so busy, our home garden and farms are playgrounds for our kids," says Prissentiazie, chuckling. "It's also where we spend quality, golden moments."

Their kids, ages 3 to 9, love getting their hands dirty, playing in the mud and fishing at the pond on their dad's farm. The couple teaches their kids how to plant seedlings, nurture them, and watch them grow.

"It's a way to teach life lessons: take care of the land well and it gives back. Same with life, put in the effort and you'll see the results," Prissentiazie muses.

"At the end of the day, we just want to keep farming sustainably and leave behind a legacy our children and the next generation, can carry on," she sums up.



MALAYSIAN PALM OIL: READINESS FOR A NEW SUSTAINABILITY ECONOMY

Malaysia's palm oil sector is entering a defining phase shaped by climate policy, sustainability expectations, and the emergence of structured carbon markets.

MALAYSIA'S climate direction is articulated through several national policy instruments. Malaysia's updated [Nationally Determined Contribution \(NDC\)](#) under the [Paris Agreement](#) commits to reducing the greenhouse gas emissions intensity of GDP by 45% by 2030 relative to 2005 levels. This establishes a long-term national emissions trajectory.

At the same time, the Ministry of Natural Resources and Environmental Sustainability in Malaysia has issued a consultation paper on the proposed [National Climate Change Bill \(RUUPIN\)](#), outlining a legal framework for emissions reporting, reduction, and potential carbon market mechanisms. The consultation process signals a structured, phased approach to implementation.

Within the commodity sector, the [National Agricommodity Policy 2021-2030 \(DAKN 2030\)](#), led by the Ministry of Plantation and Commodities, Malaysia, emphasises sustainable production, value addition, and alignment with climate commitments.

Taken together, these frameworks provide clearer policy visibility for industries, including the palm oil industry.

For the palm oil sector, these policy signals offer regulatory clarity and transition lead time, enabling companies to strengthen emissions data systems, pilot emissions reduction initiatives, and prepare for carbon-linked compliance mechanisms. Complementing this development, the launch of the Bursa Carbon Exchange under Bursa Malaysia offers a structured marketplace for credible carbon transactions, positioning Malaysia within the growing global carbon economy.



The launch of Bursa Carbon Exchange (BCX) in 2022 marks an essential step in creating a domestic platform to facilitate carbon credit trading and support national climate goals.

From a readiness standpoint, emissions-reduction practices are already part of how many producers operate today. Methane capture at the mill level, biomass utilisation, and land-based management practices are implemented across a significant share of operations and increasingly reflected in sustainability reporting.

The next phase focuses on expanding coverage, strengthening measurement systems and ensuring that emissions reductions can be credibly verified under evolving carbon market and regulatory frameworks.

Circular Economy Integration: Operational Maturity

At the mill level, palm oil mill effluent is increasingly captured and converted into biogas, reducing methane emissions while generating renewable energy for on-site use. Across estates, biomass streams such as empty fruit bunches and oil palm trunks from replanting are utilised for energy generation and material applications rather than treated as waste.

Even downstream, used cooking oil is being channelled into sustainable aviation fuel pathways, linking plantation-based resources to broader global decarbonisation efforts.

These practices are not standalone environmental projects. They sit within Malaysia's wider sustainability agenda under the **Twelfth Malaysia Plan** and renewable energy initiatives supported by the **Sustainable Energy Development Authority (SEDA)**.

Biomass streams, including empty fruit bunches and oil palm trunks from replanting, are utilised for green energy production and downstream material applications. Used cooking oil is being channelled into sustainable aviation fuel pathways, supporting global decarbonisation efforts.

As carbon and environmental credit systems evolve, the ability to quantify reductions from methane capture, biomass utilisation and land management becomes increasingly relevant. What was once framed primarily as efficiency improvement is now being viewed through a market lens, where measurement and verification determine long-term value.

Inclusivity Across the Value Chain

Malaysia's palm oil value chain is diverse. Alongside large plantation groups, it includes independent mills, medium-sized estates and a substantial smallholder base.

As circular economy practices expand, technological developments are making broader participation more feasible. **Research** on decentralised waste-processing systems, including mobile facilities for biomass recycling, suggests that modular approaches can reduce transport distances, optimise feedstock use and lower capital intensity compared to fully centralised models.

In practical terms, this means that emissions-reduction and biomass-utilisation initiatives do not necessarily require large-scale infrastructure concentrated in a few locations. More distributed systems can enable wider operational adoption across geographically dispersed estates and mills.

This widening participation strengthens overall supply chain consistency and reinforces environmental performance at the national level.

In parallel, sustainability is increasingly viewed not only through compliance requirements but as part of long-term operational planning. When circular practices are integrated across different operational scales, they contribute to both resilience and market readiness.

Positioning for Global Leadership

Global expectations around agricultural sustainability continue to evolve. Transparency, emissions accountability and traceability are increasingly shaping how commodities are evaluated in international markets.

The next phase centres on execution. Strengthening emissions data systems, expanding mitigation coverage and embedding sustainability considerations into long-term business planning are now part of operational reality across the sector.

Malaysia's palm oil industry is working within established certification, reporting and policy frameworks that support this transition. With national climate commitments articulated, mandatory standards implemented and carbon market infrastructure taking shape, the foundations for sustained competitiveness are already in place.

In a market where carbon performance and traceability increasingly influence procurement decisions, Malaysia's structured approach provides clarity and confidence to global partners.

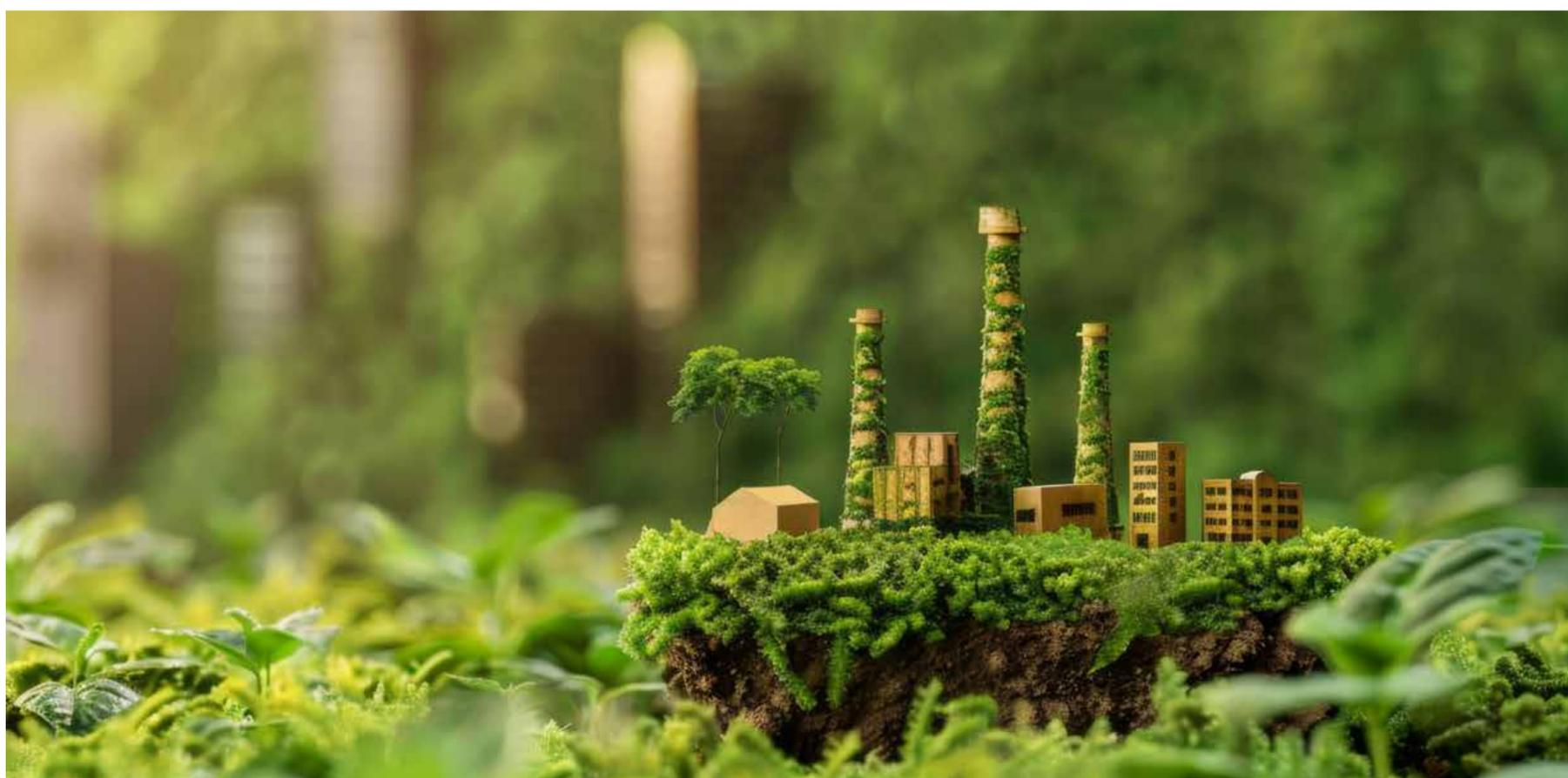


Methane capture at the mill level, biomass utilisation, and land-based management practices are implemented across a significant share of operations.

FROM MILLS TO MARKETS: UNLOCKING CARBON CREDITS POTENTIAL IN THE MALAYSIAN PALM OIL INDUSTRY

Swinburne University and Sunway University conducted a preliminary study on the carbon credit potential of the Malaysian palm oil industry.

By Mr. Yeo Lip Siang; Ir. Associate Professor How Bing Shen; Ir. Professor Viknesh Andiappan (Swinburne University of Technology Sarawak Campus); Dr. Ngan Sue Lin (Universiti Kebangsaan Malaysia); Dr. Jaya Prasanth Vasudevan Rajakal (Hamid Bin Khalifa University, Qatar); and Ir. Professor Denny Ng Kok Sum (Sunway University, Malaysia)



THE Paris Agreement (2015) has guided signatory countries to set climate goals and to commit to long-term emissions-reduction targets. In the recent third iteration of its Nationally Determined Contributions (NDC-3.0), Malaysia has projected to achieve peak greenhouse gas emissions no later than 2034 and net-zero by 2050. Carbon credits are proposed within the Paris Agreement framework as a climate financing mechanism to support countries' transition towards a low-carbon economy.

A carbon credit refers to the reduction, avoidance, or removal of one metric tonne of carbon dioxide equivalent (CO₂eq), achieved through the implementation of verified emissions-reduction projects. These carbon credits are typically sought by countries or organisations that are unable to meet their emissions targets, enabling compliance with regulatory requirements or, in some cases, voluntary commitments.

Article 6 of the Paris Agreement enables the international transfer and trading of carbon credits among entities across different countries. The platform on which carbon credits are traded is called a carbon market.



PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

The palm oil industry, one of the major contributors to Malaysia's economy, has significant potential to support the nation's net-zero ambitions.

Potential of Carbon Emission Reduction in the Malaysian Palm Oil Industry

To address the abovementioned goals, it is important to understand the Malaysian palm oil industry's net zero potential.

A 2024 study, [Towards Net Zero Emissions](#), by Swinburne University of Technology, Sarawak, and Sunway University in collaboration with Malaysian Palm Oil Council (MPOC) identified opportunities to scale up emerging technologies and nature-based solutions, enabling the industry not only to achieve net zero but also to potentially become carbon negative.

Building on these findings, researchers from Swinburne University of Technology Sarawak and Sunway University are currently undertaking a preliminary study to assess the carbon credit potential of the Malaysian palm oil industry under prevailing market and policy conditions.

This exercise is intended to provide early-stage insight for industry stakeholders. It is not designed as a definitive investment guide, but as a structured foundation for informed strategic considerations.

This initial study exemplifies efforts in advancing evidence-based decision-making to support national climate objectives.

The ongoing study examines:

Technology-based pathways

- Anaerobic digestion
- Biomass combined heat and power (CHP)
- Briquetting and pelletisation
- Gasification
- Composting
- Fast pyrolysis
- Fermentation

Nature-based pathways

- Afforestation, reforestation and revegetation (ARR)
- Peatland rewetting

Preliminary findings indicate that composting and fast pyrolysis may have the highest potential for carbon credits. Briquetting, pelletisation, and ARR could provide lower costs but yield fewer credits.

Under current market and policy conditions, these pathways have been identified as potentially most promising for immediately scaling:

- Biomass CHP
- Briquetting/pelletising

Here, projects must align with international standards, such as Verra's Verified Carbon Standard (VCS), the Gold Standard, or Puro Earth, to ensure credibility and access to carbon markets.

Key objectives:

- Preliminary study to assess the carbon credit potential of the Malaysian palm oil industry
- Provide initial considerations for mills and plantations seeking to implement emissions-reduction projects
- Not meant to serve as a definitive reference, but rather as an early step to support informed strategic considerations and offering an initial understanding of opportunities and challenges in carbon markets
- Study completion target: End March 2026

Keep an eye out for the upcoming carbon credit preliminary assessment led by Swinburne University of Technology Sarawak and Sunway University. The report, which will be published on the MPOC website, is expected to provide initial considerations for mills and plantations seeking to implement emissions-reduction projects, offering early insights to help reduce risks in their decision-making.





FREQUENTLY ASKED QUESTIONS (FAQ)

Your essential guide to the palm oil industry, covering nutrition and health, sustainability, environmental impact, and industry best practices.

Acknowledgement:

Dr. Ariati Aris / Mr. Bryan See, PhytoGaia Sdn. Bhd. | Info@PhytoGaia.com

QUESTION:

Ageing is inevitable, but what's really happening inside our bodies as we grow older?

Ageing is a natural part of life, but what happens inside our bodies as we grow older is far more complex than the simple passing of time. Today, science shows that ageing is shaped by how well our cells respond to everyday challenges such as oxidative stress, inflammation, and the gradual accumulation of cellular damage. As interest in healthy ageing continues to grow, researchers are increasingly looking toward natural nutrients that may help support these underlying biological processes. Among the most promising is tocotrienol, a lesser-known yet highly potent form of vitamin E.

QUESTION:

What makes tocotrienols stand out as a potential ally in healthy ageing?

Recent research has further strengthened the case for tocotrienols in healthy ageing. A breakthrough clinical study led by Prof. Madya Dr. Razinah Sharif and her team at the National University of Malaysia (UKM), added important human scientific evidence to the growing body of research on tocotrienols and healthy ageing¹.



In this randomised, placebo-controlled trial, 67 healthy older adults with an average age of around 60 consumed a daily Tocotrienol (TocoGaia®) - enriched beverage for six months. The researchers monitored a broad range of biological and psychological markers linked to ageing, including oxidative stress levels, inflammatory markers, antioxidant activity, psychological well-being, and telomerase activity (an enzyme closely associated with DNA protection and cell health).

QUESTION:

What benefits did participants experience from taking tocotrienols?

The tocotrienol group showed several significant improvements compared to placebo. Levels of inflammatory markers associated with ageing (often referred to as 'inflammaging') were significantly reduced, indicating a broad systemic anti-inflammatory effect. This is a critical finding for anyone concerned with longevity. By suppressing inflammatory markers such as TNF- α , tocotrienols help the body fight 'inflammaging' – the silent, underlying driver of chronic age-related decline. Reducing DNA damage isn't just a lab result; it means your cells retain the 'blueprint' they need to function correctly as you age, effectively slowing the biological clock from the inside out.

QUESTION:

Beyond ageing markers, how did tocotrienols affect overall health and well-being?

Participants receiving tocotrienols also showed significantly higher activity of antioxidant enzymes, including superoxide dismutase (T-SOD) and catalase, strengthening the body's defence against oxidative stress, one of the primary mechanisms of age-related cellular damage. Notably, telomerase activity increased significantly, suggesting improved cellular maintenance and genomic stability, both of which are critical markers of healthy ageing. Improvements were also observed in cortisol and insulin levels, reflecting better stress regulation and metabolic balance. Participants reported enhanced psychological well-being, indicating improved emotional resilience and quality of life. Importantly, the study was also found to be safe and well-tolerated with no adverse effects reported.

QUESTION:

Can tocotrienols support brain health and cognitive function, too?

Addressing healthy ageing requires a multi-factorial approach. Expanding clinical evidence has positioned tocotrienols as an essential and increasingly recognised nutrient in the science of brain and cognitive health, particularly in healthy ageing. Supporting this, an early study by Sen et al. (2000)² demonstrated that tocotrienols provide superior neuroprotection effects, helping to shield brain cells from oxidative stress - a critical factor in maintaining cognitive function and reducing age-related cognitive decline. Beyond ageing populations, emerging evidence suggests that tocotrienols may also enhance cognitive performance in healthy individuals. Studies have reported that daily supplementation with natural full-spectrum tocotrienol/tocopherol complex improved neural efficiency, attentional capacity and memory³, highlighting their potential role in supporting brain health across the lifespan. In an era where cognitive longevity is a top priority, these neuroprotective properties offer more than just cellular defence. By maintaining 'white matter' integrity and neural efficiency, tocotrienols help ensure that your mental sharpness, memory and focus remain resilient against the natural wear and tear of time.

Official Recognition and Regulatory Confidence

Ministry of Health Malaysia's recognition of Palm Tocotrienol-Rich Fraction's (TRF) nutritional claims:

1

Palm TRF may help to improve cognitive function.

2

Palm TRF is an antioxidant and may help to reduce oxidative stress.

This regulatory recognition reflects the growing confidence in the science supporting tocotrienols and their role in health and wellness.

References:

1. Sharif, R. *et al.* Tocotrienol-Enriched Beverage Enhances Psychological Well-Being, Antioxidant Defence and Genomic Stability in Older Adults: A Randomised Controlled Trial. *Nutrients*. 2025 Jun 30;17(13):2179.
2. Sen, C. *et al.* Molecular basis of vitamin E action. Tocotrienol potently inhibits glutamate-induced pp60(c-Src) kinase activation and HT4 neuronal cell death. *J Biol Chem*. 2000. 275 (17), 13049-13055.
3. Par, RYX. *et al.* An open-label, single-arm pilot study of tocotrienols supplementation on improving memory and attention in healthy young adults. *J Funct. Foods*, Vol. 92, 2022, 105055.

Malaysian Palm Oil Council (MPOC)

Level 25, PJX HM Shah Tower,
No. 16A Jalan Persiaran Barat PJS 52,
46200 Petaling Jaya,
Selangor Darul Ehsan, Malaysia

Tel: [+603 7806 4097](tel:+60378064097)

Fax: [+603 7806 2272](tel:+60378062272)

Email: palmsphere@mpoc.org.my

Web: mpoc.org.my

Copyright © Malaysian Palm Oil Council 2026.

