



**XX**  
Conferencia  
Internacional sobre  
20th International

**PALMA  
DE ACEITE**  
Oil Palm Conference

**EL PODER TRANSFORMADOR  
DE LA PALMA DE ACEITE**

# **OIL PALM INDUSTRY: CHALLENGES & OPPORTUNITIES**

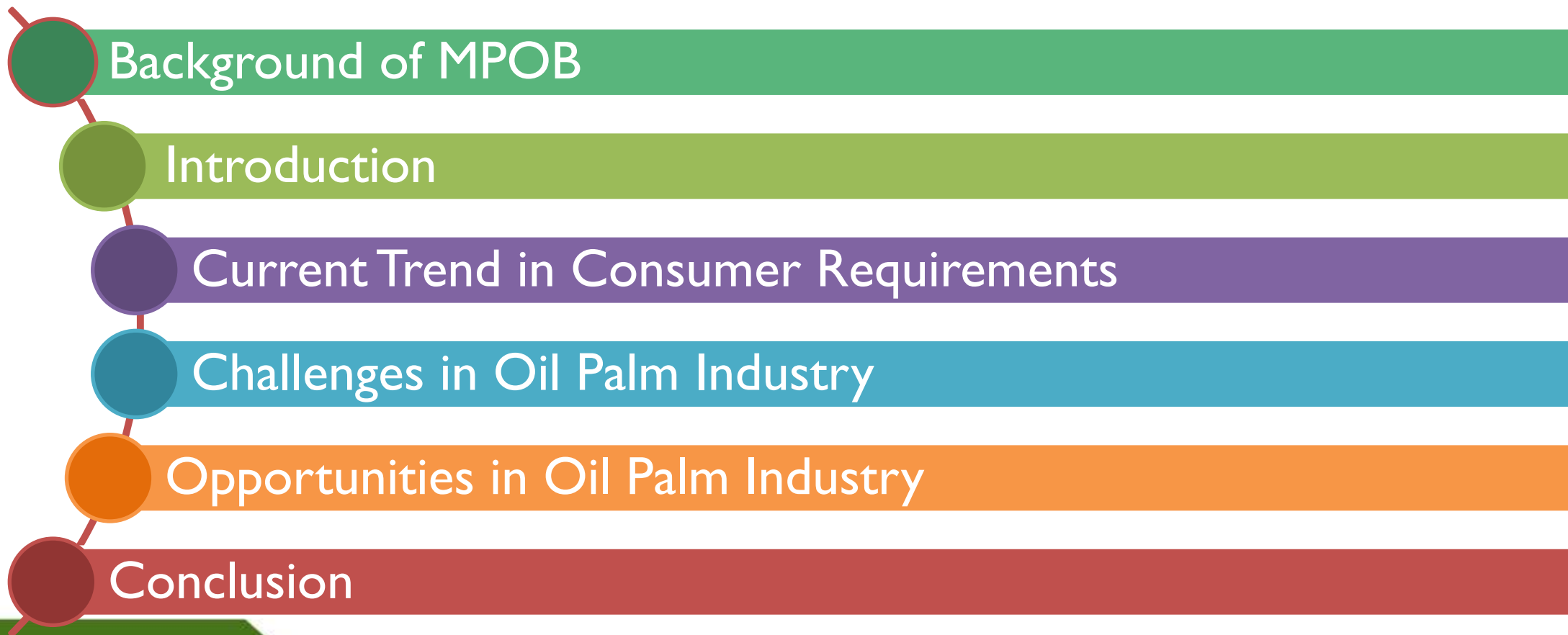
**Ahmad Parveez Ghulam Kadir**

**Director General**

**Malaysian Palm Oil Board (MPOB)**

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# PRESENTATION OUTLINE





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# **BACKGROUND OF MPOB**

## Malaysian Palm Oil Board (MPOB)



- Agency of **Ministry of Primary Industries**
- Statutory body – established under the Malaysian Palm Oil Board Act 1998 (Act 582) effective **1 May 2000**

...taking over the functions of

- Palm Oil Research Institute of Malaysia (**PORIM**)
- Palm Oil Registration and Licensing Authority (**PORLA**)



Estd. **1977**  
Function:  
Licensing &  
Enforcement



Estd. **1979**  
Function:  
Research &  
Development



## ROLES & FUNCTIONS OF MPOB

MPOB's main **role** is to **promote and develop national objectives, policies and priorities** for the **well-being** of the Malaysian palm oil **industry**

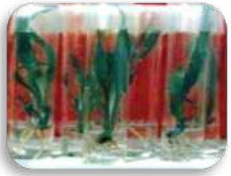
### RESEARCH & DEVELOPMENT (R&D)

- Biology & Sustainability Research Division
- Advanced Biotechnology Breeding Centre
- Smallholder Development Research Division
- Engineering & Processing Research Division
- Advanced Oleochemical Technology Division
- Product Development & Advisory Service Division

### SERVICES

- Economics & Industry Development Division
- Licensing & Enforcement Division
- Information Technology & Corporate Services Division'
- Finance Management & Development Division

All activities of the Malaysian palm oil industry are licensed and enforced



1. Oil Palm Seed Producer
2. Plants from Oil Palm Tissues Producer
3. Nursery
4. Estate
5. Small Holding \*

\* No license fee



6. Palm Fatty Acids Dealer
7. Oil Palm Fruit Dealer
8. Palm Kernel Dealer
9. Palm Oil Dealer
10. Mixed Palm Oil Dealer
11. Palm Oleochemicals Dealer
12. Oil Palm Seeds and Seedlings Dealer
13. Plants from Oil Palm Tissue Dealer



14. Commencement of Construction of Oil Palm Mill
15. Oil Palm Mill
16. Palm Kernel Crushing Factory
17. Palm Oleochemicals Plants
18. Refinery



24. Oil Palm Products Exporter
25. Oil Palm Products Importer



22. Laboratory
23. Surveying of Oil Palm Products



19. Transporter



20. Commencement of Construction of Bulking Facilities
21. Bulking Facilities



Licence Categories

**Wildlife Matters**

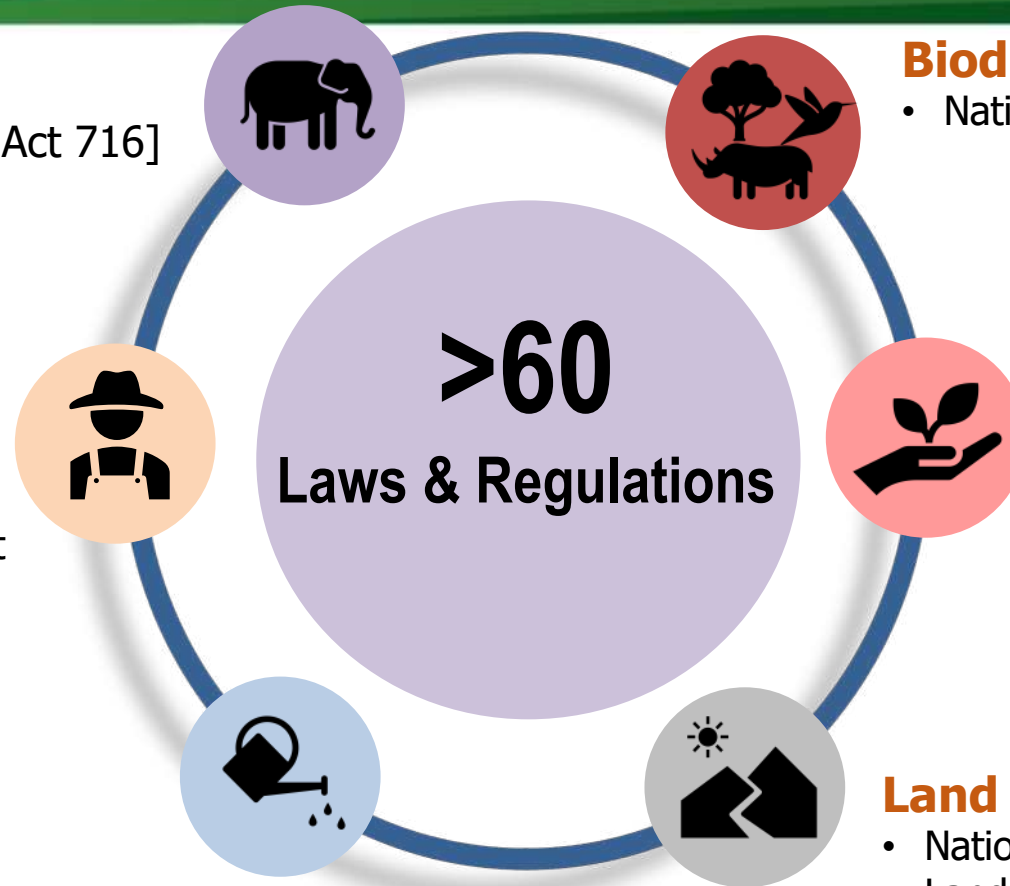
- Wildlife Conservation Act 2008 [Act 716]

**Labour and Employees Matters**

- Labour Law
- Workers' Minimum Standard of Housing & Amenities Act 1990
- Occupational Safety & Health Act 1977
- Factories & Machinery (Noise Exposure) Regulations 1989
- Passport Act 1966
- Education Act 1996

**Pesticide Use**

- Pesticides Act 1974 (Pesticides Registration) Rules 1988
- Pesticides (Licensing for sale & storage) Rules 1988
- Pesticides (Labeling) Regulations 1984



**Biodiversity**

- National Biodiversity Policy 2016-2025

**Environmental Matters**

- Environmental Land Conservation Act 1960 (revised 1989)
- Quality Act 1974 (Environmental Quality) (Prescribed Premises) (Crude Palm Oil) Regulation 1977
- Environmental Quality (Clean Air) Regulation 1978
- Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987

**Land Matters**

- National Land Code 1965
- Land Acquisition Act 1960

**A HIGHLY REGULATED INDUSTRY**





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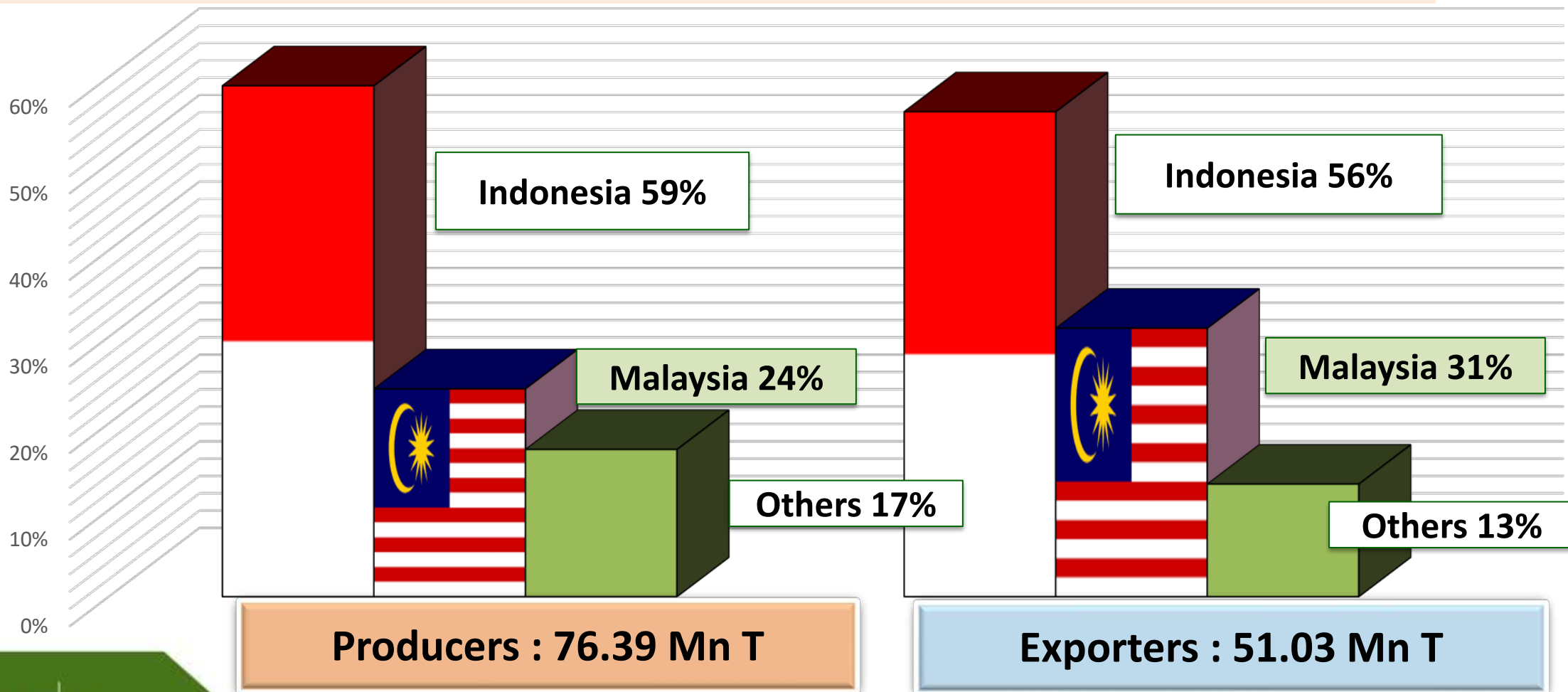
Oil Palm Conference

**EL PODER TRANSFORMADOR DE LA PALMA DE ACEITE**

# INTRODUCTION

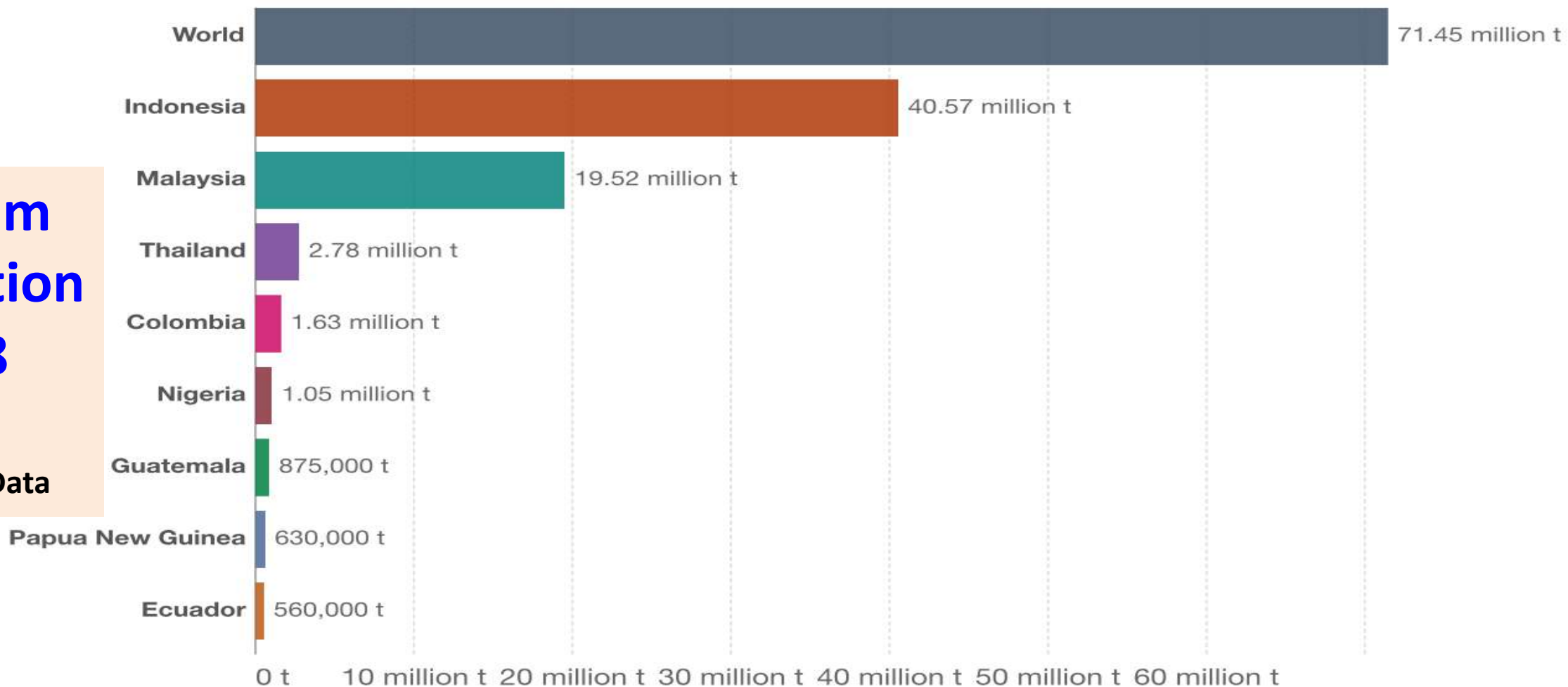


## MAJOR PALM OIL PRODUCERS AND EXPORTERS, 2021



Sources: Oil World & MPOB

Oil Palm Production 2018  
Oil World Data



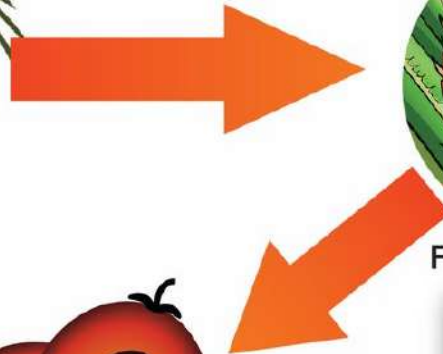
Source: UN Food and Agriculture Organization (FAO)

OurWorldInData.org/agricultural-production • CC BY

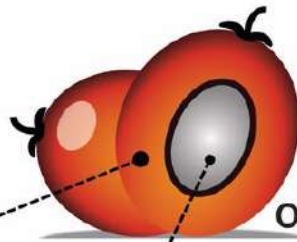
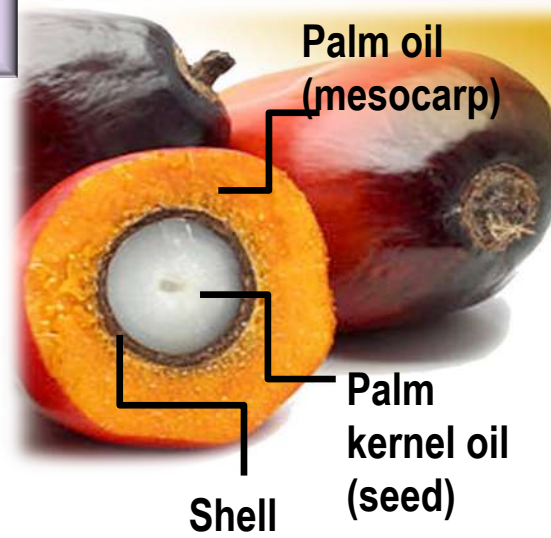
**Source of palm oil and palm kernel oil**



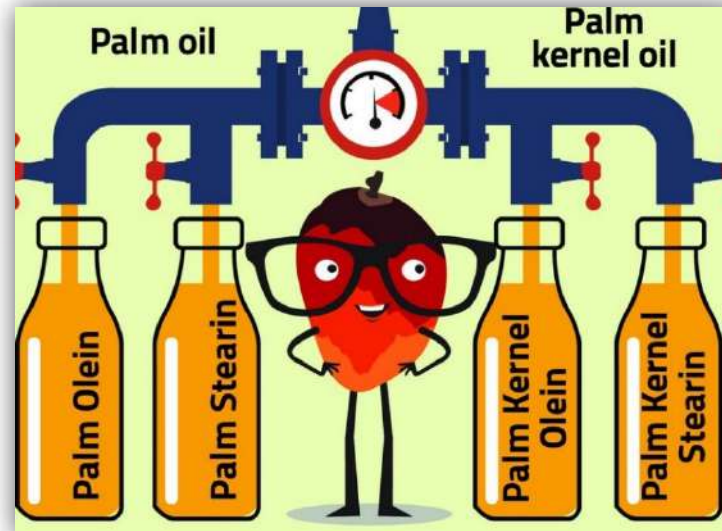
Oil Palm Tree (*Elaeis guineensis*)



Fresh Fruit Bunch

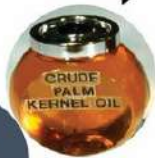


Oil Palm Fruits



Oil #1

Crude palm oil



Oil #2

Crude palm kernel oil

Fruits per bunch  
1000 to 3000

Bunch weight  
15 to 25 kg

Kernel per fruit  
5 to 8%

Mesocarp per fruit  
85 to 92%

Oil per mesocarp  
20 to 50%

Oil per bunch  
23 to 25%



## Different types of palm-based oils & fats & physicochemical properties

### Oils and Fats from Mesocarp

1. Palm oil (semi solid)
2. Palm olein (liquid)
3. Super olein (liquid)
4. Top olein (liquid)
5. Palm stearin (solid)
6. Soft stearin (solid)
7. Superhard stearin (solid)
8. Soft palm mid fraction (solid)
9. Hard palm mid fraction (solid)

### Oils and Fats from Kernel

1. Palm kernel oil (semi solid)
2. Palm kernel olein (semi solid)
3. Palm kernel stearin (solid)





“...The most versatile ingredients for food products...”

Cooking oil

Specialty fat products

Solid- and semi-solid fat industry

Non-dairy based industry

Snack foods

Supplements

Bakery products





MARKET AND PRODUCTS PRODUCED BY DOWNSTREAM SECTOR

The growing demand from the downstream sector has diversified the global demand for palm oil



Pharmaceutical



Biofuel



Cosmetics



Phytonutrient



Functional Foods



Personal Care



Oleochemical



Finished Products

## MALAYSIA'S POSITION IN GLOBAL OILS & FATS MARKET

- ❖ The **5<sup>th</sup>** world largest producer of oils & fats
- ❖ Accounted for **8.4%** of total global oils & fats production
- ❖ The **2<sup>nd</sup>** largest exporter of oils and fats
- ❖ Exports of Malaysian palm oil was 15.57 Mn T represented:
  - **16.6%** of total global oils & fats exports
  - **31.0%** of the global PO trade





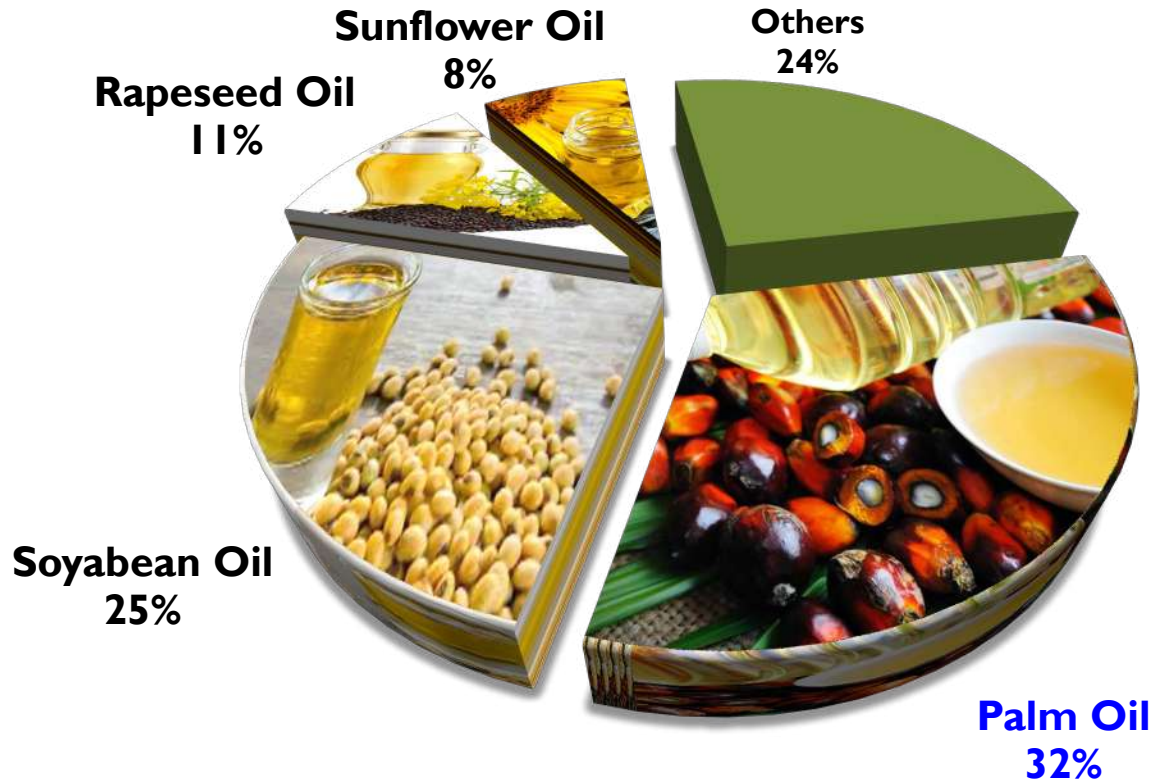
## PALM OIL CONTRIBUTION TO THE MALAYSIAN ECONOMY

- Most significant agricultural commodity to the economy.
- Accounted for **3.2%** of the total GDP in 2021.
- Export earnings of PO and palm-based products in 2021 worth **RM108.52 Bn**, contributed **51.8%** to the total export of commodity and commodity-based products or **8.8%** to the total export of merchandise.
- Ranked **3<sup>rd</sup>** in exports earnings in 2021 after electrical & electronic products and Oil & Gas Industries
- Socio-economics - create jobs to more than half a million people in Malaysia and contribute to the alleviation of rural poverty.





**PRODUCTION AND EXPORT OF MAJOR OILS & FATS, 2021**



**Production**  
**241.36 Mn T**



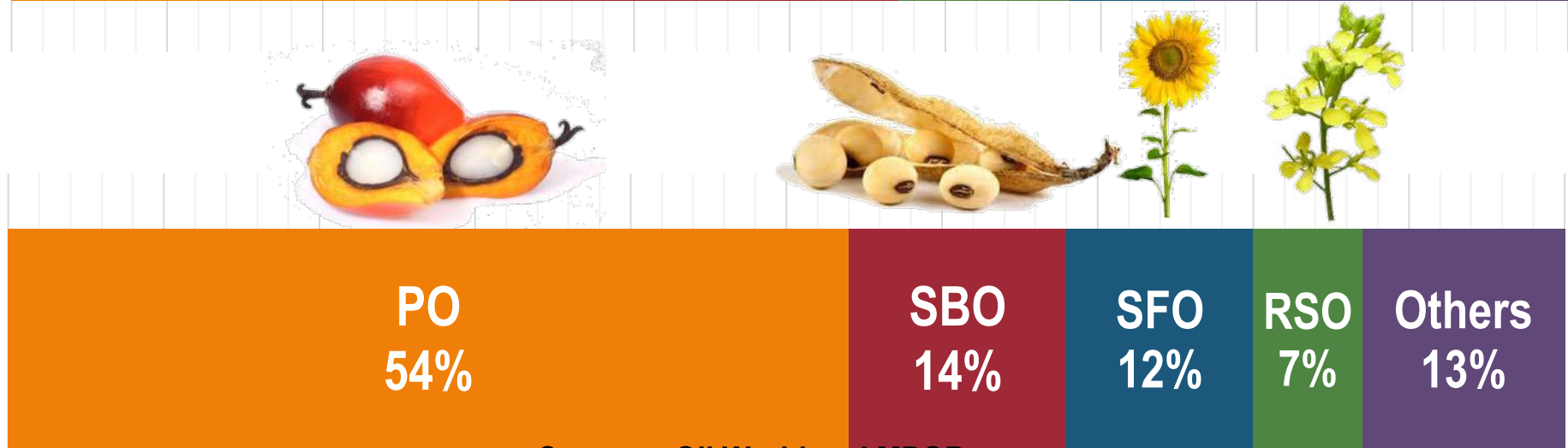
**Export**  
**95.18 Mn T**

Palm oil in the global oils and fats in 2021

**PRODUCTION**  
241.36 Mn T



**EXPORT**  
95.18 Mn T



Sources: Oil World and MPOB

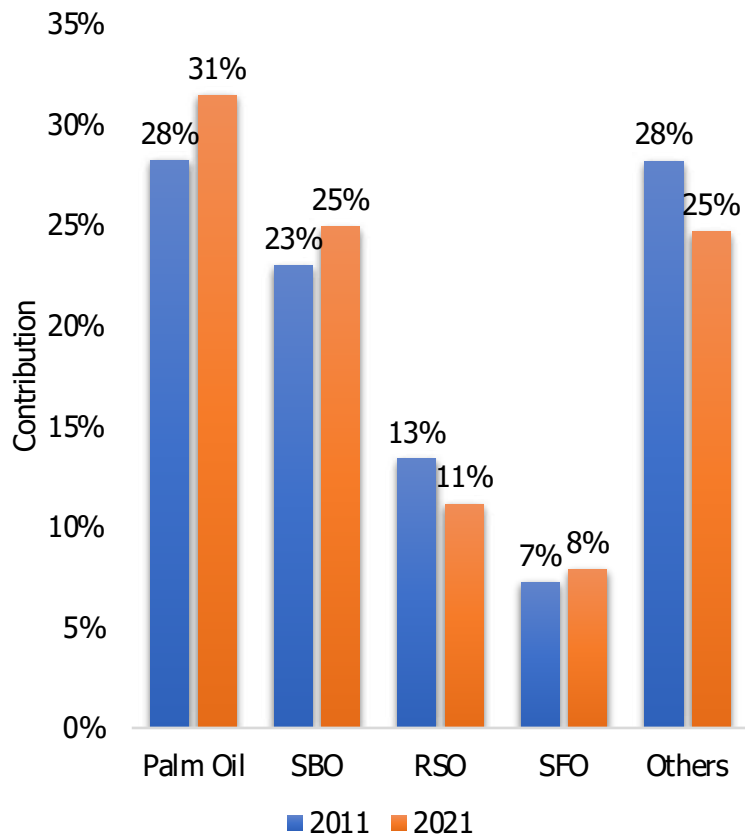


CONSUMPTION OF MAJOR OILS & FATS, 2021

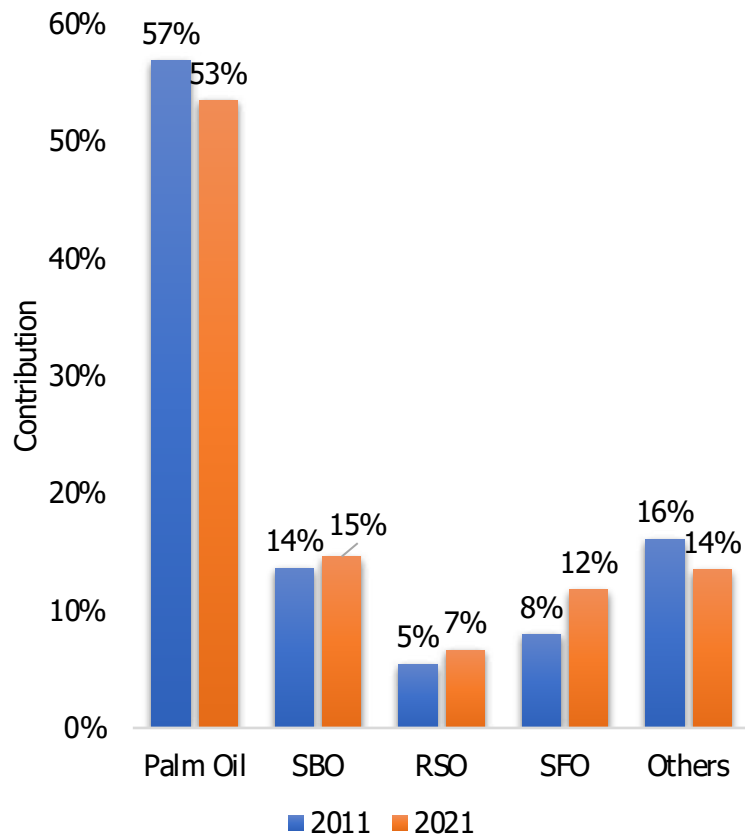


Consumption: 241.46 Mn T

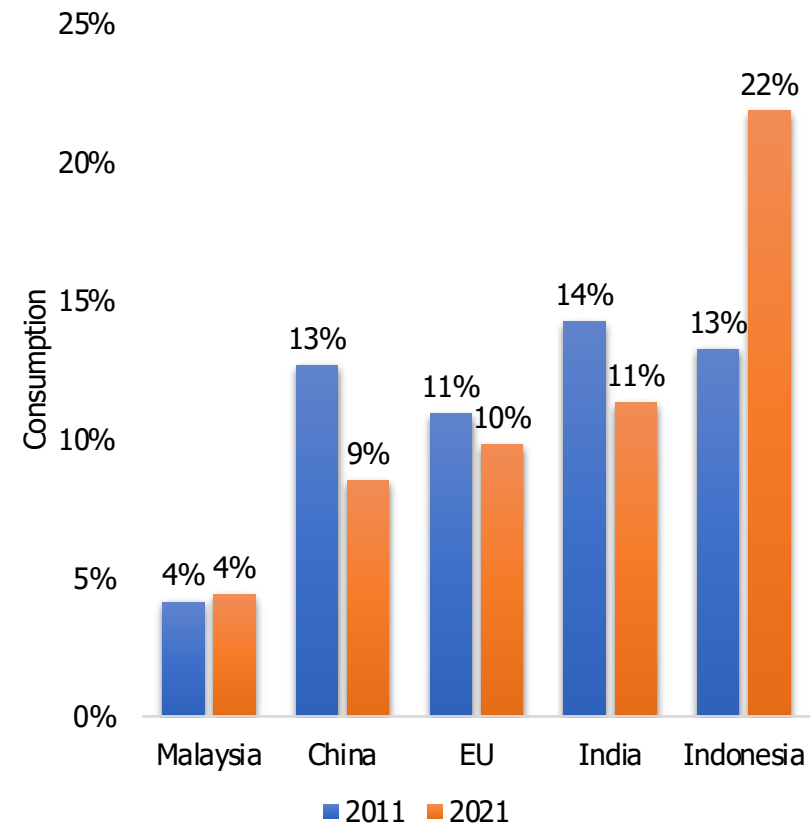
**World Production of 17 Major Oils & Fats**



**World Export of 17 Major Oils & Fats**



**World Consumption of Palm Oil**



Source: Oil World & MPOB

- Palm oil contribution to the total world production of oils & fats expanding
- However, the contribution of palm oil to the world export of oils & fats is declining on the back of the expansion in the downstream sector.



# CURRENT TREND IN CONSUMER REQUIREMENTS

- ❖ Sustainable production
- ❖ Food safety -Trans fat free

**MALAYSIAN SUSTAINABLE PALM OIL (MSPO): STRUCTURED SUSTAINABILITY PRACTICES**

- 🔥 Palm oil industry has always been adhering to **requirements of importing countries**
- 🔥 Continuous improvements through structured sustainability practices
- 🔥 Implementing **3P** sustainability principles of **People, Planet, Profit**



1980s  
Quality Certification



2005  
RSPO – business standards  
Voluntary implementation



2015  
Voluntary implementation of MSPO



2022  
Introduction of MSPO 2022



2000s  
Codes of Practice  
Quality, food safety & sustainability



2013  
MSPO – Malaysian Standard, MS2530:2013

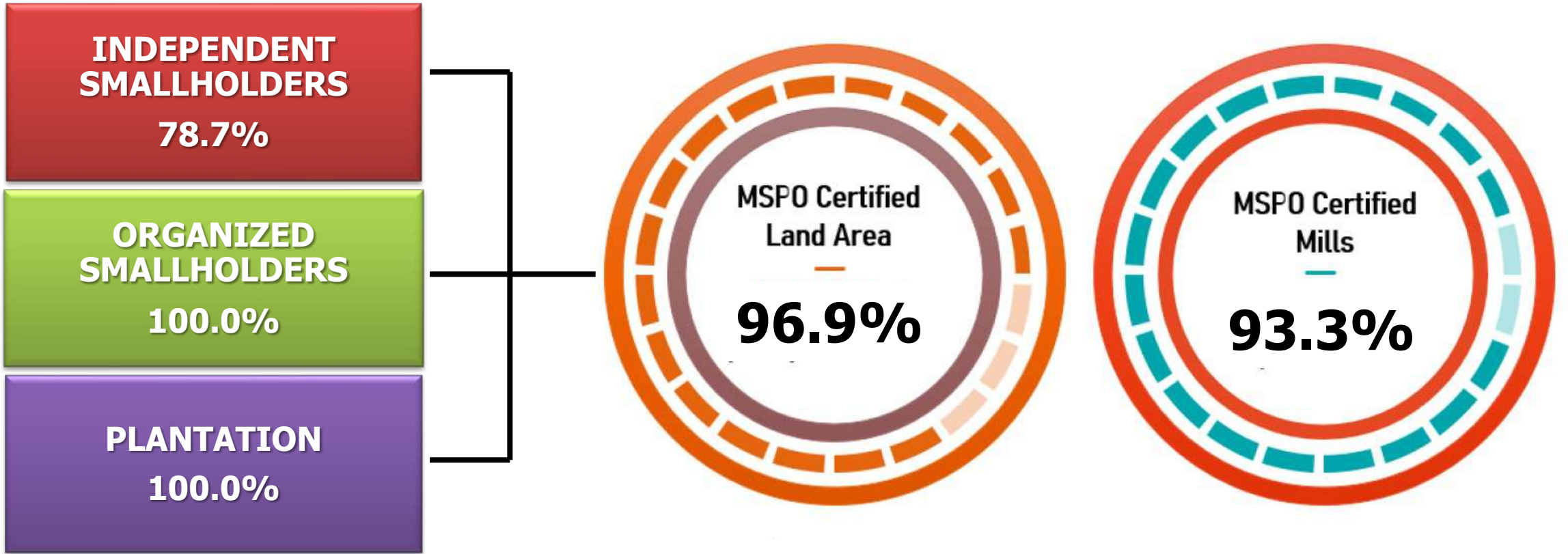


2017 - 2019  
Mandatory implementation of MSPO

**1 Jan 2020**

**Amsterdam declaration**

# MSP0 Achievement (as of 31<sup>st</sup> August 2022)



Source: MPOB, MPOCC  
\*as of December 2021

## MSPO 2.0 - IMPROVED SUSTAINABILITY REQUIREMENTS

Introducing & Incorporated the **Social Impact Assessment (SIA)** approach to all level of the MSPO Standard User.

Introducing & Incorporated the **High Conservation Value (HCV)** approach to major part of the palm oil industry.

The MSPO Standard supports the **Sustainable Development Goals (SDG) 2030** by incorporated the elements into the revised Standard.



01

02

03

04

05

Introducing & Incorporated **Green House Gas Calculation (GHG)** for the entire supply chain.

**Anti-corruption:** In-line with National amended MACC Act (Section 17A) which requires mandatory corporate accountability.



## ISPO

**NO 19/2011 1 Scheme** – Plantation & mills (mandatory private company)

**No 11/2015 – 6 schemes** – integrated, plantation, mill, biofuel, partnership stallholders & independent smallholders (mandatory private company & voluntary smallholders)

**No 38/2020 2 schemes** – plantation & mills and stallholders (mandatory private company & smallholders)

## RSPO

### Standard Review 2022-2023

#### Timeline



	Criteria Topic	2018 P&C Criterion No	2013 P&C Criterion No
PROSPERITY	1. Information and public availability	1.1	1.1 / 1.2 / 6.10
	Communication and consultation	1.1	6.2
	Commitment to ethical conduct	1.2	1.3 / 6.10
	2. Legal compliance	2.1	2.1 / 6.10
	Third party contractors legal	2.2	n.a.
	Third party F&B legally sourced	2.3	n.a.
	3. Long term plan and economic viability	3.1	3.1
	Continuous Improvement & Reporting	3.2	8.1
	Standard Operating Procedures	3.3	4.1
	SEIA and Plans	3.4	5.1 / 6.1 / 7.1
PEOPLE	System for managing human resources	3.5	n.a.
	Occupational Health and Safety Plan	3.6	4.7 (part)
	4. Training	3.7	4.8
	Human Rights	4.1	6.13
	Complaints and Grievances	4.2	6.3
	Contribution to local sustainable development	4.3	6.11 (part)
	Land use & FPIC	4.4 & 4.5	2.3 / 7.5
	Land Use - Compensation	4.6 & 4.7	6.4 / 7.6
	Land Use - Conflict	4.8	2.2
	Improved SH livelihoods	5.1	6.1
PLANET	5. Pay and working conditions	5.2	6.11 (part)
	6. No discrimination	6.1	6.8
	Pay and working conditions	6.2	6
	Freedom of association	6.3	6.9
	No child labour	6.4	6.7
	No harassment	6.5	6.9
	No forced or trafficked labour	6.6	6.12
	7. Safe working environment	6.7	4.7 (part)
	Effective Integrated Pest Management	7.1	4.9
	Pesticide Use	7.2	4.6
	Waste management	7.3	5.3
	Soil health fertility	7.4	4.2 / 7.2
	Soil conservation (erosion and degradation)	7.5	4.3 & 7.4 (parts)
	Soil survey and topographic information	7.6	4.3 & 7.2
	Peat	7.7	4.3 & 7.4 (parts)
	Water quality and quantity	7.8	4.4
	Energy Use	7.9	5.4
	Pollution and GHGs	7.10	5.6 / 7.8
	Fire	7.11	5.5 / 7.7
	HCV and HCS	7.12	5.5 / 7.3

TRANS FATTY ACID

The consumption of TFA provides **no nutritional benefit** and has considerable potential for harm

In promoting the **removal of TFA**, particular attention must be given to their replacement; this is a challenge for the food industry

Palm oil is a **natural substitute** for TFA



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THESE ARE TRANS-FAT FREE, RIGHT?



Our breads and cookies are Trans Fat Free!



# What are *trans* fats?

**TRANS FAT FREE BY 2023!**

**Trans Fatty Acids**

**NATURALLY OCCURING**

Produced in Gut of Animals

Food prepared from these animals eg. Milk and Meat may contain natural TFA

**ARTIFICIAL**

Produced during Partial hydrogenation of Oils

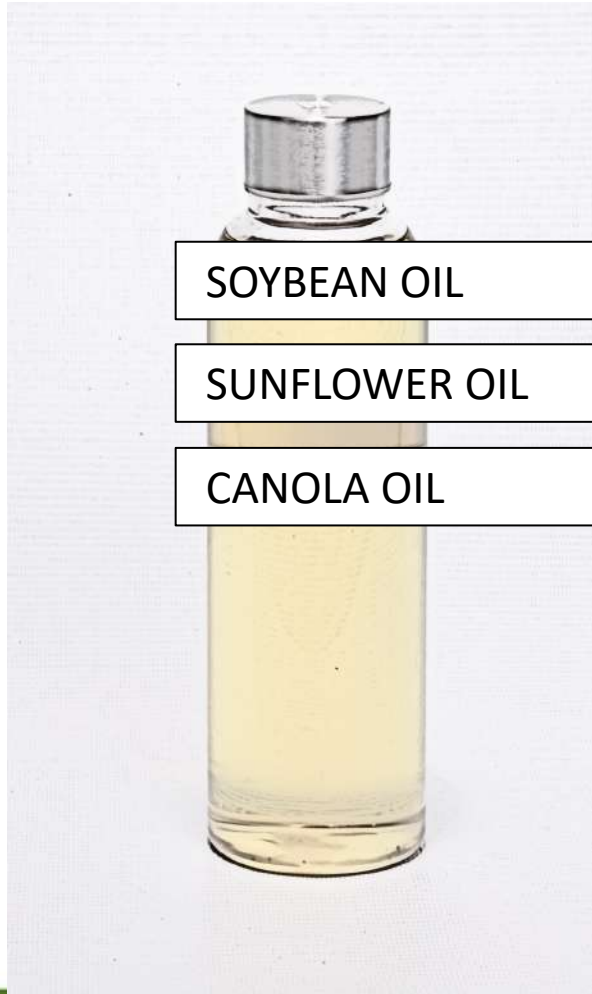
Partially hydrogenated Oils (PHO) contains trans fats





## How do *trans* fats affect my health?

- **raise your (LDL) bad cholesterol levels and lower your (HDL) good cholesterol levels.**
- **increase your risk of developing heart disease and stroke.**
- **associated with a higher risk of developing type 2 diabetes.**



Soybean Oil, Sunflower Oil and Canola oil are liquid at  $-5^{\circ}\text{C}$



PARTIALLY HYDROGENATED SOLID FATS CONTAIN TRANS FATTY ACIDS



Palm oil and Palm-based Margarine are Free of Trans Fats



Palm Oil

Hydrogenation



Margarine

Solid



# CHALLENGES IN OIL PALM INDUSTRY

- ❖ Food Safety
- ❖ Labour issue
- ❖ Deforestation & sustainability
- ❖ Anti Palm Oil Campaign
- ❖ Protectionism Policies

### 3-MCPDE IN THE EU

In October 2018, the European Commission suggested **TWO POSSIBLE MAXIMUM LEVEL FOR 3-MCPDE** in refined vegetable oils



**1.25 ppm** for soft oils including **palm kernel oil**  
**2.5 ppm** for **palm oil** and fish oil

Entry into force: **1 January 2021**

PO producing countries are facing challenges in complying with the stringent requirement set by the EU

## Process contaminants

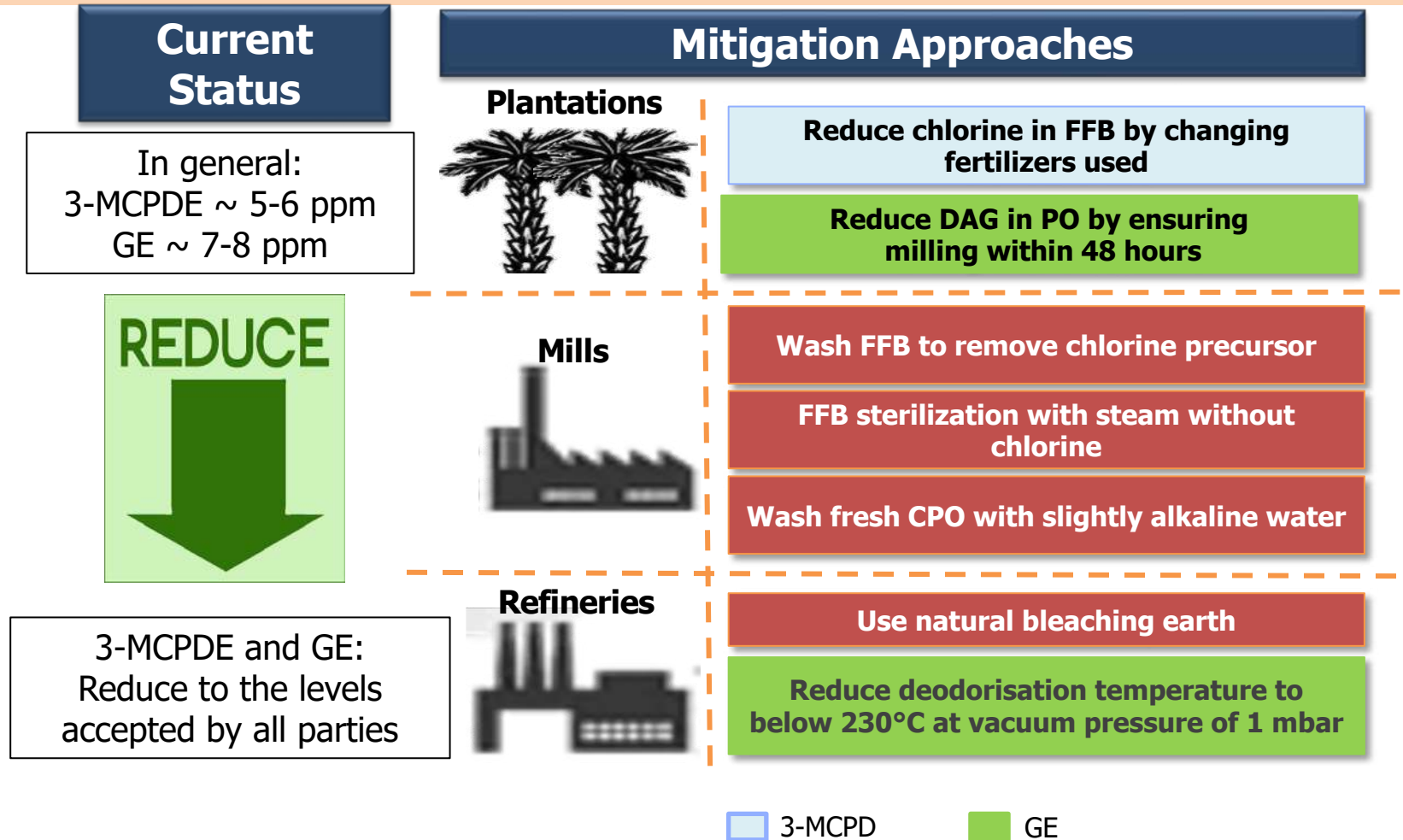
3-monochloropropane diol (3-MCPD).	Possibly carcinogenic to human <sup>1</sup>
3-MCPD ester (3-MCPDE)	Harmful to kidney <sup>2</sup>
Glycidyl Ester (GE)	Probably carcinogenic to humans <sup>1</sup>

<sup>1</sup>*Classification by International Agency of Research on Cancer*

<sup>2</sup>EFSA



## Addressing Food Safety & Health



FOOD SAFETY: MINERAL OIL HYDROCARBONS

01 First reported issue on Mineral Oil Hydrocarbons (MOH) in 2018

Sunflower oil adulterated with MOH from unidentified source was shipped from Ukraine to EU



02 EFSA published an opinion on MOH contents in food in 2012

To date, there is no EU regulation on the maximum limit for MOH



03 Mineral Oil Saturated Hydrocarbons (MOSH)

Causing inflammation to human livers

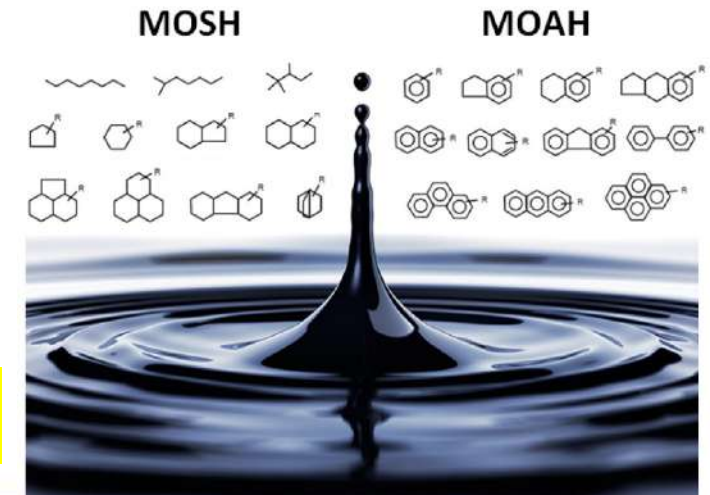


04 Mineral Oil Aromatic Hydrocarbons (MOAH)

Possible genotoxic and carcinogens



Nestle 2019



## LABOUR INTENSIVE SECTOR



- Oil palm sector is **labour-intensive** by nature.
- This nature **limits the adoption of technology**, particularly in the key job category, harvesting the fresh fruit bunch (FFB).
- **Harvesting of FFB** requires **high physical efforts**, as such the **technology applicable** for this purpose needs to **design appropriately** to match the human capabilities.
- This **specific requirement** contributes to the **slow technological adoption** in the oil palm sector, affecting the sector's productivity.





A12

Borneo's Best Source Of Info  
**thesundaypost**  
www.theborneopost.com



**Highlights** No death, new cases drop to 352 yesterday — SDMC ● P3 'Recoda's signature roads will spur economic growth' ● P7

# Palm oil industry facing collapse

## Oil palm planters facing ruin as pandemic halts recruitment of foreign workers

**KUCHING:** Sarawak's palm oil industry is teetering on the brink of collapse because of crippling labour shortage and restrictions of the standard operating procedure (SOP) imposed to curb the Covid-9 pandemic.

Labour shortage is a perennial problem besetting the industry, because locals generally shun jobs in the industry forcing refineries, oil palm estates and smallholders to depend heavily on foreign workers.

Before the advent of the Covid-19 pandemic, recruiting foreign workers had always been a hassle the industry players had to bear with, now the situation is exacerbated by additional restrictions imposed to comply with the measures to curb cross-border spread of the disease. As a result the industry is suffering unprecedented decline in productivity and yields.

Statistics from the Malaysian Palm Oil Board show that Sabah and Sarawak collected a total of 15.246 million tonnes of fresh fruit bunch (FFB) from January to May this year.

This marked a drop of 970,350 tonnes or about six per cent from the same period last year.

This drop consequently raised the prices of computed FFB prices from RM381.81 per metric tonne in 2019 to RM516 in 2020 and RM802.71 this year.



Palm oil estates, mills and refineries across the state are suffering from a decline in productivity and yields due to problems with bringing foreign workers into Sarawak.

Douglas Uggah Embas on

requesting anonymity.

players.

peak production period, which

Even with the current good price of crude palm oil, farmers cannot benefit as there is an acute shortage of workers in the industry.

— Andrew Cheng, Sarawak Oil Palm Plantation Owners Association president

### Sarawak's tedious steps to bring in foreign workers

The process to bring foreign workers into Sarawak has several steps. First, employers need to apply for approval in principle (AP) from the Department of Labour Sarawak through the Monitoring System of Employment of Non-Sarawakian (MSEN).

After the AP is approved at the One Stop Centre, the employer can proceed to apply for a labour licence under the AP through MSEN at the Department of Labour Sarawak.

Based on workers' name in the labour licence, employers need to apply for a calling visa (CV) and a mytravel pass through the Immigration Department of Sarawak.

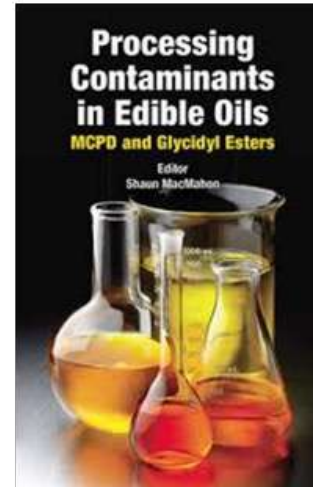
When the CV is approved, employers then need to apply for 'mycentersarawak' through the Sarawak Disaster Management Committee (SDMC). New workers must have valid RT-PCR Covid-19 negative test



PALM OIL GLOBAL ISSUES



17 oils & fats



Oil Palm Plantation is key contributor to massive deforestation



Allegation of negative nutritional properties of palm oil



US-Dept. of Labor: report of Forced & Child labor in the oil palm plantations

No Palm Oil Label on food products



Emission of GHG GAS

Sustainability issue on palm oil production



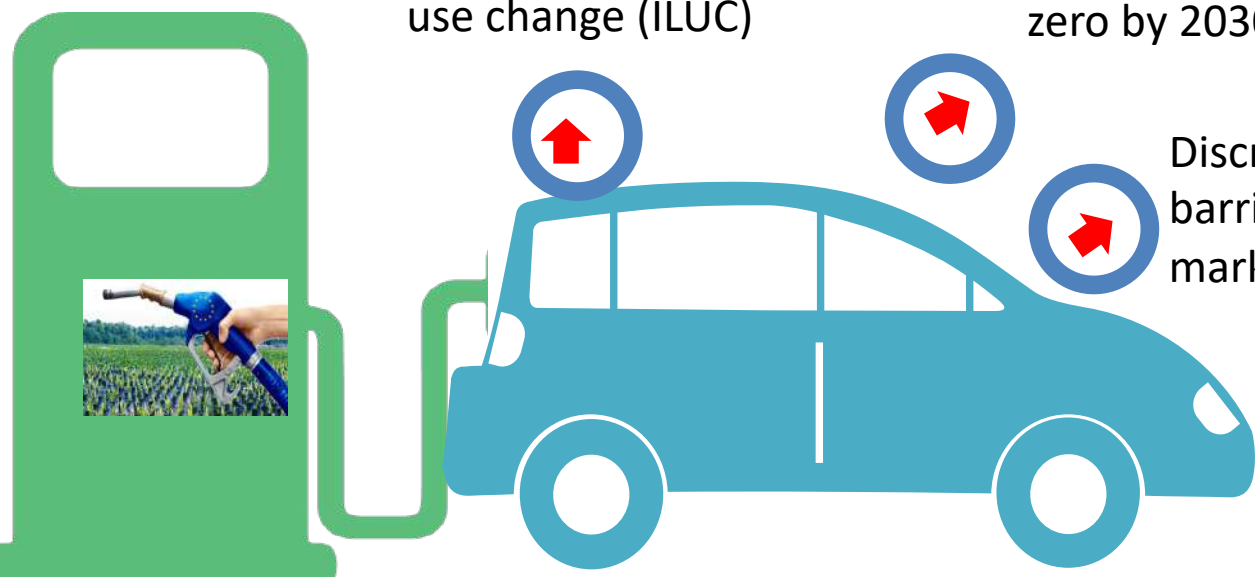
## **RENEWABLE ENERGY DIRECTIVE II (RED II) IN THE EU**

EU RED II classifies palm oil that poses a high risk of indirect land use change (ILUC)

Palm oil demand for biodiesel to be capped at 2019 level for the period 2021-2023, before it gradually reduced to zero by 2030.

Discrimination against palm oil products and imposition of trade barriers obstructing palm oil products' access to the European market.

- 1) Malaysia initiated WTO dispute complaint against EU palm oil measures.
- 2) Malaysia took WTO legal action against EU over palm oil biofuel curbs.
- 3) The World Trade Organisation (WTO) agreed to a request from Kuala Lumpur to establish a panel examining a European Union law that restricts the use of palm oil-based biofuels.





## THE US NEW LEGISLATION ON DEFORESTATION

- The US Congress plans to impose *The Fostering Overseas Rule of Law and Environmentally Sound Trade Act* (FOREST) on import of commodities originating from **illegally forested land**
- Targeting specific commodities – **palm oil, soyabean, cocoa, cattle, rubber and wood pulp**

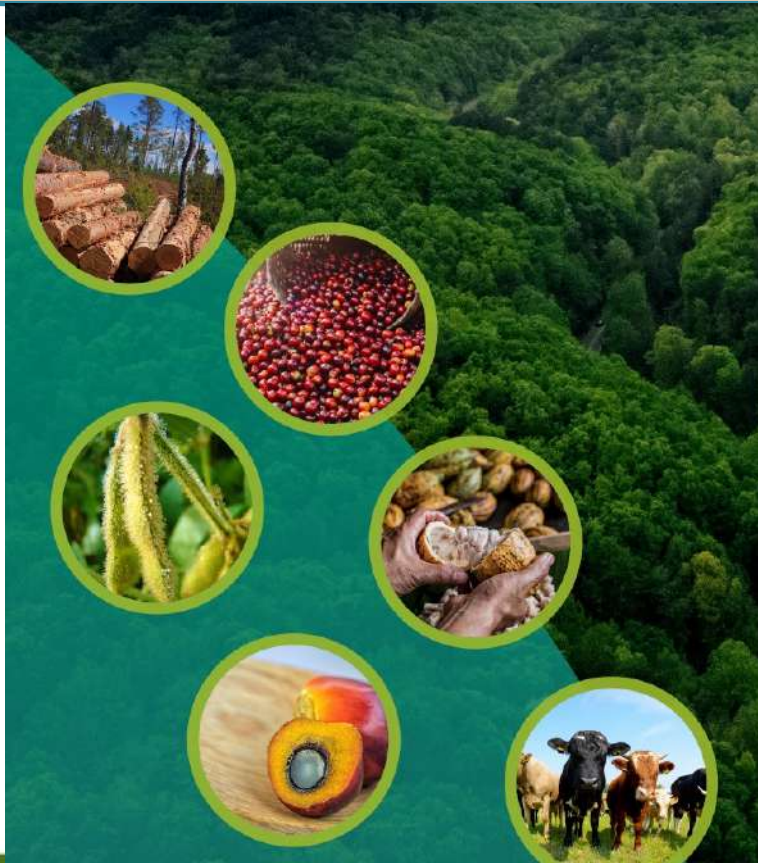


United States  
U.S. Congress Democrats target palm oil, beef trade in deforestation bill  
By Richard Coven and Paulin Ungku



## EU'S NEW LEGISLATION ON IMPORT OF GOODS LINKED TO DEFORESTATION

- The **EC proposed legislation** aims at preventing imports of commodities **link to deforestation**
- Products includes **palm oil, soyabean, beef, wood, cocoa and coffee**
- Companies/importers to **prove their global supply chain are not contributing to deforestation** and commodities are produced in accordance with the laws of producing country
- Commodities are not grown on any land **deforested after 31 Dec 2020**





# Oil Palm – The Most Productive Oil Crop

How many hectares are needed to produce 1 ton of vegetable oils?

Soybean oil



Sunflower oil



Rapeseed oil (Canola)

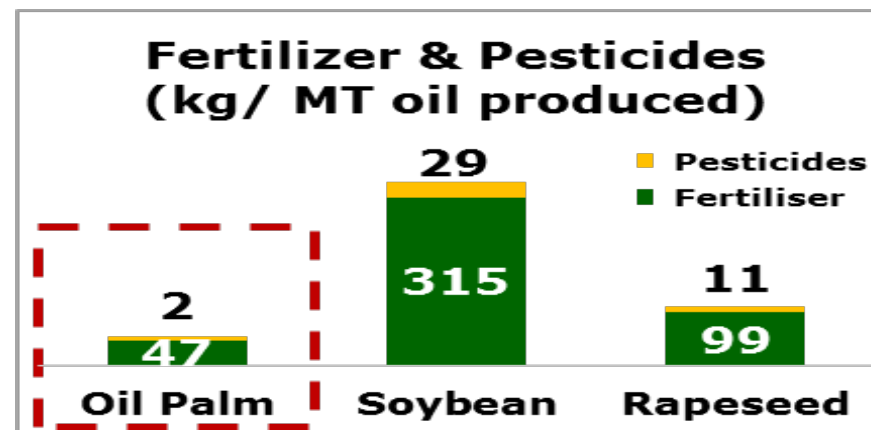


Palm oil



Oil palm produces about 35% of all vegetable oil on less than 10% of the land allocated to oil crops.

- 6 to 8 MT/Ha of oil yields can be achieved by more efficient Oil Palm producers
- Oil Palm requires the least fertilisers and pesticides among oilseed crops



Source: MPOC, The New Straits Times, MPOB, Oil World 16/17, Palm Oil Action Group Australia, The Guardian (2014)

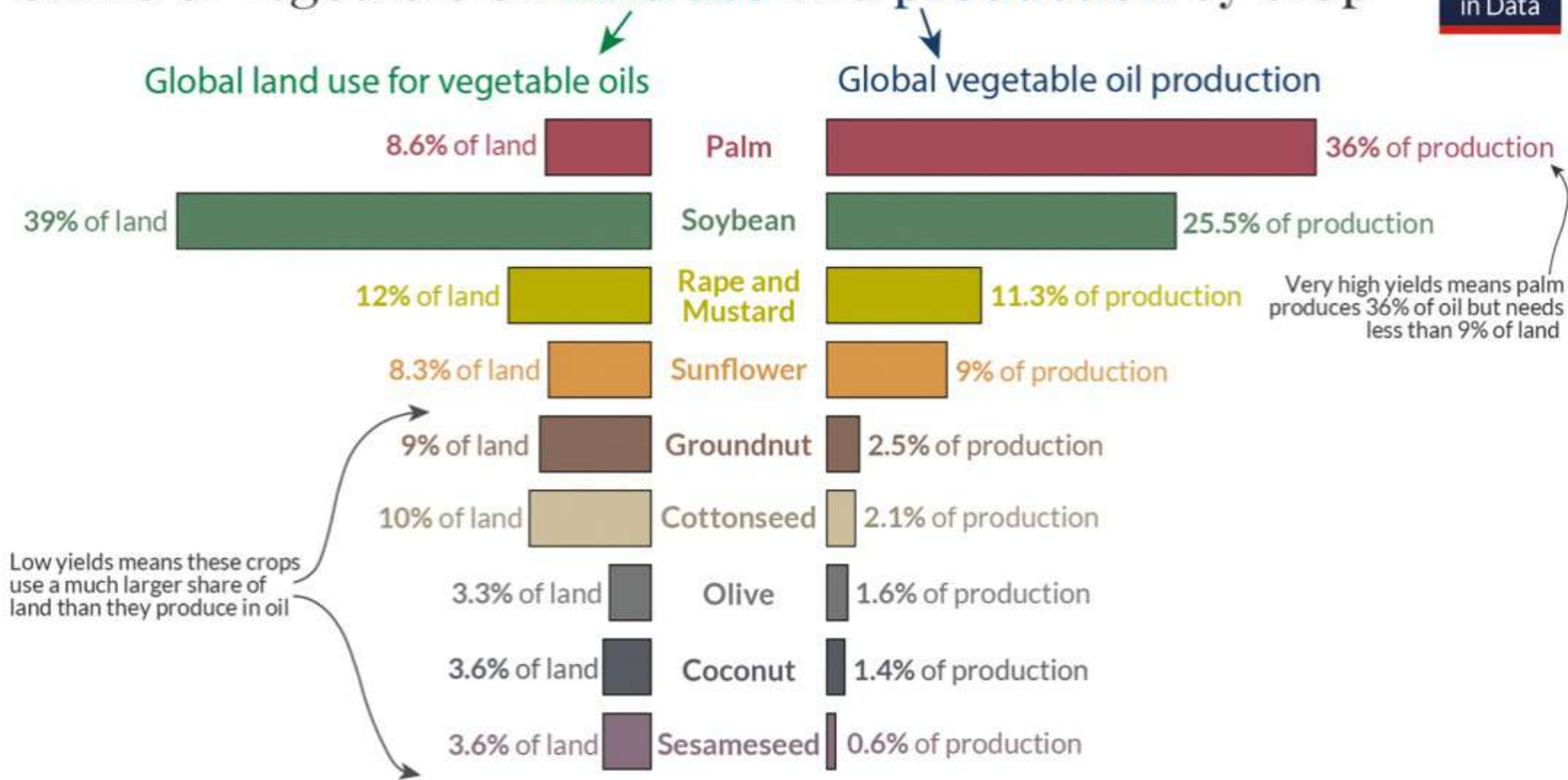


## Oil Palm – The Most Productive Oil Crop

Oil Crops	Production (Mn T)	% of total production	Total area (Mn Ha)	% of total area
<b>Oil palm*</b>	78.26	<b>44.17</b>	19.07	<b>9.28</b>
<b>Soybean</b>	54.92	<b>31.00</b>	125.68	<b>61.24</b>
<b>Rapeseed</b>	25.55	<b>14.42</b>	33.36	<b>16.24</b>
<b>Sunflower</b>	18.43	<b>10.40</b>	27.351	<b>13.31</b>

Share of vegetable oil land use and production by crop

Our World in Data



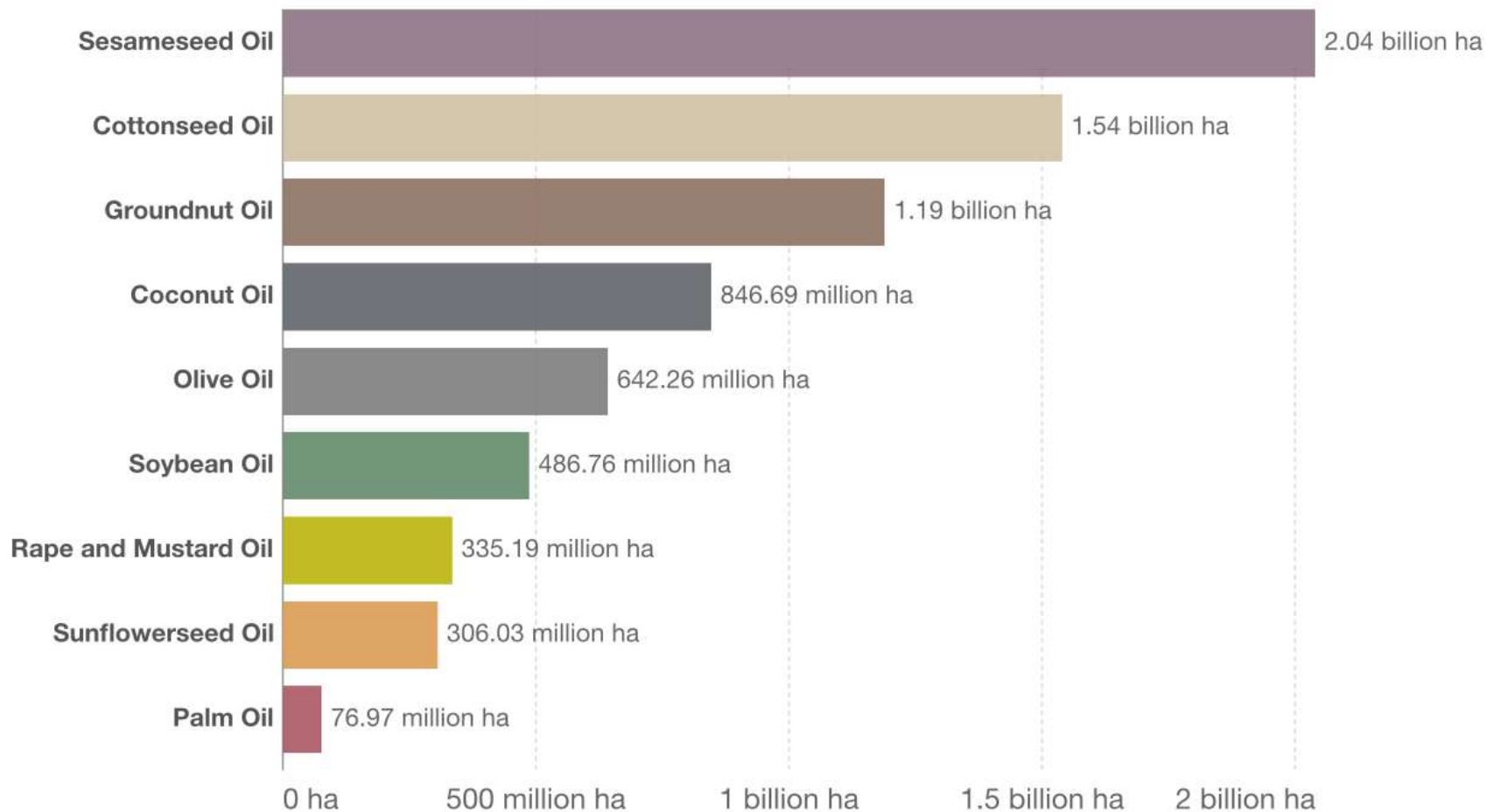
Data source: Calculated by the authors based on production and land use data from the UN Food and Agriculture Organization (FAO) for the year 2018. OurWorldinData.org - Research and data to make progress against the world's largest problems. Licensed under CC-BY by the author Hannah Ritchie (Updated June 2021).

# EL PODER TRANSFORMADOR DE LA PALMA DE ACEITE

## Area of land needed to meet global vegetable oil demand, 2018

Our World in Data

This metric represents the amount of land that would need to be devoted to grow a given crop if it was to meet global vegetable oil demand alone. Global vegetable oil demand was 218 million tonnes in 2018.



Source: Calculated by Our World in Data based on data from the UN Food and Agriculture Organization (FAO) [OurWorldInData.org/palm-oil](http://OurWorldInData.org/palm-oil) • CC BY



**ANTI PALM OIL CAMPAIGNS ARE INTENSIFYING**

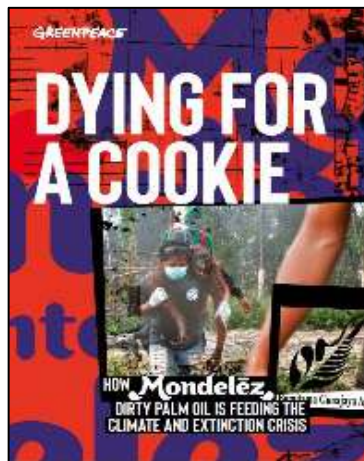


**No palm oil in my tank!**

Frans Timmermans, First Vice-President of the European Commission, Commissioner Cañete, Commissioner Malmström and Jean-Claude Juncker (President of the EU Commission)

**Petition**

We urge the European Commission to stop the use of high risk fuels like palm oil in the EU that destroy our forests and kill orangutans. By February 1, 2019, we demand that the Commission through a delegated act carries out the the EU Parliament's vote to stop subsidising palm oil diesel.



Oil Palm Plantation is key contributor to **massive deforestation**



CUISINE  
**SANS COLORANT**  
**SANS CONSERVATEUR**  
**SANS HUILE DE PALME**



ANTI PALM OIL CAMPAIGNS



Even the Italian Association for Research on Cancer says...

CELLPHONE USAGE CAN CAUSE  
BRAIN CANCER?

**NO**

L'uso dei cellulari può causare  
un tumore al cervello?

**NO**

Attualmente non si può affermare che vi sia un nesso, in particolare riguardo ai cellulari di nuova generazione a basse emissioni di onde a radiofrequenza. Un lieve aumento di rischio è stato segnalato da alcuni studi solo per il neurinoma, un tumore benigno del nervo acustico.



IS RED MEAT BAD  
FOR YOUR HEALTH?

**IT DEPENDS**

Le carni rosse fanno  
male alla salute?

**DIPENDE**

Un consumo eccessivo aumenta il rischio di sviluppare alcuni tumori, ma l'aumento è proporzionale alla quantità e frequenza, per cui mangiare carne rossa una o due volte a settimana è accettabile, mentre le carni rosse lavorate (salumi, insaccati e carne in scatola) andrebbero consumate solo saltuariamente.



An excessive consumption increases the risk to develop some cancers, but the increase is proportional to the quantity and to the frequency. So, it's acceptable to eat red meat one or two times per week, but processed red meat (cold cuts, sausages and canned meat) should be consumed occasionally

IS IT TRUE THAT PALM OIL CONSUMPTION  
CAN INCREASE THE RISK TO DEVELOP  
CANCER?

**YES**

È vero che consumare olio di palma può  
aumentare il rischio di sviluppare un tumore?

**sì**

Ma con una normale alimentazione è molto difficile raggiungere le quantità che aumenterebbero davvero in modo misurabile il rischio individuale di sviluppare un tumore.



But in a normal diet is very difficult to reach the quantities that would increase in a measurable way the risk to develop a cancer.

**Palm Oil is associated with  
the risk of getting CANCER IS  
NOT TRUE!!!!**

## SATURATED FAT: IMPACT ON HEALTH

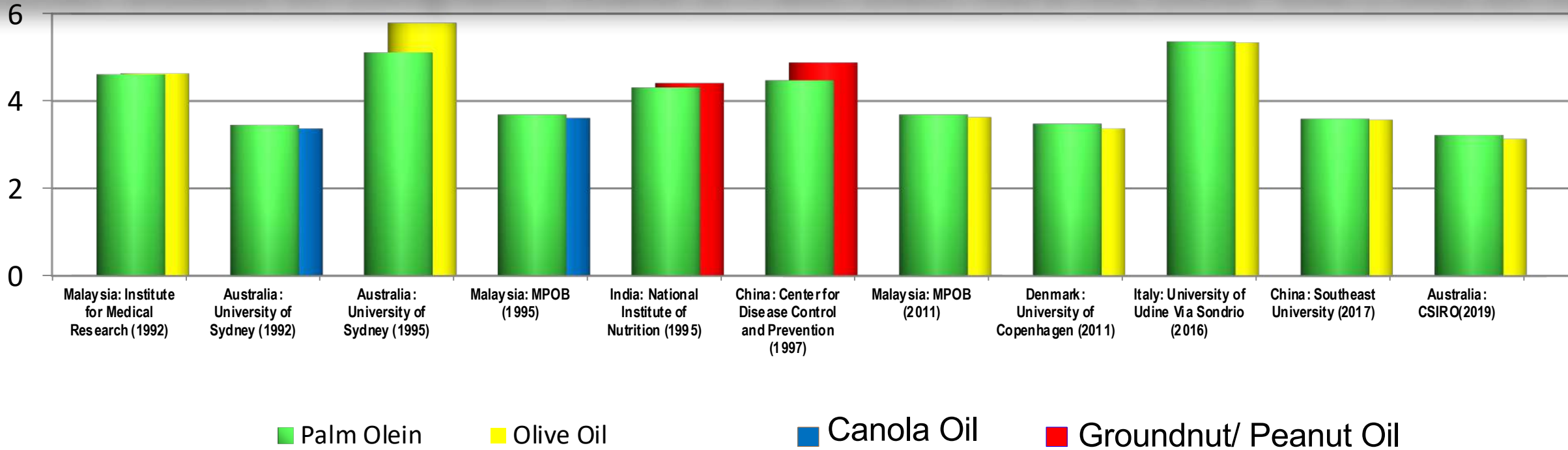
- In the late 1950s, Ancel Keys postulated that:
  - "***Fats cause heart disease***"
  - "***Saturated fats raise cholesterol levels***"
- Often referred to as the **lipids theory** or diet-heart theory:
  - **Widely accepted**
  - Most people today perceive that this is **TRUE**
- **Current evidence** shows **otherwise**





# Human Studies on Long-term Intake of Palm Olein vis-à-vis Other Oils (1992-2019)

TC: HDL Cholesterol Ratio



**Palm olein behaves more like a monounsaturated oil in its effects on cholesterol levels, although it contains saturated fatty acids**

**REFERENCES:**

1. Ng et al. 1992 Am J Coll Nutr
2. Truswell AS et al. 1992 Nutr. Res.
3. Choudhury et al. 1995 AJCN
4. Sundram et al. 1995 Nutr. Biochem.
5. Ghafoorunissa et al. 1995 Lipids
6. Zhang et al. 1997 Asia Pacific J Clin Nutr
7. Voon et al. 2011 AJCN
8. Tholstrup et al. 2011 AJCN
9. Lucci et al. 2016 Food Funct.
10. Sun et al. 2017 Asia Pacific J. Clin. Nutr.
11. Welma et al., 2019, EJCN

## PROTECTIONISM POLICY - ILUC

- The EU has been debating on the inclusion of **indirect land use change** (ILUC) into their **Renewable Energy Sources Directive**, referred to as the RED.
- **Palm oil** has been singled out as a **high ILUC risk feedstock** while the **other major oil crops** are categorized as **low ILUC risk feedstock**.
- **Restricts** the use of **palm oil as a biofuel feedstock** in the EU.
- Palm oil **demand for biodiesel** to be capped at **2019 level** for the period 2021-2023, before it is gradually **reduced to zero by 2030**.
- This regulation is **discriminatory to palm oil** and it takes away the major market share of palm oil in the EU.



## Other Challenges

- ❖ Price fluctuation
- ❖ Agricultural input prices
- ❖ Policy changes by exporting and importing countries





**XX**

Conferencia  
Internacional sobre  
20th International

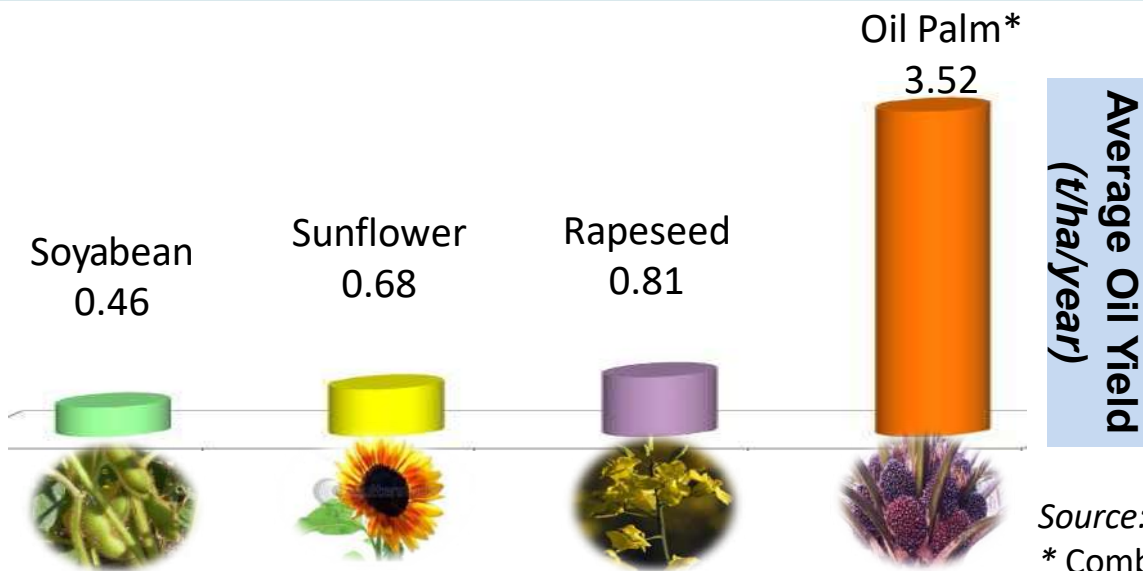
**PALMA  
DE ACEITE**

Oil Palm Conference

**EL PODER TRANSFORMADOR DE LA PALMA DE ACEITE**

# **OPPORTUNITIES IN OIL PALM INDUSTRY**

## OIL PALM : MOST PRODUCTIVE OIL CROP



Planted on just **8%** of land occupied by oil crops

**YET**

Contributes to **35%** of world's production of oils & fats

Source: Oil World

\* Combined tonnage of palm oil and palm kernel oil

Oil Crops	Production Oil (Mn T)	% of total production	Total area (Mn Ha)	% of total area
Oil palm*	83.9	34.7	23.8	8.0
Soyabean	60.2	24.9	130.8	43.7
Rapeseed	26.9	11.1	33.0	11.0
Sunflower	19.0	7.9	28.0	9.4

## **INCOME DIVERSIFICATION THROUGH INTEGRATION FOR SUSTAINING OIL PALM SMALLHOLDERS' WELLBEING**

- **Crop and livestock integration** activities can optimize land use and diversify their income.
- Example: **Integration of pineapple with oil palm**
  - Pineapple sales revenue: **~US\$200** (monthly net return)
  - Oil palm (FFB) sales revenue: **~US\$175**
  - Estimated total income per hectare: **US\$375/month**
  - Estimated income for 3.8 hectares: **US\$1,425**





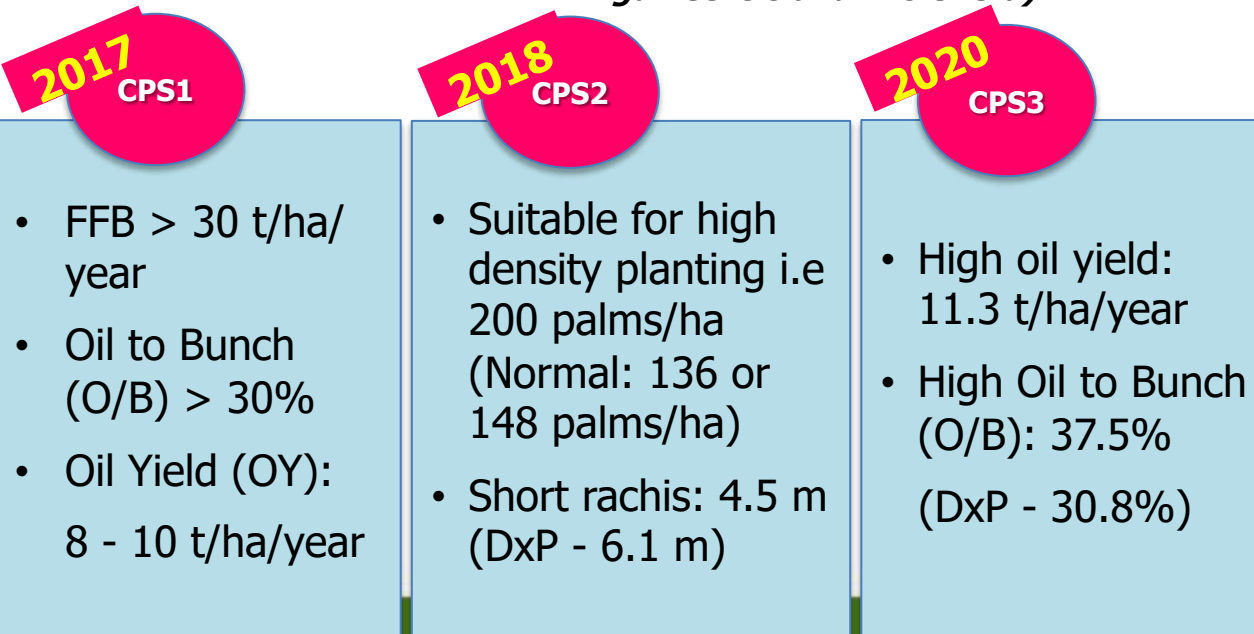
## HIGHER PRODUCTIVITY THROUGH BIOTECHNOLOGY

- Biotechnology tools improve **breeding & cloning efficiency** to develop superior planting materials that are:
  - disease resistance;
  - resilient to climate change, and;
  - have optimal yields.
- Various planting materials for improvement on downstream – **MPOB's Palm Series**
- Tissue culture technology - **Clonal Palm Series (CPS)** with appealing properties - CPS1, CPS2 and CPS3.

### MPOB's PALM SERIES (PS)

- ▶ **PS1 & PS 1.1 – slow height increment**
- ▶ **PS2 – high iodine value**
- ▶ **PS3 – high kernel palms**
- ▶ **PS4 – high carotene (*E. oleifera*)**
- ▶ **PS5 – thin-shell *teneras***

- ▶ **PS6 – large fruit *duras***
- ▶ **PS7 – high bunch index**
- ▶ **PS8 – high vitamin E (*E. guineensis*)**
- ▶ **PS9 – peach palm (*Bactris gasipaes*)**
- ▶ **PS10 – long-stalk palm**
- ▶ **PS11 – high carotene (*E. guineensis*)**
- ▶ **PS12 – high oleic**
- ▶ **PS13 – low lipase**
- ▶ **PS14 – high protein kernel (*E. guineensis* and *E. oleifera*)**



## PALM OIL & PALM OLEIN - THE MOST NATURAL STABLE FRYING OIL

- ✓ **Widely used** in frying application all over the world for both **economic and performance** reasons.
- ✓ Highly **resistance to oxidation and heat** at prolonged elevated temperature
  - **High in oleic** acid and **low in linoleic & linolenic** acids
  - Contains **high** level of tocopherol and tocotrienol (**natural antioxidants / Vitamin E**)
- ✓ **Can be blended** with other soft oil to further **improve** its cold **stability & flavour**.

	Oxidative Stability (at 110°C)
<b>Palm Olein</b>	<b>28.09 hrs</b>
<b>Soybean Oil</b>	<b>6.33 hrs</b>
<b>Sunflower Oil</b>	<b>4.64 hrs</b>
<b>Rapeseed Oil</b>	<b>7.71 hrs</b>



Red palm oil is an excellent source of **Vitamin E** and **Carotene** (Pro-Vitamin A)

**Palm Vitamin E** consist of **75-80% tocotrienols** and 20-25% tocopherols (the reason why palm Vitamin E known as Tocotrienol-Rich Fraction, TRF).



**Vitamin E (Tocotrienols & Tocopherols)**



**Carotene from Red Palm Oil**



**Palm Fruit, Rich in phytonutrients**



- Squalene
- Lecithin
- Coenzyme Q<sub>10</sub>
- Phytosterol

Choo et. al. 2008

**Red palm oil contains 50 times more carotenes** than tomatoes & 15 times more than carrots

15 TIMES MORE THAN CARROTS  50 TIMES MORE THAN TOMATOES 



Palm micronutrients have myriad of health enhancing benefits .e.g., **Vitamin E – antioxidant effects, cholesterol lowering and possible anti-cancer activities.**

**Palm oil – Nutritious and Functional**

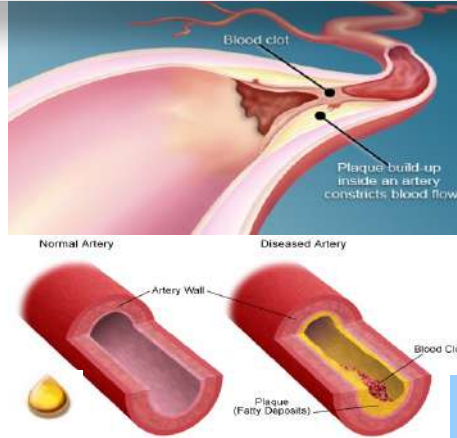


<b>Phytonutrients</b>	<b>Concentration (ppm)</b>
<b>Vitamin E (tocotrienols, tocopherols)</b>	<b>600-1000</b>
<b>Carotenoids (<math>\alpha</math>-carotene, <math>\beta</math>-carotene, lycopene, phytoene)</b>	<b>500-700</b>
<b>Phytosterol (Sitosterol, stigmasterol, campesterol)</b>	<b>300-620</b>
<b>Squalene</b>	<b>250-540</b>
<b>Lecithin (Phospholipids)</b>	<b>20-100</b>
<b>Co-enzyme Q10 / Ubiquinones</b>	<b>10-80</b>
<b>Polyphenols (phenolic acids, flavonoids)</b>	<b>40-70</b>

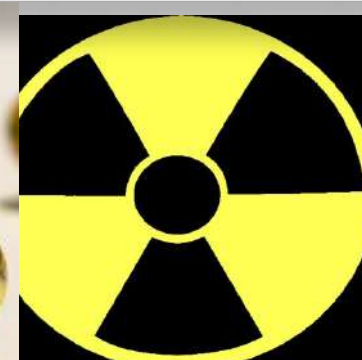
# Health Benefits of Palm Tocotrienols



Anti-inflammation



Antioxidant



Radioprotection



Neuroprotection



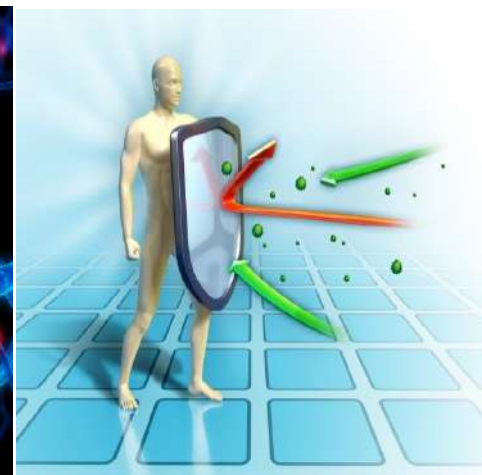
Skin protection



Bone protection



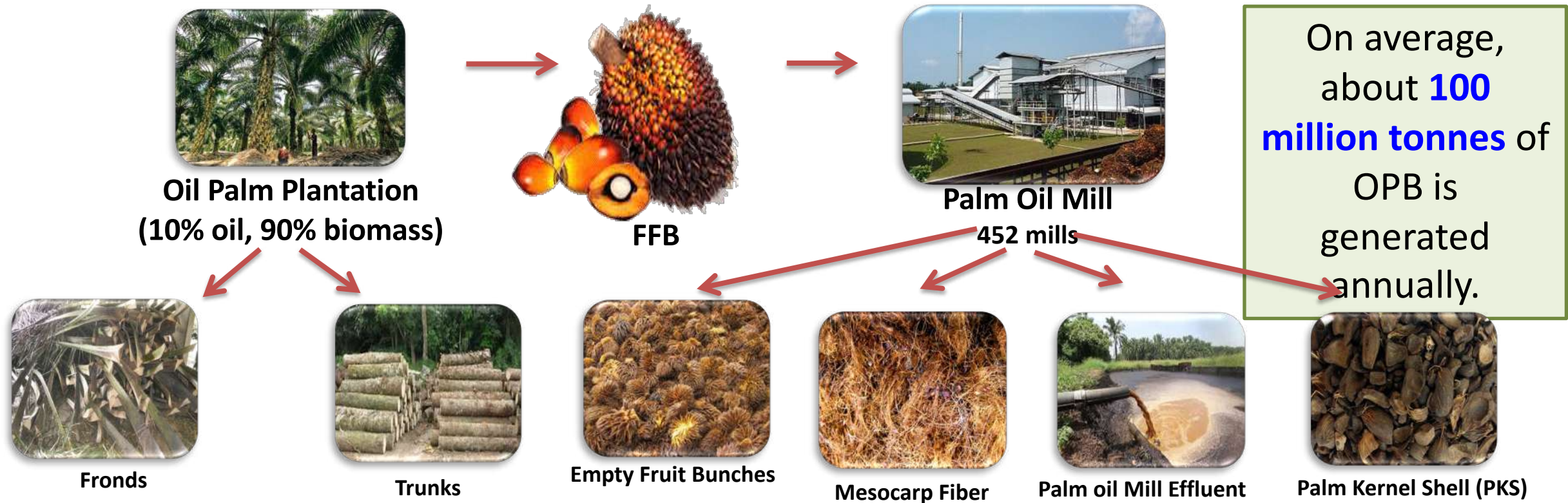
Hormone regulator



Immune booster



# ABUNDANCE SUPPLY OF OIL PALM BIOMASS





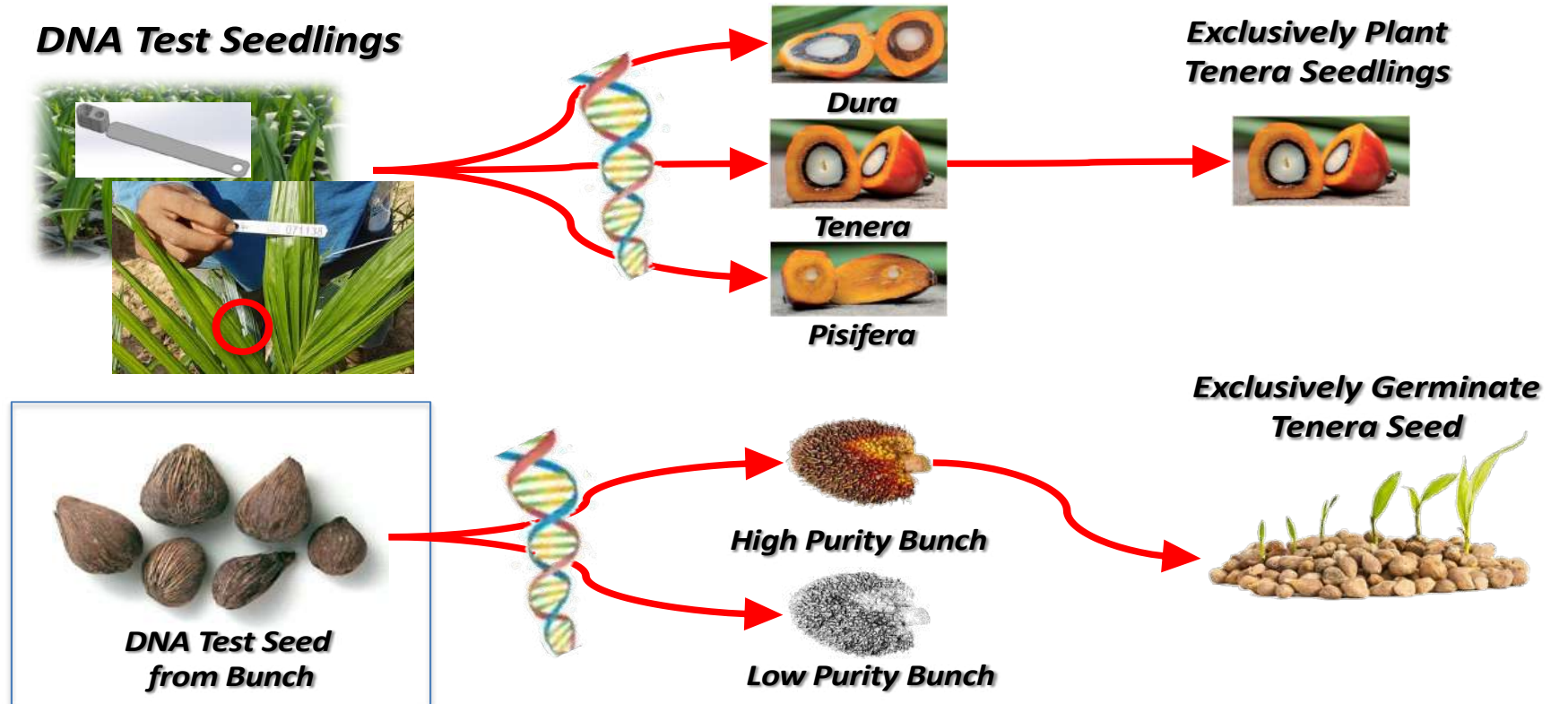
## **DIGITALIZATION IMPROVE PRODUCTIVITY**

- Digitalization across the value chain is able to **increase the productivity** of the oil palm sector.
- In modern agriculture, the use of **artificial intelligence, predictive analytics, the internet of things**, and other technologies is deemed to be essential.
- In the oil palm operation, the use of **mobile devices** and **functions** helps planters to **digitally record data of activities** on the field and have them stored in a cloud-based system.
- Eg: **Recording** of crop production with **GPS location** tagging improves traceability, **enhances crop quality** monitoring, hence the overall productivity.

## DIGITALIZATION IMPROVE PRODUCTIVITY

Adoption of **Genome/Post-Genomic Technologies** into Breeding Processes

**SureSawit™ SHELL Diagnostic Assay**



## BLOCKCHAIN – MSPO TRACE



- Blockchain provides **traceability** to **sustainable palm oil products** throughout the value chain.
- Traceability and the understanding **FFB source, direct and indirect sources**, is a key step towards sustainable sourcing and production
- MSPO Trace - record the **transactions of MSPO-certified palm oil products** along the supply chain starting from **palm oil mill to downstream** processing facilities.
- It also provides a platform for the public/consumer to trace the **MSPO-certified products back to its source or origin** (farm/estate).
- Could be explored for other certification systems such as **ISPO**



**MECHANISATION TECHNOLOGIES**



*Mobile lifter*



*The Grabber*



*Beluga*



*Trailer Motorcycle*



*Cantas*



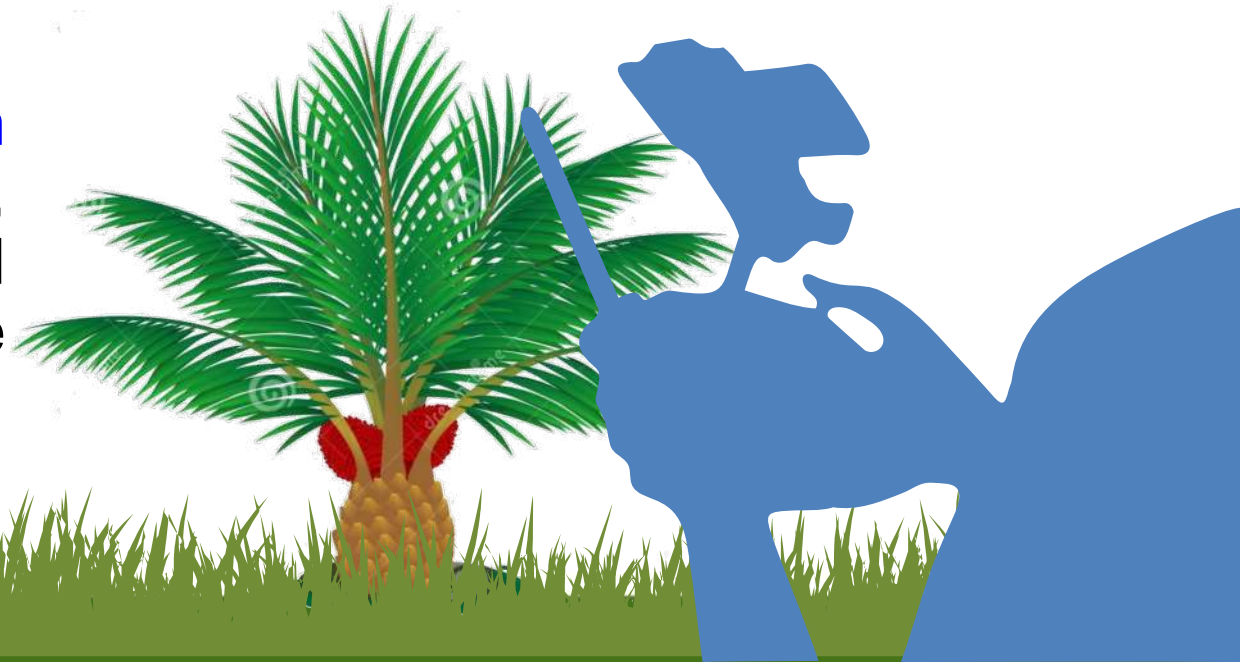
*Hydra Porter*





## **MECHANISATION & AUTOMATION FOR OIL PALM**

- Acts as a **Government – Industry platform to discuss, develop and adopt Quantum Leap Technologies** to reduce dependency of labour shortage in the industry for medium and long term target.
- Implementation strategy will be **based on the technology acquisition programme**, where identified technologies' producer and developer will be funded to produce the desired solution.



## CONCLUSION

- In navigating the challenges, **R&D activities** here been strengthened so as to provide the **best quality products** to the world.
- The rising concerns on **environmental awareness** has gradually changed the global demand pattern to more **sustainable products** and this has become the key element in promoting **agriculture-based products** to the global market.
- With a head start of more than 100 years in the oil palm business, Malaysian palm oil cements its position as a preferred supplier of **sustainable palm oil globally**.



*See You at*

# PIPOC 2023



**MPOB INTERNATIONAL PALM OIL CONGRESS AND EXHIBITION**

**7-9  
NOVEMBER**

**KUALA LUMPUR CONVENTION CENTRE,  
KUALA LUMPUR, MALAYSIA**

**THANK YOU**



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