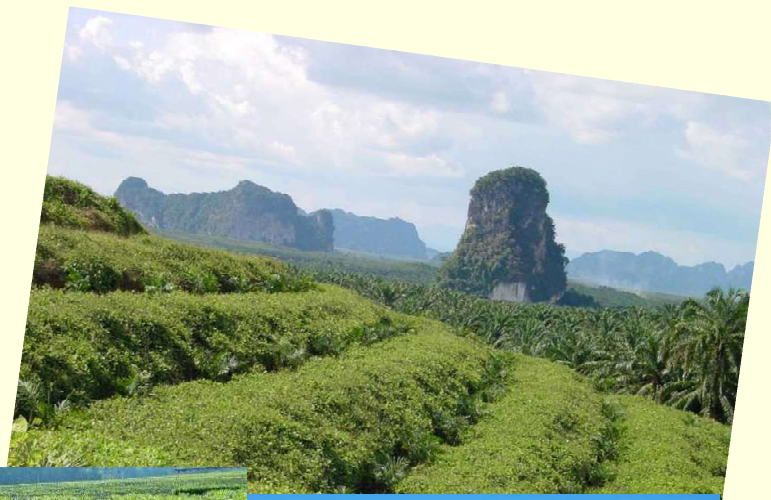
Four Pillars of Sustainable Palm Oil Production in Thailand

with comparison of the

Thailand and Philippines Oil Palm Industries

on the 50th Anniversary of their first plantings

1969 - 2018



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2- Why one has prospered and the other has not.
The social and environmental implications.

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the Growers' response to the right incentives

4- Summary : Four key conclusions and our shared responsibility
for the future

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Thailand and Philippine Oil Palm Industries

Both regions are of similar latitude and climate, previously considered to be marginal for oil palms

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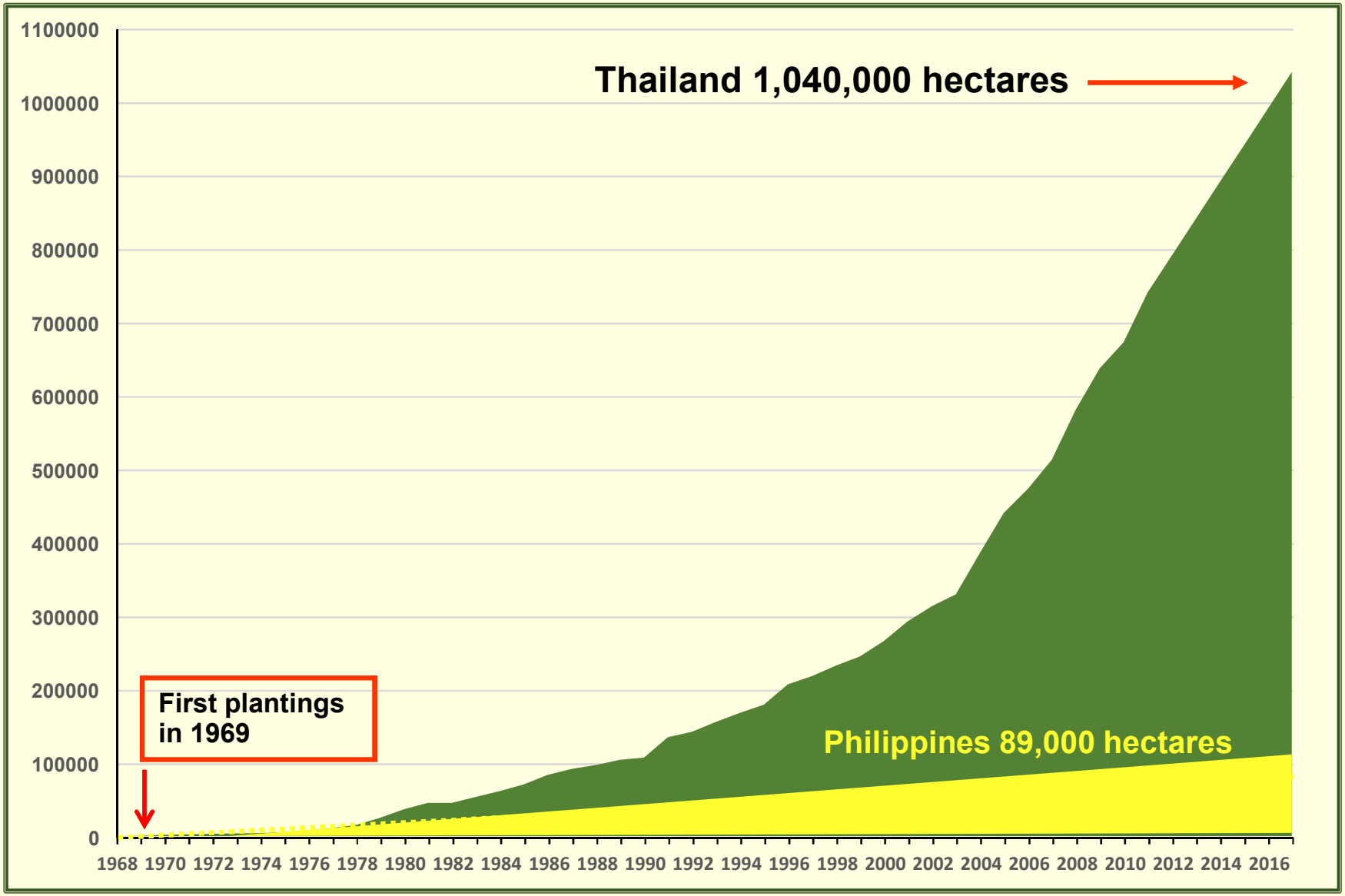
Fifty years ago :

	Thailand 1969	Philippines 1969
Population (million)	35.83	34.79
Economy (GDP US$ billion)	6.695	8.408
GDP per Capita US$	186.86	241.70
Life expectancy (years)	58.90	60.65
Palm Oil Production	zero	zero

Fifty years later :

Planted Area since 1969 first plantings in Thailand and in Philippines



Source : DOA

Fifty years later :

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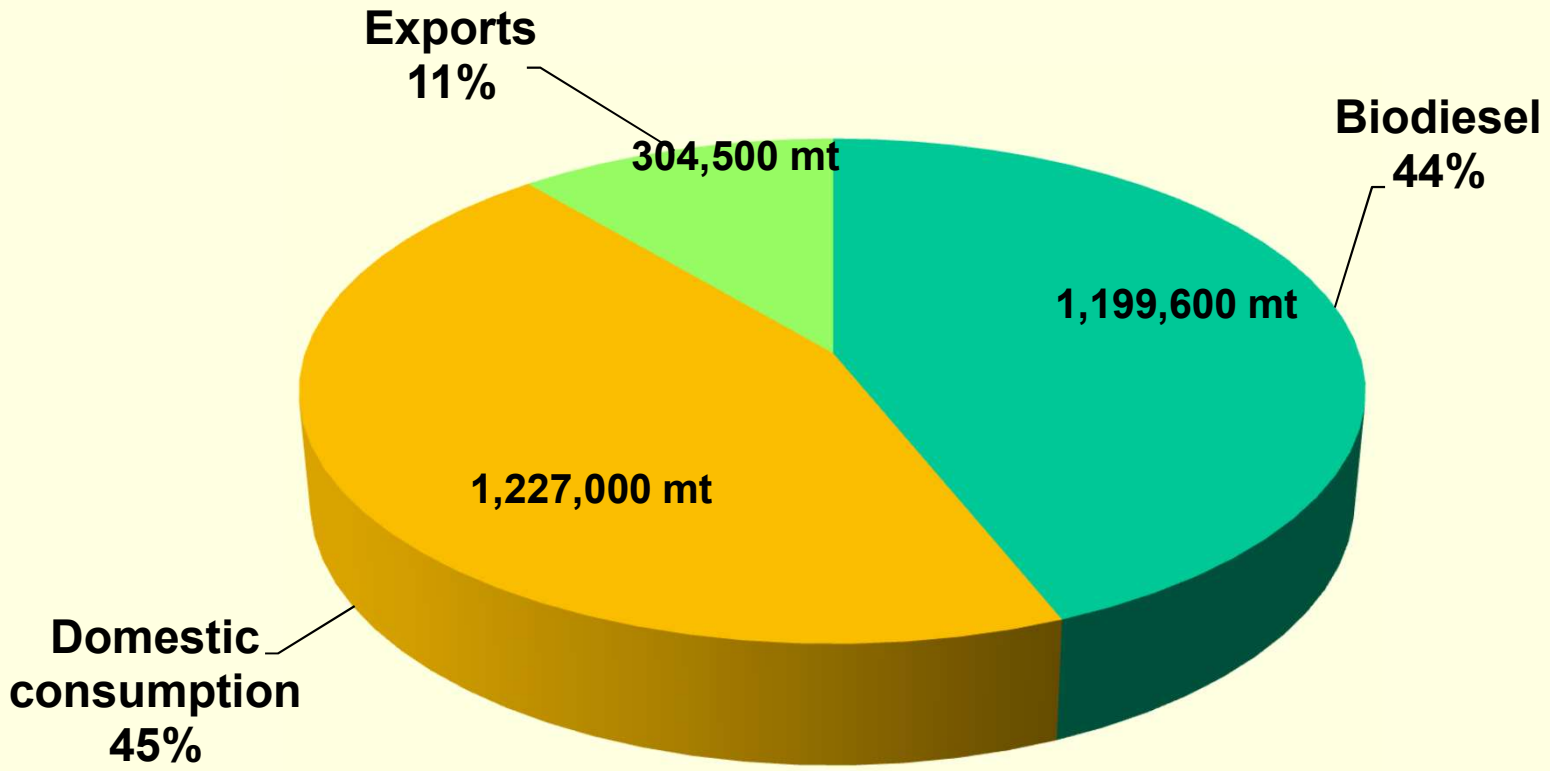
Thailand's Production of CPO in 2018

2,778,108 tonnes CPO



Source : Department of Internal Trade

Fifty years later :

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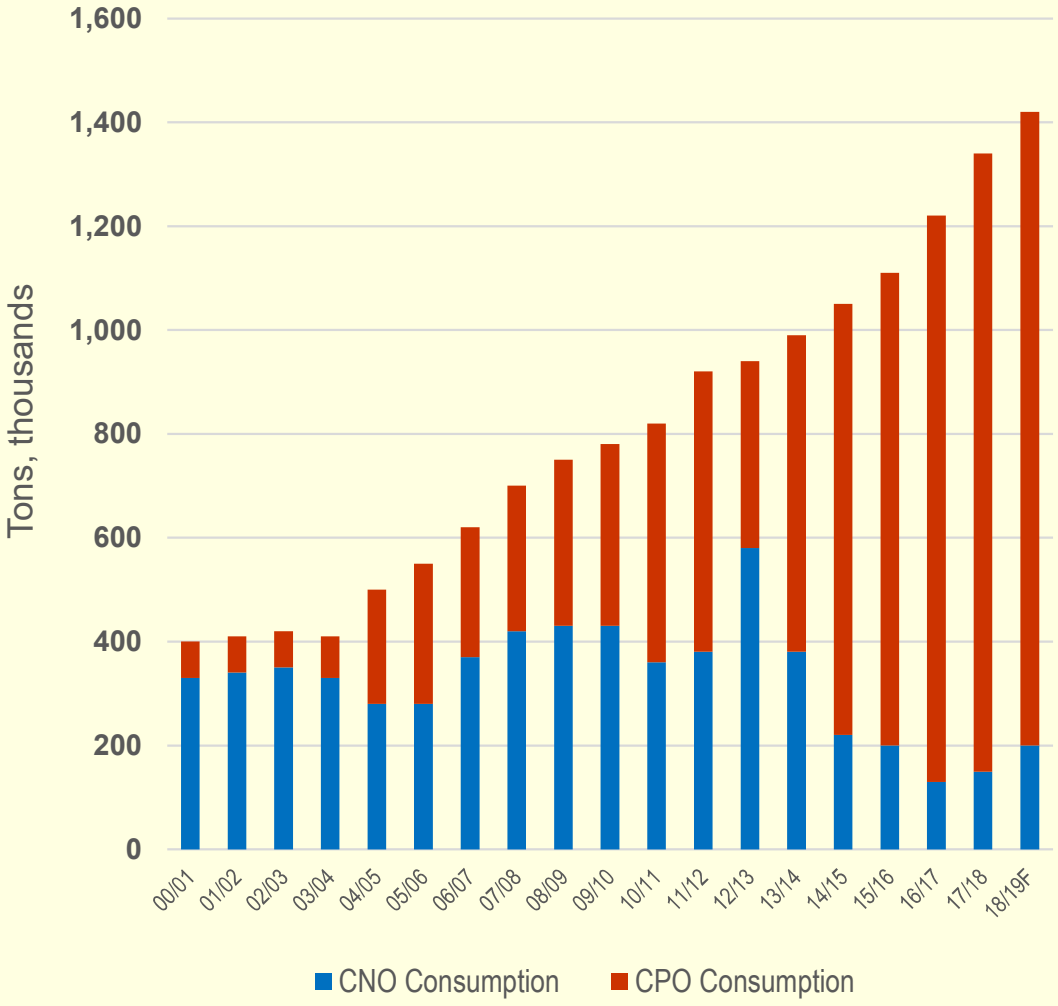
Philippine Vegetable Oil Consumption



- Veg oil consumption has increased very rapidly from 400,000 mt in 2000 to 1.36 mil mt in 2018, forecast to rise to 1.41 mil mt in 2019 *
- CNO made up 85% of consumption in 2000 but this had dropped to 12% by 2018
- Imports of palm oil have risen to 1.2 mil mt *
- Domestic palm oil production has failed to meet this growing demand.

* Some believe that actual consumption may be much higher, due to unreported imports of palm oil from Indonesia and Malaysia.

Thanks to Oil World https:/www.oilworld.biz
ISTA Mielke GmbH

Why has the Philippine Oil Palm Industry failed to prosper ?

1) <u>The unintended consequences of Agrarian Land Reform</u> :

1988	Comprehensive Agrarian Land Reform Program	(CARP)
1998	Comprehensive Agrarian Land Reform Law	(CARL)
2009	Comprehensive Agrarian Reform Program Extension with Reform	(CARPER)

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Objectives of CARP, CARL & CARPER :

- redistribution of private and public land
- beneficiaries to be independent small farmers
- create equality for landowners in terms of income and opportunities
- empower landowner beneficiaries to have equitable ownership
- enhance agricultural production and productivities
- provide employment for more agricultural workers
- put an end to conflicts regarding land ownership

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Achievements of CARP, CARL & CARPER :

2003 UN/ ADB/ EU study

poverty incidence amongst beneficiaries declined from 47.6% to 45.2%

" " amongst non participants increased from 55.1% to 56.4%

as of Dec 2013

Govt has acquired & distributed 6.9 million hectares with max allowable 3 ha to 5 ha per individual or corporation

Well intentioned Agrarian Land Reforms which restrict individual or corporate land ownership to max 5 ha and have stifled agricultural development

One of the unintended consequences ;

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These school children in rural Mindanao face a difficult future

Children of the exhausted logging industry in Agusan del Sur Province

Children of the exhausted plywood and paper-pulp factories in Surigao Province

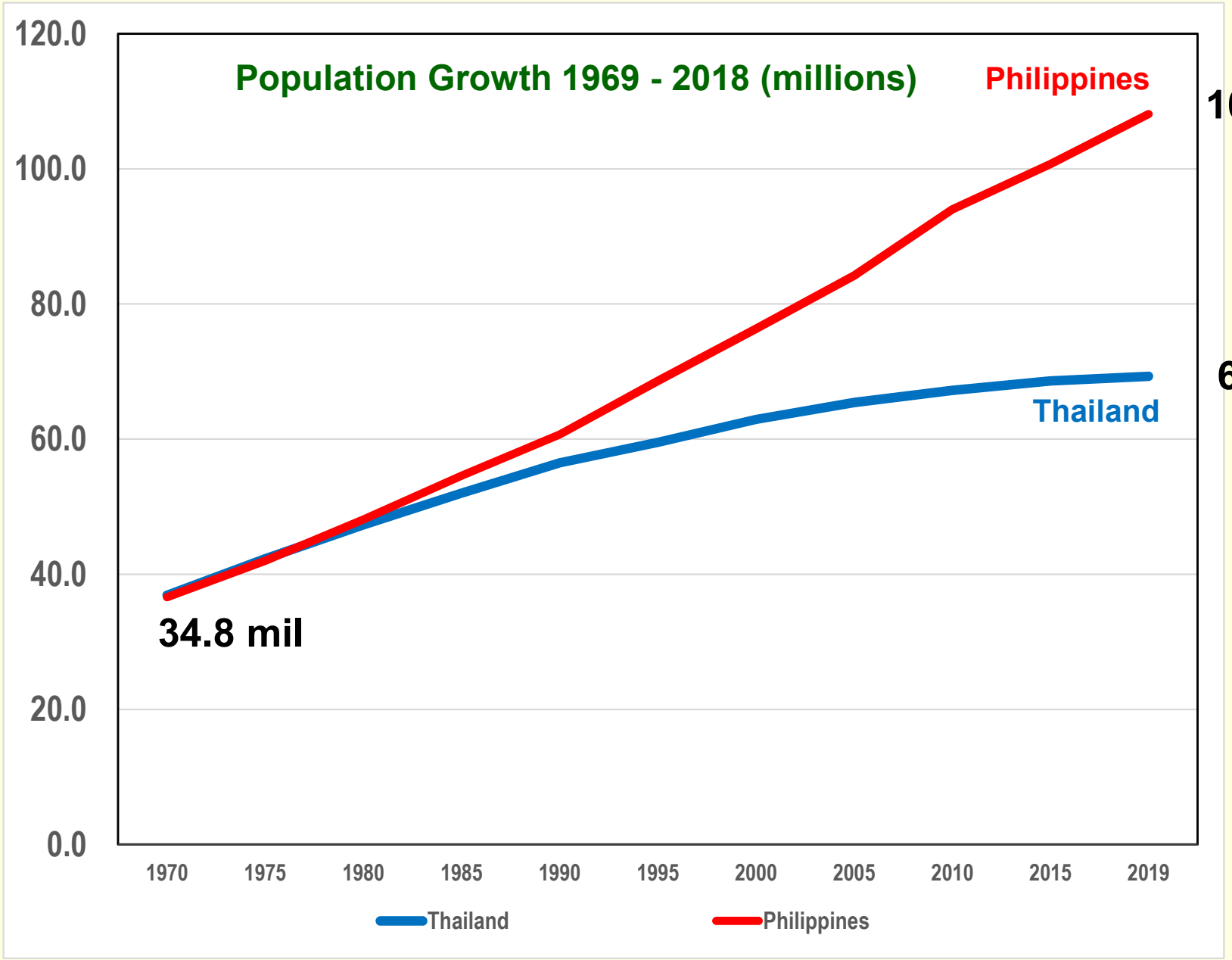
Their forests have gone

Central Mindanao

and population pressure is ensuring that those forests will never return

But what will replace them ??

Soaring populations and rural poverty are creating pressure on land and food resources



Source : UN Population Estimates
worldpopulationreview.com

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What else has happened over the past 50 years ?

	Thailand		Philippines	
	1969	2018	1969	2018
Population (million)	35.83	69.66	34.79	106.65 *Incr 1,731,922*
Economy (GDP US$ billion)	6.69	504.99	8.41	356.81
GDP per Capita US$	186.86	6,361.6	241.70	2,988
Life expectancy (years)	58.90	75.50	60.65	71.16
Palm Oil Production (tonnes)	zero	2.8 mil	zero	0.1 mil
Ease of doing business (of 190 countries)		*21st*		*95th*

Despite this alarming situation some Philippine environmental and social NGOs persistently attack oil palms

THE PALM OIL PLAGUE HITS PALAWAN PHILIPPINES

Despite this abundance of troubling information, the demand for palm oil continues to defy logic, with the industry expecting to grow exponentially in the coming decade.

It's already the most widely produced vegetable oil in the world, and its inclusion on the ingredient list for candy bars, soap, biofuel, lipstick and more seems to be growing. Consequently, companies are looking for more hot, balmy climates to convert, and Palawan Philippines has come center stage.

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In Summary :

After 50 years of largely fruitless effort the Philippines oil palm industry is struggling to produce barely 10% of the country's soaring edible oil requirements.

In 2019, it will cost the Philippines approximately one billion USD to import palm oil which could and should be produced by its own farmers.

Why is it different in Thailand ?

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Three Key features of Thailand's Oil Palm Industry

1- **Small farmers owning less than 8 ha (50 rai) comprise more than 90% of the 1.0 mil planted hectares.**

2- **More than 300,000 small farmers and their families are now supported by oil palms.**

3- **Smallholder farms are being converted from existing crops. *eg. from rubber, coconuts, cattle grazing.***

<u>No</u> deforestation to plant oil palms in Thailand

Policies which have made the difference

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1- Less industry regulation

Notwithstanding the region's most stringent environmental standards

2- Government encouragement of qualified Investors

Land concessions up to 3,000 ha offered to a small number of qualified nucleus investors

3- Policies to encourage small farmers

Protection from imports, encouragement of nucleus developers, access to rural finance

Thailand Growers' Response

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Four Pillars of Sustainable Palm Oil Production in Thailand

❶ Advances in Science

❷ Environmental Best Practice

❸ Development of sustainable markets

❹ Social Sustainability

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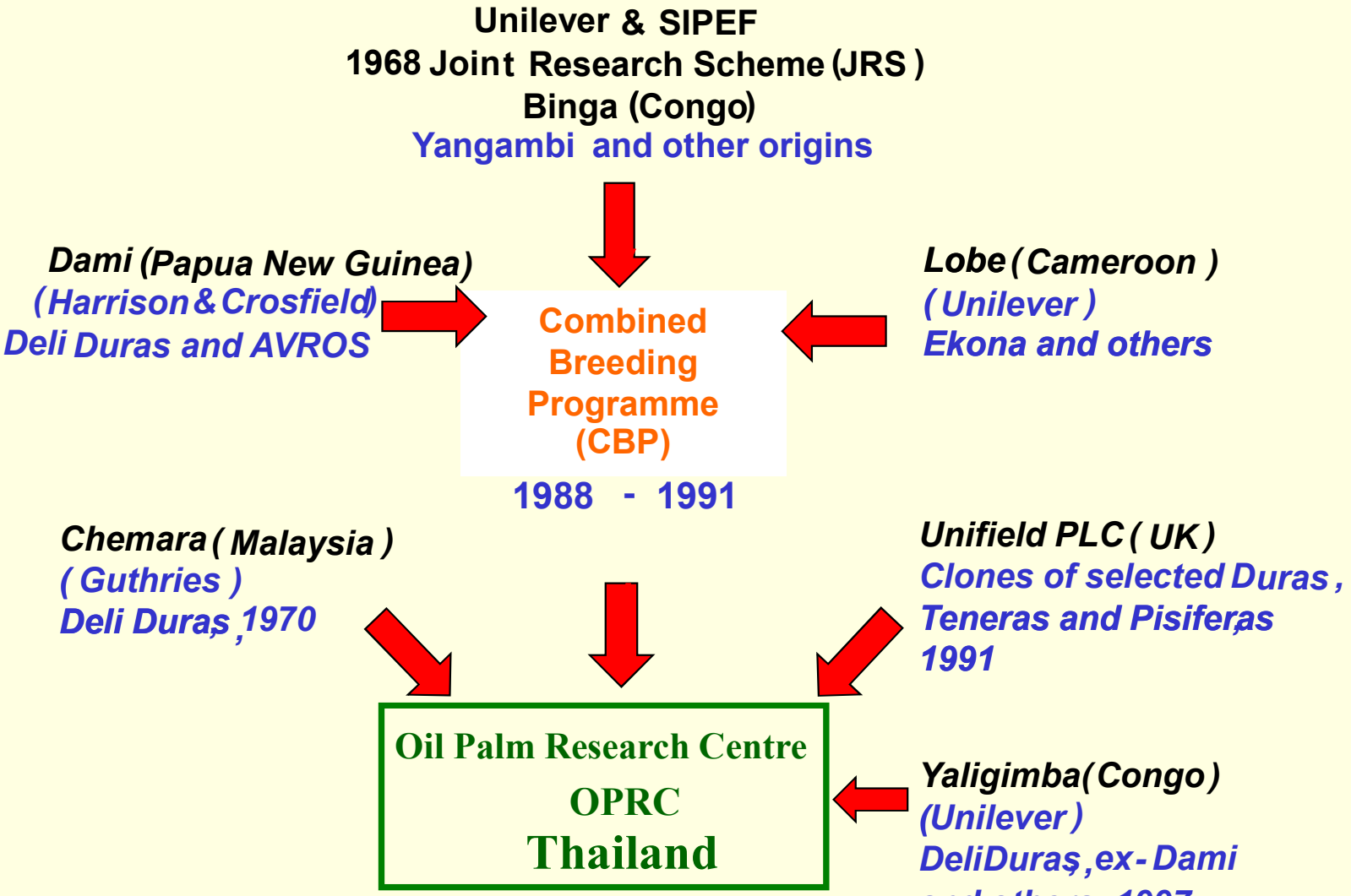
Private sector oil palm breeding for Drought Tolerance

Collection of genetic material from leading overseas programmes



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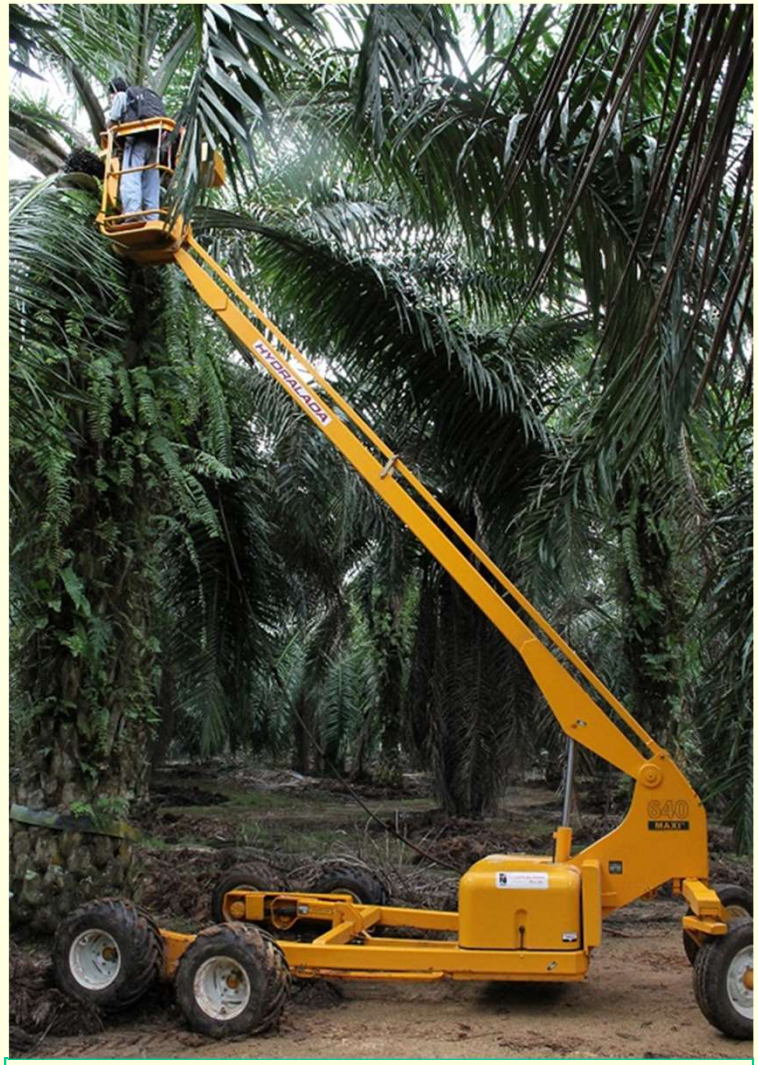
Oil palm breeding for Drought Tolerance



Controlled pollination of selected mother palms

Testing more than 1,000 hybrid crosses for 5 years of yield records

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Producing new generations of higher yielding palms

Seeds selected for drought tolerance and higher yields in Thailand's dry climate

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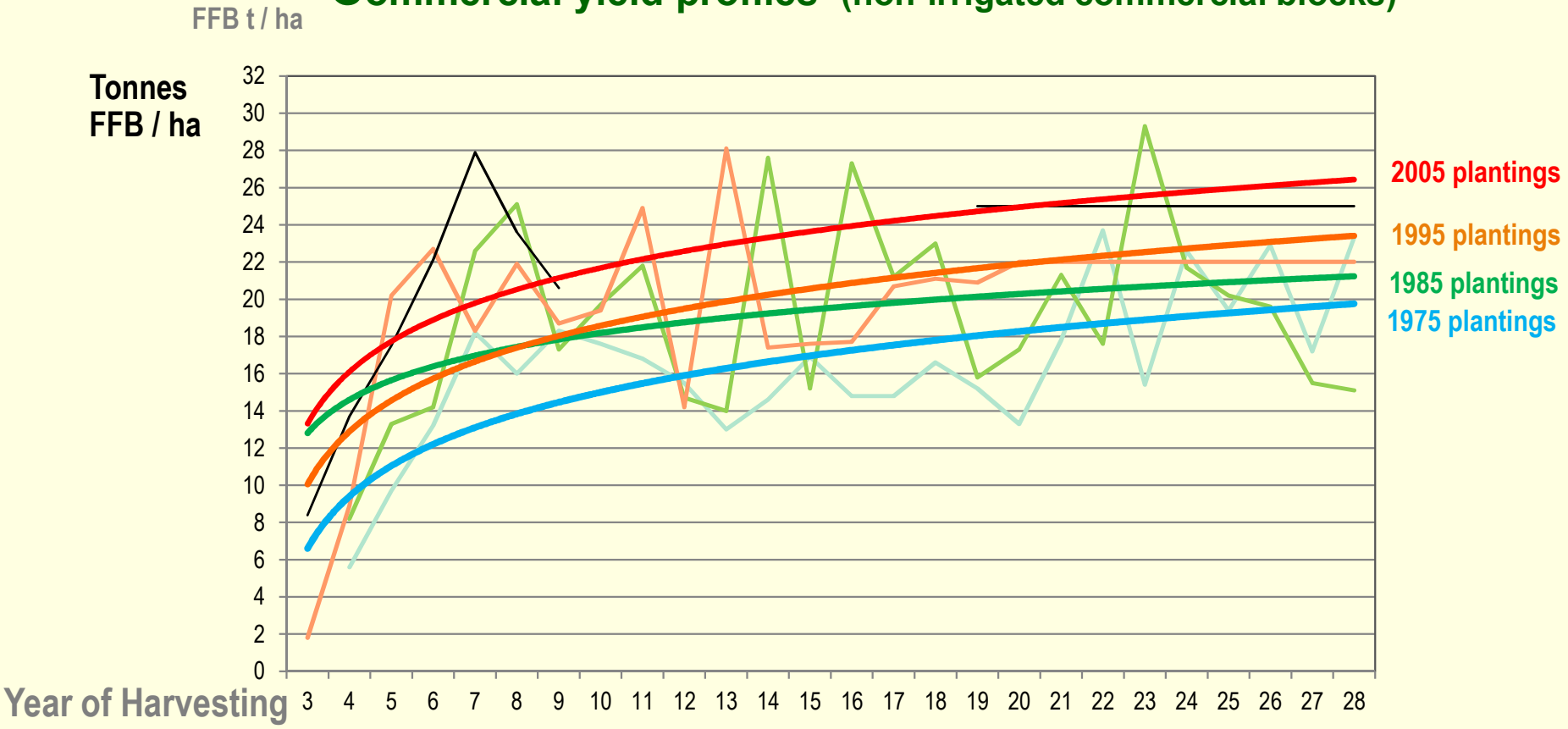
Improvement over Generations

Commercial yield profiles (non-irrigated commercial blocks)



Total Fruit Yield to year 7 from planting

1975 plantings	=	46.7 t/ha
1985 plantings	=	58.3 t/ha
1995 plantings	=	71.9 t/ha
2005 plantings	=	89.6 t/ha

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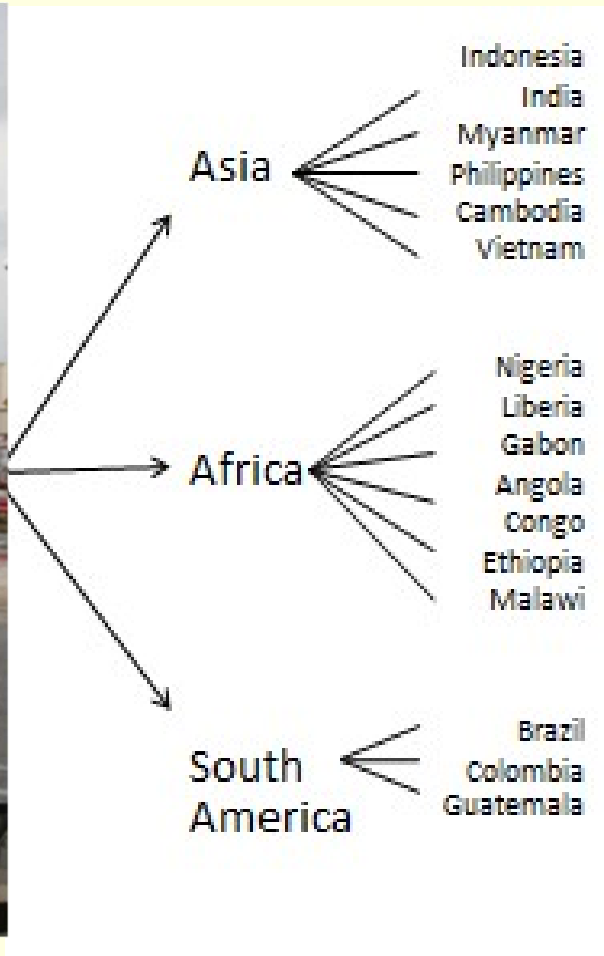
Now exported to growers around the world



Thailand's drought tolerant seeds are exported to growers in more than 15 countries

Increasing economic sustainability in dry climates

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Also supplied to Thailand's small farmers as premium seedlings

Supplying local farmers with millions of drought tolerant seedlings

Increasing economic sustainability for Thailand's growers

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Advanced technology ; Oil Palm Tissue Culture Laboratories

New technology for Thailand’s latest advance in oil palm breeding

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Thailand's oil palm clones

Cloning elite palms from the breeding programmes

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Cloned elite mother palms are now producing clonal seeds

Increasing economic sustainability for Thailand's growers and overseas customers

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Genomics Laboratory to support Thailand's oil palm breeding

for DNA 'finger-printing' and tracing of genetic markers

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Developing new techniques for replanting old palms

Avenue underplanting with phased felling of the old palms

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Avenue Replanting

Underplanting spreads the economic cost of replanting and optimises the use of biomass nutrients from the old stand of palms

Improving environmental & economic sustainability

Advances in Science

The Planters, 2012

The Planter, Kuala Lumpur, 88 (1033): 241-256 (2012)

Maximising Oil Palm Yield by High Density Planting and Thinning

PALAT, T, CHAYAWAT, N

Univanich Palm Oil Public Co Ltd, P O Box 8-9, Aoluk, Krabi 81110, Thailand

AND

CORLEY, R H V

Highlands, New Road, Great Barford, Bedford, United Kingdom

Optimal planting density for current yield is much higher in young oil palm than in palms over 10 years old. High density planting followed by thinning allows early yields to be increased, while avoiding the loss from excessive inter-palm competition in later years. At Univanich Palm Oil PCL in Southern Thailand, the trial described here confirmed that, for cumulative yield over the life of a planting, the optimum is about 145 palms per hectare. The optimal density for current yield decreased with age, reaching a minimum 11-12 years after field planting, but then increased slightly in year 13. With initial planting at 160 or 180 palms per hectare, followed by 25 per cent or 33 per cent thinning to leave 120 palms per hectare, results up to 16 years after planting gave cumulative yields at least 15 per cent higher, or up to 36 tonnes FFB per hectare more, than a fixed density of 143 palms per hectare, provided that thinning was done at year 8-9 after planting to benefit from the period of low optimal density in years 11-12.

PIPOC Conference, Kuala Lumpur, 2013

MAXIMISING LIFETIME YIELD FOR GREATER ECONOMIC SUSTAINABILITY

Corley, R.H.V.[2] and Palat, T.[1]

[1] *Univanich Palm Oil Public Company Ltd, Aoluk, Krabi, Thailand*
[2] *Highlands, New Road, Great Barford, Bedford, UK*

ABSTRACT

To ensure economic and environmental sustainability, yield must be maximised over the entire life of an oil palm planting. Much work has been done on breeding for higher yield, and on optimising fertiliser inputs. In this paper we review some other important factors studied in trials carried out by Univanich Palm Oil PCL in Thailand, including choice of planting density and replanting methods, and, for drier climates, irrigation and breeding for drought tolerance.

Planting at 160 palms/ha with later thinning by 25% gave 18% greater yield over 18 years than planting at 143/ha without thinning, provided that thinning was done in year 8. If thinning was delayed until year 12, the yield increase was negligible.

In a comparison of irrigation methods, drip irrigation proved the best. With a mean annual water deficit of around 290 mm, drip irrigation at 450 litres/palm per day gave an average yield increase of 10 t FFB/ha.yr from mature palms. There are large differences between DxP progenies in response to drought, with yield reductions ranging from zero to 50%. Planting drought tolerant material will help to increase yields where a regular dry season occurs, and irrigation is not possible.

Yield loss at replanting can be reduced by underplanting. In commercial practice this gave 36% more FFB compared to clear felling over the first 5 years after replanting, with little difference thereafter. Thinning and replanting 50% of the stand at 10 years, while retaining the other 50% in a two-tier canopy, gave 9% greater yield over 18 years than a standard planting. Either method allows the possibility of continuous production, and recycling of biomass nutrients after felling of the old stand should be more efficient, reducing the need for conventional fertilisers.

Second Pillar

of Sustainable Palm Oil Production in Thailand

❶

Advances in Science

❷

Environmental Best Practice

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Returning biomass to the field

Reducing the need for chemical fertilisers

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EFB compost for use in oil palm nurseries

Increasing economic & environmental sustainability

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Reducing chemical poison for rat control in plantations

Introducing barn owls to Thailand's plantations

Each barn owl family consumes 3 rats per day.

Improving economic & environmental sustainability

Thailand's small farmers are adopting more environmental friendly Barn Owls to help control rats in their family farms

Improving economic & environmental sustainability

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Reducing Green House Gas emissions

Palm oil mill effluent (POME) is normally treated in deep anaerobic ponds which do not contain toxic materials but emit methane biogas during anaerobic treatment

Traditional effluent treatment ponds : A source of potent greenhouse gas emissions

Construction of Biogas Reactors to capture the methane

First Project
2006/2007 - Siam Project

Second Project
2007- Lamthap Project

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Capturing the Green House Gases

Completed Biogas CIGARS

(Covered In-Ground Anaerobic Reactors)

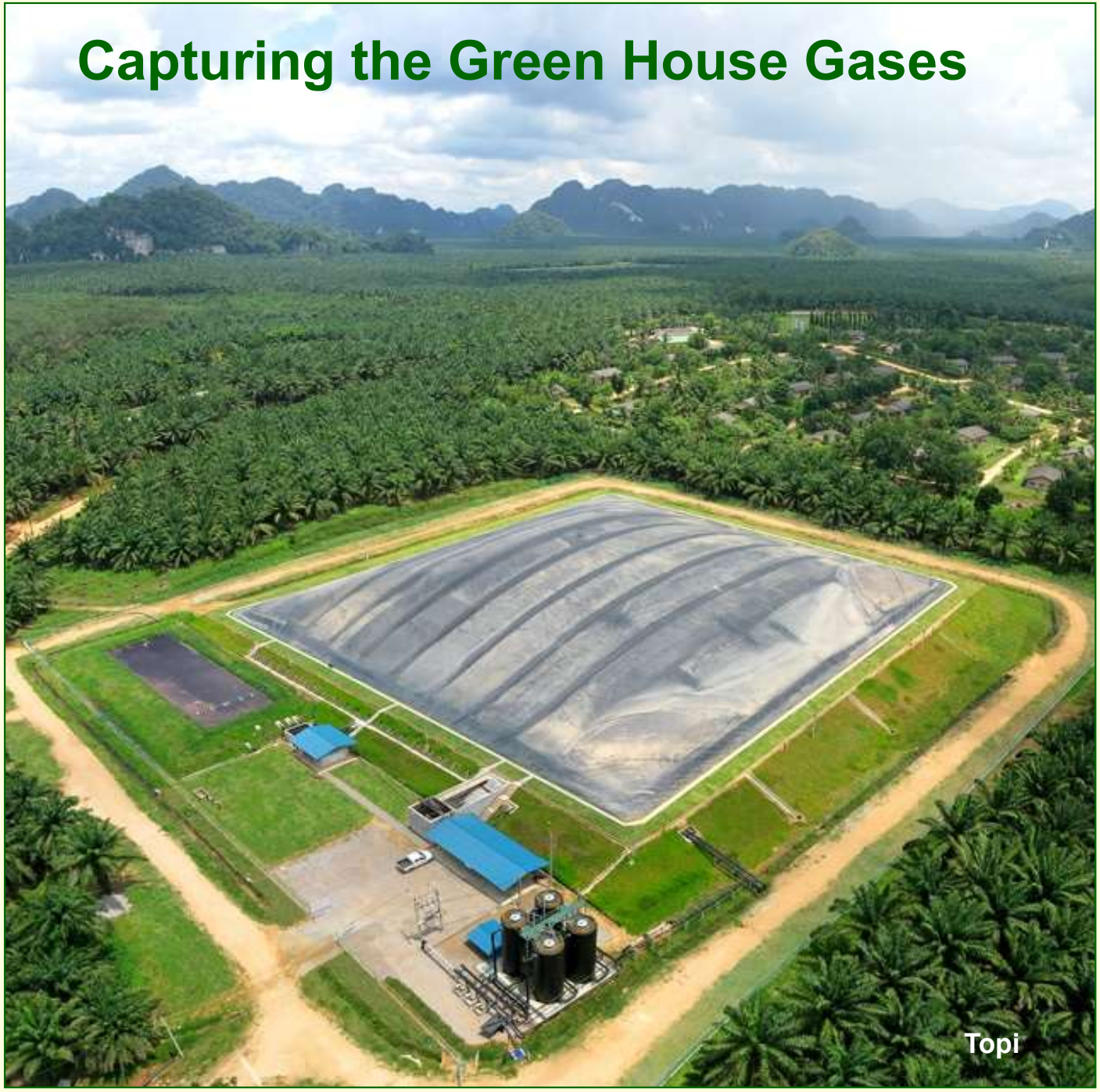
– Siam

Commissioned December 2007

– Lamthap

Commissioned June 2008

Capturing the Green House Gases



Topi Project

Commissioned
August 2009

Capturing the methane biogas as a renewable fuel

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Captured methane biogas used as fuel

Gas engine generators fueled by methane biogas now supply electricity to Thailand's national grid

Surplus Methane is burnt in flares to also qualify for **Certified Emissions Reductions (CERs)**

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Supplying Renewable Energy to the National Grid

The sustainability objectives have been achieved

- large reduction in greenhouse gas emissions
- renewable energy source has replaced fossil fuels
- waste water treatment has improved
- factory efficiencies have improved
- new skilled jobs have been created in three rural communities

Increasing economic, environmental and social sustainability

Third Pillar

of Sustainable Palm Oil Production in Thailand

❶ ❷ ❸

Advances in Science

Environmental Best Practice

Development of sustainable markets

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Thailand's first export of Certified Sustainable Palm Oil (CSPO) in 2013

to premium markets in Germany

Promoting economic sustainability for Thailand's small growers

Laemphong Jetty and Tank Farm
Thailand's west coast port for palm oil exports to India or Europe

Fourth Pillar

of Sustainable Palm Oil Production in Thailand

❶

Advances in Science

❷

Environmental Best Practice

❸

Development of sustainable markets

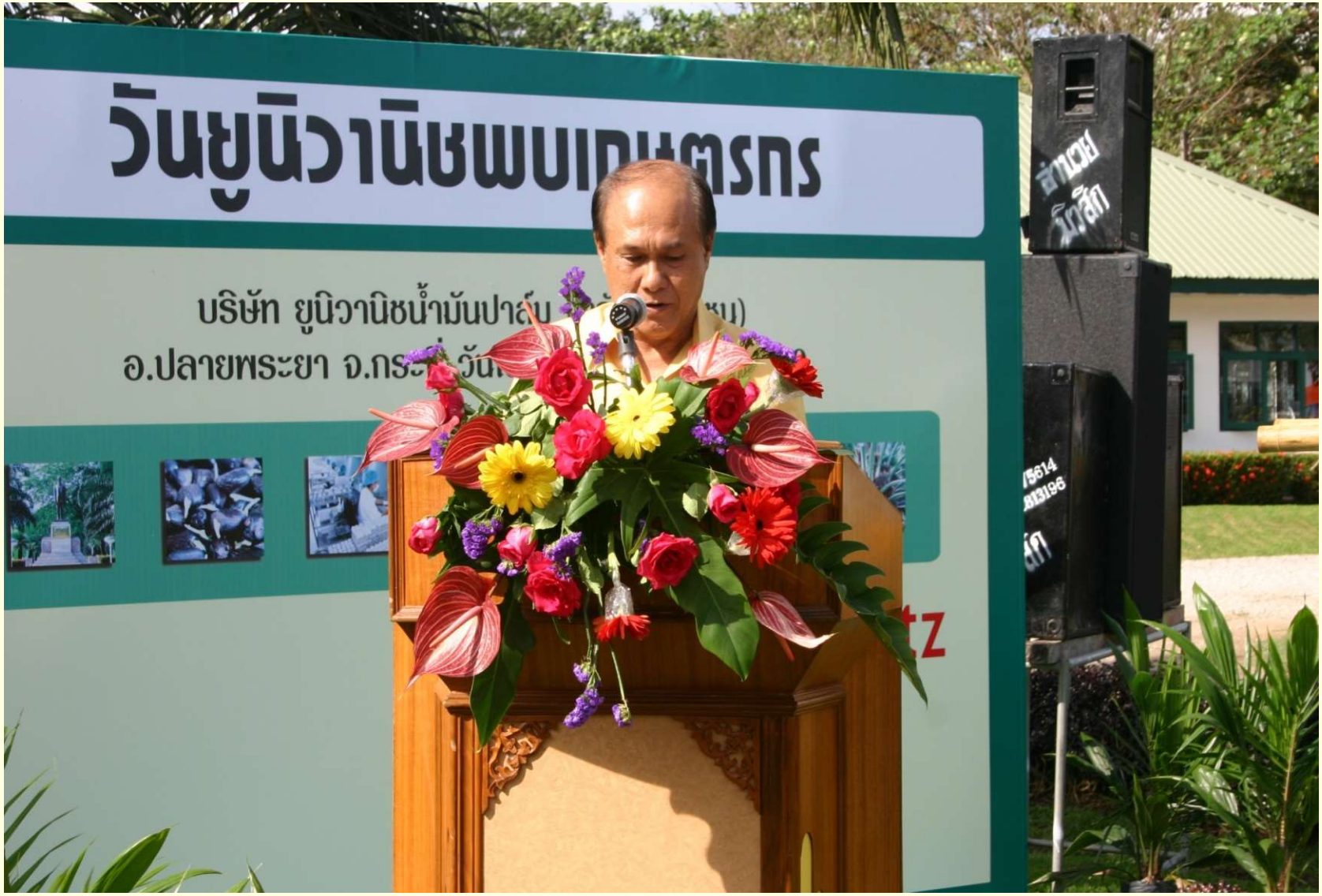
❹

Social Sustainability

Social Sustainability

Sharing the technology and spreading the prosperity

Farmer Field Days



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Farmer Field Days

More than 1,000 small-holder farmers attending an oil palm field day

Sharing the technology and spreading the prosperity

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Farmer Field Days

Sharing results of fertiliser trials with local farmers

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Learning centre for small-holder farmers

Helping farmers to improve their economic and environmental sustainability

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The first independent small farmers to be RSPO Certified in 2012

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RSPO's first independent smallholders to be certified

In 2012 Thailand's smallholders receive the award in Singapore

Thailand companies have also developed skilled and stable workforces

5S, ISO, RSPO programmes for clean & safe workplaces

Quality housing for plantation workers & their families

Promoting economic and social sustainability

Oil Palms are now supporting many rural communities

New Ambulance for Aoluk Hospital

Portable Oxygen Generators for Aoluk Hospial

Community Hall at Plaipraya School

New Dental Clinic for Plaipraya Hospital

Promoting Thailand's economic and social sustainability

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In conclusion :

Thailand's oil palm industry has brought dramatic improvement to previously impoverished rural communities

Small farmers delivering their fruit to the crushing mill

A new prosperity for many thousands of rural families

But looking 30 years ahead ;

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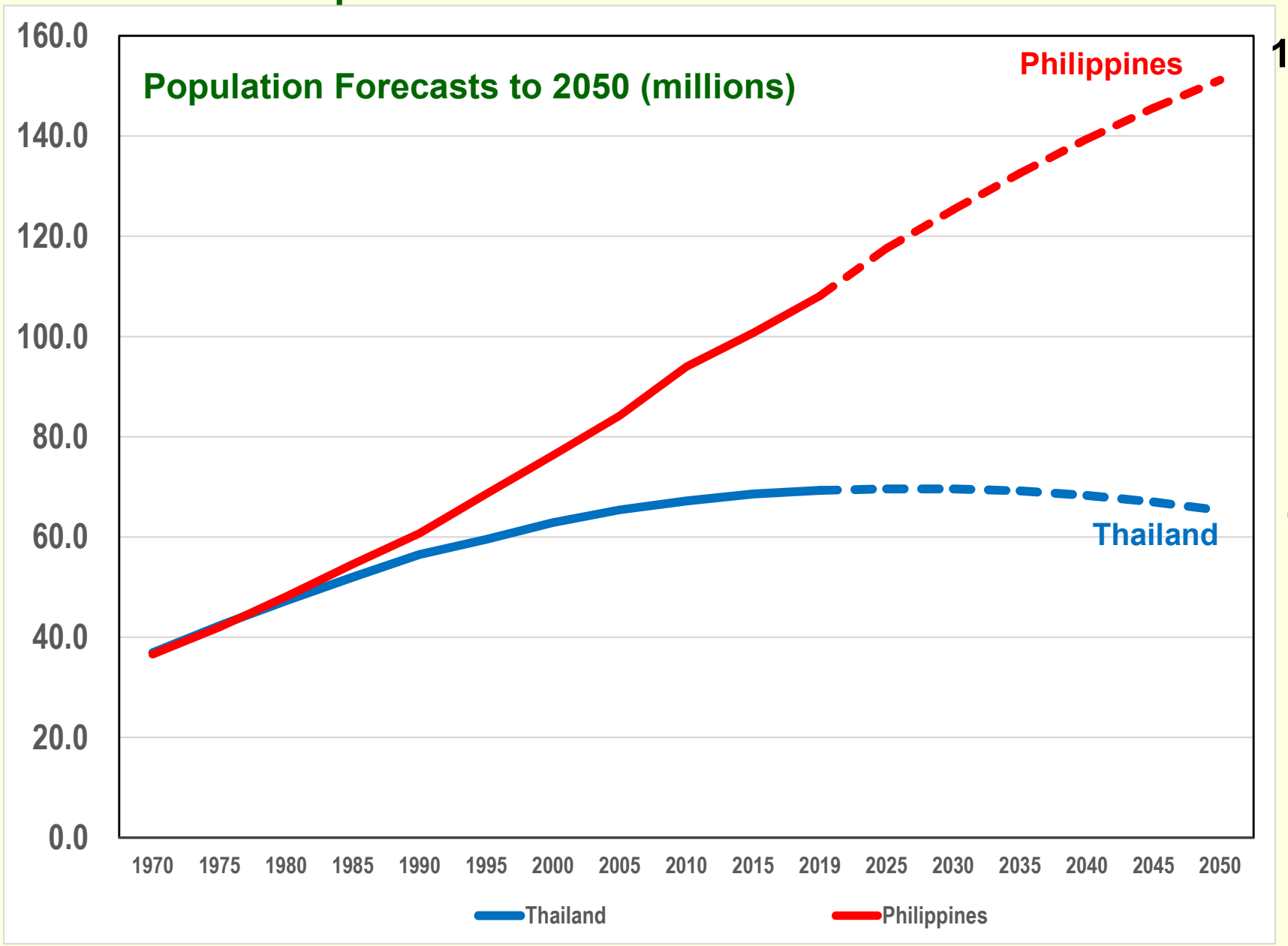
Soaring global populations and rural poverty are creating pressure on land and food resources



Source : UN Population Estimates
worldpopulationreview.com

Looking to the future

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Summary : Four key conclusions and our shared responsibility for the future

1- As we have seen in Thailand
Given the right incentives small farmers are able to develop a very sustainable industry.

2- The unintended consequences of well-intended social policies can be a barrier to oil palm development. This will have serious consequences for many societies and for the global environment.

3- As we can see from population trends, not just in Philippines, but globally, the soaring demand for vegetable oils does not “defy logic”

4- We have a shared responsibility to address the reasons for the current global slowdown in new oil palm plantings before that slowdown results in more serious social and environmental problems.

ขอบคุณครับ

Thank you for your attention