



Oil palm area expansion: Some perspectives

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November 2016.

Objective and outline

Objective: To provide a long term and system view of the implications of oil palm area expansion on food sector.

Outline:

- ☐ The issues

- ☐ Simulations

- ☐ Policy alternatives

Structural change in agriculture:

Share of oil palm to agricultural land as at 2015 is 80%

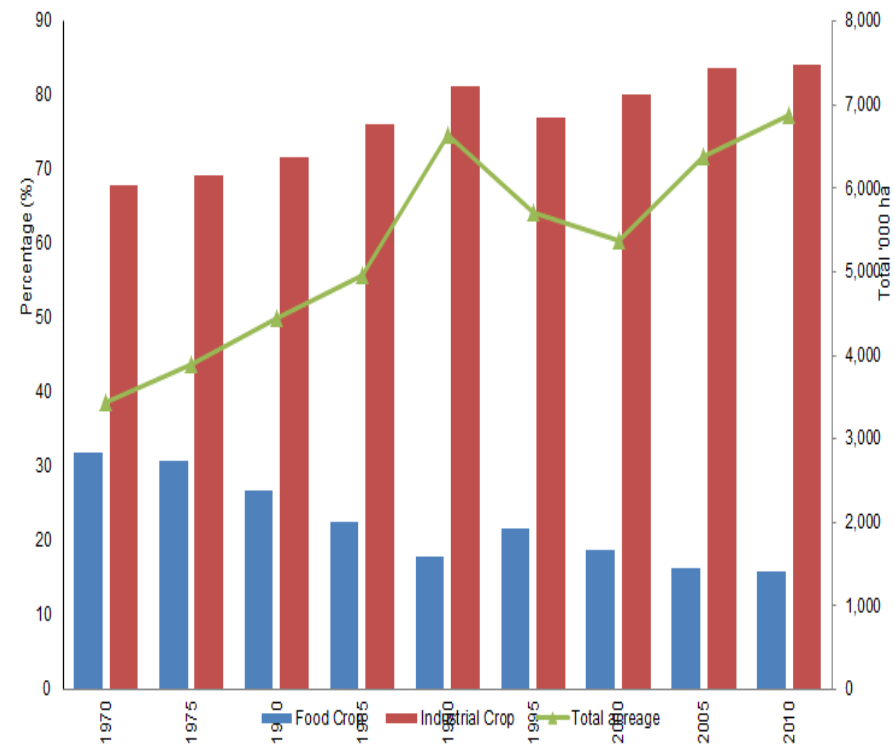
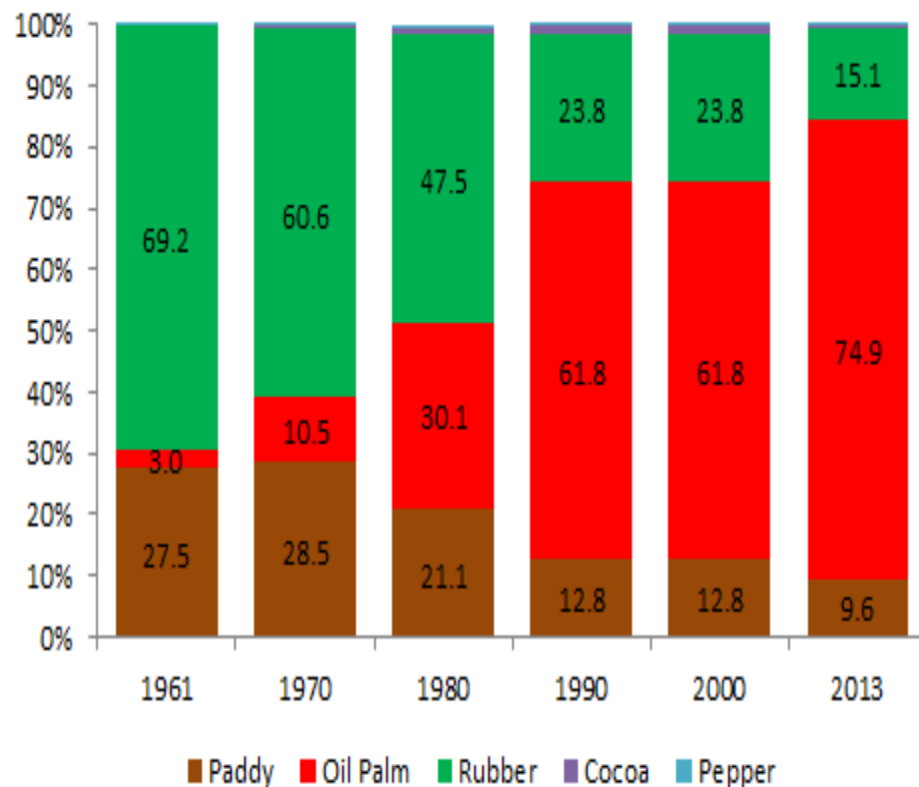
Land use of selected crop (%)

Year	Paddy	Oil Palm	Rubber	Cocoa	Pepper	Total
1961	27.5	3.0	69.2	0.1	0.3	100
1970	28.5	10.5	60.6	0.2	0.3	100
1980	21.1	30.1	47.5	1.0	0.4	100
1990	12.8	61.8	23.8	1.4	0.2	100
2000	12.8	61.8	23.8	1.4	0.2	100
2013	9.6	74.9	15.1	0.2	0.2	100

Industrial crops centric:

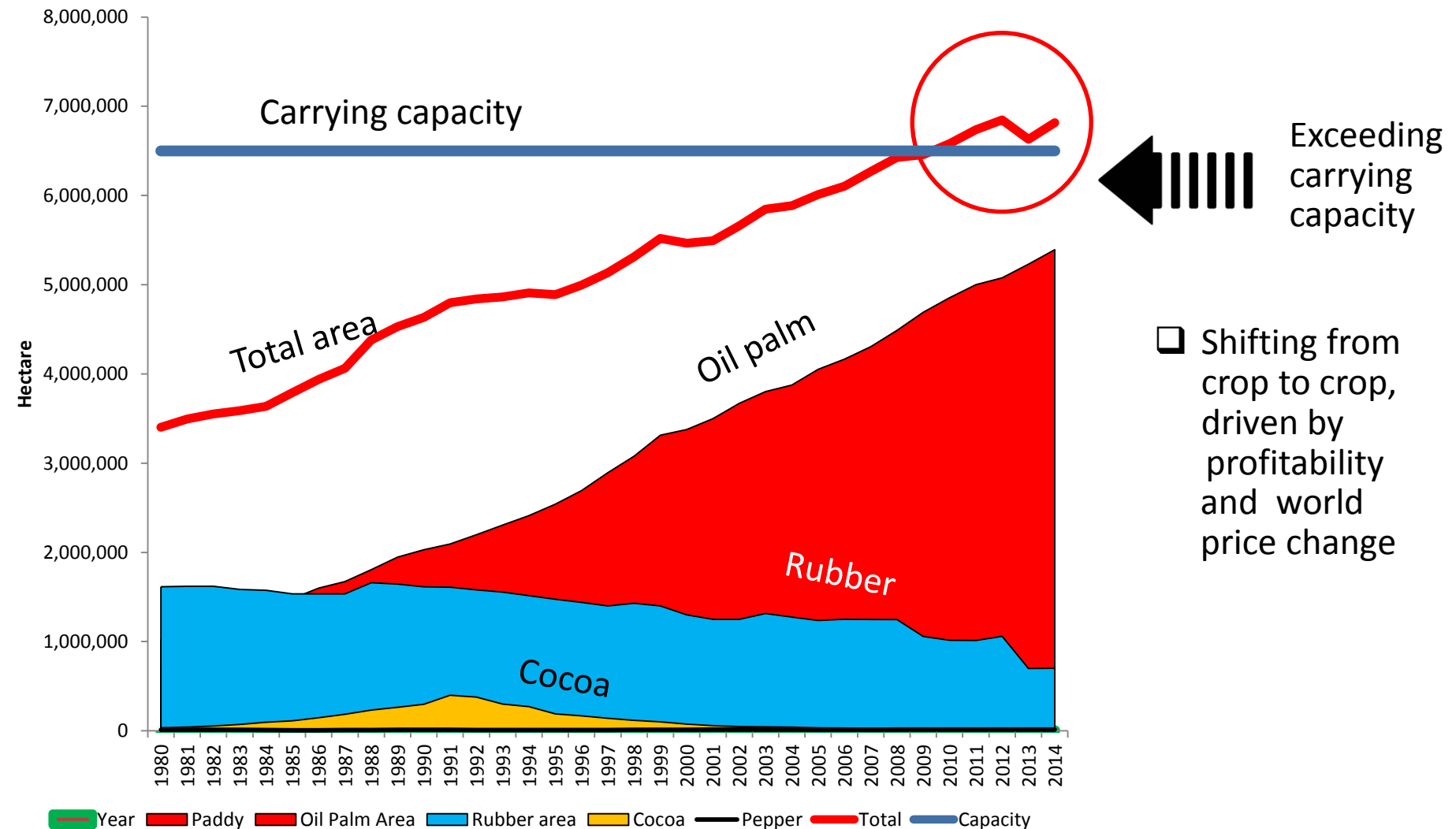
At the expense of food sector

Land use of selected crop (%)



Source: FAOstat

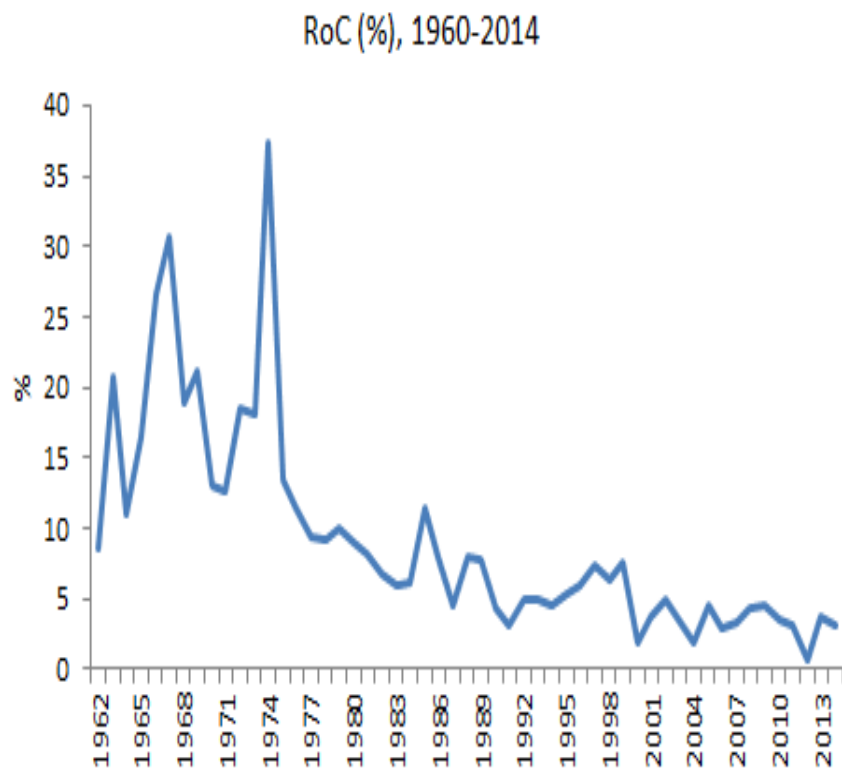
Industrial crops: *Convergence to oil palm?*



System view of oil palm area expansion:

The need for a balanced development for agriculture as planted area reaching carrying capacity

Annual percentage in oil palm area
1960-2014



- ❑ Despite dynamic shift within the agriculture sector, the agricultural sector remains slow in growth.
- ❑ Among the agriculture crops, oil palm is predominant in terms of growth and expansion.
- ❑ But the area expansion is increasing at a declining rate, the beginning of a decline
- ❑ Apparent convergence to oil palm mono-cropping
- ❑ Decision is driven by external market forces, ie price.
- ❑ Growing DIVIDE: inter and intra industries
- ❑ Social and environmental concerns

Policy targets for oil palm: *Ambitious and inflated goal of area expansion 6.3 mn ha in 2020*

Policy targets

Policy Targets	2011	2015	2020 (target)
Planted Area (mn/ha)	5	5.3	6.3
FFB Yield (ton/ha/yr)	21	18.6	26.2
OER (%)	0.2035	0.2046	0.2300
FFB Production (ton/yr)	98,452,146	99,007,904	165,060,000
CPO (ton)	20,035,012	20,257,017	37,963,800
Replanting (ha)	91451	83,000	365,414



Ambitious
expansion

Rate of change (%)

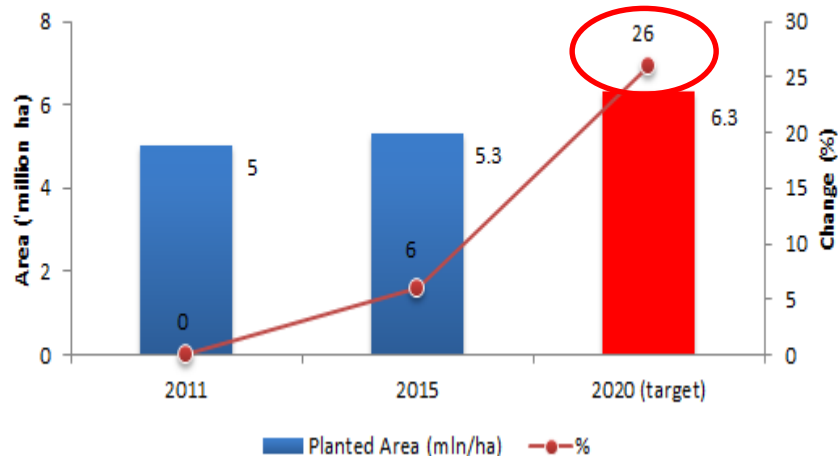
Policy Targets	RoC, 2011-15 (%)	RoC, 2015-20 (%)	RoC, 2011-20 (%)
Planted Area (mn/ha)	6.0	18.9	26.0
FFB Yield (ton/ha/yr)	-11.4	40.9	24.8
OER (%)	0.5	12.4	13.0
FFB Production (ton/yr)	0.6	66.7	67.7
CPO (ton)	1.1	87.4	89.5
Replanting (ha)	-9.2	340.3	299.6

Unachievable
targets

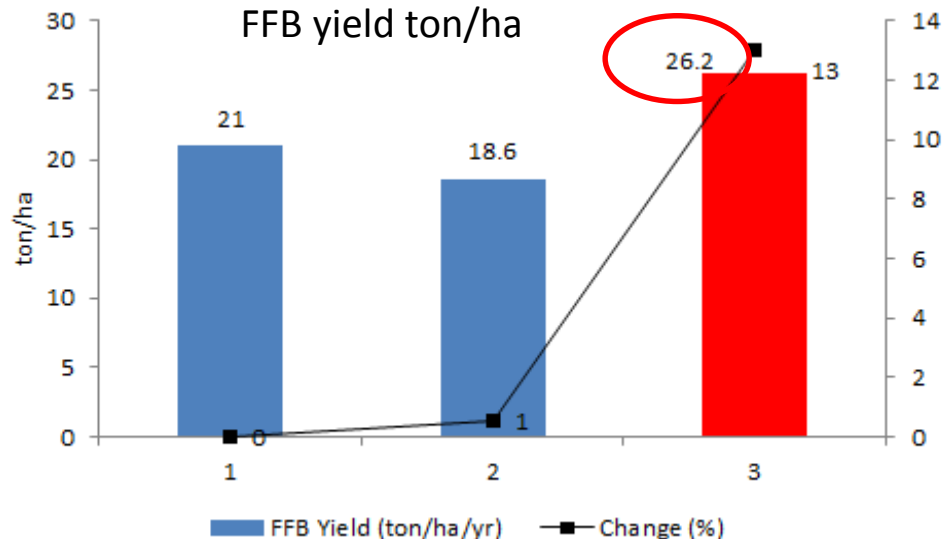
Policy targets for oil palm industry:

Five more years to go, but the growth is below expectation

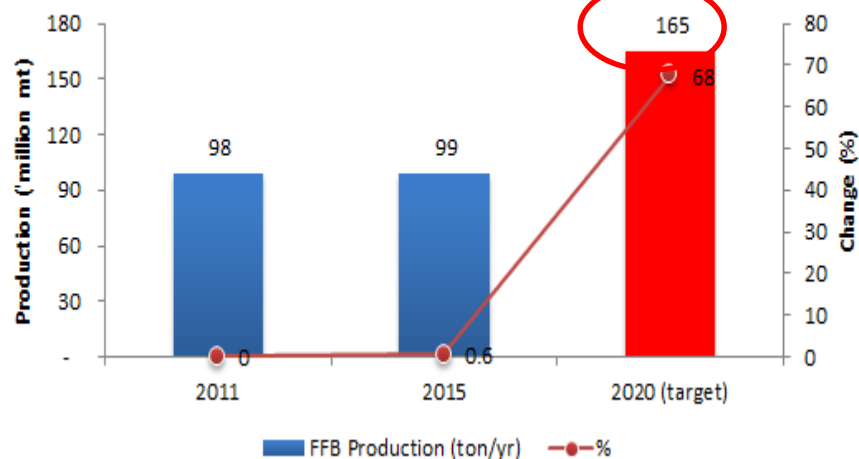
Planted Area



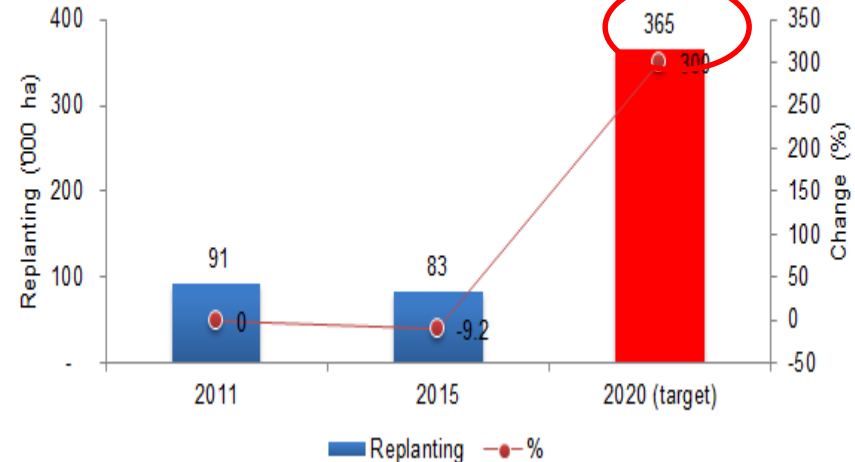
FFB yield ton/ha



FFB Production

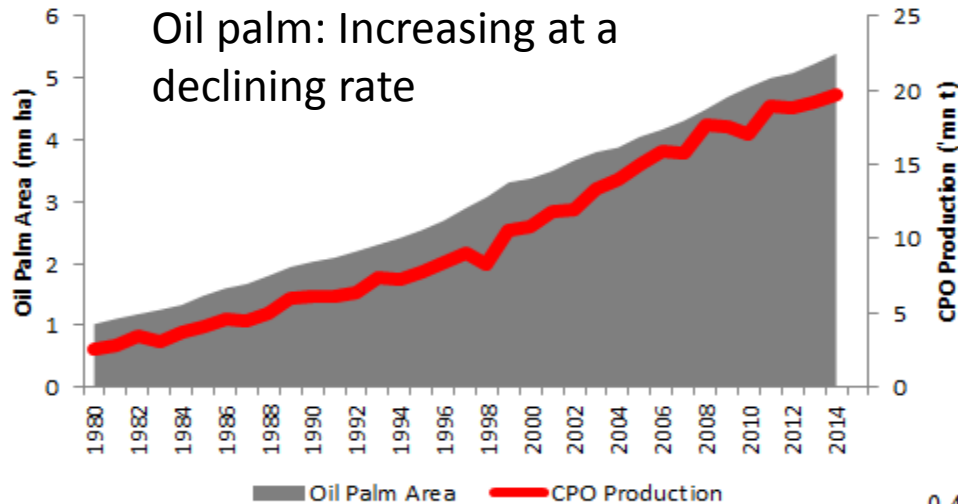


Replanting



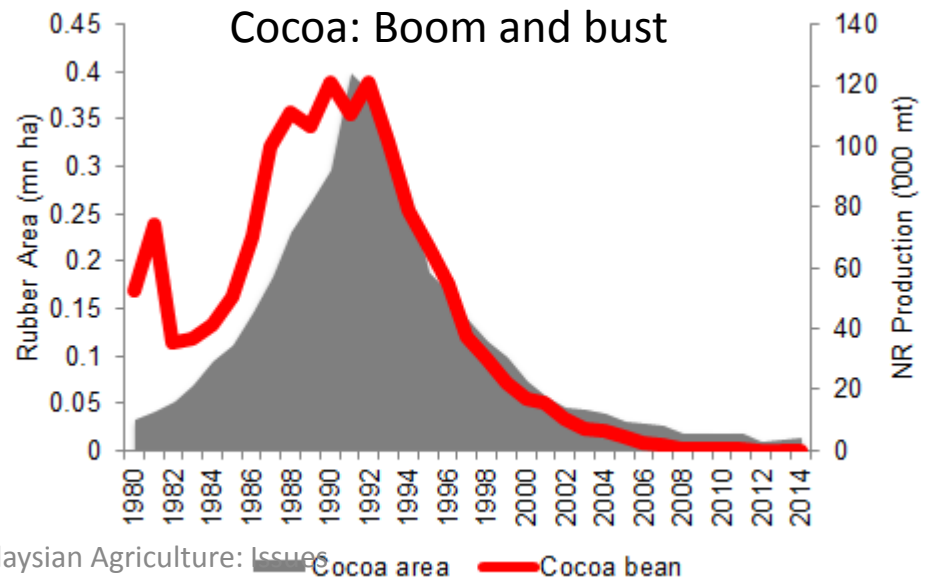
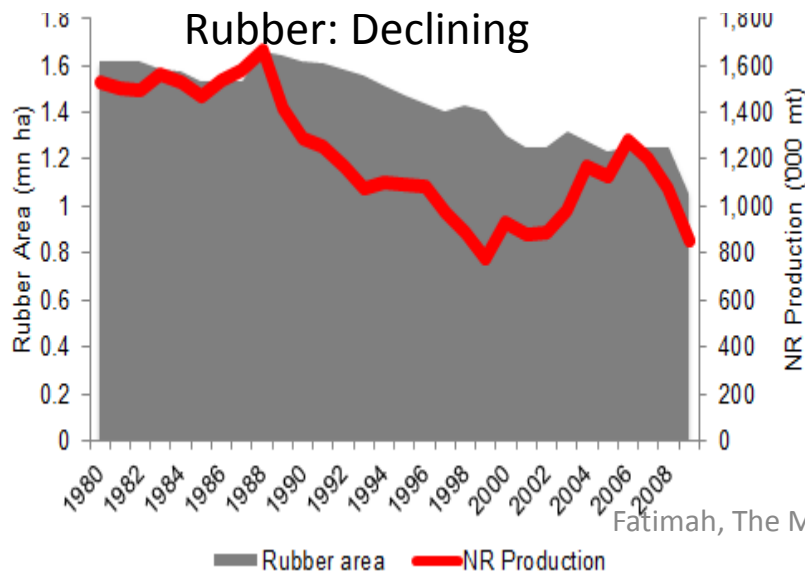
Commodity life cycle:

Limits to growth and lessons to be learnt



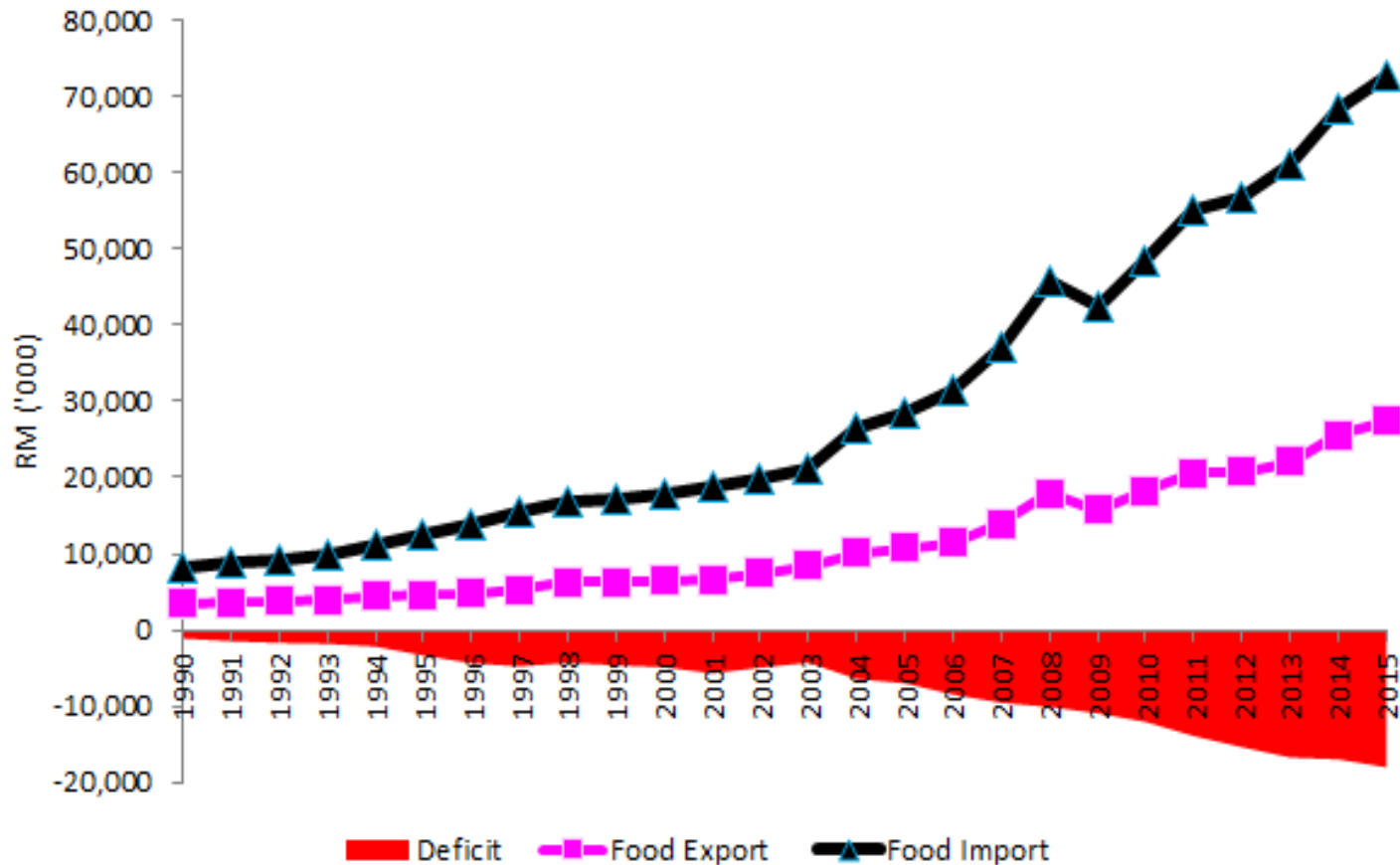
Behaviour:

- ☐ Market and trade driven
- ☐ TRADE OFF: Short term profit vs building up long term “niche”
- ☐ Carrying capacity as a constraint
- ☐ Susceptible to shocks and market vagaries
- ☐ Competition for resources and from competitors



Malaysia's food sector:

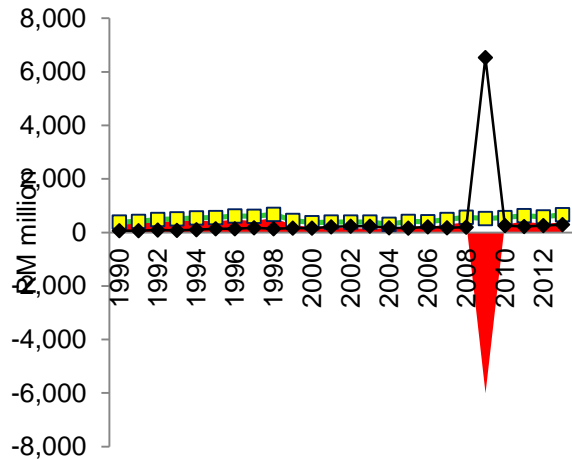
A neglected sector, somewhat



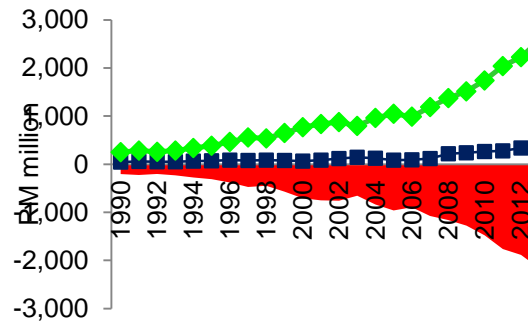
Source: www.epu.gov.my

Food sector: *Cannot compete with oil palm sector hence an outflow of resources*

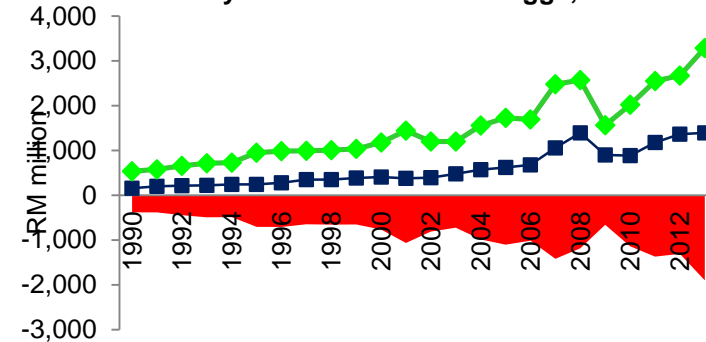
Live Animals



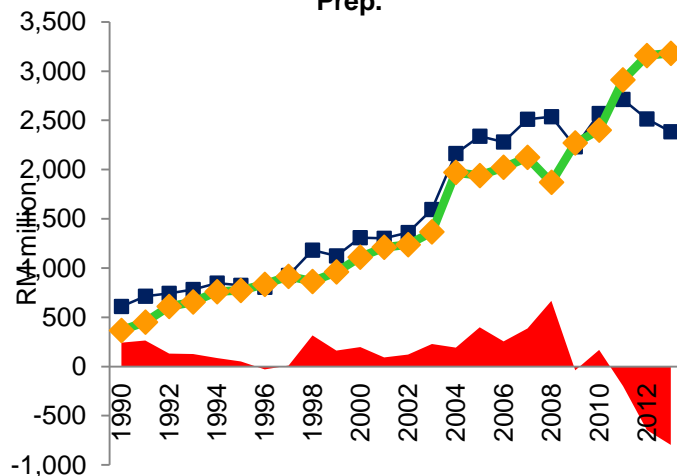
Meat and Meat Preparations,



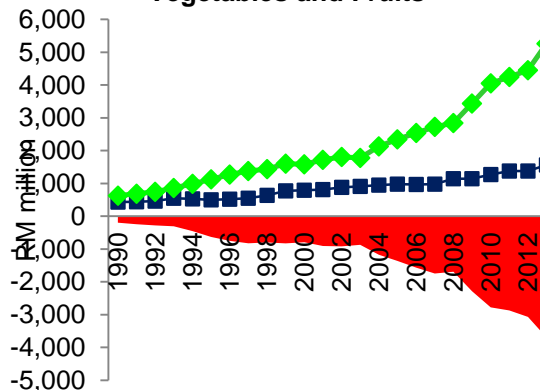
Dairy Products and Birds' Eggs,



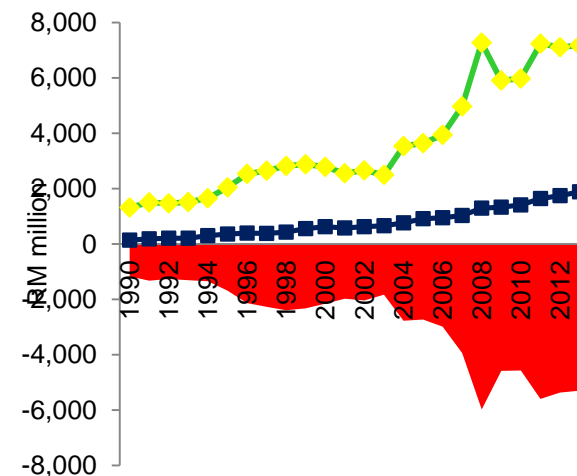
Fish, Crustaceans and Molluscs, and Prep.



Vegetables and Fruits

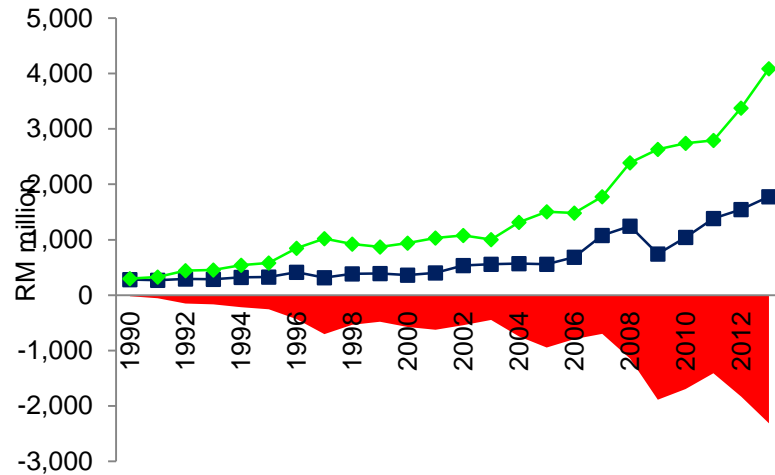


Cereals

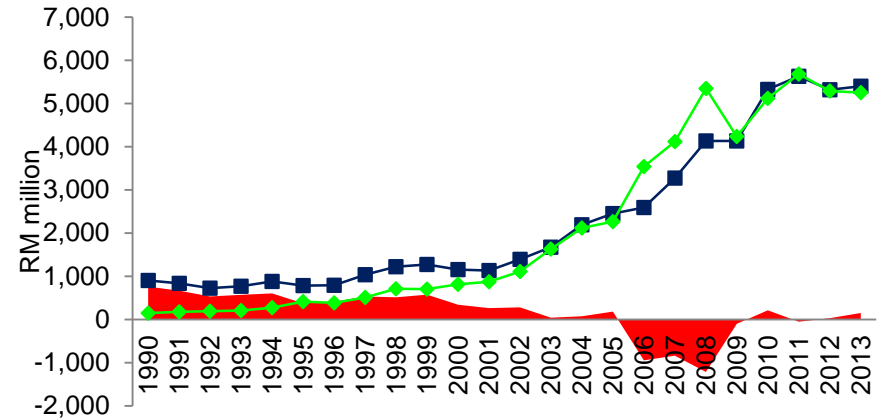


Food security: *slow growth*

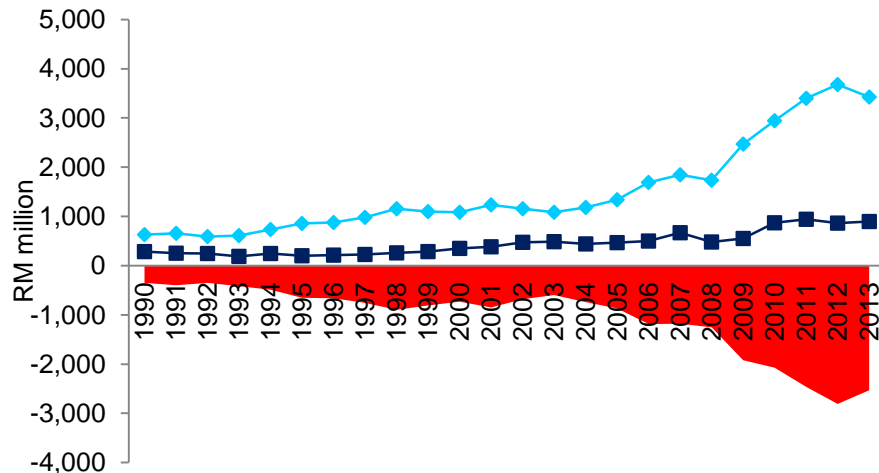
Feeding Stuff for Animals



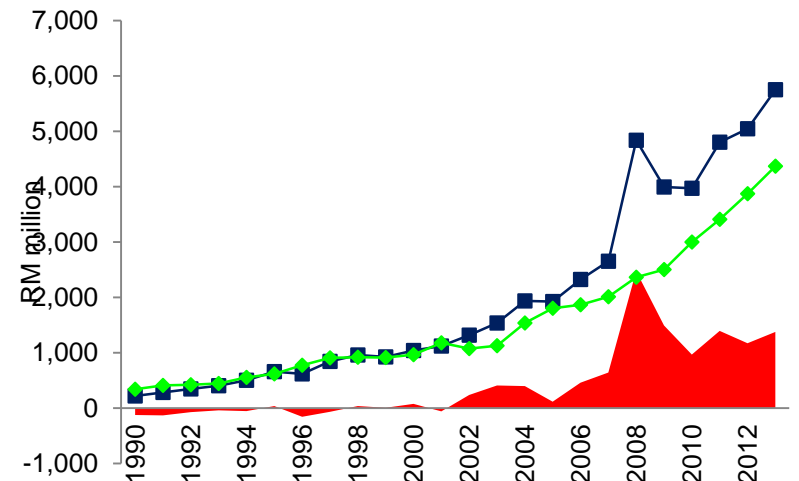
Coffee, Tea, Cocoa, Spices, and Manufactures



Sugars & Preparations

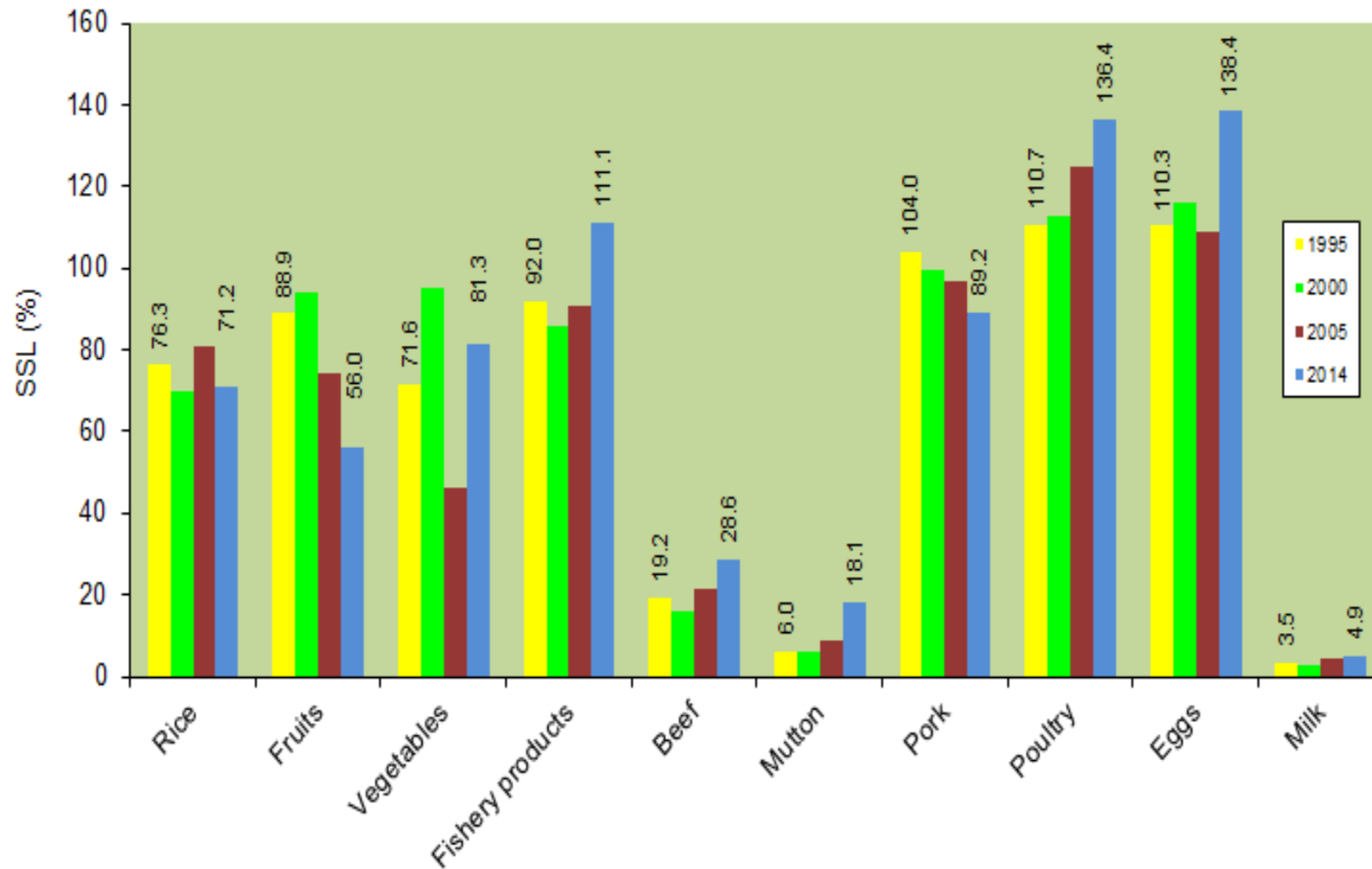


Miscellaneous Edible Products & Preparations,



Food security: *No shift in SSLs*

Self Sufficiency Level of Food in Malaysia, 1995-2014 (%)

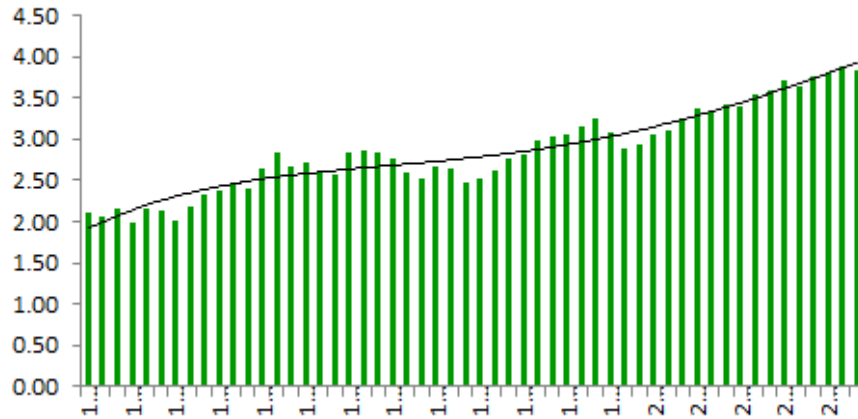


Source: Agrofood Statistics (various issues)

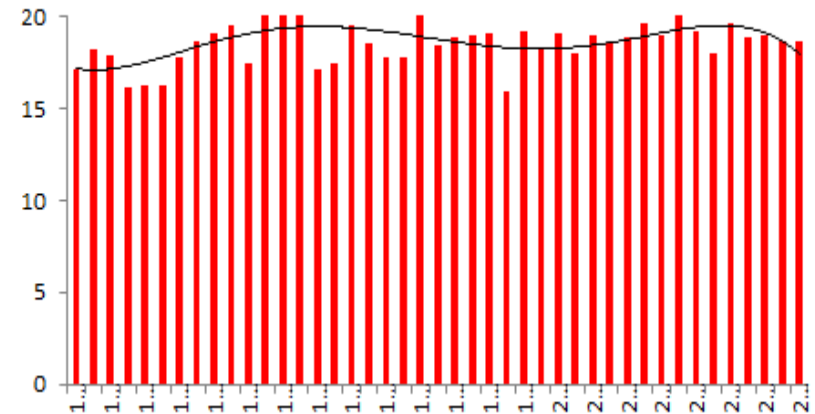
Upstream development is missing:

Yield remains low (fffb and oer)

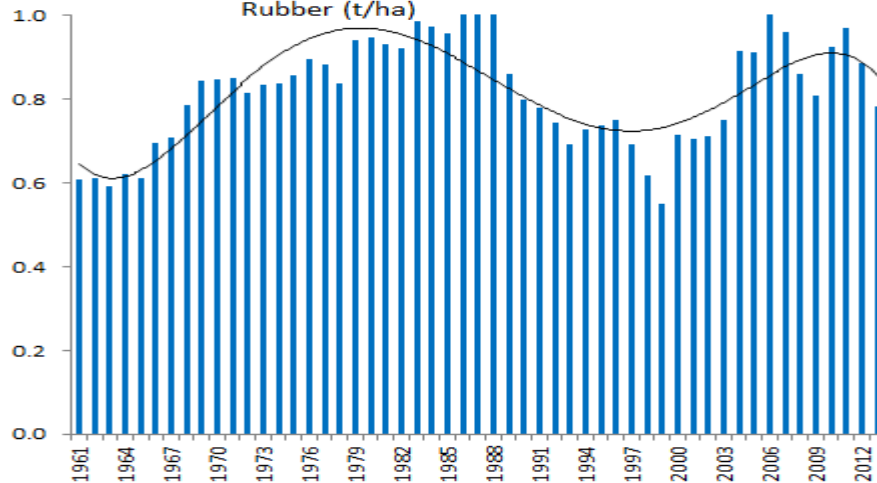
Paddy (t/ha)



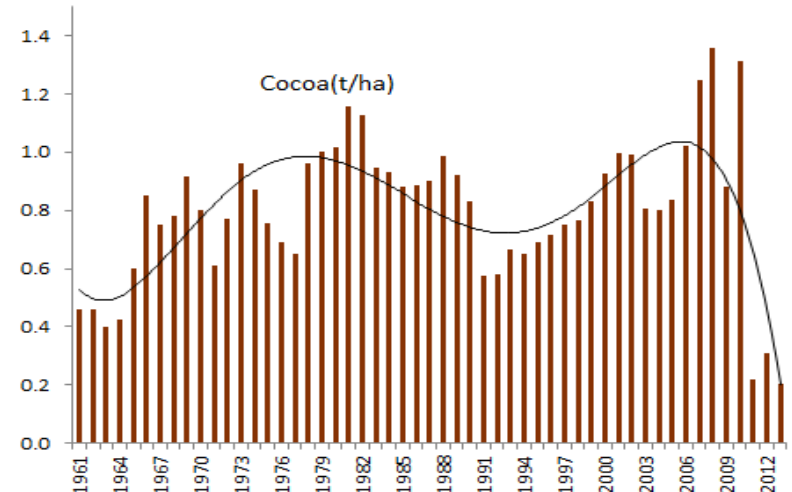
FFB (t/ha)



Rubber (t/ha)



Cocoa(t/ha)



Questions?

- ☐ What are the implications of oil palm area expansion?
- ☐ What are the alternatives?

Outline

- ☐ The issues
- ☐ Simulations
- ☐ Policy alternatives

Dynamic hypotheses

1. Production of oil palm could be increased through productivity rather than large additional area expansion.
2. Mono-cropping is economically risky, particularly in the event of low prices and diseases.
3. Replanting rate increases the mature tree area and hence productivity.

Simulation using system dynamics

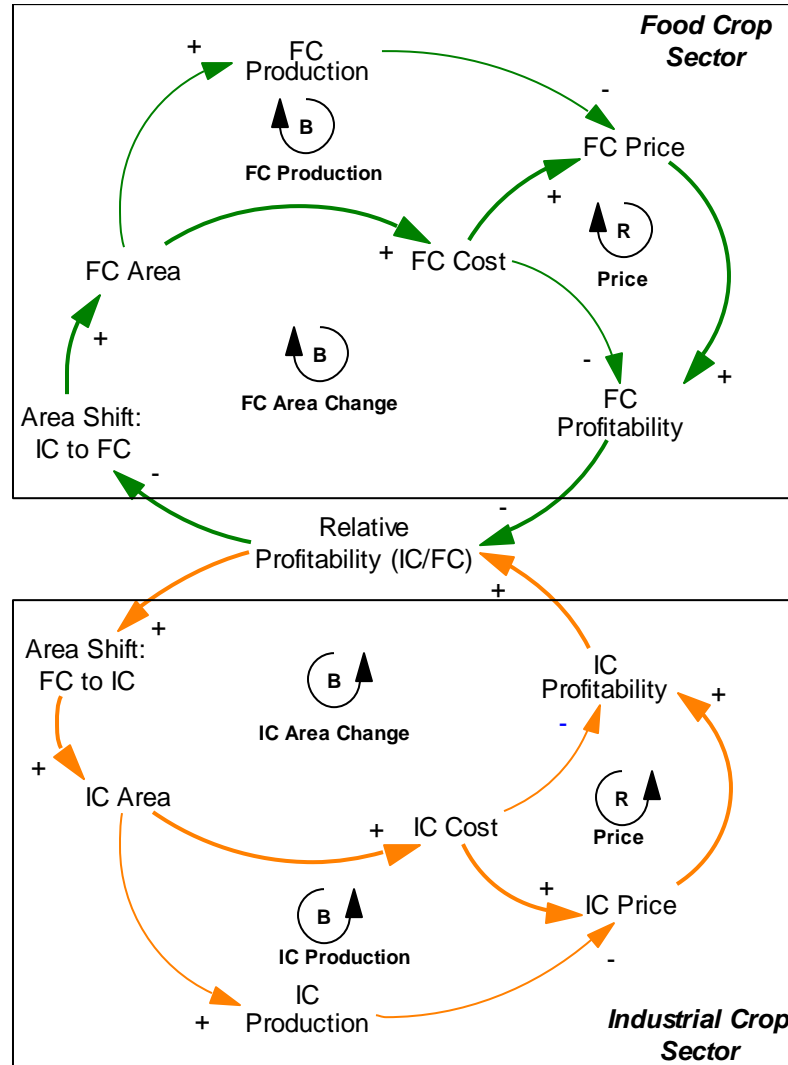
Scenarios examined

- ☐ Price reduction 10%, 25% and 50%
- ☐ Increase in R&D to improve yield by 25% and 50%
- ☐ Increase replanting by 30%, 60% and 100%

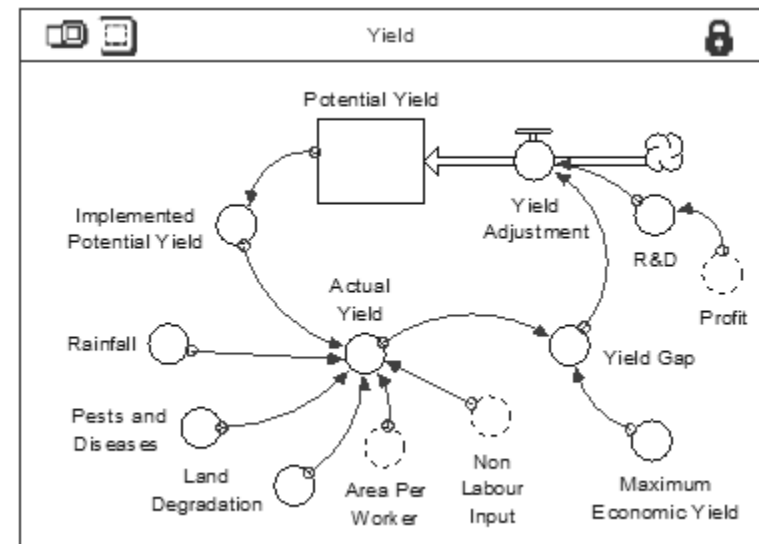
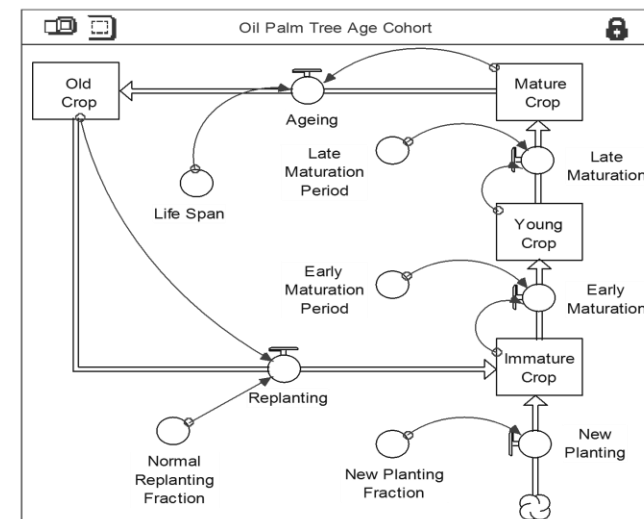
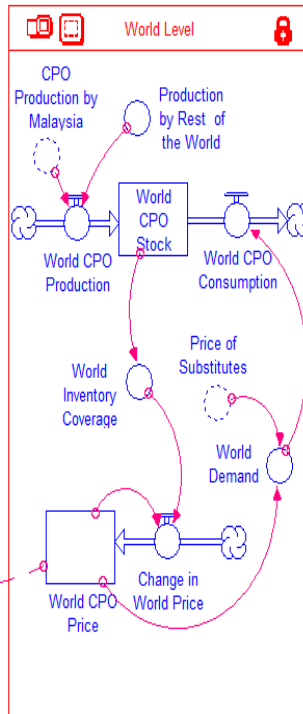
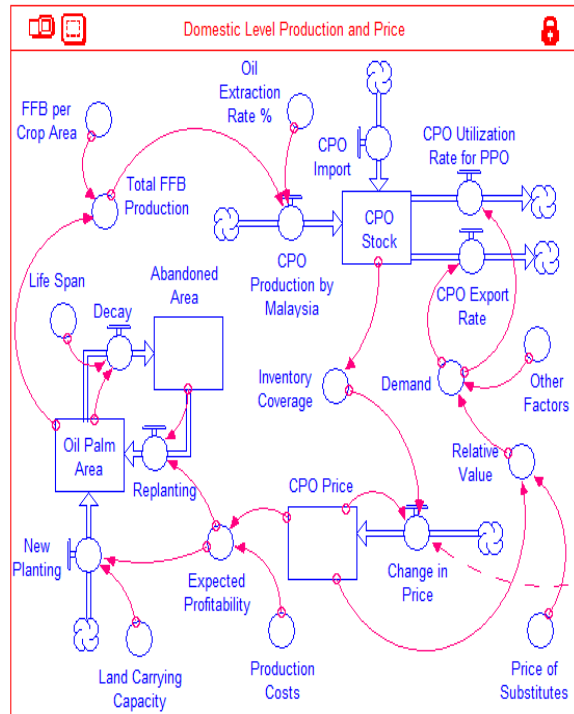
Impacts examined

- ☐ Area planted
- ☐ FFB production
- ☐ Yield of FFB
- ☐ Mature areas

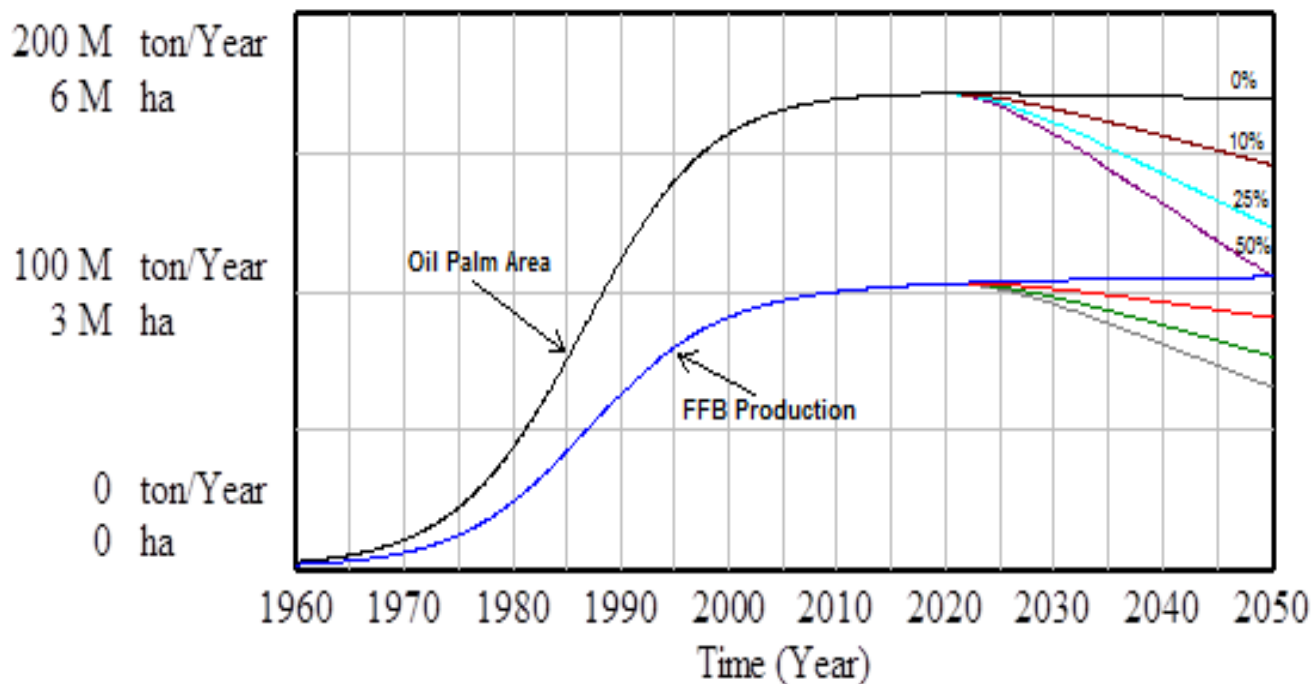
Causal loop of the relationship between oil palm and food sector (paddy and rice industry)



System dynamics model

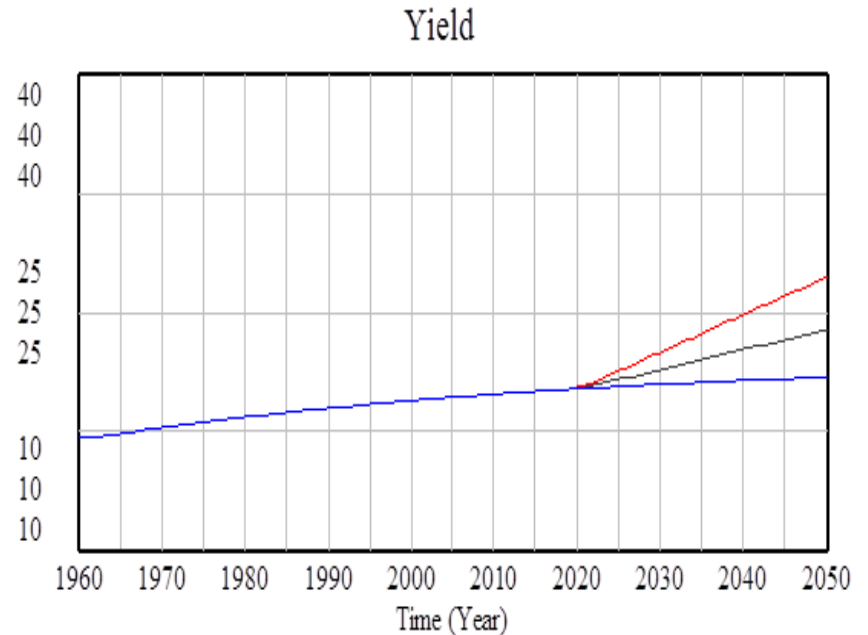
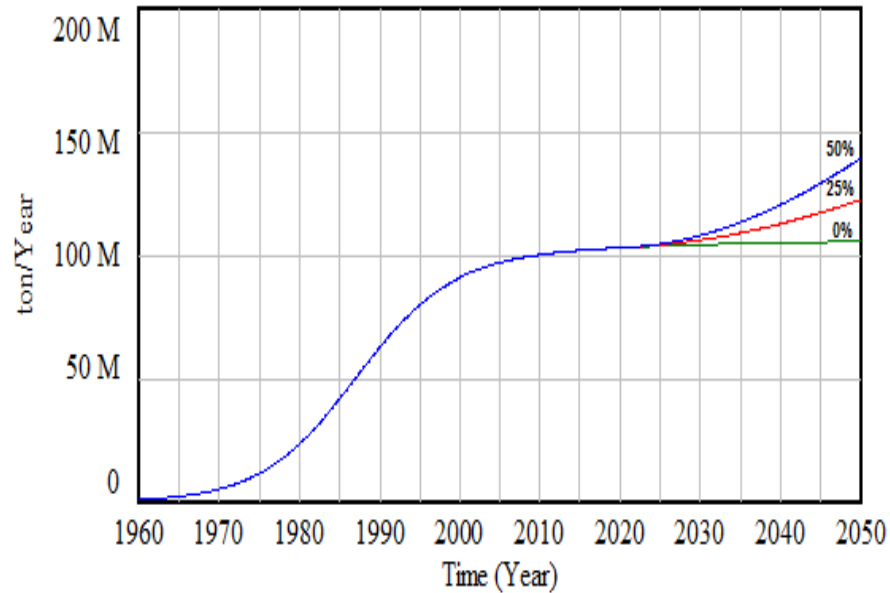


Simulation of oil palm area and FFB production under four price decline scenarios from 0 to 50%



Scenario	Area (ha)		FFB Production (tonne)	
	2020	2050	2020	2050
Baseline	5,128,146	5,074,145	102,981,080	105,520,152
Price decline 10%	5,128,108	4,365,366	102,799,400	90,562,736
Price decline 25%	5,128,075	3,693,051	102,798,728	76,615,056
Price decline 50%	5,128,047	3,160,240	102,798,168	65,561,512

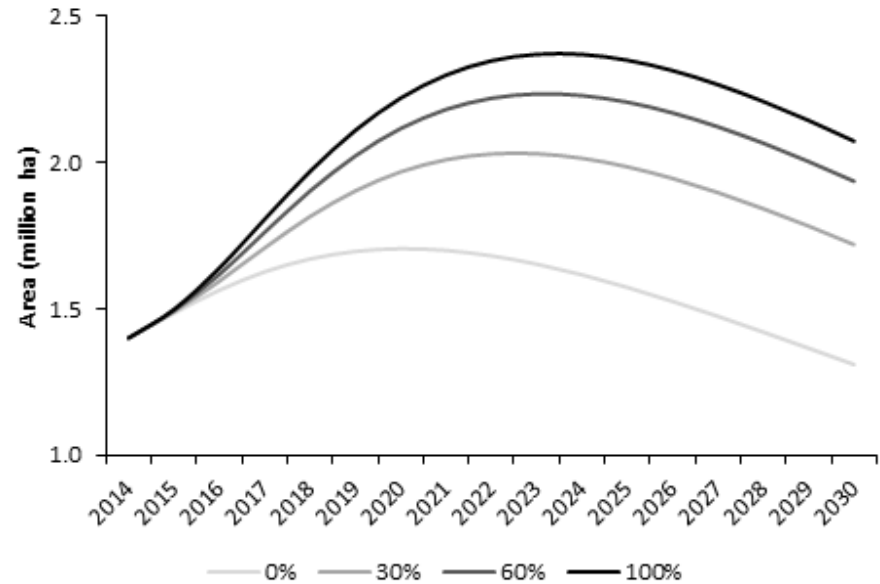
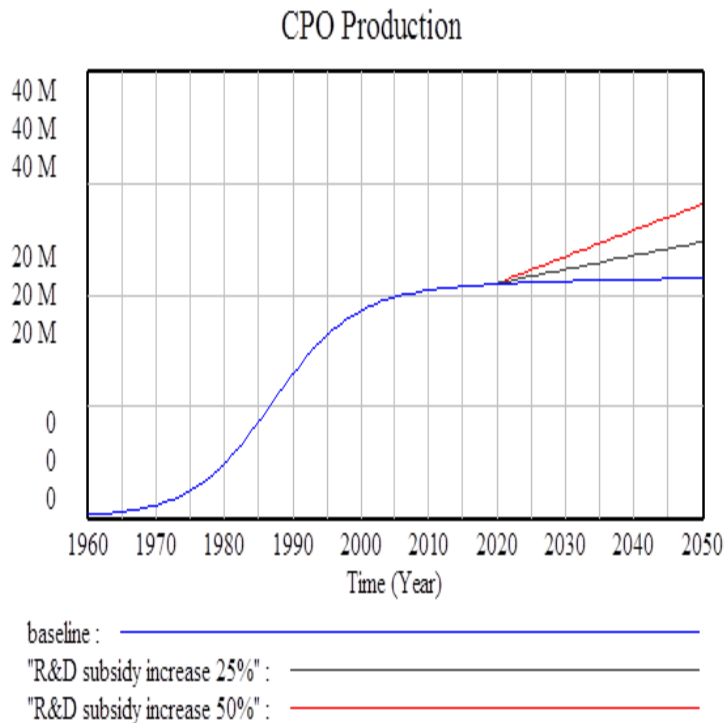
FFB production and yield under the three R&D subsidy increase scenarios from 0 to 50%



Scenario	2020	2050
Baseline	103,004,656	105,521,472
R&D increase 25%	103,004,664	122,432,840
R&D increase 50%	103,004,664	139,344,192

Scenario	2020	2050
Baseline	20.09	20.57
R&D increase 25%	20.09	23.87
R&D increase 50%	20.09	27.17

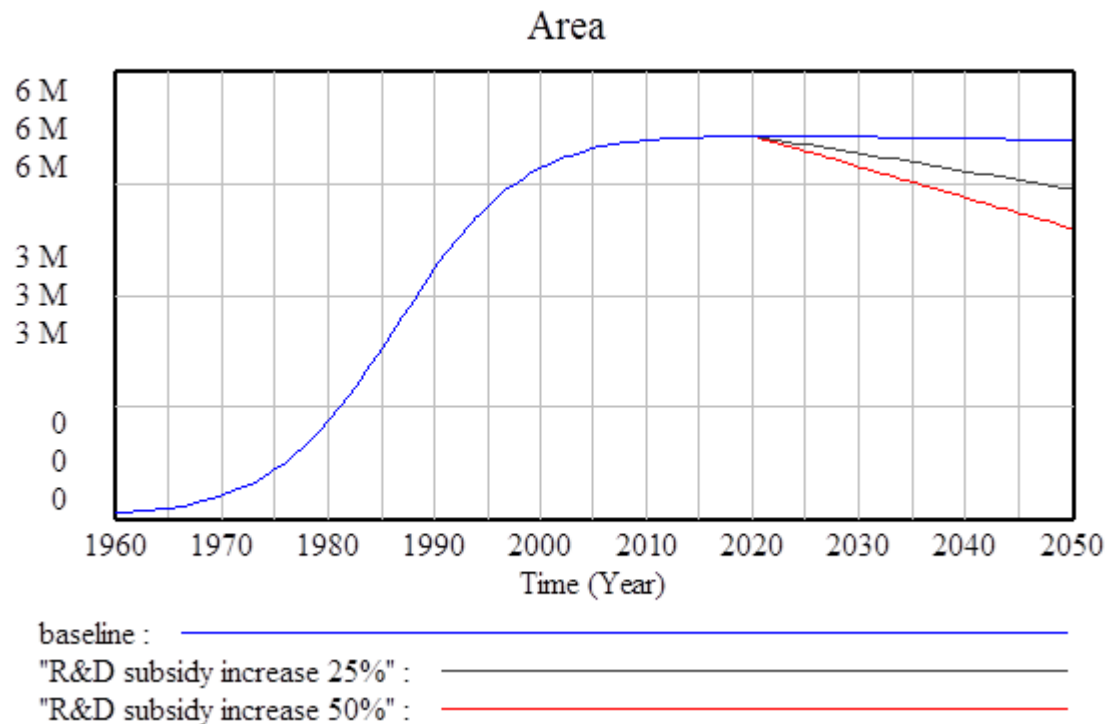
CPO production and mature are under the three R&D subsidy increase scenarios from 0 to 50%



Scenario	2020	2050
Baseline	20,961,449	21,473,620
R&D increase	20,961,449	24,915,083
R&D increase	20,961,449	28,356,543

Scenario	2020	2050
baseline	1,400,000	1,309,436
Replanting 30%	1,400,000	1,719,318
Replanting 60%	1,400,000	1,935,944
Replanting 100%	1,400,000	2,073,088

Production can be increased, *without large increase in area but through improvements in yield via R&D subsidy*



Scenario	2020	2050
Baseline	5,499,582	5,129,872
R&D increase 25%	5,499,582	4,420,673
R&D increase 50%	5,499,582	3,883,749


Conclusions

- ❑ With “business as usual”, the targets set in NKEA are not achievable.
- ❑ The targets can be achieved under a lower hectarage with higher yield of ffb and replanting.
- ❑ Convergence to mono-cropping is economically risky particularly under a price downturn
- ❑ However there are other long term pertinent issues worth looking into...


Outline

- ☐ The issues
- ☐ Simulations
- ☐ Policy alternatives and other pertinent issues


Back to basics: *production is not ONLY a function of land but CAPITAL, labour, input, input prices and weather*

- ❑ Area expansion clearly is not sustainable due to carrying capacity limit. Large area expansion may not be necessary in the future.
- ❑ To some extent area expansion takes place at the expense of food sector (eg cocoa, pineapple, paddy)
- ❑ Capital formulation at the farm level is still low hence the need enhance to improve productivity. Capital= human, physical and financial. **Malaysia sacrifices technological improvement by importing cheap labour. Internal technological capacity is lost.** 
- ❑ Production increase can be achieved through R&D to increase yield of ffb and OER, other aspects of production efficiencies and higher value added.

Back to basics: *upstream sector is UNDERDEVELOPED*

 ☐ The survival of the industry lies on the upstream sector, but it does not receive deserving attention with the exception of land expansion.

☐ Note that poor upstream development of cocoa sector partially led to its decline.

☐ Like other agricultural sector, upstream sector is underdeveloped whereby almost all input are imported: seeds, fertilisers, chemicals, machines and labour. Dependence on imported input increase cost of production. Hence **urgent need to improve internal capacity building through input sector development.** 

☐ Smallholders non-optimal performance and low income requires institutional reformation.

Next-gen cooperative business model – may holds good promise. 

Social and externalities:

unproven hard facts and costs



- ☐ Environmental effects and biodiversity sacrifices
- ☐ Pollution eg “jerebu”
- ☐ “land grabbings”
- ☐ Forced labour
- ☐ Undocumented workers

Academic question:

Is oil palm really giving that good return on all land after taking into account the social standpoint ie. ALL costs (full costing) are taken into account?

In the long term food sector deserves a bigger share: *Food security is becoming a serious concern as natural resources are challenged by climate change*

- ❑ Investing in food yields more than just food security but also social and environmental benefits – ie multi-functional.
- ❑ Land is a constraining issue in food production but it was not taken into account in the oil palm area expansion. Hence the need for an integrative policy to ensure a **sustainable mix of commodities** for sustainability and equitable growth.
- ❑ Diversification is sustainable in the long term vs mono-cropping.

Thank you