

# Malaysian Palm Oil - Moving Ahead to Sustainable Production Growth

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## ABSTRACT

*Malaysian palm oil production has surged in recent decades and the palm oil industry has been transformed to become Malaysia's key socio-economic driver. Plans are underway to ensure palm oil continues to be a major growth engine and its production remains sustainable in the future. While undergoing the process of transformation, the industry faces such major issues as labour and land availability that can hinder the sustainability of production growth. This article highlights the continuous efforts made to sustain production growth in Malaysia in the future, focusing on increasing land productivity, replanting, promoting mechanisation and upgrading labour skills. In addition, the article also forecasts long-term palm oil production until 2020, the year targeted for the transformation of Malaysia into a high income economy.*

**Keywords:** palm oil, sustainable production, production growth, production forecast.

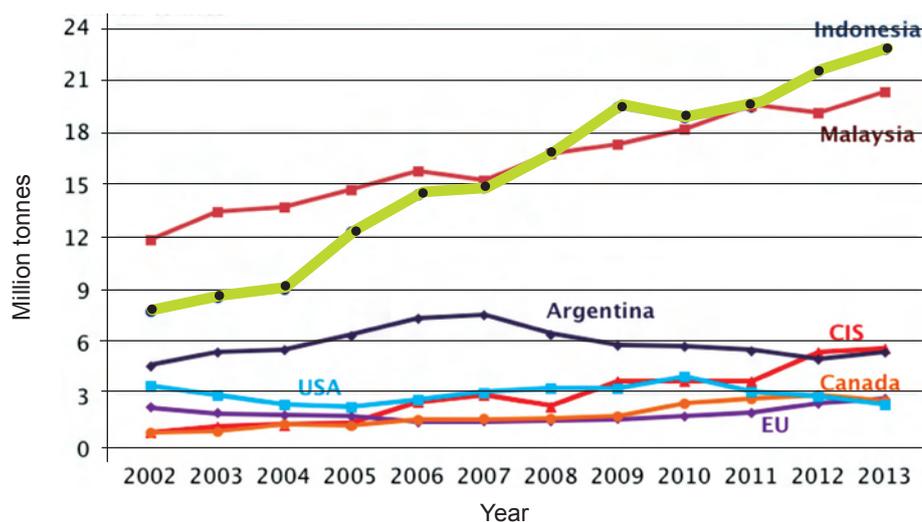
## INTRODUCTION

With a rapidly growing world population, the demand for palm oil is increasing (Choong and McKay, 2013). Indeed, palm oil has become the most important vegetable oil in the world. Palm oil production has risen by more than four times in the past 20 years from 14.3 million tonnes in 1994, and is estimated to reach 60.2 million tonnes in 2014/2015 (MPOB, 2001; Oil World Annual, 2014). It is projected that in 2020, at least 78 million tonnes of palm

oil will be required to meet global demand (Mielke, 2013). In 2013, Malaysia and Indonesia together exported 42.9 million tonnes of palm oil which accounted for 58% of the world's total export of oils and fats (Figure 1) (MPOB, 2014b).

Malaysia's oil palm industry is one of the significant contributors to the national economy. It has been transformed to become Malaysia's key socio-economic driver, eradicating poverty and providing direct employment to more than 610 000 people, including over 177 000 smallholders (ETP, 2012).

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Source: MPOB (2014b).

Figure 1. Export of oils and fats from major countries.

The oil palm industry accounts for 5%-6% of Malaysia's Gross Domestic Products (GDP), and the importance of the industry to the country's export earnings is very significant (Table 1) ([www.palmoilworld.org](http://www.palmoilworld.org)). In 2011, the industry contributed RM 80.3 billion worth of export earnings, or 61.8% of the overall export value of all commodities.

In 2013, Malaysia had 5.23 million hectares of oil palm. The state with the largest oil palm area was Sabah with 1.48 million hectares (or 28.2% of the total area), followed by Sarawak with 1.16 million hectares (23.2%) (MPOB, 2014a). In terms of category of ownership, the industry

was dominated by large plantation companies usually owned by private investors and government-linked companies which accounted for 62% of the total oil palm area. There was a growing level of integration along the value chain. However, a significant share of oil palm area was under the ownership of organised smallholders and independent smallholders, which still accounted for 24% and 14% of the total area, respectively (Figure 2) (MPOB, 2014b).

The palm oil industry in Malaysia has great growth potential in both fresh fruit bunch (FFB) yield and in oil extraction rate (OER). This is reflected by the high level of variation in yield performance

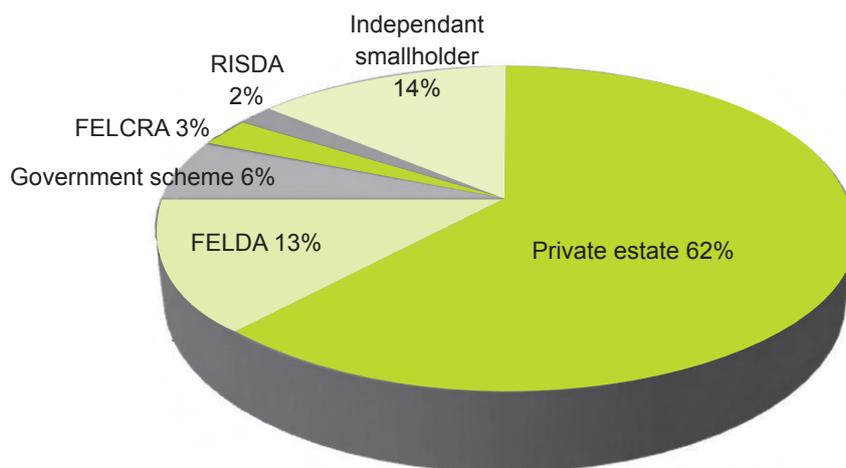
between large, medium and small plantations, and smallholdings, as well as the variation in OER from mills across Malaysia. Evidence collected from high-performing plantation companies suggests that best practices are in place. The best practices adopted by these companies if shared with the others can bridge the performance gaps. This would result in higher FFB yields and OER across the nation (Economic Transformation Programme: NKEA, 2009).

A recent study by the Forest Resource Assessment revealed that 62% of the land area in Malaysia is still covered by forest (Table 2) (FAO, 2010). Compared to many other countries including some

**TABLE 1. CONTRIBUTION OF THE OIL PALM INDUSTRY TO MALAYSIA'S EXPORT EARNINGS**

| Year | Palm oil export value (RM billion) | Export value of all commodities (RM billion) | Percentage contribution from palm oil |
|------|------------------------------------|--|---------------------------------------|
| 1980 | 2.89                               | 48.80  | 6.1                                   |
| 1990 | 5.50                               | 20.70  | 26.6                                  |
| 2000 | 14.94                              | 42.72  | 35.0                                  |
| 2009 | 49.50                              | 91.2   | 54.0                                  |
| 2000 | 59.79                              | 113.3  | 52.8                                  |
| 2011 | 80.30                              | 130.0  | 61.8                                  |

Source: [www.palmoilworld.org](http://www.palmoilworld.org)



Note: FELDA – Federal Land Development Authority.  
 FELCRA – Federal Land Consolidation and Rehabilitation Authority.  
 RISDA – Rubber Industry Smallholders’ Development Authority.  
 Source: MPOB (2014b).

Figure 2. Oil palm area by category, 2013.

| TABLE 2. FORESTED AREAS IN SELECTED COUNTRIES, 2010 |                 |  |                                    |
|---|-----------------|--|------------------------------------|
| Country   | % Forested area | Total forested area (million hectares) | Total land area (million hectares) |
| Argentina   | 11              | 29.400                                 | 273.669                            |
| Brazil  | 62              | 519.522                                | 832.512                            |
| France  | 29              | 15.954                                 | 55.010                             |
| Germany   | 32              | 11.076                                 | 34.877                             |
| Indonesia   | 52              | 94.432                                 | 181.157                            |
| Malaysia  | 62              | 20.456                                 | 32.855                             |
| United Kingdom                                      | 12              | 2.881                                  | 24.250                             |
| United States                                       | 33              | 304.022                                | 916.193                            |

Source: FAO (2010).

developed countries, Malaysia may be considered ahead in forest conservation. In line with Malaysia’s commitment to the Rio Summit pledge to maintain at least 50% of her total land area under forest cover (Basiron, 2012), the country continues to be steadfast in maintaining her deforestation rate at the lowest possible. As a result, expansion in oil palm area is made mainly through the conversion of land previously cultivated with other agricultural crops such as rubber, cocoa and coconut (Table 3). In 2012, oil palm accounted for

about 15% of the total land area, or 77% of the total agricultural land (Sime Darby, 2014).

To date, 5.2 million hectares of land are in use for oil palm cultivation. Given the above scenario, the potential for further land expansion for oil palm cultivation is limited. The expansion potential is estimated at a maximum of 1.3 million additional hectares, of which 75% or 1 million hectares is located in Sarawak (Economic Transformation Programme: NKEA, 2009).

Limited land space is now becoming one of the greatest challenges faced by the local industry. This situation has become a driving force causing many large Malaysian companies to redirect their resources and efforts towards international expansion. With the situation in Indonesia being more favourable for the expansion of oil palm plantations, Indonesia has become the most preferred destination for many Malaysian oil palm companies. As of 2009, Malaysian companies own about 25% of all the oil palm plantations

| <b>Crop</b>  | <b>1990</b>  | <b>2005</b>  |
|--------------|--------------|--------------|
| Oil palm     | 1.980        | 4.050        |
| Rubber       | 1.823        | 1.250        |
| Cocoa        | 0.416        | 0.033        |
| Coconut      | 0.315        | 0.130        |
| <b>Total</b> | <b>4.534</b> | <b>5.463</b> |

Source: Basiron (2006).

in Indonesia. However, some companies have recently shown interest in other parts of Asia, as well as in Africa and South America (Economic Transformation Programme: NKEA, 2009).

Malaysia can only count on a maximum potential increase by 28% of her oil palm area, and this will be mostly on hilly terrain or peatland. As a result, Malaysia has been gradually losing her global production market share to Indonesia. In 2009, Indonesia overtook Malaysia in market share for crude palm oil (CPO) production with Indonesia holding 46% of the global production market share compared with Malaysia's 41% (Economic Transformation Programme: NKEA, 2009). As of 2013/2014, Indonesian palm oil production was estimated to have reached 29.8 million tonnes while Malaysia was at 19.7 million tonnes (Mielke, 2014).

The production of palm oil in Malaysia is labour intensive (Fuad *et al.*, 2009), with a land-labour ratio of 10.14:1 (Azman, 2014). This means that one worker is needed for every 10.14 ha of land. Low involvement of the locals makes the industry heavily reliant on foreign labour, especially from Indonesia, for harvest, fruit collection, and other general maintenance work. Labour issues started to emerge when many Indonesian workers returned home while locals shied

away from working in the oil palm plantations. This is because Indonesia is currently expanding her land utilisation for oil palm cultivation. This situation creates job opportunities in Indonesia, and at the same time motivates Indonesians who have experience in working in the Malaysian oil palm industry to return to their home country. The salary gap between Malaysia and Indonesia is also closing rapidly (Norasikin *et al.*, 2014). As a result, there is a labour shortage of 27 339 workers or 6.1% of the total number of workers required in plantations (Azman, 2014).

If current agronomic practices continue, the labour demand is expected to increase to more than half a million workers by 2020 as Malaysia is anticipated to expand the area for oil palm cultivation to 5.6 million hectares (Simeh *et al.*, 2010). Thus, it would appear that the issue of labour shortage in the oil palm plantation sector will never be resolved.

#### TARGET AND ASPIRATION

Considering the land limitation for oil palm cultivation, especially in Peninsular Malaysia, as well as labour shortage, there is a critical need for the palm oil industry to increase its productivity as well as to revitalise the sector through modernisation and

commercialisation, particularly in the smallholder sub-sector. Thus, Malaysia will have to find ways to sustain her palm oil production growth. This section discusses the actions that are needed to ensure sustainability in palm oil production growth.

#### Accelerating Replanting and New Planting of Oil Palm

Replanting is one of the key elements to ensure that the productivity of oil palm land will be enhanced. Through replanting, low-yielding mature palms can be replaced with more productive seedlings. As of now, the quality of planting materials used in oil palm plantations has been controlled by the government through MPOB in order to ensure that only high-yielding planting materials are used by plantations and smallholdings. The planting materials approved by MPOB include *dura x pisifera* (DxP) hybrid seed, tissue culture plantlets, clonal seeds and interspecific hybrid seeds (Kushairi *et al.*, 2010). These planting materials have been proven to significantly increase palm oil production in the long run.

However, high palm oil prices often discourage the industry from undertaking aggressive replanting schemes, leading to a backlog of ageing palms, above 25 years old, with yields declining to below 15 t/ha/yr. Small farmers and plantation firms often delay replanting to profit from strong prices, although this compromises productivity in the long run (ETP, 2013).

In 2013, the backlog areas to be cleared by plantations and organised smallholders for replanting stood at 251 024 ha, while the actual area of replanting and new planting by independent smallholders was recorded at 57 679.27 ha from January

2011 to December 2013. The effort to encourage independent smallholders to replant and to newly plant has been rather challenging, especially in 2013. For 2013, the government set an ambitious target of 30 000 ha for replanting and new planting of oil palm by independent smallholders. Only 15 005.44 ha, or 50% of the 2013 target, of replanting and new plantings were completed during the year (ETP, 2013).

Applications for financial incentives of up to RM 9000/ha for independent smallholders to implement replanting or new planting were highest in number from Sarawak. To safeguard the interests of the state and the smallholders there on property rights, the state government has imposed stricter land ownership and suitability verifications. This is an important process to ensure targeted assistance is given out to smallholders in areas suitable for oil palm planting, and that yields will be delivered under the most optimum environment. As a result of this move, there have been delays in the implementation of oil palm projects in Sarawak in 2013. The federal government together with the independent smallholders are committed to complete clearing the backlog projects in 2014 (ETP, 2013).

The government aims to continue to lead initiatives and provide financial assistance to independent smallholders to facilitate replanting and new planting. This will contribute towards a sustainable supply of FFB while reducing the proportion of aged palms. Moving forward, the government is committed to ensuring replanting and new plantings by independent smallholders that were delayed in 2013, and has allocated an additional RM 28 million to finance new applications by independent smallholders, with an overall 2014

Key Performance Index (KPI) target of 35 000 ha (ETP, 2013).

#### Improving Fresh Fruit Bunch Yield

The yield of FFB depends on two main factors, namely, the number of bunches produced and the weight of each bunch. As the age of the palm increases, bunch weight increases while bunch number decreases. The number of bunches produced per palm depends on frond production, sex ratio, abortion and bunch failure rates (Tarmizi and Kushairi, 2014).

Fertiliser is a major factor in oil palm cultivation. Correct and timely application of fertiliser has major impact on yield and economic returns. Fertiliser requirements depend on the age of the palms, soil type and field conditions. By using an efficient oil palm nutrient supply system, productivity per unit area can be increased (Tarmizi and Kushairi, 2014).

Pests and diseases are a major threat to oil palm cultivation. The lack of proper management will lead to a significant drop in FFB yield. Bagworms and nettle caterpillars are the most serious insect pests of oil palm. Outbreaks of these pests result in severe defoliation. The pests are managed by insecticidal sprays, trunk injection, or through biological control (Wahid *et al.*, 2000). In addition, the rhinoceros beetle damages the oil palm crown, and is especially devastating in young palms. Due to environmental concerns, biological control of the pest such as by pheromone trapping is widely used (Tarmizi and Kushairi, 2014).

Basal stem rot caused by *Ganoderma boninense* is a major oil palm disease in Malaysia. To date, there is no remedy for the disease. Treatment of the infected palm is by removing the infected

tissues. Trunk injection of the infected palm with hexaconazole can prolong the economic life of the palm. Breeding for *Ganoderma*-tolerant oil palm progenies show promising results (Tarmizi and Kushairi, 2014).

Smallholdings, which constitute about 40% of Malaysia's oil palm area, are being strongly supported by the government to boost their overall FFB yield. This is part of the task to achieve the 2020 target of raising annual FFB yields to 26.2 t/ha as the national average across all categories of ownership, smallholdings and plantations included. Some of the ways to achieve this are to encourage independent smallholders to adopt the best industry practices, and to set up cooperatives of oil palm planters across the country to educate and increase awareness in new improved technologies. As a result, 210 457.39 ha of land have achieved compliance with various best practices in 2013, exceeding the set target of 200 000 ha (ETP, 2013).

This initiative has successfully established a total of 30 cooperatives. Under the umbrella of a cooperative, smallholders enjoy bulk discounts when purchasing agricultural inputs and, more importantly, they receive better pricing for their produce sold to palm oil millers. In a pilot initiative, a smallholders' cooperative in Saratok managed to offer a price which is 20% higher for FFB compared with the price offered by existing dealers (ETP, 2013).

About 210 457.39 ha have achieved compliance with best industry practices, such as MPOB's Code of Practices (CoP) and the Roundtable on Sustainable Palm Oil (RSPO). As a result, yields have improved; the annual national average has risen to 19.02 t FFB/ha in 2013 compared with 18.89 t/yr before (ETP, 2013).

### Improving Workers' Productivity

To address the issue of labour shortage, the current productivity of workers has to increase from 1.5 t of FFB per worker to 3 t per worker or higher per day. Productivity can be increased by improving oil palm mechanised operations (Norasikin *et al.*, 2014). Advancements in field mechanisation for the oil palm plantation industry involve the introduction of machines and implements that are adapted to local terrain conditions. Through research and development, mechanisation in the industry has undergone several changes, and is still currently progressing well. Over the years, the industry has adopted several mechanised operations in various field activities (Norasikin *et al.*, 2014). They include buffalo-assisted harvesting, *Cantas* and *C-Kat* harvesting, semi-mechanical manuring, mini tractor grabber system and prime movers.

Although the area under oil palm cultivation reached 5.2 million hectares in 2013, only 60% of these areas are suitable for mechanisation, mainly because of

topographic reasons. Thus, only 3 million hectares of the total area are suitable for farm mechanisation technologies. However, even with this area, the full adoption of mechanisation will reduce worker reliance by 33%-46%. Therefore, mechanisation is a tool to reduce over-dependency on foreign labour and improve farm efficiency (Norasikin *et al.*, 2014).

Concerned over the issue of labour shortage, especially for harvesting and FFB collection, the government has made some efforts to address the problem. To encourage locals to work in the plantation sector, effective January 2013, the government introduced a minimum wage of RM 900 per month for Peninsular Malaysia and RM 800 per month for Sabah and Sarawak (Azman, 2013).

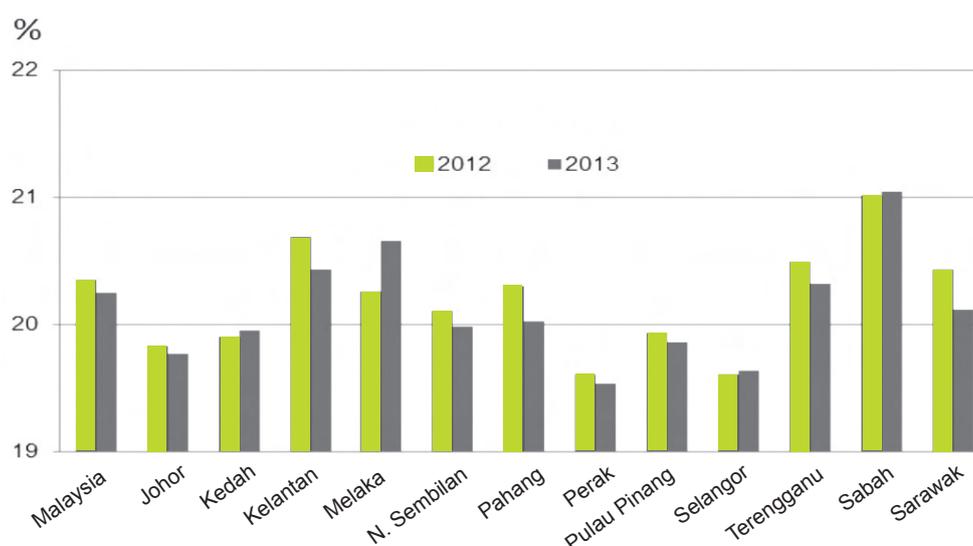
To reduce the dependency on labour from Indonesia, the government has agreed to allow the plantation sector to recruit workers from Bangladesh on a government-to-government basis. In the initial stage, the government requested 10 000 workers from Bangladesh to alleviate the acute

labour shortage faced by oil palm plantations in Peninsular Malaysia (Azman, 2013).

### Increasing the OER

A key performance indicator for the palm oil industry is its oil extraction rate (OER), which has remained stagnant at below 20.5%. Entry Point Projects (EPP) aims to increase OER to 23% by 2020, chiefly by getting more mills certified under MPOB's CoP. MPOB has also placed more than 200 of its officers at selected mills across the country to provide advisory and enforcement services on FFB quality. This will ensure that only high quality and ripe FFB are accepted and processed at all mills (ETP, 2013).

Statistics on the national OER for 2013 show a drop of 0.10% from 20.35% in 2012 to 20.25% in 2013. Four states with oil palm mills saw an improvement in OER, namely, Kedah, Melaka, Selangor and Sabah, while OER in the other states recorded decreases (ETP, 2013) (*Figure 3*). The highest OER was achieved in Melaka with a



Source: MPOB (2014b).

Figure 3. Annual oil extraction rate (OER) (2012-2013).

0.4% increment. Meanwhile, the worst performance was recorded in Sarawak (-0.31%), Pahang (-0.28%) and Kelantan (-0.26%).

MPOB continues to strengthen the foundations leading to improved OER and quality of crude palm oil through the adoption of standards. This is being carried out through awareness activities aimed at palm oil mills, encouraging them to comply and obtain certification under the MPOB's CoP as well as other international certification such as RSPO. In 2013, a total of 28 mills were certified under the MPOB's CoP and other international certifications, exceeding the set target of 25 mills (ETP, 2013).

MPOB plans to hire an additional 53 enforcement officers to bring the total to 294 personnel. The enforcement officers will be assigned to targeted mills, and they will be monitored and evaluated based on the OER performance and unripe crop intake at their assigned mills. This initiative is expected to contribute to an increase in OER at their assigned mills by 0.1%-1.0% point (ETP, 2013).

### PALM OIL PRODUCTION FORECAST

It is important for the Malaysian oil palm industry to sustain its production growth. With a

fast-growing world population, Malaysia has to be prepared for an increasing global demand for oils and fats. Given that Malaysia has the capacity to successfully increase her productivity by applying the above measures, her crude palm oil production is projected to grow at around 2.86% per annum for the next seven years until 2020 (Figures 4a and 4b). With such stable growth, it is projected that crude palm oil production could reach 23.3 million tonnes by the year 2020 (Table 4).

As mentioned above, this expectation comes with the assumption that the Malaysian palm oil industry is able to strengthen

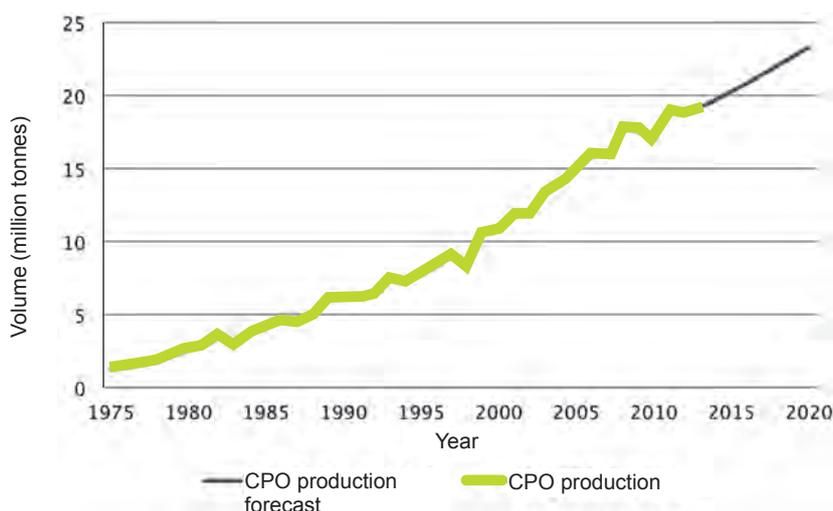


Figure 4a. Crude palm oil (CPO) production forecast.

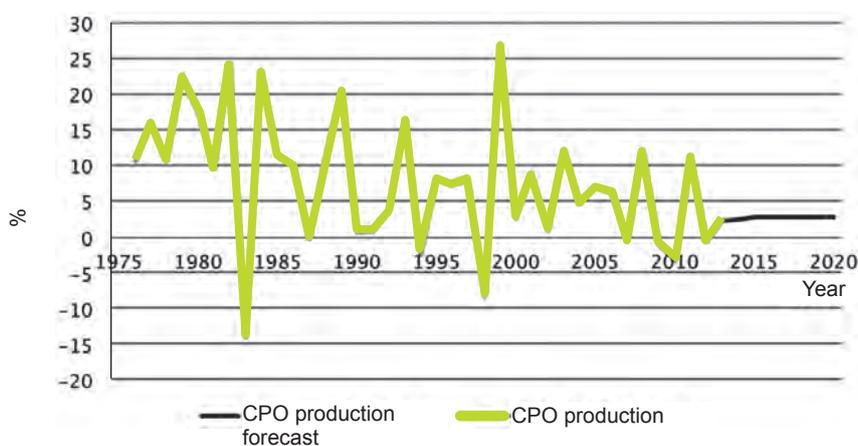


Figure 4b. Crude palm oil (CPO) production growth forecast.

**TABLE 4. PALM OIL PRODUCTION PROJECTION (2014-2020)**

| Year | Production (million tonnes) | Growth rate (%) |
|------|-----------------------------|-----------------|
| 2014 | 19.69                       | 2.49            |
| 2015 | 20.26                       | 2.86            |
| 2016 | 20.84                       | 2.86            |
| 2017 | 21.43                       | 2.86            |
| 2018 | 22.04                       | 2.86            |
| 2019 | 22.67                       | 2.86            |
| 2020 | 23.32                       | 2.86            |

its foundations by increasing its productivity as well as revitalising the sector through modernisation and commercialisation, especially in the smallholder sub-sector. Apart from that, this forecast does not take into consideration any external forces that may distress the performance of the palm oil industry, such as the phenomena of *El Niño* and *La Niña* which could cause a significant drop in FFB production.

### CONCLUSION

In maintaining the competitiveness of the Malaysian palm oil in the world market, it is important that this sector continues to increase its productivity. Therefore, *in situ* development involving land consolidation, rehabilitation, replanting, drainage, irrigation, and flood mitigation is given priority.

Over the years, the palm oil industry in Malaysia has developed and adopted numerous environmentally sound and sustainable practices in the cultivation and production of the crop, and in refining palm oil. These include the zero burning technique, integrated pest management, treatment of palm oil mill/refinery effluents, utilisation of biomass and development of value-added natural co-products.

Organic growth in yield levels will be the key to drive upstream developments. Planting materials will improve due to wider utilisation of quality clonal materials, hybrid seeds, bi-clonal and semi-clonal seeds, and better crop recovery through marginal improvements in collecting practices. As a result, plantations and organised smallholdings will gradually increase their productivity.

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