Palm Oil: The Driving Force of World Oils and Fats Economy

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ABSTRACT

Palm oil accounts for 21% and 47% of the global oil and fats production and trade respectively. Both Malaysia and Indonesia together are the world's largest producers and exporters of palm oil with 84% and 90% share of world palm oil production and export, respectively. The paper outlines the increasingly dominant role that palm oil has played in the world oils and fats supply and demand equation during the past 40 years. The ascent of palm oil as a powerhouse in the global oils and fats market has been achieved by leveraging upon the techno-economic advantages of palm oil vis-à-vis competing oils as well as positive developments arising from consumer concerns on health, environment and food security. In efforts to maintain continued market growth, the future direction of the industry relating to improving competitiveness, widening the uses of palm oil, eliminating trade barriers and exploring new innovative marketing approaches will be discussed. These positive developments augur well for palm oil in its role as the driving force of the world oils and fats economy.

POWERHOUSE OF SUPPLY

The oil palm industry worldwide has provided the fastest increase in global oils and fats supplies over the last four decades. World palm oil production increased 20-fold from a mere 1.2 million tonnes in 1962 to 25.0 million tonnes in 2002, growing at a rate of 7.8% p.a. or more than double the total world oils and fats production growth of 3.5% p.a. during this period. In fact, the growth of palm oil output exceeded that of oilseeds production which only expanded moderately by 3.7% p.a., despite a harvested area for the former which expanded 26 times more than the oil palm mature area. As a result, the global oils and fats market has grown accustomed to the ever increasing availability of palm oil to meet the rising oils and fats demand.

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The significant expansion in palm oil production surpassed the growth of even the largest produced oils and fats, *i.e.* soyabean oil which registered an annual growth of 5.5%. Other major oils and fats also grew at a slower pace compared to palm oil, namely, rapeseed oil (6.3% p.a.) and sunflower oil (3.0% p.a.). In the case of animal oils and fats, production only grew marginally by 1.6% p.a., whilst its share of total oils and fats production declined by 20.4% during the same period, thus, maintaining vegetable oils as the dominant category.

The share of palm oil production in the world oils and fats complex has increased markedly by five-fold from 4% in 1962 to 20.8% in 2002, as compared to the only two-fold increase experienced by soyabean oil during the same period. The sharp increase in palm oil output was mostly triggered by continued worldwide expansion of the oil palm planted area and the mature area coming into production as well as growing world demand for vegetable oils (*Table 1*).

Oil palm by virtue of being a perennial crop can always be counted upon as a steady source of vegetable oil to breach the gap in the supply shortfall of seasonal oilseed crops, which are affected by agricultural policies, farmers' annual planting decisions and the vagaries of weather. Rarely does palm oil experience an output decline due to climatic changes. In the last 40 years, the global supply of palm oil has quadrupled and in the rare occasions when production did decline, as was the case in 1998, it was due to the *El Nino* phenomenon.

The status of palm oil as it is today in the world market is without doubt due to the significant contribution by the Malaysian palm oil industry. In fact, the country has become a role model for many other palm oil producing countries in their plans to spur economic development in the agricultural sector and to gain foreign exchange through exports of surplus production. In addition, oil palm is also featured as an important socio-economic crop in most producing countries especially for alleviating rural poverty amongst poor farmers.

Both Malaysia and Indonesia continue to remain the largest producers of palm oil, accounting for 84% of the world production in 2002. In addition, an increasing number of other palm oil producers in Asia and South America also recorded favourable growth in production, namely, Thailand, Colombia and Brazil. Coupled with this is the fact that the rapid expansion in palm oil output has been propelled by market-driven forces. In fact, the oil palm plantation industry is one of the few examples of an agricultural development in the Third World which, without any government subsidies, can successfully compete with the highly protected farmers in the G7 countries (Davidson, 2003). The sustenance of oilseeds production in developed countries, particularly soyabean in the US, is continuously being heavily subsidized.

The oil palm is the most productive crop amongst the major oil-bearing crops with a world average yield of 3.34 t of oil per hectare in 2002, followed by rapeseed oil, a distant second with 0.60 t, sunflower oil 0.48 t and soyabean oil 0.43 t. Furthermore, as a result of the inherent high yield of oil palm, only 7.5 million hectares of land were utilized to produce 25.0 million tonnes of palm oil in 2002, compared to rapeseed, sunflower and soyabean which required 23.9, 18.4 and 79.8 million hectares to produce only 13.3, 7.6 and 29.7 million tonnes of oil, respectively, the same year. In fact, each hectare under oil palm yields eight times more oil than most other major oil bearing crops.

According to United Nations projections, the world population is expected to increase by only 1.1% p.a in the next 18 years, but in absolute terms to leap by 1.3 billion to 7.54 billion by 2020. Of this number, the largest portion of the population increase will continue to take place in Asia. The comparative advantage of oil palm over oilseeds makes it the most productive and important source of vegetable oil to meet the growing needs of the growing world population particularly the

TABLE 1. PALM OIL EXPANSION IN PRODUCTION ('000 t)

Oils/fats	1962	% Share	2002	% Share	40-yr Avg. growth p.a. (%)
World oils/fats production	30 779	-	120 477	-	3.5
Palm oil	1 234	4.0	25 034	20.8	7.8
Soyabean oil	3 432	11.2	29 748	24.7	5.5
Rapeseed oil	1 163	7.5	13 326	11.1	6.3
Sunflower oil	2 294	3.4	7 611	6.3	3.0
Animal oils/fats	12 040	39.1	22 588	18.7	1.6

Sources: PORIM (1994); MPOB (2002); Oil World (various annual issues).

developing countries in Asia. This is a point that cannot be ignored since the world's available land for food production continues to diminish due to increased population, urbanization and industrialization.

It is further envisaged that with the development and commercial planting of high yielding planting materials, the palm oil industry is poised to achieve yields of up to 7-8 t of oil per hectare. Therefore, the aspiration of the Malaysian palm oil industry to achieve 35 t of fresh fruit bunch (FFB) with an oil extraction rate of 25% is not inconceivable! With such development, palm oil will continue to exert its dominance over soyabean oil despite the latter being increasingly produced through genetically modified (GM) seeds. In this regard, *Oil World* has forecasted that the world palm oil production will reach 51.0 million tonnes in 2020, exceeding that of soyabean oil. The bulk of the future growth in palm oil production is expected to come from Indonesia with its ample land and labour advantage over that of Malaysia. Therefore, it will not come as a surprise that many experts have already predicted that the palm oil industry is best placed to meet the future global oils and fats demand.

POWERHOUSE OF TRADE

Palm oil's performance in the global oils and fats trade is just as impressive. Palm oil again recorded a sterling performance, rising 9.3% p.a. to exceed the average world oils and fats exports growth of a moderate 5.0% p.a. over the 40-year period. Palm oil's growth is matched only by that of rapeseed oil, a close second at 9.1%, albeit with a smaller export volume. The growth of soyabean and sunflower oil hovered around 6.4% p.a. and 5.8% p.a., respectively, while the growth of animal oils and fats was even less, increasing only marginally by 1.0% p.a.

Besides competing with other vegetable oils to gain market share, palm oil also has to compete with oilseed imports which enjoy less protectionist policies compared to oils and fats in importing countries. This has helped increase the global oilseeds trade which is dominated by soyabean (nearly 80% of the annual oilseeds trade) for local crushing in the major importing countries, namely, China, P.R., European Union (EU) and Japan, owing to their high demand for meal. Despite the trading flexibility that the soyabean producers enjoy, the combined average export growth of soyabean oil and the oil-equivalent of imported soyabeans at 6.2% p.a. is still below the growth of palm oil achieved during this period. This implies that palm oil has stimulated vegetable oil demand in the major importing countries despite the growth in the oilseeds trade.

In tandem with the significant growth in global production, world palm oil exports rose by a hefty 35-fold, jumping from a mere 0.55 million tonnes in 1962 to 19.2 million tonnes in 2002. Palm oil took the largest share of the world oils/fats traded in the four decades (1962-2002), expanding from 9.2% in 1962 to a commendable 46.9% in 2002 compared to soyabean oil which only rose moderately from 12.8% to 21.9% in the same period. Both Malaysia and Indonesia together accounted for the lion's share of world palm oil exports during the period, with almost 90% of the total share in 2002. The sunflower oil and rapeseed oil shares of world exports grew marginally from 4.1% and 0.7% in 1962 to 5.7% and 3.1%, respectively, in 2002. However, the share of animal oils and fats shrunk sharply from 43.0% to 9.3% in the same period, thus maintaining vegetable oils as the leading category in the global oils and fats trade (*Table 2*).

Palm oil has featured prominently in the world oils and fats trade because of its large supply for exports, lower cost of production, competitive pricing and technical superiority by virtue of its use in a wide range of applications. Furthermore, with its steadily increasing supply, palm oil has not only increased in its existing markets, but has also penetrated many new markets by replacing other imported oils and fats or complementing the locally produced oils in various

TABLE 2. GROWTH OF THE PALM OIL TRADE ('000 t)

Oils/fats	1962	% Share	2002	% Share	40-yr Avg. growth p.a. (%)
World oils/fats exports	5 938	-	40 994	-	5.0
Palm oil	547	9.2	19 236	46.9	9.3
Soyabean oil	763	12.8	8 986	21.2	6.4
Rapeseed oil	39	0.7	1 278	3.1	9.1
Sunflower oil	246	4.1	2 324	5.7	5.8
Animal oils/fats	2 556	43.0	3 823	9.3	1.0

Sources: PORIM (1994); MPOB (2002); Oil World (various annual issues).

applications. The traditional markets like the EU, USA and Japan continue to import palm oil, but rapid economic development taking place in recent years has pushed developing countries to the forefront as major importers of palm oil at the expense of the developed countries. Developing countries now account for almost 80% of the total world palm oil imports compared to only 30% in the 1960s.

Many developing countries are experiencing acute shortages in oils and fats owing to limited arable land and rising demand due to their increasing population and per capita income. Only seven countries in the world are major net exporters of oils and fats. They are Canada, USA, Brazil and Argentina in the Americas, and Malaysia, Indonesia and the Philippines in Southeast Asia. Most other countries, for example, India and China, P.R., import their oils and fats requirement from these countries. Even the net exporting countries are themselves importers of palm oil for techno-economic reasons. For example, the US imported significant quantities of palm oil to the tune of 219 000 t in 2002, registering a 40-fold increase in four decades despite its position as a net exporter of soyabean oil. This suggests that palm oil can readily enhance the world oils and fats trade provided impediments to market access are removed to provide a level playing field.

Although a significant portion of the world oils and trade is done on a cash basis, innovative marketing approaches have been introduced by palm oil exporting countries with the aim of locking in a significant palm oil export volume. Both Malaysia and Indonesia have increasingly adopted counter-trade mechanisms in their palm oil export business. Such counter-trade measures will create smart partnerships between the palm oil exporting countries and their consuming countries, with the latter exporting their hi-tech products and services to the former.

Counter-trade and barter trade are also viable payment options, especially in Eastern European and African markets where foreign exchange difficulties are already a permanent feature encountered by businessmen. As such, dealing in modes of payments other than cash with markets in these regions is inevitable to overcome the problems in paying for their basic foodstuffs such as vegetable oils. Many of these countries' consumption of oils and fats is way below WHO's recommended level of 22 kg per capita/annum. Through such innovative marketing approaches, the major palm oil exporting countries, namely, Malaysia and Indonesia, have been able to effectively maintain the dominant position of palm oil in the increasingly competitive world oils and fats trading environment.

SHARP INCREASE IN CONSUMPTION

The world disappearance of oils and fats has continued its upward trend, rising 3.5% p.a. from 30.4 million tonnes in 1962 to 121.6 million tonnes in 2002 due to the increasing global population and per capita income, mainly in the developing countries. Equally, world demand is correlated to world GDP growth. The average GDP of selected major developing countries, namely, China, P.R., India and Pakistan, has been growing at faster rate of 9.5%, 5.2% and 4.2%, respectively, compared to those of the developed countries, such as the EU (1.9%) and US (2.9%).

Amongst the 17 oils and fats, palm oil consumption recorded the highest growth rate of 7.9% p.a. during the past 40 years, more than double the average world oils and fats consumption of 3.5%, thus underscoring once again the rapid acceptance of palm oil by consumers. Its consumption witnessed a sharp increase of 21-fold from 1.2 million tonnes in 1962 to 25.3 million tonnes in 2002. Meanwhile, soyabean oil, despite being the most consumed oil, grew by 5.6% and could only muster a nine-fold increase to 29.9 million tonnes in 2002. Sunflower oil and rapeseed oil recorded growths of 6.3% and 3.2%, respectively, while animal oils and fats increased only marginally by 1.6% p.a. in the same period.

In line with its fastest growth rate, palm oil's market share of world oils/fats consumption surged from 4% to 20.8% during 1962-2002, whilst soyabean oil could register only a moderate expansion from 11.1% to 24.6% in the same period. Rapeseed oil's share of world consumption grew from 3.8% to 11.1%, whilst that of sunflower oil declined slightly from 7.1% to 6.4% during the 40-year period. The share of animal oils and fats also decreased to 18.5% in 2002 due to rising health concerns amongst consumers. This only further confirmed the growing importance of palm oil as a global powerhouse in the world oils and fats consumption (*Table 3*).

COMPETITIVENESS

Palm oil is priced competitively vis-à-vis other major oils and fats in the world market. Generally, palm oil trades at a price discount to other competing oils and this discount may widen or narrow based on the dynamics of the supply and demand situation. The annual average price relationship between crude palm oil (CPO) and its main competitor, *i.e.* crude soyabean oil (SBO), from 1962 to

TABLE 3. PALM OIL – RISING CONSUMPTION ('000 t)

Oils/fats	1962	% Share	2002	% Share	40-yr Avg. growth p.a. (%)
World oils/fats consumption	30 394	-	121 551	-	3.5
Palm oil	1 204	4.0	25 261	20.8	7.9
Soyabean oil	3 368	11.1	29 911	24.6	5.6
Rapeseed oil	1 152	3.8	13 462	11.1	6.3
Sunflower oil	2 169	7.1	7 729	6.4	3.2
Animal oils/fats	11 990	39.4	22 512	18.5	1.6

Source: Oil World (various annual issues).

2002 is illustrated in *Figure 1*. Although the price relationships between vegetable oils changes daily, *Figure 1* indicates broadly the price relationship between the two major competing oils in the world oils and fats market.

In the past 40 years (1962-2002), CPO has been at a price discount to SBO for 32 years with the discounts ranging from a low of US$ 2 to an extreme US$ 157/t. Being a perennial crop, the rapid increase in palm oil production has undoubtedly contributed significantly to the world supplies of oils and fats. However, above normal increases in production in some years, resulting in a sharp build-up in stocks, have put tremendous pressure on palm oil prices in the world market as illustrated in *Figure 1*. However, the price discounts experienced by palm oil are not totally due to market forces, but also to policy decisions in importing countries to impose hefty discriminatory import tariffs on palm oil. Thus, for palm oil to compete at least on a level playing field in the importing countries, it has no alternative but to be sold at price discounts which are really unjustified.

On the other hand, there have been occasions during the past 40 years when CPO was traded at a price premium to SBO, albeit the premiums being relatively narrow, ranging from US$ 3 to US$ 64/t. This situation arose when demand for palm oil was increasing faster than that of supply such as during the mid 1990s and late 1990s.

On the whole, the competitive price of palm oil has contributed to the expansion of palm oil export demand in many developing countries, whose oils and fats needs would otherwise not have been met by the high cost of competing oils. Thus, given its price competitiveness, palm oil has been and will continue to be the vegetable oil that best meets the needs of all consumers including those of the less affluent countries.

Although in some countries, palm oil has been perceived as a poor man's oil, the palm oil industry takes pride in the fact that it has been able to leverage its cost competitiveness to reach the lower strata of society to meet their basic food need. However, there are cases where the competitive price of palm oil may not be comfortable for policy makers in countries with more expensive oils already available in the local market. In this situation, high discriminatory import tariffs are imposed on palm oil to protect the local oilseeds and oils and fats sector which are inefficient and highly protected. Even worse, a discriminatory tariff is imposed to ensure the survival of industries dependent on other imported oils. Such protective measures undertaken by some countries usually result in the consumers having to bear the brunt of high prices of cooking oils.

The competitiveness of the oil palm industry can be further enhanced by increasing the revenue from oil palm plantations through livestock and crop integration (LCI). In Malaysia, for example, 62% of the agricultural land is covered by oil palm and one of the competitive strengths is to exploit the land where oil palm is cultivated. Oil palm land can be developed into an integrated agricultural industry, with the land jointly used to produce protein and carbohydrate foods. The ability to undertake LCI with oil palm as the major crop provides further

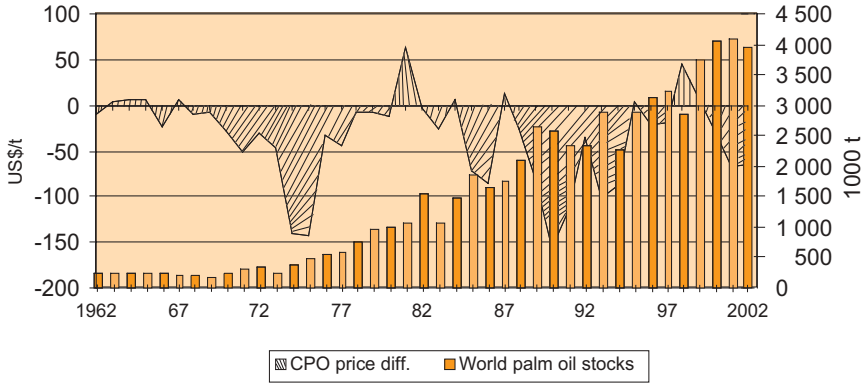

Figure 1. Crude palm oil (CPO) price premium/discount vs. *crude soyabean oil and world palm oil stocks.*

opportunity for the industry to practise diversification of its investments and enhance its competitiveness (Yusof, 2003).

The initial results of studies on double avenue planting in Malaysia have confirmed the fact that although the planting density is reduced to 136 palms/ha, the yield is not affected significantly compared to the normal planting density of 148 palms/ha. In this regard, it is possible to introduce inter-crop planting of profitable cash crops in the immature and mature periods and livestock, especially cattle, during the mature period. This would generate additional revenue per unit planted area for the whole life of the oil palm.

SUPERIOR TECHNO-ECONOMIC ADVANTAGES

The acceptance of palm oil worldwide is also due to its technically superior properties that encourage its use in a wide range of end-products. These properties have made palm oil more versatile and it is available in various fractions and refined forms to meet the specific needs of the market. At present, refined palm olein is the major form of product exported from Malaysia. Refined palm oil and refined palm stearin are also available and are suitable for various food-uses. Palm oil offers several technical characteristics desirable in food applications, such as industrial frying, because of its resistance to oxidation which contributes towards a longer shelf-life for the end-products. In addition, palm oil is also ideally suited as an ingredient in shortenings and margarines. Palm oil also has other functional attributes that make it a valuable ingredient in food formulations. In many applications, palm oil can be combined with harder fractions such as palm stearin to produce products of the required consistency without hydrogenation.

The changing trends in lifestyles and demands for consumer products based on convenience and health considerations have led to other areas of applications for palm oil and its fractions. Apart from high value-added specialty fats, new applications of palm oil in foods also include its use in emulsion-based powdered and consumer foods such as pourable margarine, mayonnaise, soup-mixes and imitation cheese. Exciting products from new processes such as red palm oil or red palm olein have been introduced as healthy cooking and salad oils.

In order to maintain continued market growth and to increase market share in the world oils and fats trade, the palm oil sector has increasingly ventured into downstream production of high value-added products in the non-food sector especially in the production of soaps, pharmaceutical products, cosmetics and other oleochemical products. In fact, the similarity in their fatty acid compositions allows palm and palm kernel oils to be used as good and competitive alternatives to tallow and coconut oil in the non-food sector.

An added advantage of using palm oil is its biodegradability attributes, thus, contributing towards environmental sustenance. It is envisaged that, with growing consideration of environmental sensitivity and the need for eco-friendly products, palm- based products will gain greater popularity. The oleochemicals sector will be the thrust of the palm oil industry in the years to come. Oleochemical products have good potential for growth with world demand expected to increase by 33% from 5.2 million tonnes in 2000 to 6.9 million tonnes in 2010.

NEW FRONTIERS FOR COMMERCIALIZATION

The palm oil industry, especially in Malaysia, is also intensifying new product development and venturing into downstream activities with greater vigour. Palm oil, being an important source of natural minor components, offers a lot of opportunities for the industry to explore new grounds, thus, giving it a competitive edge over other oils and fats. The minor components in palm oil, for example, can find their way into nutraceuticals, pharmaceuticals and food supplements. The main ones are carotenoids, vitamin E (tocopherols and tocotrienols), sterols and squalene. At present, only palm-based carotenes and vitamin E are commercially produced in Malaysia. The promising potential for minor components in the health related industries presents opportunities to prospective investors to establish value-added downstream industries to produce and market these products.

Furthermore, palm oil can also be successfully used to produce polyols, which, in turn, is used for the making of polyurethane with a multitude of industrial applications. World demand of polyurethane is expected to continue growing at a rate of 6% annually from the current 8.5 million tonnes, thus, providing a new direction for the growth of palm oil consumption. In view of this, the successful application of palm oil for polyols production creates opportunities for new applications and partial replacement of petrochemical-based polyols, thus, establishing its position once again as a dominant raw material in the non-food sector.

Palm oil, like soyabean oil and rapeseed oil, equally offers enormous potential as a

sustainable alternative fuel that is also environmentally friendly. There is no doubt that the promotion of biofuels will benefit the palm oil industry worldwide for reasons of sustainable development of the industry, reduced emissions of gases blamed for global warming, reduced dependence on fossil fuels and clean-up of the environment. Unlike fossil fuel, palm oil is a renewable resource, *i.e.*, once planted the oil palm continues its economic lifespan of up to 25 years guaranteeing supply reliability of this resource. With high yielding palms, the production capacity of such renewable resource can be further expanded.

In this regard, the Malaysian Government, for example, has initiated some moves to use palm oil as alternative fuel oil. Successful R&D breakthroughs have yielded blended CPO with medium fuel oil as an efficient alternative boiler fuel in power plants and industries. Coupled with this, the burning of RBD palm olein in diesel engines for electricity generation as well as for vehicles as blended biofuel in 5% to 10% blends with diesel has also proven equally successful. Such continued R&D breakthroughs by the palm oil sector to cater to the increasing acceptance of green fuel alternatives by governments and NGOs worldwide, yet again proves the large market potential for palm oil in the non-food sector. As such, palm oil is poised to be commercially used as a viable alternative fuel, thus, creating a safety net for its price stability.

The fibrous oil palm biomass generated from empty fruit bunches, palm press fibre, fronds and trunks is a renewable natural resource that is increasingly exploited by the palm oil industry. In Malaysia particularly, from the estimated 30 million tonnes of oil palm fibrous biomass, the empty fruit bunch offers the best prospects for commercial exploitation as raw material, for example, in the pulp and paper industry and together with shell and fibre to fuel biomass power plants and the surplus electricity to feed the national grid. In addition, the oil palm trunk has also been utilized as a cellulosic raw material in the production of panel products such as particleboard, medium density fibreboard (MDF), mineral-bonded particleboard, blockboard, plywood and furniture. In short, the use of biomass in these sectors of the palm oil industry will not only provide additional revenue to the industry but will also help achieve the long-term zero waste strategy adopted by the industry.

HEALTH AND ENVIRONMENT STRENGTHS OF PALM OIL

Consumer health concerns are increasingly manifested in trade today in the form of food standards and regulations, including labelling requirements to keep the public informed. Australia and Japan, for example, set high food standards such as the tick symbol (√) from the Australian National Heart Foundation (NHF) and Japanese *JAS* Standards on food items to meet the varied quality needs of their respective consumers. The most recent development is the growing concern over the deleterious effects of *trans* fatty acids on health. The US Food and Drug Administration (FDA) has approved the regulations to label *trans*-free oil, which will go into effect on 1 January 2006. It is here where palm oil has the edge over its competing soft oils. Palm oil, being semi-solid, need not have to undergo hydrogenation in the preparation of certain products such as margarine, shortening and frying fats. This is precisely why palm oil is increasingly used as an ideal ingredient that will be able to reduce *trans* in solid fat products. In fact, there is increased ready acceptance of palm oil in the US today due to its myriad uses and *trans*-free properties for solid fat food applications. Palm oil with its balanced saturates and unsaturated fatty acid content can also be blended with other oils to produce a balanced oil such as the *Smart Balance* (margarine) which is readily accepted in the US market.

Palm and palm kernel oil have very different chemical composition. As a result, the properties of blends of these two oils can be changed substantially by interesterification for the production of specialty fats in making various food products. Specialty fats produced from palm and palm kernel oils, especially hardened fats for the making of toffee fats, non-dairy fats and cream filling fats, are very stable against oxidation, thus, giving food processors a range of alternative raw materials to hydrogenated soft oils.

With the growing worldwide concerns over environment degradation, palm oil has taken the lead by having an industry which is exemplary in respect of being environment friendly. Increasingly, there is a greater image of oil palm emerging as an environmental friendly crop providing secondary forest cover for at least 25 years by virtue of being a perennial crop. An oil palm forest, with its perennial green cover and closed canopy, displays the main features of a tropical rainforest. Today, the total forested area and area under tree crops account for 76% or 25 million hectares of the total land area in Malaysia (32.8 million hectares). Oil palm plantations alone account for 3.67 million hectares or 62% of the total area under selected crops in the country. Such a large green vegetation cover makes an effective carbon sink for

the principal greenhouse gas, *i.e.*, it acts as a sequester of carbon dioxide. In fact, under the Kyoto Protocol, the carbon sink of oil palm can be converted to carbon credit, which can then be traded.

Furthermore, the oil palm forest also assimilates 44 t of dry matter/ha/yr compared to 25.7 t by a rainforest. Dry matter production remains high throughout the 25-year economic life cycle of the oil palm forest. One cannot say this of the oilseeds crops, which are annual crops and thus, contribute to the problem of deforestation.

As regards to fertilizers, the planting of oil palm does not degrade the soil. In fact, leguminous cover crops planted in oil palm plantations fix nitrogen in the soil, recycle organic matter, improve the soil structure, keep out weeds, reduce soil compaction and erosion and promote rainfall acceptance. About 10 t of pruned fronds are produced per hectare of oil palm per year. For example, in Malaysia about 35 million tonnes of fronds are returned to the soil each year. This translates into massive reduction of chemical fertilizer use and prevention of environmental damage. Empty fruit bunches rich in organics and potash are recycled back to the soil as mulch. On the other hand, in the case of oilseeds, planted seasonally, what it does to degrade the soil is taking crop after crop off it without replacing the lost nutrients.

With regards to pesticides, the oil palm industry makes extensive use of biological control of insect pests with predators and parasitoids, barn owls to control rats and the rearing of livestock to control weeds. In this way, the use of pesticides is far less per hectare than would be the case with oilseeds or other plantation crops.

Another important approach increasingly deployed to safeguard the environment is the eco-friendly zero burning method adopted with regard to replanting oil palm. This new technique eliminates the traditional practice of burning felled palms during replanting. The old oil palm stands are mechanically felled, windrowed and shredded, thus, allowing it to rot naturally in the avenues adding organic fertilizers to the land. This technique recycles 90-100 t of organic matter per hectare containing large quantities of nitrate, phosphate, potassium and magnesium, thus saving substantially on fertilizer cost.

A recent spate of claims unleashed by the World Wildlife Fund (WWF) that the planting of oil palm in major producing countries like Malaysia has resulted in serious damage to the surrounding environment, *i.e.* through the felling of virgin jungle area is in fact totally unfounded. This is based on the fact that the 1.0 million hectares of oil palm in Sabah accounts for only 13% of the total Sabah land area. This coincidentally is the same percentage as that of the United Kingdom land mass which is covered by cereals and it is less than the area under vines in France (1.25 million hectares).

LEVEL PLAYING FIELD

Undoubtedly, agriculture is very much a protected and subsidized sector compared to other sectors. The concerns over escalating cost of production in developed countries, food security amongst net food importing countries, mainly from the developing countries, and the need for a level playing field in international trade continue to exert a central role in shaping government policies with regard to agriculture, including the oilseeds and oils and fats sector. Hence, it was only in the Uruguay Round of multilateral trade negotiations that a serious effort was made to effectively eliminate the adverse trade distorting effects of protectionism and allow comparative advantage and production efficiency to prevail under trade rules that are fair, equitable and enforceable. These concerns continue to be addressed in the new WTO rounds of negotiations, an avenue opened to address the shortcomings of the Uruguay Round. There is much to be done.

Despite major efforts to improve agricultural trade, according to OECD, farm subsidies in 2002 remained at the same level as in 2000. In fact, support to producers in the OECD as a whole remained unchanged at 31% above world prices in 2002, the same as in 2001, it added. In the case of the US, for example, the New Farm Bill 2002 provides a staggering total of US$ 180 billion in subsidies to US farmers over the next 10 years. US farmers, according to USDA, collectively received an average US$ 20 billion p.a. in direct payments for the period 1998-2002, up from US$ 8.8 billion p.a. during 1990-1997. In 2002, the US estimates a total of US$ 21.7 billion in direct payments will be disbursed to their farmers. The US has also allocated US$ 5.7 billion under the various agricultural export assistance programmes such as PL 480 and GSM 102/103. Besides farm support, protection provided by both tariff and non-tariff barriers, including unjustified and stringent sanitary and phytosanitary (SPS) measures, remains very high.

As such, correcting this situation would lead to a substantial increase in global GDP and, subsequently, generate significant gains to developing countries. By eliminating such production and export support programmes as well as improving market access through the removal of discriminatory tariffs and non-tariffs, the world palm oil industry, particularly for major exporters like Malaysia and Indonesia, will gain more in the context of a level playing field, where the consumers will be the deciding factor in the intake of oils and fats.

PROMISING OUTLOOK

The future growth in the export trade for palm oil will depend on the continuing acceptance of palm oil products. Price competitiveness, superior technical performance and nutritional acceptability will be the key determining factors for continuing improvement in the demand for palm oil. Palm oil will continue to be competitively priced for the world market. Uses of palm oil are expanding rapidly and new uses are being discovered through R&D efforts, while more countries are becoming aware of the suitability of palm oil to serve their needs. Palm oil has gained greater acceptance among consumers worldwide. Based on recent studies, palm oil has been shown to be a wholesome, safe and nutritious oil that does not have any negative health effect. The simple concept of saturated fats raising cholesterol levels has begun to break down. Studies have indicated that certain saturated fatty acids such as palmitic acid (the predominant saturated fatty acid in palm oil) do not appear to increase serum cholesterol levels as originally perceived.

CONCLUSION

The commanding position that palm oil holds today in the world oils and fats economy is due to the fact that it offers a practical and attractive choice to importers in terms of price competitiveness and its techno-economic superior attributes for various edible and non-edible applications. The rapid expansion of world palm oil production and its assured all-year round supply availability make it the preferred choice for manufacturers worldwide, thus, compounding its position yet again as the driving force of the world oils and fats economy.

The competitiveness of the oil palm industry can be further enhanced by increasing the revenue from oil palm plantations through livestock and crop integration. Thus, the same oil palm land can also be used to supply protein and carbohydrate through integrated agriculture. In addition, the competitiveness of the oil palm can also be improved further through the exploitation of biomass and biofuel as well as new product development and downstream activities.

Palm oil is increasingly used as an ideal ingredient that will be able to reduce *trans* in solid fat products, which is a growing concern among consumers today. In fact, it is sold in the US as a health product. Besides this, there is also greater awareness of oil palm emerging as an environmental friendly crop providing secondary forest cover for at least 25 years by virtue of being a perennial crop as compared to oilseeds. In this respect, the carbon trading opportunities can be exploited to palm oil's advantage.

In the era of trade liberalization and globalization, the oil palm industry is looking forward to WTO as an avenue to bring agriculture into the mainstream of trade, with all subsidies eventually reduced or eliminated. This would create a level playing field between the developed and developing countries. In addition, importing countries also equally enjoy a further benefit from the booming palm oil trade in view of the spin-offs to their local brokerages and transportation operators, manufacturers, wholesalers, dealers and retailers.

Palm oil will undoubtedly continue to serve the needs of a broad cross-section of world consumers, especially in making a contribution to the availability of oils for adequate nutrition in many oils and fats deficient countries. In view of the scarcity of land and other resources, the most competitive and productive oil bearing crops will be at an advantage and will thus become the lead players in the world oils and fats stage. Although other oils will continue to play their role, palm oil will not only be the preferred, but also the most logical choice to meet future global demands for oils and fats.

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