Development of Palm Oil and Related Products in Malaysia and Indonesia

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Introduction

Oil palm currently occupies the largest acreage of farmed land in both Malaysia and Indonesia having overtaken rubber and coconuts respectively. The first oil palm trees planted in Malaya came from Sumatra (Indonesia). Government promotion of oil palm started in these countries in the early and late 1960s respectively. Despite similarly early commercial efforts it was Malaysia among the two that first promoted successfully oil palm cultivation and diversification. Indonesia's experience became successful particularly only after 1988.

Malaysia overtook Nigeria as the world's leading exporter and producer of palm oil in 1966 and 1971 respectively (Gopal 2001: 122; Harcharan Singh Khera, 1976; Malaysia, 1975), while Indonesia is poised to become the leading exporter and producer in the years to come. By 1986, when the Industrial Master Plan (IMP) was launched, oil palm had become Malaysia's leading agricultural commodity and third-largest export earner (Malaysia 1986). Malaysia now accounts for about half of the world production of palm oil; its plantations, processors, and manufacturers are generally regarded as operating at the industry's technological frontier. Malaysia evolved from simple cultivation and crude oil processing to become the industry's leading innovator,

controlling the industry's value-added chain. Oil palm had become the prime commercially cultivated crop in Indonesia since 2003.

Our examination of the development and export expansion of the oil palm industry in Malaysia offers lessons for Sub-Saharan Africa, where cooking oil was first extracted from oil palms (in western and central Africa) and where the industry originated. Palm oil remains a major consumption item in those economies, but although climatic and soil conditions there are ideally suited for oil palm cultivation, Malaysia was able to displace Nigeria as the major producer of oil palm. Policy recommendations derived from Malaysia's success should help improve the cultivation, processing, diversification, and export of the commodity in Africa.

The framework adopted here examines the role of policy instruments and how those instruments, and the institutions they create, affect firms. We focus on government-led strategies to engender growth and structural change, how government policy can create or transform structural conditions to induce desired conduct in firms (Scherer, 1985; Porter 1990; Lall, 2001), and how high-tech institutions help stimulate innovative activities in economies on a national scale (Freeman, 1989; Lundvall, 1992; Nelson 1993).

The paper traces the critical drivers that helped make Malaysia and Indonesia leading exporters of palm oil and related products in the world. In the case of Indonesia certain policies also acted as barriers to the development of the industry. Three pillars support our analysis. The first consists of the policy instruments and institutions that were created to support the industry. The second involves network connections and coordination among economic agents directly related to the operations of palm oil firms.

Those connections helped resolve information flow and allocation problems among firms. The third pillar concerns developments at the firm level (including plantations and smallholdings), where production is carried out. The focus here is on learning and innovation and the extent to which production strategies have integrated workers participation in these processes.

We examine the sources of technical change in the industry and how Malaysian and Indonesian firms have confronted change as latecomer learners and as innovators. Owing to the process-based nature of the industry, much of the change involved efficiency-driven techniques designed to boost quality and speed delivery. Technology also contributed to the development of new uses for processed palm oil and by-products such as kernel oil and oil palm waste. Although the empirical evidence is sketchy, the firm-level study suggests that human resource practices in both countries simply focus on reducing injury and raising productivity.

This paper begins with an introduction of the oil palm sector, which provides compelling reasons for the paper. Next, it continues with a discussion of industrial structure, government policies and institutions. This is followed by an investigation to the barriers and drivers of export expansion and finally the conclusion to this paper.

Government Policy

Oil palm cultivation and downstream processing has enjoyed considerable government support in Malaysia and Indonesia. Especially in Malaysia government efforts have been dominant as Export Oriented interventions were instrumental in the deliberate shift from CPO to PPO production, and providing the leadership necessary to motivate private firms to participate in new product development. In Indonesia,

government efforts consisted of Import Substitution interventions to stabilize the domestic price of cooking oil, which consequently were less successful in creating a dynamic environment to encourage the development of forward linkages and new product development.

Under colonial rule the government emphasized plantation cultivation for CPO extraction primarily for export markets. After independence in 1957, government intervention focused on increasing value added, boosting exports, and alleviating poverty through land schemes. The colonial government had imposed an export tax on primary commodities, using much of the revenue to develop and maintain infrastructure (Lim 1968; Jomo 1986; Rasiah 1995). Most processing of palm oil was done in Europe. Unilever, which processed palm oil to produce cooking oil, margarine, soap, vanaspati, and detergents, established a plant in Kuala Lumpur in 1952 (Rasiah, 1995: chapter 3; Gopal 2001: 149). Singapore-owned Lam Soon established a similar plant in 1962 (Lim 1968: 42).

Early intervention

Under British rule, planters of oil palm specialized in primary production and received no subsidy or protection from the government. Specialization in primary production continued after independence. The government's first intervention came in the late 1960s, when foreign-owned estates were acquired by parastatals—among them the state economic development corporations, Permodalan Nasional (PERNAS) and later Permodalan Nasional Berhad (PNB). In the 1950s and 1960s the government extended the Rural Industry and Smallholders Development Authority (RISDA) to include oil palm

cultivation and launched FELDA and the Federal Land and Crop Authority (FELCRA) to alleviate poverty.

When launched in 1957, FELDA applied to rubber cultivation. Oil palm (375 hectares) was added in 1961 (Tunku, Shamsul, and Thong 1988). Unlike the estate cultivation, which was motivated by market expansion and the search for profit, FELDA focused on alleviating poverty while improving efficiency. In line with the Second Malaysia Plan's objective of engendering restructuring along ethnic lines, only poor Bumiputeras, primarily those with experience in agriculture, were targeted (Malaysia 1971; Arif and Tengku Mohd Ariff 2001).

Government efforts to diversify Malaysia's exports to reduce the negative effects of poor terms of trade in rubber and tin[1] focused on oil palm (Malaysia 1971, 1981, 1984; Rasiah, Osman and Rokiah, 2001). As a consequence, rubber plantations gave way to oil palm plantations (Sekhar 2000). While agricultural land use has gradually expanded, rubber acreage has declined in absolute terms (Table 1). Oil palm acreage grew from 320,000 hectares in 1970 to 3.3 million hectares in 2000.

Table 1: Malaysia - Agricultural Acreage 1970–2000 [1000 Hectares]

Crops	1970	1985	1990	1995	2000
Oil palm	320	1,482	2,030	2,540	3,338
Rubber	2,182	1,949	1837	1,679	1,590
Rice	533	655	681	673	692
Coconut	349	334	316	249	116

Source: Arif and Tengku Mohd Ariff (2001: 2).

[1] Rubber faced competition from synthetic rubber and overproduction from new plantations in Indonesia and Thailand. Tin-mining was suffering from exhaustion of reserves and the entry of new producers, especially in China and Brazil.

Instruments Of Government Coordination

Industrial policy in Malaysia's oil palm sector was carefully coordinated with the private sector. Apart from FELDA,[2] which encouraged oil palm cultivation indirectly, the first government support for oil palm cultivation came with the launch of the Palm Oil Registration and Licensing Authority (PORLA) in 1974. Until then only commercial transactions of palm oil was recorded and were governed from the United Kingdom, though pooling of output emerged in Singapore in 1953.

During World War II and until 1952, most palm oil was sold to the U.K. Ministry of Food, which determined prices on a long-term bulk contract. The Malayan Palm Oil Pool (MPOP) was started by the major palm oil producers in Singapore (which was then part of British Malaya) in 1953 (Gopal 2001: 233). Pooling locations grew as oil palm production expanded. The Joint Selling Committee (JSC), located in London, quoted prices and received supply commitments from shipping companies based on decisions made by brokers in Europe. The MPOP simply helped the coordination of pooling of scattered production units across British Malaya. The bulk pool was relatively easy to manage because the large producers gathered the output of the small producers owing to their capacity to undertake simple off-estate processing and hence output to the pool involved a fairly small number of large producers – both foreign and local.

The MPOP gave way to PORLA in 1974 as problems of coordination became too big to handle when the number of producers and their distance from pooling locations began to rise. However, pooling remained a key strategy, albeit between a collection of

[2] In addition to FELDA, the government also promoted oil palm cultivation under the land tenure systems of FELCRA and RISDA, albeit the scale was small.

estates and smallholders - because it brought scale economies in transport, processing, and storage. Smallholders brought their crops to nearby estates equipped with crude processing plants and storage facilities under FELDA. Collaboration between the planters with and without processing capabilities was established and strengthened through networks formed within the Oil Palm Growers Association (OPGA). While the role of MPOP was already falling owing to problems of coordination, the government's forays into the opening of the large land tenure program under FELDA further quickened its displacement. Resentment among FELDA's administrators over foreign plantations' control of pooling raised further calls for changes in the coordination role of MPOP. FELDA's participation in oil palm cultivation also led to the creation of the Malaysian Palm Oil Producers' Association (MPOPA), but this development changed pooling practices only by shifting the activity from London to Kuala Lumpur, where producers and a large segment of consumers were located. Transport costs alone made continued operations in London uneconomic.

Producers were assisted by the founding, in 1980, of the Kuala Lumpur Commodity Exchange (KLCE), which acts as an instrument for price setting, hedging, and dissemination of market information to reduce market risk (Mohd Arshad and Mohd Noh, 1994).

In the 1960s, research and development (R&D) in oil palm breeding began to expand after the Malaysian Department of Agriculture established an exchange program with West African economies and four private plantations formed the Oil Palm Genetics Laboratory (OPGL) (Hartley 1988; Kajisa, Maredia, and Boughton 1997: 10). The government also established Kolej Serdang, which became the Universiti Pertanian Malaysia (UPM) in the 1970s (and was renamed the Universiti Putra Malaysia in 1997),

to train agricultural and agro-industrial engineers and agro-business graduates to conduct research in the field.

Without a clearly defined quota structure, the government nevertheless promoted the appointment of Bumiputera managers on estates where they enjoyed influence and in the management of FELDA. Private plantations, too, bent to government pressure to hire Bumiputera managers, and the numbers of non-Bumiputera managers in the plantations gradually fell.

After strong lobbying from the OPGA and MPOPA, and with support from the Malaysian Agricultural Research and Development Institute (MARDI) and UPM, the government set up the Palm Oil Research Institute of Malaysia (PORIM) in 1979. PORIM was entrusted with the role to undertake R&D to support the oil palm industry.

Acting against the advice of international agencies, the government began in the late 1970s to encourage a shift from CPO to PPO. Before large-scale PPO production took off it was believed that Malaysia did not enjoy a comparative advantage in processing (Little and Tipping, 1972). But the government went against this position. In 1976 Malaysia introduced an export tax on CPO to stimulate participation in PPO production (Malaysia 1986: 31). At the same time the government raised tariffs on bleaching earth, a key input used in PPO production. Bleaching earth accounted for 40 percent of processing costs in 2000. To prevent a domino effect on prices the government tied the price of bleaching earth sold domestically with world prices. To encourage lumpy investment into refineries the government offered tax incentives on capital investment and regulated the number of refineries within the country to prevent overcapacity.

Incentives and Export Allowances

Early financial incentives for oil palm refining fell under the import-substitution initiatives of the Pioneer Industry Ordinance of 1958. This ordinance was not very successful owing to the small domestic market. But the export-oriented Investment Incentives Act of 1968 is generally regarded as the first major incentive upon which oil palm firms relied in making investment decisions (Gopal 2001: 251–252). The investment abatement allowance conferred a 40 percent abatement of corporate income tax for two years, which could be extended, and of excess profit and development taxes over eight years (Gopal 2001: 254). Palm oil refineries that obtained "pioneer status" enjoyed a tax holiday for seven years. Nine palm oil refineries obtained pioneer status between 1969 and 1974. (After 1974, palm oil refineries were no longer eligible for the pioneer status). The investment tax credit (later the investment tax allowance) allowed firms to obtain tax exemptions through capital spending. In the period 1969–78, one firm obtained a 100 percent tax exemption, 22 firms a 50 percent exemption, one firm a 30 percent exemption, and 19 firms a 25 percent exemption under the investment tax credit instrument (Gopal 2001: table 6.2).

From generous incentives for most kinds of oil palm processing, the government tightened conditions after 1978. Palm oil refining and fractionation in developed areas and not owned at least in part by Bumiputeras were removed from the incentives list. Fractionated products and cooking oil continued to qualify for a 50 percent investment tax credit (Yusof 1979, cited in Gopal 2001: 258). Margarine, vanapasti, and shortening qualified for higher tax credits. The qualifying criteria included location in underdeveloped areas and Bumiputera ownership. Even here, incentives were removed by the early 1980s.

Although the Investment Incentives Act of 1968 was very generous its application was governed along ethnic lines from the mid-1970s. The government launched the NEP with the Second Malaysia Plan in 1971 to carry out poverty alleviation and economic restructuring along ethnic lines. The Industrial Coordination Act of 1975 imposed ownership conditions on the basis of export-orientation and NEP criteria. Firms exporting all output did not have to meet the ethnic criteria of the NEP. The required share of Bumiputera equity varied with the percentage of sales going to the domestic market but is application remained arbitrary until the promulgation of the Promotion of Investment Act of 1986. Export allowances were also offered, but the relief amounted to only 5 percent (FOB value) of gross income. Quoting Malaysia (1984: 304–305), Gopal (2001: 260) argued that this incentive was essentially redundant and was used by just 15 of 52 refineries in 1982. Malaysia (1984: 306) implied that the Export Credit Refinancing scheme that offered export-oriented firms loans with preferential interest rates was more widely taken up than the export allowance by PPO firms.

Three major explanations account for the success of some of the incentives offered to oil palm processors. First, the processors were big and coordinated easily with the Ministry of International Trade and Industry (MITI), the authority offering the incentives. Second, because the major firms were also involved in oil palm cultivation and CPO, they were glad to expand into a higher-value-added segment because of the rent they enjoyed from processing downstream in relation to exporting CPO. Thirdly, firms received strong support from MITI, the Standards and Industrial Research Institute of Malaysia (SIRIM), the Malaysian Palm Oil Promotion Council (MPOPC), and PORIM to expand into PPO activities. In addition to technical and market know how (including promotional exhibitions abroad) firms were considered favorably for incentives.

Export Taxes

Gopal (2001: chapter 6) argues that the key factor behind Malaysia's export shift from CPO to PPO was the assessment of export duties on CPO simultaneously with export duty exemptions on PPO over the period 1968-84 (Table 2). Exemptions from export duties for PPO reduced government revenue to the extent that palm oil manufacturers shifted from CPO exports to PPO exports. The exemption represented a duty difference of 7.5 percent in 1968, which was sufficient to stimulate first-stage processing (Gopal 2001: 289). In addition, figure 3 also shows that the period of subsidy on PPO was high during period of 1976-80 and highest over the period 1980-84.

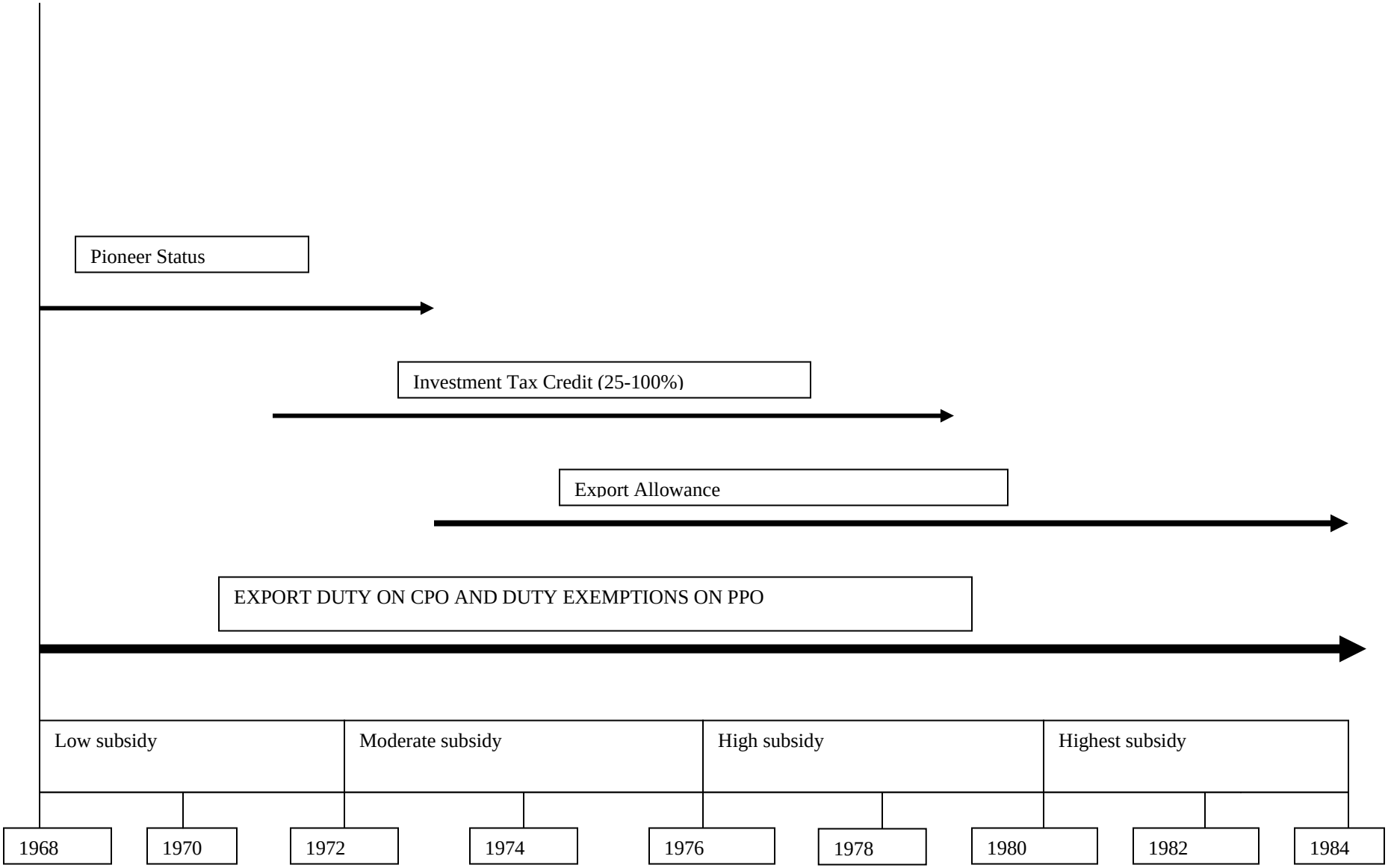
The exemptions offered to PPO producers did not entail a transfer of government revenue from non-oil-related products. This meant only that the differential export duty increased the cost of exporting CPO over PPO. In imposing the duties, the government had four goals: (1) to make PPO processing attractive; (2) to avoid overburdening CPO producers; (3) to protect duty revenue as much as possible; and (4) to avoid providing financial support from other sources, even when the industry was not profitable (Gopal 2001: 290).

As with most measures of competitiveness, past studies do not establish a clear pattern. Ali and Osman's (1986) aggregate study at the five-digit level showed that the palm oil industry was still profitable in 1981 even though its effective protection rate was negative (–62 percent). Alavi's (1996) aggregate study using measures of domestic resource cost also found oil palm processing to be competitive against international prices in 1987. Although the differentials caused problems as producers took advantage of a faulty customs mechanism that led to leakage, the duties did have their intended effect of stimulating a transition from CPO exports to PPO exports—so much so that the learning

involved in the transition helped Malaysian producers to lower costs below world prices by the mid-1980s. The new PPO producers initially acquired knowledge from equipment suppliers or purchased it through arms-length transactions. Subsequently the machinery and equipment of foreign companies were bought by Malaysian companies. In fact, IOI and Golden Hope each reported acquiring a plant from Unilever in Rotterdam in 2004.[3]

[3] Interview by author on April 20–24, 2004.

Table 2: Malaysia - Direct and Indirect Subsidies for Export-oriented PPO Products, 1968-1984



Source: Adapted slightly from Jaya Gopal (2001: Figure 6.2)

Industrial master plan

Oil palm was one of the industries flagged in the IMP of 1986 for sectoral support (Malaysia 1986). The task force appointed to implement the plan emphasized the rationalization of palm oil refining and fractionation to increase efficiency and competitiveness in world markets. In addition, it called for the development of the different segments of the industry in the value chain (Table 3). The oleo-chemical industry was targeted for special support and hence was promoted strongly with financial incentives. Incentives were also offered to promote downstream processing and production of oil palm products (Malaysia 1986: 28).

As with other sectors, the IMP set sectoral targets, which, given the low levels expected from the crisis of 1985, proved too modest and were achieved well before the target (Malaysia 1990). Only in oleo-chemicals was there a deficit.

The Government decided at the launch of the IMP PPO production and the inputs used (including bleaching earth) had already become economic and of world-class quality. Hence it started scaling down tariffs on CPO exports and bleaching earth. The government's response to detariffication was also a consequence of complaints from oil palm growers and processors. But clearly the government's prior coordination with plantations and processors allowed for the unleashing of competition as capabilities were built. This example resembles the experience Taiwan had in the development of its machine tool industry (see Fransman, 1985). The same framework was used to promote the manufacturing of acids, cartons, tins, drums, labels, adhesive tapes, plastics, and equipment used in the production of palm oil products.

Table 3: MALAYSIA - Elements of the Palm Oil Value Chain Stressed in Malaysia's Industrial Master Plans

Links in value chain				
Plantation	Crude output	Refining/fractionation	Downstream	Complementary industries
IMP (1985–95)				
Peninsular Malaysia Fresh fruit branch	CPO CPKO	Crude palm olein/palm Crude palm stearin/palm kernel stearin RBD palm oil/olein/stearin	Cooking oil, shortening, margarine, vanaspati, frying fat Cocoa butter substitute, dough fat, salad oil, confectionery fat, nondairy creamer Chocolate products	Bleaching earth, acids Cartons, tins, drums, labels, adhesive tapes, plastics Imported and locally made equipment Shipping, tankers, storage, bulk pumping stations, services at ports
IMP 2 (1996–present)				
East Malaysia Offshore Mass tissue culture Genetic engineering and biotechnology Cloning to get better pericarp breeding Mechanization	Increased supply of CPO/CPKO Specialty fats (e.g., high carotenes, high lauric, high olein)	Trans-fatty-acid-free POP Red POP Increased volume of current products	Microencapsulated POP, emulsifiers, food ingredients Powdered ice cream, salad dressing/oil Low-calorie products, palm oil–based cheese Biotechnologically modified oils/fats, vitamins E and B, carotenes Pharmaceuticals and other nutrient products	Competitively priced local products Specialized packaging materials to meet consumer and environmental requirements Locally made equipment for domestic use and export Adequate dedicated services and facilities

POP = palm oil product; CPKO = crude palm kernel oil; RDB = Refined, Bleached and Deodorized Source: Malaysia 1996: figure 6.3.

Under the IMP, oil palm refineries enjoyed a tax abatement of corporate income amounting to 50 percent of export sales. Oil palm refineries also enjoyed the double-deduction tax benefit on export sales. Through a combination of these two provisions, many export-oriented firms managed to avoid paying tax altogether. The Export Credit Refinancing facility coordinated by the Bank Negara was continued under the IMP. Unlike CPO, where the large growers that enjoyed scale economies built crude oil palm

processing (simple off-estate processing) to reduce their dependence on others, PPO required substantially more sophisticated processing know-how and final markets at a time when European buyers were reluctant to lose their grip on PPO. In the end, however, European processors either declined in significance or gradually switched to other activities as a tariff-induced fall in exports of CPO reduced supplies available to European processors. The export tariff on CPO also raised PPO costs in Europe.

Oil palm was also one of the sectors promoted under the National Agricultural Policy (NAP). Launched in 1992, the NAP was designed to address concerns over increasing imports of agricultural products and their evolution following rapid expansion in manufacturing. It aimed to stimulate agricultural growth over the period 1992–2010 (Malaysia 1996: 203). However, the NAP did not have much impact on oil palm cultivation because its focus was much more on agricultural foodstuffs.

The IMP provided generous incentives to stimulate R&D activities in manufacturing. A tax allowance of 50 percent was offered on qualifying R&D expenditures over a period of 10 years. The allowance included expenses incurred on personnel, buildings, machinery and equipment, contract R&D, and materials.

Although a specialized training institution with national coordination did not emerge for many years, the IMP did extend incentives to stimulate training of staff. One incentive, in force between 1988 and 1992, allowed for double deduction of approved training expenses. That program was replaced with the Human Resource Development Fund, created by law in 1992, and implemented in 1993 for firms with at least 50 employees. Smaller firms could still seek tax exemptions under the double-deduction scheme.

Since its founding in 1979, PORIM has been the key public and privately coordinated institution for advanced training in the sector, conducting training on chemistry, quality, analytical techniques, processing operations, transportation, and handling related to palm oil products (Gopal 2001: 266). From originally participation in largely training activities related to CPO and PPO, PORIM expanded its role into R&D after the IMP was launched in 1986. Under the IMP, PORIM's role in supporting the industry's marketing functions was expanded to include training and R&D in oleo-chemicals, specialty fats, and processed palm kernel oil were added.

Unlike the period after 1976, the government began to deregulate control over the oil refineries from 1986. The PPO industry was already regarded a competitive player and hence considered to be able to operate without subsidies and protection. This shift also explains partly why PORIM's activities also changed from PPO to new product development – e.g. oleo chemicals, specialty fats and palm kernel oil following the IMP of 1986.

Industrial master plan 2

By the time the second industrial master plan (IMP 2) was launched in 1996, Malaysia's processing capacity exceeded the supply of CPO. CPO production reached 7.8 million metric tons in 1995, substantially less than the 10.1 metric tons that the 41 processing mills could handle (Malaysia 1996: 176). IMP 2 called for productivity gains and encouraged Malaysian firms to seek raw materials from abroad. Indonesia became a major supplier of CPO.

The exhaustion of labor and land reserves in Peninsular Malaysia led to the extension of IMP 2 to East Malaysia (see Table 3). The IMP2 offered incentives for

labor-intensive and agro-processing industries located in East Malaysia. Until when FDI shares fell dramatically following the financial crisis of 1997-98, the government had scaled down incentives for labor-intensive firms located in Western Peninsular Malaysia. Among the impact of this extension was the opening of export-oriented processing and assembly plants in East Malaysia. Also, export processing zones only emerged in East Malaysia since the 1990s. In addition to the development of basic infrastructure, IMP 2 also called for the expansion of bulking, onshore pumping, storage, and handling facilities in Sarawak and Sabah (see Table 4).

IMP 2 also stimulated participation in mass tissue culture, genetic engineering, cloning, and mechanization. In the crude processing phase of the value chain, the focus was on stepping up production of CPO, CPKO, and specialty fats. IMP 2 also encouraged the production of complementary products such as packaging, machinery and equipment and related services (Table 3). The human resource, technology, financing, physical infrastructure, and tax and regulatory requirements of achieving the IMP 2 are presented in Table 4.

IMP 2 also called for the localization of machinery and equipment production, which had been largely imported (Table 3). Special support was approved to manufacture machinery and equipment for the oil palm sector. Local firms have successfully used incentives to manufacture oil processing machinery equipment: all six firms interviewed for this study asserted that domestic supply of machinery, equipment, and components—

including repair and fabrication services—has helped reduce downtime and costs arising from freight charges and exchange rate fluctuations.[4]

Table 4: MALAYSIA - Institutional support for the oil palm industry under Industrial Master Plans 1 and 2

Human resources	Technology	Financing	Physical infrastructure	Tax and regulatory agencies
IMP (1985–95)				
Training Institutes, universities On-the-job training	Adapted process and R&D technology from PORIM Local fabrication	Equity, own fund, bank, cess, offshore loan and venture capital	Cooking oil, shortening, margarine, vanaspati, frying fat Cocoa butter Substitute, dough fat, salad oil confectionery fat, nondairy creamer Chocolate products	Government incentives
IMP 2 (1996–present)				
PORIM—Institutions of higher learning to provide training, especially on downstream products Training of R&D personnel Overseas training	Adaptation, innovation and development to enhance local technology for domestic use and export	Equities, own fund, bank, access to offshore loan and venture capital	Improved onshore pumping facilities, more onshore storage, and handling facilities and utilities, particularly in Sabah and Sarawak, to meet growing demand.	Market-coordinated incentives

Source: Malaysia (1996: figure 6.3).

IMP 2 gave MPOPC the task of developing a comprehensive strategy to build Malaysia into an international leader in oils and fats and to market and distribute downstream products.[5] A privately registered but government controlled institution, MPOPC has played a major role in promoting palm oil products, including raising

[4] Interviews carried out by the author from April 24 to May 2, 2004.
[5] The launch of that initiative coincided with a campaign by the American Soybean Association to persuade the public that palm oil was nutritionally unhealthy. That campaign cut demand in developed economies. Nevertheless, the exponential growth in demand from the developing economies – especially India and China – has led to stable prices in the industry.

consumer awareness of their content, benefits, and uses. Unlike other government-owned institutions where accountability existed under the civil service domain, the MPOPC existed as private entity though it was owned by the government. The difference in the coordination was aimed at introducing private corporate management practices within a government owned institution.

Downstream activities to increase value added were a major focus of IMP 2 (see Table 3). The focus on biotechnology, in particular, has increased sharply since the plan began. Plugging the gaps in value chains and clusters required the efficient production of inputs and machinery and equipment. For that reason, as previously noted, IMP 2 emphasized the expansion of complementary industries for the oil palm cluster (see Table 4). Adding value also required the Malaysian oil palm processors to diversify into new products and to improve processing technology. To achieve that, PORIM was instructed to intensify R&D activities, including in downstream products (see table 4). Joint-venture R&D activities were encouraged to facilitate early commercialization (Malaysia 1996: 178).

Because ties among the government, plantations, and downstream processing firms are fairly strong, fluctuations in world prices are coordinated fairly smoothly. Oil palm firms have often used coordination meetings to lobby for support for their own initiatives. Also of significance is the support firms have received from the government to promote their products in developing economies (especially Africa, China, and India) and to negotiate bilateral trade agreements involving PPO exports to these economies. Given this level of cooperation, plantations tend to respond quickly to government initiatives—which help the firms in the long run. For example, a government plan launched in July 2001 to replant 200,000 hectares on which the trees were more than 20 years old was

fulfilled by June 2002. In the interval, the reduction in supply helped improve prices. Relations between the government and firms are also kept fluid to allow for quick changes in direction. For example, the government managed to halt quickly its plans, launched in 2001, to burn 500,000 tons of CPO as industrial fuel to push prices up. This quick reversal in decision was a consequence of efforts not to support prices for suppliers from abroad and the emergence of new markets from bilateral barter trade agreements with China, India and Myanmar. Without resorting to price controls or caps, the government has played an active role to ensure acceptable and stable prices in the market.

Oil palm and its downstream and complementary products have figured prominently in government policies. The focus has shifted from diversification and processing in the 1970s to expansion of exports by manufacturing (from 1986) and strengthening of sectoral clusters from 1996). The government devised strategies to widen and deepen value chains—vertically and by involving complementary industries. Stronger institutional and systemic coordination achieved those ends. Training, R&D, and marketing promotion became important from 1996. Although MITI played the pivotal government role in coordination of the oil palm value chain, MPOPC, MPOB, and producer associations also played pivotal roles.

Indonesia

Oil Palm was first introduced to Indonesia in 1848, when seedlings were planted at the Bogor Botanical Gardens. It was only in 1911, that the first commercial oil palm plantation was established in Sumatra. Injection of Dutch capital expanded oil palm cultivation in Indonesia so that it became the world's largest exporter of palm oil by 1938 (Potter, L. and Lee, J., 1998). There were 3 distinct phases of government policies

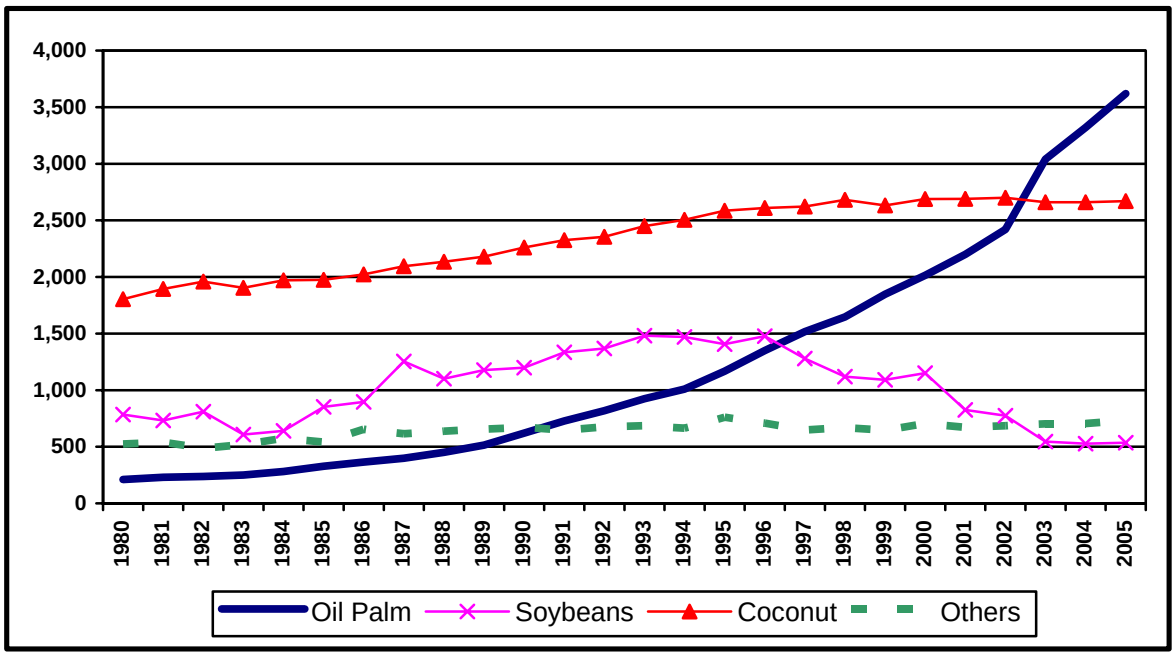
directed to this agriculture sub sector. In the first period of 1968-1988, growth resulted from direct government investments in State Owned Plantations - Perseroan Terbatas Perkebunan (PTP). The second period of 1988-1994, saw the implementation of a joint government and private sector development scheme called the Pir-trans, which promoted the growth of smallholdings. In the following decade, investment took the form of KKPA which was a government supported private sector and cooperative investment. Under this initiative, a private sector developer needed to partner with a cooperative formed by a group of smallholders to realize scale economies and efficiencies (Larson, Donald F., 1996). As a consequence of these policies, area under oil palm cultivation expanded more than tenfold from about 210,000 hectares in 1980 to 2,420,000 hectares in 2002 (Table 5). By then, oil palm has already exceeded coconut - Indonesia's traditional oilseed crop in terms of planted area. Oil palm which was only 6% of total major oilseed planted area in 1980 had by 2005 a commanding share of 43%.

Palm oil is the highest yielding oil seed crop. It yields on the average 3-4 metric tonnes of palm oil per hectare/year while other competing oil seeds yield less than 1 metric tonnes/hectare/year (Mohd. Basri Wahid, Siti Nor Akmar Abdullah and I. E. Henson, 2004). Hence in terms of production, it has exceeded all other oil seeds since 1980 (Table 6). By 2005, annual oil palm production stood at 15.4 million tonnes contributing a disproportionate 95% of total oil seed production.

The Pir-trans and KKPA schemes encouraged the oil palm smallholdings of between 2–4 hectares as a vehicle for rural development. These smallholdings were organized in the periphery of PTPs. Under this arrangement, the PTP became the nucleus which provided access to palm oil mills to the smallholdings. As a consequence, smallholdings which were non-existent prior in 1978 grew to 972,000 hectares in 1999

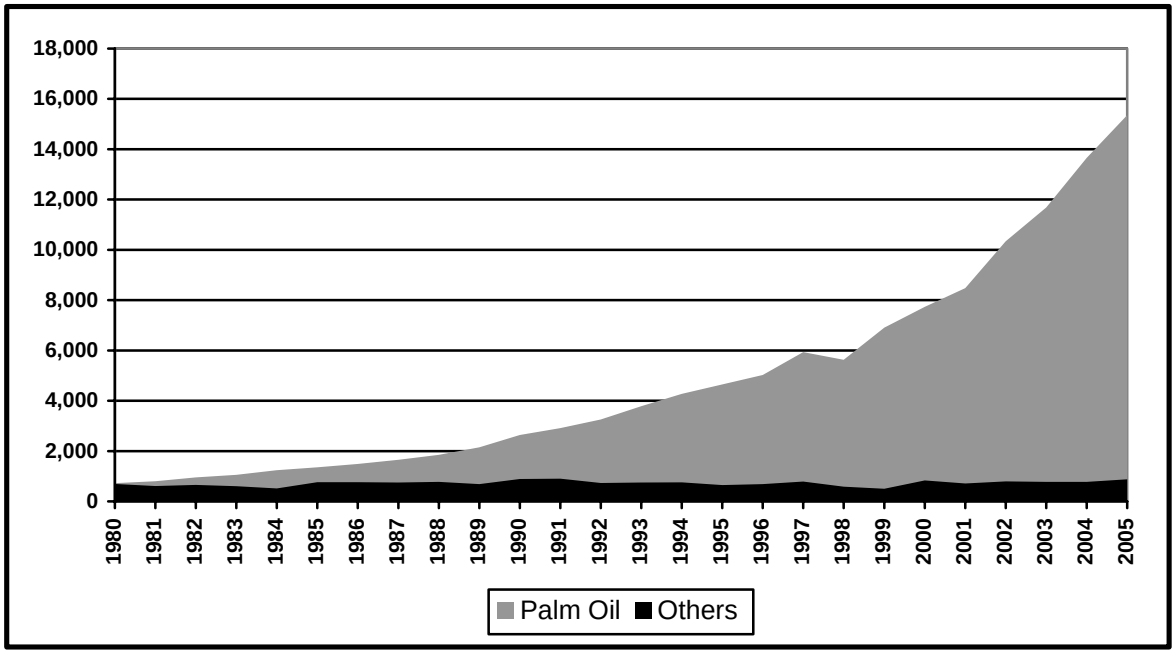
with 33% of total oil palm planted area (Table 7), while state owned and private plantations contributed 17% and 50%, respectively.

Table 5: INDONESIA: MAJOR OILSEEDS PLANTED AREA - [1000 HECTARES]



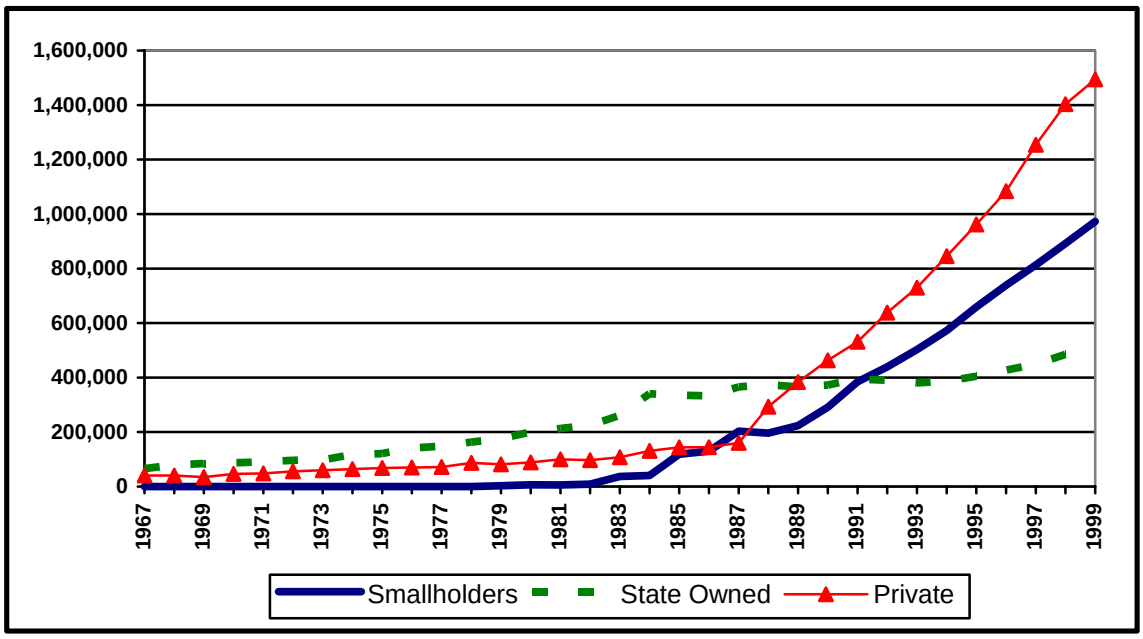
Others = Sunflower + Groundnut + Cottonseed
Source: MPOB, Oil World

Table 6: INDONESIA : MAJOR OILSEEDS PRODUCTION - [1000 METRIC TONNES]



Others = Soybeans + Coconut + Sunflower + Groundnut + Cottonseed
Source: MPOB, Oil World

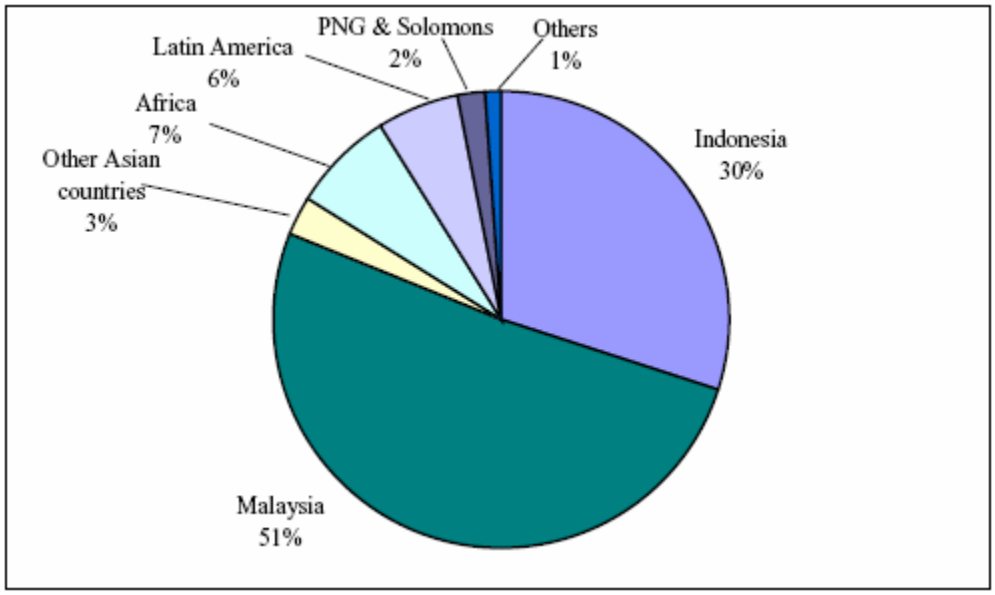
Table 7: INDONESIA: OIL PALM: PLANTED AREA [HECTARES]



Source: Directorate General of Plantation Estates (1998), Casson (1999)

The growth of the Indonesian Oil Palm sub-sector has been spectacular. By 1997, Indonesia was already the world's second largest CPO producer after Malaysia, contributing 30% to the global palm oil production (Table 7). In that same year, 2.9 million tonnes of palm oil were exported bringing in earnings valued at 1.4 billion USD, which was 31% of Indonesia's agricultural exports and 3.5% of Indonesia's total non oil and gas exports (Casson, 1999). According to the USDA website www.usda.gov, Indonesia's oil palm production is forecasted to exceed Malaysia for the first time in 2007.

Table 8: INDONESIA - Share of CPO Global Production in 1997



Source: Directorate General of Plantation Estates (1998), Casson (1999)

Indonesia was the world's lowest cost palm oil producer in 1997 as a consequence of its abundance labour and land (Table 9).

Table 9: CPO Production Costs in 1997

US$ per tonne	Colombia	Cote d'Ivoire	Indonesia	Malaysia	Nigeria	World Average
Establishment	71.2	69.5	64.3	60.7	224.5	72.1
Cultivation	91.2	136.1	72.5	75.7	113.7	79.3
Harvesting/transport	78.9	33.8	40.2	45.1	90.7	47.3
Milling costs	106.1	105.3	82.6	98.3	130.7	96.6
Kernel milling costs	6.9	7.7	7.2	7.6	8.2	7.5
Kernel oil and meal credits	(58.2)	(54.0)	(60.0)	(61.9)	(65.6)	(61.5)
Total	296.1	298.4	206.2	225.5	502.2	241.6

Source: Directorate General of Plantation Estates (1998), Casson (1999)

In 2001, Indonesia exported a total of 5.2 million tonnes of palm oil, which consists of 39% CPO and 61% PPO (Table 10).

Table 10: Palm Oil Exports 2000-2001

Destination	Malaysia				Indonesia			
	2000		2001		2000		2001	
	CPO	PPO	CPO	PPO	CPO	PPO	CPO	PPO
EU	116.5	921.5	512.9	1 093.2	1 201.8	359.4	713.3	471.7
Japan	19.7	328.7	21.5	378.6	1.7	8.5	1.2	8.3
Pakistan	2.0	1 100.3	5.9	1 126.1	6.0	9.1	-	96.5
S. Korea	-	209.3	5.8	269.5	-	2.0	-	3.1
Singapore	9.0	326.6	-	405.8	-	-	-	-
China PR	-	1 022.0	14.8	1 266.9	167.6	525.8	256.5	436.7
Egypt	13.3	421.7	0.5	452.8	-	34.8	-	95.6
Nigeria	-	85.2	-	78.7	-	51.2	-	44.6
S. Africa	-	145.7	-	163.6	-	60.7	-	135.5
Tanzania	-	27.5	-	44.1	-	87.2	-	109.2
India	215.1	1 819.6	613.2	1 415.1	-	727.0	-	806.5
Bangladesh	-	96.9	-	174.7	-	59.8	-	172.8
Yemen AR	-	73.7	-	42.9	-	44.8	-	51.6
Saudi Arabia	17.9	139.8	2.2	173.6	-	2.3	-	0.6
UAE	3.7	185.4	2.5	177.6	-	8.1	-	8.1
Others	1.2	1 779.2	96.4	2 085.9	440.6	341.2	1 076.0	693.6
Total	398.4	8 682.7	1 275.7	9 349.1	1 817.7	2 321.9	2 047.0	3 161.0

Source: MPOB, Oil World, Casson (1999)

Policies and Institutions

There are four government institutions,which provided support for the Indonesian oil palm industry. The Directorate General of Estate Crops (Direktorat Jenderal Perkebunan) formulates policy and controls The Indonesia Oil Palm Research Institute (IOPRI) and the Plantation Crops Advisory Service (Dinas Perkebunan). The Ministry of Industry and Trade formulates marketing policies, while the Department of Statistics which assembles oil palm data.

There is also the Indonesian Oil Palm Producers Association (Gabungan Pengusaha Kelapa Sawit Indonesia or GAPKI), representing state owned, private estates, co-operatives and smallholders. The Indonesian Edible Oil Association (Assosiasi

Minyak Makan Indonesia or AIMMI) represents palm and other edible oil producers and exporters.

However, the existing arrangement is fragmented, weak, and unable to effectively represent the Oil Palm industry. In an interview by the Star newspaper dated 28 September, 2005, the Chairman of Indonesian Palm Producers Association Mr. Bangun recognized the need for the Indonesian Oil Palm industry,

> *"to have a dedicated body coordinating body to look into increasing external pressure brought about by environmental, marketing, trade and social issues"*

and hence called for the setting up of a full-fledged palm oil board similar to the Malaysian Palm Oil Board (MPOB).

According to Barlow, C., Zen, Z. and Gondowarsito, R., (2003),

> *"Yet while these institutions would seem to cater for most industrial needs, there are numerous difficulties. Some employers feel inadequately represented, and many companies do not support any representative organizations. Some producer groups vie with one another, further undermining consensus in scenarios recalling conditions in Malaysia before establishment of the Malaysian Palm Oil Association. Certain bigger employers disregard standard wages, setting rates below those agreed with local governments and inciting worker strikes. Both government and other interests recognize that the current industrial structure cannot formulate effective overall policies, regretting the absence of the superior umbrella arrangement they perceive in Malaysia."*

The Indonesian counterpart of PORIM is IOPRI, which is a non-profit research institute fully funded by the government. Its business-oriented research areas covered

culture techniques, oil processing, engineering, and social economy. Additionally, the institution claimed to own the largest culture laboratory in the world. On its website www.iopri.org IOPRI reported collaboration with domestic and international bodies such as universities, PTP Nusantara, PT Perkebunan Swasta, BIOTROP, Badan Litbang Pertanian, PT Indofood, International Society of Oil Palm Breeders (ISOPB), CIRAD, Unilever, International Society of oil Palm Agronomist (ISOPA) and Gottingen University.

Fuglie, K.O., (1995) reported that the private oil palm plantations had weak connections to IOPRI. This is because public oil palm research was viewed by the large plantations as either not very effective or focused on smallholders and state owned plantations. Applied and adaptive research efforts have primarily supported the expansion of the oil palm area through the determination of optimal soil and fertility management. Private sector breeding programs have also been successful at identifying improved varieties.

Unfortunately, few policies were specifically designed to promote private sector agricultural research. There were no tax incentives for private research, and no patent protection existed prior to 1991. The most important government contribution to private research and technology transfer was through the supply of skilled technical and scientific staff. Private companies hired public sector agricultural researchers as consultants or hire them as permanent staff. However, the availability of qualified scientific personnel at the postgraduate level in agricultural fields is still very limited.

Consequently, linkages between public research and private research were limited. Public and private research institutions and companies outside of Indonesia

rather than from public research institutions within the country became the important source of innovations and technical change in the Oil Palm industry.

Price and Direct Controls

The government implemented numerous price, export quantity and domestic allocation controls for palm oil beginning from 1973 in an effort to keep domestic supply of cooking oil adequate with stable prices (Table 11).

Table 11: Indonesia - Price and Direct Controls on Palm Oil

Year	Policy	Impact
1978	Domestic allocation control - A portion CPO produced by private foreign owned plantations must be sold through the KPB-Medan, which in turn sold at a fixed price to a cartel of firms. These firms were mainly in trading but with some interests in processing.	Reduced profits of private foreign owned plantation. Transfer profit to KPB-Medan and cartel. Opportunity for cartel to purchase CPO at below market price and sell at higher domestic and world prices.
1987	(PAKDES) Deregulation of Exports of RBD Olein and Stearin.	Dismantled Cooking Oil Stabilization policy. Only firms with refining capacity could export and profits were limited by a firm's ability to influence government agencies that allocate prices and fix prices.
1988	RBD Olein Procurement for Market Operations which sets a producer price based on a delivery price for Jakarta less charges for VAT, transportation costs and a distribution cost of Rp40/kg.	The distribution cost is in fact forcing the producers to subsidise the cooking oil distributors. Transfer of income from estates and smallholders to some of the wealthiest business groups in Indonesia.
1988	(PAKNOP) Reduced Non Trade Barriers to imports of edible oils.	Price of cooking oil remained high because import tariffs still complemented the lack of competition in the industry.
1989	Cooking Oil industry was added to investment negative list.	Strengthened the hands of local processors.
1990	Annual export permits for CPO, RBD Olein and PKO replaced individual parcel permits.	Exports still hampered by domestic allocation permits.
1991	(PAKJUN) Eliminated all quantitative domestic allocation controls. Import duty of 10% plus 30% surcharge for CPO and Refined Palm Oil, while Olein and Stearin faced 10% duty.	Private firms were allowed to export CPO.
1994	Export tax on CPO, RND, Crude Olein, and RBD Olein, which was imposed on the differential between the FOB export price and a specified base price.	Despite the incidence on Export tax which dampened price fluctuations, domestic prices were still greatly affected by exchange rate fluctuations.
1994	BULOG demands that certain cooking oil	Increased profits of intermediaries at the expense of

(Sept)	producers to sell at below market price	processors and consumers.
1997	Ban on Foreign Investments in the Oil Palm Sector amid concerns of Malaysian Oil Palm owners exporting CPO to be processed in Malaysia.	Reduced competition for land at the expense of rural landowners.
1997 (July)	Simplified Export Tax with ad valorem rates of 5% for CPO, 4% on RBD and crude olein, and 2% on RBD Olein.	The structure is now in favour of the processors with a protection rate of about 2.2%. Net gain to processors but reduced relative gain to consumers.
1997 (Dec)	Indefinite ban on export CPO, Olein and Stearin products and PKO. to overcome the effects of the Financial Crises when IR depreciated by 75% causing prices of palm oil to quadruple.	Generated adverse incentives and rent seeking activities. Suppliers hoarded palm oil in anticipation of the end of the ban which would have allowed them to sell their supplies at higher prices. Smuggling was rampant. Added pressure by increasing world price while domestic price kept increasing. Lack of storage for stearin products. Reduced foreign exchange earnings when it was needed most.
1998 (Apr)	Withdrew ban and implemented an export tax rate of 40% for CPO and 35% on RBD Olein.	
1998 (Jul)	Higher export tax rate of 60% for CPO, 55% on RBD Olein and 60% on FFB.	
2003	Lower export tax rate of 3% for CPO, 1% for RBD PO, 3% for Crude Palm Olein, 1% for RBD Palm Olein	Domestic prices now in tune with world prices.

Source: Tomisch and Mawardi (1995), Marks S., Larson D. and Pomeroy J., (1998), Mohd Nasir Amiruddin (2003)

However, these controls had varied success in meeting the intended objective. An analysis by Tomisch and Mawardi (1995) concluded that during the period under review, consumers paid up to 12% premium over import parity. On hindsight, it seemed that the government was misguided even in its objective because according to Larson (1996),

> *"Cooking oil contributed less than 4% of the household budget of the poorest 20 percent of the rural population. As a result, the 21 percent increase in the prices of cooking oil in 1994 only contributed 0.3 points to the inflation rate. Further, the costs to the poorest consumers of the increase in palm oil were equivalent to a 0.4 percent decrease in their household income. It is unlikely, with average incomes growing at more than 6 percent, that the price increase generally created a burden for consumers."*

He concluded that while the scheme was effective in keeping down the price of cooking oil it lead to market distortions that did not encourage palm oil to be processed domestically. This disincentive arose from the fact that CPO and PPO were similarly taxed independent of the margin between milling and refining palm oil.

Additionally, these controls also transferred wealth from the government and palm oil producers of which about 22% were the rural poor smallholders off the Java Island to the pockets of intermediaries and the more affluent consumers, the majority of whom were on the Java Island (Table 12).

Table 12: Impact of Export Tax ($ Million), 1995

Non-state-owned oil palm estates	**–195.2**
Loss to smallholder oil palm estates due to lower CPO prices	–68.2
Loss to private oil palm estates due to lower CPO prices	–127.0
Government	**–18.1**
Tax revenues from palm oil and olein export taxes	91.8
CPO	66.9
RBD palm oil	9.0
Crude olein	0.1
RBD olein	15.8
Loss to state-owned oil palm estates due to lower CPO prices	–109.9
Palm oil refiners	**–2.5**
Gain to palm oil refiners due to lower CPO prices	238.3
Loss to palm oil refiners due to lower RBD olein prices	–240.8
Palm oil and olein importers	**–4.6**
Loss to CPO importers	–0.0
Loss to RBD olein importers	–4.6
Palm cooking oil consumers and distributors	**220.5**
Gain to distributors	102.0
Gain to final consumers	118.5

Source: Tomisch and Mawardi (1995)

Drivers and Barriers to Oil Palm Export Expansion

Given the mixed experiences, this section will discuss the drivers and barriers that have faced the oil palm industry in Malaysia and Indonesia. Policy initiatives in Malaysia

were more successful owing to a sustained long-term focus as well as the flexibility the government offered to adapt policy to meet changes in global demand. In addition, whilst government in Malaysia emphasized a shift to manufacturing and upgrading under a broad framework of industrialization Indonesia did not include oil palm for a long time in its industrialization and technological modernization efforts.

The main difference between the Malaysian and Indonesian policy initiatives were that the Malaysian policies were Export Oriented while the Indonesian policies were to encourage Import Substitution. Export Oriented policies encourages competition and therefore it is imperative for the industry to acquire scale and technical efficiencies and to innovate, which leads to dynamism. On the other hand, Import Substitution policies generate adverse incentives and rent seeking activities, which contributes to a moribund industry.

Indonesia failed to capitalize on its comparative advantage of abundance in labour and land, and lower production costs to seize leadership in the global supply of palm oil. Instead, Malaysia despite of its higher production costs has led the global supply because its Export Orientation policy encourages firms to overcome inefficiencies and develop capabilities. In the case of Indonesia, export taxes and controls on CPO and PPO to stabilize the price of cooking oil, worked perversely to fatten the profits of intermediaries to the detriment of producers, processors, and consumers (Marks S., Larson D. and Pomeroy J., 1998).

According to Tomich, T.P. and M.S. Mawardi., (1995), as a consequence of export taxes and direct controls, the nominal adjusted protection rate for palm oil processors was -2.1% for the period 1994-1995, while Marks S., Larson D. and Pomeroy

J., (1998), calculated that the nominal adjusted protection rate for palm oil processors was 10.6% for the period 1997-1998.

As a result, Malaysian palm oil refining capacity expanded so that by 2001, 96% of palm oil exports consisted of PPO, while PPO contributed to only 61% of Indonesian palm oil exports (Table 10). The comparison of CPO and PPO prices in Table 13 further illustrate Malaysia's dynamic efficiencies vis-à-vis Indonesia. It can be observed that Malaysian prices are consistently lower as a result of efficiency and competitiveness.

Table 13: Price Differential between Malaysian and Indonesian Palm Products [FOB]

	Crude palm oil			RBD palm olein		
	Malaysia	Indonesia	*Differ. CPO	Malaysia	Indonesia	*Differ. olein
Jan 01	190.00	199.68	9.68	213.85	237.01	23.16
Feb	177.00	187.59	10.59	204.48	222.04	17.56
Mar	199.50	214.60	15.10	245.25	248.05	2.80
Apr	211.50	222.15	10.65	236.10	256.66	20.56
May	192.50	210.91	18.41	227.42	244.37	16.95
Jun	194.50	224.07	29.57	249.96	255.88	5.92
Jul	260.00	317.34	57.34	343.05	369.61	26.56
Aug	304.50	337.70	33.20	337.05	401.63	64.58
Sep	292.00	271.72	20.28	277.00	313.93	36.93
Oct	221.00	230.00	9.00	248.76	261.91	13.15
Nov	274.00	279.86	5.86	307.10	316.51	9.41
Dec	281.00	293.34	12.34	319.30	332.04	12.74
Jan 02	291.00	318.35	27.35	333.75	342.02	8.27
Feb	280.50	322.65	42.15	329.00	300.66	(28.34)
Mac	291.50	317.25	25.75	329.00	361.85	32.85
Apr	303.50	330.79	27.29	335.88	361.73	25.85
May	322.00	357.94	35.94	353.88	383.41	29.53
Jun	372.00	403.82	31.82	389.65	436.85	47.20
Jul	365.50	393.14	27.64	396.77	422.02	25.25
Aug	384.50	410.01	25.51	413.60	440.61	27.01
Sep	368.00	391.93	23.93	389.37	428.99	39.62
Oct	366.00	389.48	23.48	401.56	419.82	18.26
Nov	402.00	406.28	4.28	437.40	463.40	26.00
Dec	426.00	455.91	29.91	462.00	487.40	25.40

Sources: MPOB, GAPKI, Mohd Nasir Amiruddin (2003)

Additionally, Indonesia's inconsistent and oscillating export and control policies also hindered further investment in the oil palm industry by creating an environment of

risk and uncertainty. This may be contrasted with Malaysia's consistent Export Oriented policies, which attracted and promoted investment.

In contrast to policy initiatives designed for the sole purpose of making domestic industries competitive in global markets, Malaysia's efforts to expand oil palm exports were part of an economic restructuring effort that was intended to alleviate poverty and inequality. Land development schemes attracted poor Bumiputera tenants to work on smallholdings carved out of large plots of land that had been appropriated by the state. In the end, however, smallholders and the large estates faced a similar environment in the marketplace. By the late 1980s, distortions created in markets (relative prices) to stimulate the movement of domestic firms had been removed as domestic firms successfully expanded from CPO to PPO. Differences persisted only in factor markets. The critical drivers and barriers identified here are (1) pro-active strategy to diversify exports (2) efforts to drive techno-diversification (as distinct from ordinary diversification), network cohesion, and engaging the poor in Malaysia and the lack of it in some cases and problematic protection initiatives that acted as a barrier to expansion in Indonesia.

Government initiatives to diversify exports

Realizing from historical experience with rubber and tin that dependence on narrow product lines can bring disastrous price downswings, Malaysia's government embraced diversification as a way to sustain production and exports. While rubber cultivation fell sharply from the 1960s, the area under oil palm increased dramatically. The very strategy to reduce dependence on a few exports formed the basis for strong emphasis on oil palm production. Hence, unlike the experience of several developing

economies Malaysia did not allow falling terms to trade of just a few commodities to negatively affect growth. Simultaneously, from specialization in CPO production, emphasis shifted to exports of PPO. As argued earlier, various instruments were used to encourage the shift from CPO to PPO exports.

Government support for the shift from the lower-value-added and price-volatile CPO to the more stable PPO caused a massive shift in exports from the former to the latter. Between 1960–70, Malaysia exported no PPO at all. Thereafter, exports of PPO expanded sharply from 17,000 tons in 1970 to 9.7 million tons in 2002 (Table 14), whereas exports of CPO fell from 957,400 tons in 1975 to 13,100 tons in 1985, before rising again to a new peak of 1.3 million tons in 2001. CPO exports rose sharply in 2000–2001 to offset a sharp dip in export revenue caused by falling prices. This rise was influenced strongly by bilateral barter trading arrangements organized by the Malaysian government with China, India and Myanmar.

One clear measure of the pervasiveness of the shift from CPO to PPO is the steady decline in exports of CPO as a share of CPO production. That share fell sharply from 76.1 percent in 1975 to a trough of 0.3 percent in 1985 as CPO was increasingly processed in Malaysia and exported as PPO (Table 14). Malaysia's share of world production of PPO rose from 2 percent in 1971 to a peak of 78 percent in 1982 (Table 15) and has never dipped below 62 percent since 1980. Meanwhile, share of world PPO production held by the European Union and the rest of the world declined sharply from 53 percent and 45 percent respectively in 1971 to 9 percent and 27 percent in 1995 (Table 15). The massive expansion in export-oriented PPO production helped Malaysia raise its share of all processed oil production in the world from 0 percent in 1971–75 to 10 percent

in 1995. A huge simultaneous expansion in acreage ensured that imports of CPO to satisfy domestic demand remained low.

The 50 firms interviewed for this chapter foresaw no immediate threat to their exports of oil palm and related products. Indonesia's expanses of arable land and large labor force are obviously attractive to Malaysian firms eager to secure supplies of CPO. Some Malaysian companies have already established plantations. Interviewees reported that palm oil will continue to grow as a share of edible oils. Given rapid expansion in the Chinese, Indian, and African markets, the U.S. soybean lobby, which mounted a campaign in the 1990s to persuade the public that palm oil was unhealthy, is not seen as a serious threat to check its growth.

Although the ease with which oil palm and its downstream products can be developed might be expected to encourage competitors to enter the market, climatic conditions would hamper cultivation in China and India, while infrastructure in Africa, Indonesia, Thailand, and Philippines is still insufficiently developed to pose a serious threat to Malaysian firms in the medium term. If improvements in political stability and infrastructure allow those economies to expand cultivation, efficiency and new product development are likely to improve in Malaysia as a result of the increased competition.

Table 14: Malaysia - Exports of CPO and PPO, 1960-2002 [1000 metric Tonnes]

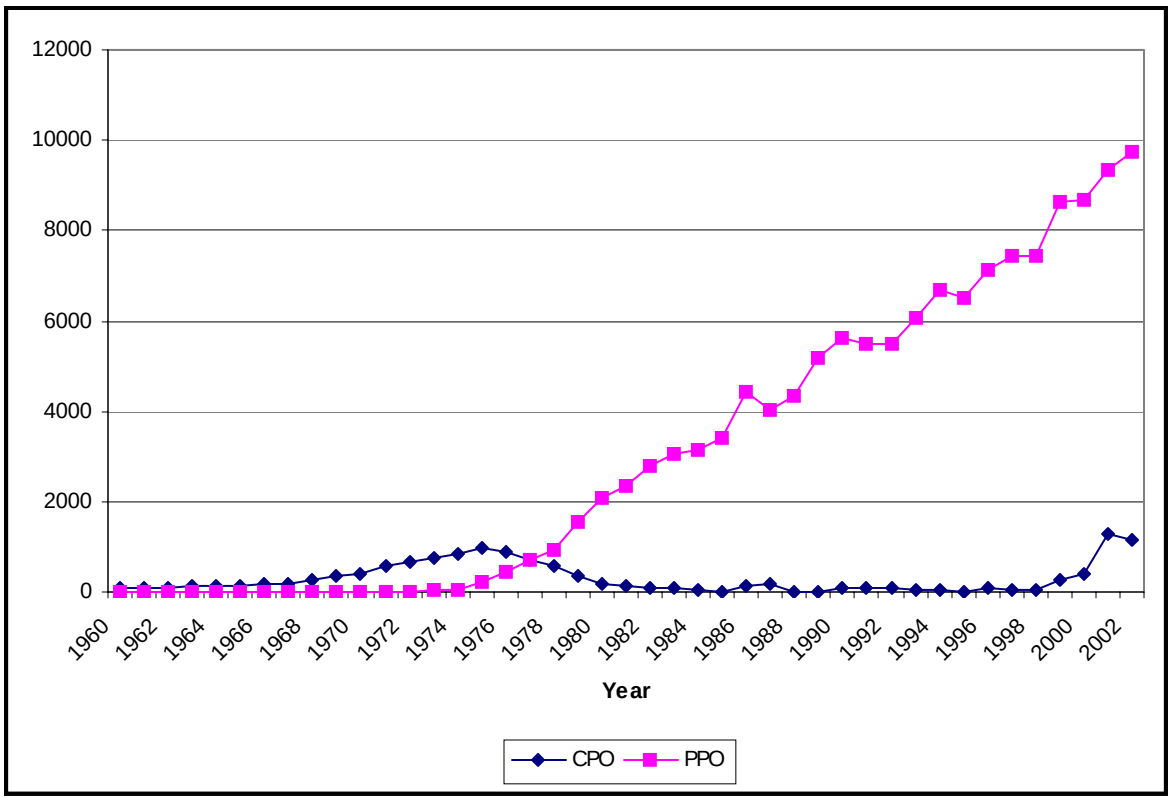
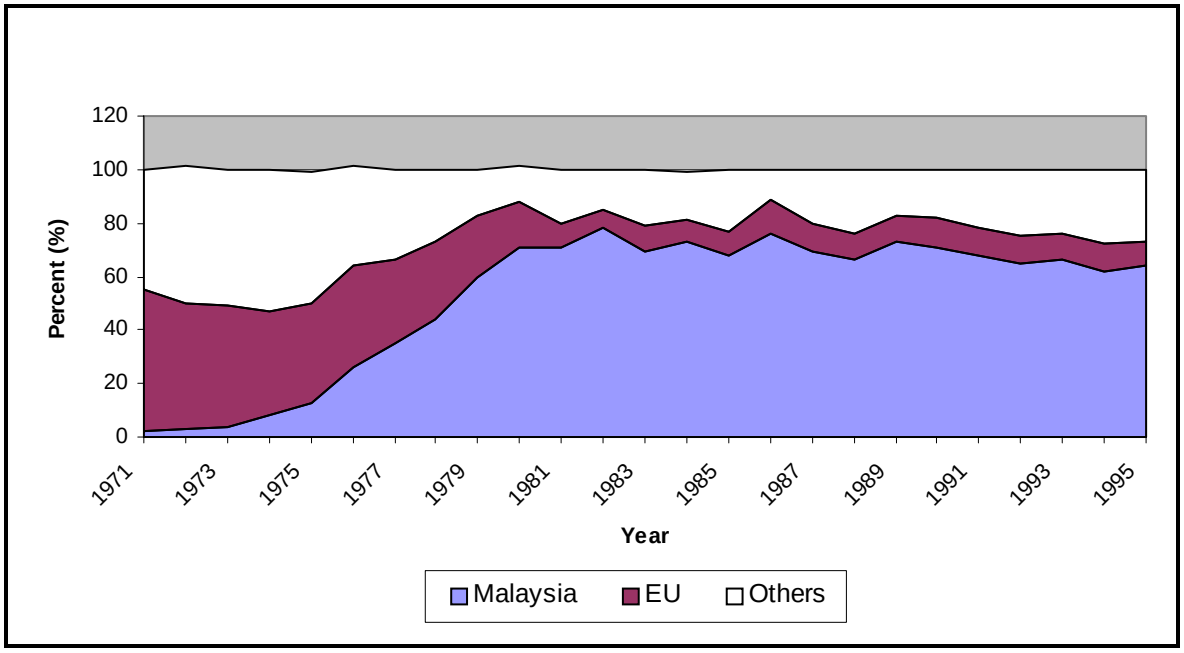


Table 15: Malaysia's share in World PPO Production, 1971-1995



Source: Drawn from Jaya Gopal (2001: Table 4.5)

Techno-diversification

Oil palm is an example of a resource-based industry in which Malaysian producers have learned to increase value added and pilot new product development. Indonesia has also begun R&D on oil palm related products. Table 16 shows oil palm related patents taken in the United States. Although the numbers pale in comparison against the United States and a number of other countries, Malaysia and Indonesia had 19 and 2 patents each in the period 1976-2005. With the benefit of extensive R&D undertaken by PORIM and universities, Malaysian producers have led the world in refining existing products and defining new ones. Thirty-five of the 50 firms interviewed believed that PORIM had played a critical role in training and market prospecting to encourage upgrading and new product development in firms. Although PORIM is owned and operated by the government, its activities—including training—are strongly influenced by private member firms.

Oil palm continues to be the one industry in which Malaysia holds a considerable lead in global markets. As the main producer of a product consumed by hundreds of millions of people, Malaysia controls the value chain from raw materials to final consumer goods and is the engine for new product development in the industry. To some extent Malaysian firms have been able to participate in product-based, rather than just price-based, competition. As first movers in new products they have no competition until rivals enter the market. Oil palm has also emerged recently as an environment friendly crop (see Basiron Yusof, 2001). Bio diesel is now used as an alternative fuel in Europe. However, the product-related innovations are rarely firm-based but rather emerge from an institutional framework and are shared by the participants in the processes. Although that dampens profit levels it increases diffusion through the value chain.

In addition to the incentives that palm oil firms enjoyed for R&D investments provided by two industrial master plans, firms enjoyed access to R&D carried out in PORIM, MARDI, and universities. Personnel in those institutions, and in MARDI, MPOB and universities, strove for product diversification, new product development, and higher value added in the oil palm chain. The three institutions above had access to RM1 billion set aside by the government under the Intensification of Research in Priority Areas (IRPA) program, which was part of the Sixth Malaysia Plan (Malaysia 1991). The five-year program was renewed in 1996 and 2001 under the Seventh and Eighth Malaysia Plans (Malaysia 1996, 2001). Sustained financial support made it possible to introduce new products in markets (e.g. bio diesel, specialty fats and vitamin A. The scope of R&D efforts expanded from oleo-chemical by-products to environment-friendly cultivation and manufacturing methods, productive recycling of waste, and raising value added in existing products.

Table 16: Palm Oil Related Patents 1976-2005

Country	Patents	Country	Patents	Country	Patents	Country	Patents
Turkey	2	Czechoslovakia	4	Brazil	13	Switzerland	152
Indonesia	2	South Africa	5	Israel	16	Belgium	155
Egypt	2	New Zealand	6	India	17	UK	227
Luxembourg	2	Ireland	6	Malaysia	19	Netherlands	252
Philippines	3	Norway	6	Australia	27	France	484
Iceland	3	Taiwan	8	South Korea	29	Germany	600
Greece	4	China	8	Sweden	38	Japan	1119
Poland	4	Finland	8	Spain	39	USA	3090
Romania	4	Mexico	8	Italy	48	Total	6592
Singapore	4	Austria	12	Denmark	65		
Thailand	4	Hungary	13	Canada	84		

Source: USPTO Website

Network cohesion

Considerable differentiation has occurred within the oil palm industry, although vertical integration has reduced the division of labor among firms. Fairly cohesive relations between firms – made easier by the participation of medium and large sized

firms – institutions and policy instruments has helped drive systemic efficiency and product technology in the palm oil industry. Firms have developed ever-closer ties with universities where R&D is undertaken, with MARDI's specialized agricultural research institution, and with associations of planters and manufacturers.

The network of institutions involved in the oil palm value chain is presented in Table 17. Close coordination between the government, on the one hand, and the associations of planters, processors, and manufacturers has led to the formulation of contingency strategies to regulate supply in response to prices. Because Malaysia dominates the industry, accounting for more than half of global exports of many oil palm products, the regulation of production has kept prices fairly stable. Unlike the situation in the early 1970s, when government began to intervene in the industry, relations among the players are no longer asymmetrical. A smooth flow of information has led to effective implementation of government policy.

The private sector has conceived and advocated for government policies in the sector. Apart from initiating the first commercial cultivation of oil palm in 1917, private companies were also responsible for several important organizational innovations. Pooling or bulking was begun by four foreign-owned private plantations to achieve scale economies. That organizational technology was subsequently adopted throughout the country—including the smallholder schemes under FELDA—and later abroad. The private sector was also instrumental in lobbying the government to coordinated overseas promotional efforts.

The government strengthened the oil palm cluster by creating three vital institutions—the Palm Oil Regulatory and Licensing Association (PORLA), the Palm Oil

Research Institute of Malaysia (PORIM), and the Malaysian Palm Oil Promotion Council (MPOPC). The first two remain under government ownership and control, while the third is a privately registered company owned by the government. While PORLA played an administrative role, PORIM helped resolve collective action problems by deepening and broadening R&D in oil palm activities. MPOPC has also played a major role in promoting market expansion. PORLA and PORIM merged in the 1990s to form the Malaysian Palm Oil Board (MPOB).

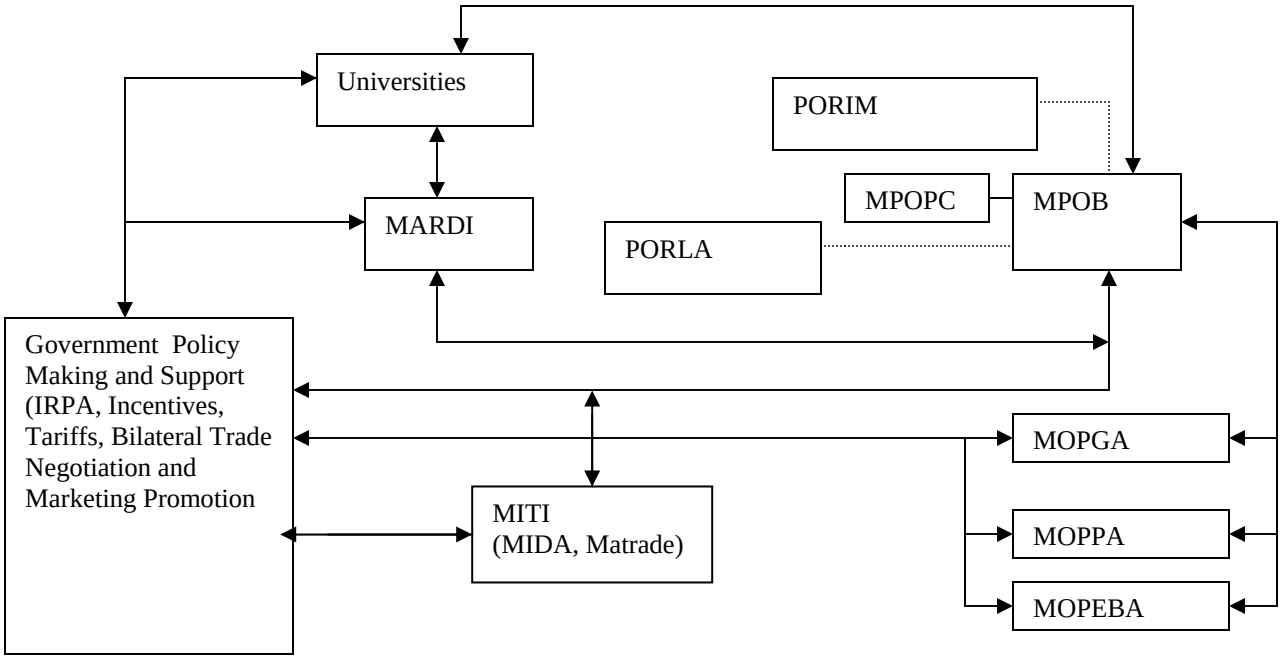
These institutions coordinated smoothly with university teaching and research units active in agriculture, and with MARDI, MITI (including MIDA and MATRADE), and industry associations (Table 17). MITI, in particular, promoted international trade of manufactured goods, exhibiting new palm-oil products developed by Malaysian manufacturers. MPOPC and MPOB were dedicated to developing the oil-palm value-added chain. A constant flow of information and discussion improved institutional support services to firms.

Interviews show that the industry associations did a good job of representing the interests of private firms and avoiding potential problems. Ex-ante discussions within the associations between the captains of industry and government officials formed the basis of a number of eventually defined policy directives in the industry. Trust was an important coordination mode that helped strengthen ties within the network. For example, the government provided RM12 per hectare to encourage growers to replant plantations with trees over 20 years old. The gesture was timed with a glut in world markets in 2000–2001 to revive prices as well as encourage productive renewal. The replanting subsidy scheme was often used to reduce supply during times of glut so that mature trees gave way to new ones when prices were low. All 35 firms queried on this point considered this

a major instrument that helped keep prices from falling sharply, while offering an incentive for firms to invest in new crops. Incentives to promote manufacturing of critical inputs, machinery, and equipment for the industry in the 1990s also attracted firms' participation. The participation of FELDA settlers (who obtained land titles) in these networks was handled through the FELDA management company. As late as in September 2005 titles offered to individual settlers only offered them ownership rights but neither the independence to sell their lots nor to change crop cultivation. If FELDA seeks to maintain parastatal governance structures to specialize on such scale-intensive commodity cultivation then these conditions may be necessary to maintain to retain effective coordination.

Consistent with Porter's (1990) idea of high-tech clusters, following the IMP2 the government encouraged strong connections among firms in the oil-palm value chain and suppliers of human capital and R&D in universities, labs (both PORIM and MARDI), and the Standards and Industrial Research Institute of Malaysia (SIRIM). Government IRPA grants have also been extensively used by university academics to undertake R&D on palm oil products with joint support from the firms. The same degree of coordination among government, firms, and knowledge institutions has not been observed in many other sectors.

Table 17: Systemic Framework



MARDI – Malaysian Agricultural Research and Development Institute
MATRADE –
MIDA – Malaysian Industrial Development Authority
MITI - Ministry of International Trade and Industry
MOPGA – Malaysian Oil Palm Growers Association
MOPPA – Malaysian Oil Palm Processors Association
MOPEOMA – Malaysia Oil Palm Edible Oil Manufacturers Association
MPOB – Malaysian Palm Oil Board
MPOPC – Malaysian Palm Oil Promotion Council
PORIM – Palm Oil Research Institute of Malaysia
PORLA – Palm Oil Regulatory and Licensing Association

Source: Compiled by Author, 2004

Welfare-oriented Elements

The Malays were not engaged in any significant numbers in oil palm cultivation—a foreign crop brought to Malaysia for commercial benefits. Most early workers on oil-palm estates were Indians who resettled from rubber estates. The picture changed considerably in the 1980s, as workers migrated to factories. Post-independence efforts by the government to build canals, drainage systems, and other infrastructure to raise agricultural productivity quickened urbanization. Plantations resorted to Indonesian labor to slow down wage pressures.

With the exception of the royalty and a small middle class, most of Malaysia's indigenous people were engaged in sedentary land tenure without clearly defined ownership rights (see Jomo, 1986). Some enjoyed access to Malay reserve land that could not be sold to non-Malays. The FELDA land scheme was one of the initiatives the government devised to absorb Malay labor displaced from farming and other rural activities. FELDA was introduced to help poor displaced Malays a few years after independence at a time when many Malays had lost access to land following the transformation of land ownership with private titles during British colonialism.

FELDA land schemes became a major instrument for alleviating poverty and equalizing income distribution. Selection criteria gave priority to poor and landless settlers, as well as age, marital status, and physical fitness. The original group came from a background of agricultural workers (22 percent), estate workers (10 percent), rubber smallholders (14 percent), and paddy farmers (12 percent) (Arif and Tengku Ariff 2001: 11). Having begun with FELDA, Malay participation in oil palm expanded to large

estates after the government acted to acquire foreign estates on the London stock market in the late 1970s.

The concept of peasant participation in plantation crops emerged from a 1953 fact-finding mission headed by Francis Mudie that recommended, among other things, separate replanting funds for estates and smallholdings (Halim 1987). The World Bank then recommended land schemes in 1955 to raise the living standards of rural people. Rubber became the first crop planted under the FELDA program in 1957. Oil palm was added in 1961, with the incorporation of 375 hectares planted to the crop (Tunku Shamsul and Thong, 1988). By 2000 oil palm acreage under FELDA had expanded to 685,520 hectares—a fifth of the acreage under oil palm cultivation in Malaysia.

FELDA has operated as a resettlement scheme. Much of its new lands are currently opened in East Malaysia. Settlers were assigned to cultivate a parcel of 10 hectares in a large, cooperatively owned tract of land (Arif and Mohd Ariff 2001: 8; Mohd. Arshad and Mohd. Noh 1994). Ownership was bestowed once settlers had worked long enough to pay for their parcel. The system had three stages. In the first stage settlers tended and harvested fields (Tunku Shamsul and Thong 1988). In stage two they managed small blocks to prepare them for greater independence. In stage three settlers became land owners. Although land ownership shifted from cooperative to individual ownership, the nature of oil palm cultivation (with significant economies of scale) meant that FELDA managed the holdings. By 2000, 48,826 settlers held individual titles to 221,938 hectares of land. By 2004, 70 percent of settlers had become owners of their roughly 10 hectare farms (Nungsari 2005). In 2000, FELDA enrolled 102,750 settlers, two-thirds of whom were engaged in oil palm cultivation (Arif and Tengku Ariff, 2001: table 8).

FELDA confronted enormous problems and complaints from the outset, causing the program to undergo considerable change as problems were solved. Those problems included the wide disparity in skills, learning ability, and income of the settlers.

FELDA's success was not assured from the outset. The income levels of FELDA settlers fluctuated but remained higher than the poverty income level between 1980 and 2000 (Arif and Tengku Ariff 2001). Serious social and health problems afflicted the settlers in the 1960s, 1970s, and 1980s. Investments in infrastructure (especially schooling and health centers) gradually reduced those problems. Productivity levels were generally low in the early decades, compared with the private estates. A flexible plan characterized by continuous appraisal reduced the productivity gap—a remarkable accomplishment given that the land allocated to FELDA settlers was less fertile than the estates.

Once it was realized that oil palm is best managed on a large scale, FELDA has operated like a large estate made up of many individual owners. FELDA's management—including trading, finance, and marketing—is handled collectively. FELDA regulations require all settlers, including those with individual titles – to operate under the governance of its central management. Hence, the individual owner neither has the freedom to grow his or her own crops nor the opportunity to sell his or her on plot.

Despite problems and complaints, FELDA became a successful model of land tenure in which cooperative ownership gave way to individual titles, with management centrally coordinated to appropriate the benefits of scale economies. Centralized management not only facilitated pooling of clearing, plowing, weeding, application of fertilizers, harvesting, and refining, but also it strengthened financing, marketing

(including promotion), and investment. Thus the centrally coordinated governance mechanism succeeded in Malaysia while similar initiatives failed in Africa. Success was due in large part to market discipline: FELDA settlers enjoyed the same sale prices of their produce as private estates.

While the FELDA model has been successful, serious challenges cloud its future. Relocating settler families in rural regions made socioeconomic sense when the farmers were poor, young and uneducated. Attaching the settlers to cooperative farms offered them income and shelter, while the government's education policies gave settlers preferential access to higher education and scholarships. A direct corollary of these initiatives is that few of the children of the original settlers show interest in the collective farming system. Because the objective of alleviating poverty has been met, FELDA farmers should be given the option to sell their small plots—either to other poor settlers or to plantations. A dynamic policy must allow for such adaptations.

Similar to Malaysia, Indonesia too attempted to alleviate rural poverty by promoting and developing its tree crop sector of which oil palm is a strategic element. This is a major initiative especially since tree crop can be grown on soil too poor to cultivate food crop such rice. The government's main policy to develop palm oil smallholding is the Pir-trans project which began circa 1978. Under this project, smallholdings of 2 hectares called plasma are organized surrounding state-owned and private plantations called the nucleus, to share infrastructure and thereby raise scale, utilization and efficiency. The government through its agriculture agencies then assists by providing financial assistance and related advice.

The success of the Pir-trans project is resounding that smallholdings which was previously non-existence had by 1999 contributed 972,000 hectares or 33% of total oil palm acreage and supported approximately 500,000 families, who were the rural poor.

Conclusions

The oil palm value chain promises to remain a major source of exports, employment and value addition in Malaysia and Indonesia. Malaysia currently holds a significant lead in production and exports, and Indonesia is expected to take over gradually. Acreage expansion in Indonesia under oil palm cultivation is faster than in Malaysia, though institutions supporting learning and innovation are far more developed in the latter. Unlike typical export-oriented manufacturing such as in garments and electronics worker-friendly practices have been limited to simply meeting improvements in yield. Reductions in work accidents, health benefits, and quality training arise under circumstances of casual employment practices. Despite steady world palm oil prices wages have remained low relative to other manufacturing industries in Malaysia owing to pressure from contract workers hired from Indonesia. Hence, developments in the industry suggest little movement toward mutual gains business arrangements.

Export diversification in Malaysia helped reduce the deleterious effects of overproduction and falling prices associated with primary commodities (Rasiah, Osman, and Alavi 2000). Indonesia enjoyed these advantages later as oil palm cultivation became a major export crop from especially the 1990s. In Malaysia oil palm cultivation under the FELDA land-distribution program to drive poverty alleviation and redistribution was a major driver of government support from the 1960s. Production innovation and diversification only became important from the 1980s. In Indonesia price controls on

cooking oil to shield the poor was a major instrument used by the government but it impacted negatively on the industry as the implicit subsidy was borne by the producers and not the government.

Between the two countries, Malaysia pursued a more proactive policy to drive learning and innovation. Instruments such as the MPOB, the IMP and IMP2, funding from IRPA grants and coordination networks with universities and other organizations helped drive new product development in Malaysia. Policies to promote the widening and deepening of the oil palm sector also benefited from effective coordination among government and industry to resolve collective action problems, expand into international markets, and develop new products. The lack of such instruments has largely restricted oil palm in Indonesia to cultivation and processing.

The oil palm industry offers substantial lessons for other Southeast Asian economies endowed with similar equatorial and tropical climatic conditions and soils—in the whole of Indonesia, Timor Leste, Cambodia, the Philippines, and Thailand. With large-scale planting, the right policies, and effective coordination oil palm cultivation can be made the center of a diversified economic cluster that includes products of high value added.[6] Diversified exports can finance the infrastructure needed to further develop the industry. Oil palm can also be planted by smallholders, though the management of scale economies is vital, to support poverty alleviation and redistribution in Malaysia.

[6] Oil palm grows well in areas receiving 80 inches of rainfall a year, temperatures of 20–30°C and in textured volcanic, alluvial, or marine clay (Gopal 2001: 133).

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