The Growth and Prospects for the Oil Palm Plantation Industry in Indonesia

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ABSTRACT

This article provides a historical political economy perspective of the Indonesian oil palm plantation sector. It aims to shed light on the process of how Indonesia took over from Malaysia in becoming the world's current largest producer of palm oil. This article argues that the regional trend of state-led development that relied on agribusiness as a major sector played a major role in the development of oil palm as an important crop in the region, especially in Malaysia and Indonesia. Indonesia specifically promoted and encouraged the expansion of oil palm as a way to fulfill state developmental aims; identifying it as a lucrative source of revenue, foreign exchange, and rural employment. With oil palm playing such an important role in the Indonesian economy, the state has outlined plans for rapid area expansion, to maintain its world dominance in the sector. Malaysian and Singaporean companies are currently major players in the Indonesian oil palm plantation sector, and continue to reap the benefits of this lucrative crop alongside local firms.

INTRODUCTION

This article provides a historical, political and economic perspective of the Indonesian oil palm plantation sector. It aims to shed light on the process of how Indonesia took over from Malaysia in becoming the world's current largest producer of palm oil. The first section focuses on South-East Asia as the major producing region for palm oil in the world. The second section then focuses on how economic regionalism of the oil palm sector, triggered by the Asian Financial Crisis (AFC), brought many Malaysian and Singaporean plantation companies into Indonesia, making Indonesia the world's largest producer of palm oil today. The final section discusses Indonesia's ambitions for continued dominance in the sector. As a whole, this article argues that the regional trend of state-led development that relied on agribusiness as a major sector played a major role in the development of oil palm as an important crop in the region, and especially in Indonesia.

SOUTH-EAST ASIA'S 'GREEN GOLD'

Throughout the decades, South-East Asian countries have viewed their abundant and fertile land as a rightful source of wealth to be exploited. In the mid 1900s, newly independent South-east Asian countries used the forestry and agricultural knowledge inherited...
from their colonial masters in their pursuit of nation-building and economic development (Gellert, 2005). States formally recognised the forestry and agricultural sector’s role as an engine for overall economic growth. For example, South-east Asian countries developed policies towards forestry and agriculture that moved beyond micro level and sector-specific concerns and took steps to ensure that the overall macro policy environment was conducive to the growth of the agricultural sector (Than, 1998). With the abundance of pristine forests in the region, logging was a major growth sector in the region during the 1960s and 1970s (Roberti, 1989). However, the steady reduction of pristine forest areas in the region due to unsustainable clearing of these forests for timber eventually slowed the industry (Sumiani et al., 2007), and the economic focus of South-east Asian countries began to shift to agribusiness in the 1980s (Roberti, 1989).

By the early 1990s, agribusiness was hailed as the region’s ‘next economic miracle’ (Roberti, 1989), with annual agricultural output of the region increasing at an average of 3.8% yearly (Roberti, 1989). The term ‘agribusiness’ came into popular use since the mid 1950s and implies the shift from ‘farming as a way of life’ to ‘farming as a business’ (Sutton, 2001). Most recently, it reflected the major increase in corporate investment in agriculture. Increasingly the term has come to describe an integrated farming system which links farm operations with both upstream and downstream manufacturing and distribution. The plantation approach within agribusiness is defined as the large scale production of tropical crops by a uniform system of cultivation under central management (Sutton, 2001). This could be through working the land directly or by setting up a contract farming system between the core plantation management and surrounding land-owning locals for added efficiency. Consequently, an increasing amount of logged land was converted into plantation and cropland for agribusiness. As output increased in the 1990s, South-east Asia’s resource wealth and relatively cheap labour sustained production enclaves for the export of primary agricultural products (Jomo, 2003), and economic strategies in the region converged around export-oriented resource exploitation (Hirsch and Warren, 1998). Countries in South-east Asia have since emerged as important producers and suppliers in the international market for agro-food (Sutton, 2001).

As part of this agribusiness boom in the region, the oil palm, grown either on freshly cleared forests or on old croplands, has developed into one of the most economically important plantation crops in South-east Asia (Koh and Wilcove, 2007). Presently, South-east Asia is the dominant region for palm oil production in the world (Wahid et al., 2004), due to the widespread suitability of the land and tropical weather for this crop (Butler et al., 2009). Palm oil is a major agro-industrial commodity for the economies of Indonesia and Malaysia (Othman, 2003), which are the two largest of palm producers in the world, contributing a combined total of more than 85% of world production (Ong and Chai, 2011). Singapore in turn is developing into a major plantation and palm oil refining investor for the region, an important trading hub for both palm oil and biodiesel, as well as a capital intensive, high technology, research and development-based service provider for the region’s palm oil sector (World Growth, 2011; Pichler, 2011). In this way, Indonesia, Malaysia and Singapore are of central importance to the world’s palm oil sector (Pichler, 2011).

Indonesian, Malaysian and Singaporean governments have been instrumental in the development of this sector. The rise of the palm oil plantation sector in South-east Asia has followed similar patterns of the previous natural resource booms in these countries, like timber and rubber. Firstly, under the legal structures inherited from the colonial era, land that belonged to forest-dwelling peoples and shifting farmers [known as Native Customary Rights (NCR) land] was not formally recognised by the governments and was thus insecure. This helped facilitate the transformation of NCR land into oil palm plantations, especially in Indonesia and Malaysia (McCarthy and Cramb, 2009).

Secondly, the attitudes of the decision-making elite in countries like Malaysia and Indonesia, that viewed natural resource exploitation as a tool to aid development, was also visible in policy narratives related to these plantations, which identified pristine forests or degraded land as ‘wasteland’ or ‘idle’ land if it was not exploited to its full potential (McCarthy and Cramb, 2009). McCarthy and Cramb (2009) note that:

"by counterpoising smallholder marginality and underdevelopment to the modernity of contemporary estate agriculture, these decision-makers provided a rationale for transforming the frontier in accordance with the agendas of politico-bureaucratic and corporate actors that favoured plantation development for personalistic economic and political purposes".
Therefore, this political will to develop through exploitation encouraged conversion, and resulted in policies that attempt to ‘rehabilitate’ lands to make productive use of them (Colfer, 2002). Thus, these government officials worked closely with plantation companies and central and local elites in the development of oil palm plantations (Masripatin et al., 2009; McCarthy and Cramb, 2009; Pichler, 2011).

In 2008, Indonesia overtook Malaysia to become the world’s biggest producer of palm oil (McCarthy, 2010; Jarvis et al., 2010; World Growth, 2011), producing over 25 million tonnes of palm oil annually (Interviewee I48, 2011) and contributing to about 51% of world production (Figure 1) (Di, 2011b). The following subsection details the importance of the oil palm sector to Indonesia.

THE OIL PALM PLANTATION SECTOR IN INDONESIA

Indonesia extends 5110 km west to east and 1888 km north to south, with a total land area of 1 890 754 ha. Indonesia has 18 110 islands with tropical climate and high rainfall. These geographical conditions make Indonesia a highly biologically affluent country, with huge agricultural potential (Widianarko, 2009). Therefore, Indonesia pinned great hopes on agribusiness to help solve a number of its more important developmental problems like poverty, overpopulation and unemployment (Barber, 1998). Development thus became the justification for natural resource exploitation, and systematic exploitation of natural resources provided the basic capital for the development process (Barber, 1998). Therefore, shortly after independence, in what was called ‘one of the largest land grabs in history’ the Indonesian government appropriated 90% of all forest land, thereby almost completely centralising government control over forest resources, negating NCR claims (Duncan, 2007).

The Indonesian government foresaw that by taking control of the land and developing commercial cash crops in the provinces, there would be a lifting of rural incomes which in turn should reduce the incidence of poverty and labour migration to the cities (Schwarz, 1990). Indeed, agriculture remains the most important sector in Indonesia in terms of employment, providing jobs for more than 50% of the Indonesian workforce. Outside Java, where most of the industry is concentrated, two-thirds of the population still work the land (Than, 1998).

Furthermore, for the Indonesian government, agribusiness was a substantial source of state revenue, a resource for political patronage, a safety valve for scarcities of land and resources in the densely populated Java, and a vehicle to spread ideological, political, security and economic objectives into the hinterland (Barber, 1998).

The export of natural resources played a central role in economic growth and quickly became the largest source of foreign currency for Indonesia (Nomura, 2009). During the mid 1960s, Indonesia was among the poorest nations in the world, with a per capita income of just USD 50 (Barber, 1998). However, with this natural resource and agricultural focus, the Indonesian economy experienced an average annual growth of 6.5% from 1967. There was a fall of -13.6% in gross domestic products (GDP) in 1998 during the AFC, but agricultural growth remained fairly constant during this time, with only finance, construction and manufacturing undergoing serious contractions that year (Brown, 2006). This process of economic development was praised by the World Bank in 1994 as ‘one of the best in the developing world’ (Barber, 1998). Currently, Indonesia is a major producer of estate crops like rubber, cocoa,
coconut, coffee, tea, and most importantly palm oil (Schwarz, 1990).

There have been three distinct stages in the process of Indonesia’s forest exploitation: first, the creation of a large timber and plywood industry (late 1980s); second, the campaign to become the world’s largest pulp and paper producer (1990s); and the third and current stage, the fast expansion of oil palm plantations (late 1990s) (Gellert, 1998). Large-scale oil palm plantations can be considered a relatively new industry to Indonesia, with serious expansion beginning in the late 1990s (Law, 2010).

Indonesia was actually the entry point of the oil palm tree into the South-East Asian region during the colonial era. The four African palms brought over by the Dutch in 1848, and planted in Buitenzorg Botanical Garden (now Bogor), Indonesia laid the foundation for the oil palm industries in both Malaysia and Indonesia (Wahid et al., 2004). Historically, Indonesia’s oil palm frontier developed from the core commercial plantation belt demarcated by the Dutch in North Sumatra, beginning in 1911 (McCarthy and Cramb, 2009; Sawit Watch, 2007). Following a slow start, the oil palm plantations gradually expanded into the surrounding areas that were conveniently close to existing plantation facilities during the 1970s, particularly to Riau in Sumatra (McCarthy and Cramb, 2009).

During the 1980s, the world price of palm oil surpassed that of rubber (McCarthy and Zen, 2010). The lucrative economic returns from palm oil in neighbouring Malaysia (who was an early mover for palm oil) attracted Indonesia to expand its oil palm cultivation (Basiron, 2007). Consequently in Indonesia, smallholders and large plantations began to shift from logging and pulp and paper production to oil palm cultivation (McCarthy and Zen, 2010). Most of these new plantations were established in Sumatra (now holding 73% of plantation area), then expanding to Kalimantan, Sulawesi, and West Papua (McCarthy and Cramb, 2009).

Crude palm oil (CPO) was considered to be a strategic commodity for Indonesia (Menteri Pertanian Republik Indonesia, 2003) not only for trade, but also because it is the raw material of the main cooking oil consumed in Indonesia. Furthermore, the CPO production process in Indonesia was highly efficient because of the relatively high yield obtained from trees which could be harvested throughout the year (3511 kg ha⁻¹) (Suharto, 2011), low labour costs, favourable climate and good soil conditions (Samsul et al., 2007). An industry study commissioned by PT Purimas Sasmita (an Indonesian oil palm plantation firm) recorded Indonesia as the most efficient producer of CPO in the world, with the cost of production 14.3% lower than the world average and 8.3% lower than Malaysia (Chalil, 2008). This resulted in lower production costs compared to other edible oils in the country (Casson, 2002). Further, with a land area six times larger than Malaysia, the Indonesian oil palm industry was able to grow rapidly (Basiron, 2007; Nature, 2007).

Indonesia started rapidly opening up oil palm plantations in Sumatra and Kalimantan in the 1980s (Indonesian Government, 1998). This was fuelled by a specific policy goal that was formulated by the Indonesian government in the 1980s to replace Malaysia as the world’s largest palm oil producer (Van Gelder, 2004). Expansion was pursued largely through the privatisation of previously state-run estates, particularly through the Estate Transmigration Programme and the Plantation Revitalisation Programme known collectively by its Indonesian acronym PIR-Trans. These programmes granted extensive new concessions to well-connected large-scale conglomerate firms typically led by Sino-Indonesians with close relations to the regime’s apex (McCarthy and Cramb, 2009; McCarthy, 2010; Casson, 2002). Some major Indonesian conglomerates that control significant land banks include Bakrie Sumatra Plantations (BSP), Duta Palma, Astra Agro, Makin Group and Musim Mas (Van Gelder, 2004).

After local Indonesian investors had established themselves in the palm oil sector during the 1980s, the government of Indonesia briefly opened up the oil palm sector to foreign investors during the early 1990s to boost the sector further (McCarthy and Cramb, 2009). This marked the beginning of the ‘regionalisation’ of South-East Asia’s oil palm sector, as investments tended to come mainly from neighbouring Malaysia and Singapore. These companies established joint ventures with local partners, and then proceeded to ‘take over’ smaller plantation companies as their subsidiaries. For example, the early 1990s saw the first entry of investments from companies like Malaysia’s Kuala Lumpur Kepong (KLK) (Kuala Lumpur Kepong Berhad, 2010) and Singapore’s Wilmar International (Compliance Advisor Ombudsman, 2009). By 1996, 45 Malaysian companies and several other Singaporean companies along with their Indonesian partners had been able to secure land banks totalling some 1.3 million hectares (Othman, 2003).

As a result, compared to the 1960s, the oil palm subsector expanded from around 106 000 ha to 2.5 million hectares by 1997. Correspondingly, production increased from 167 669 t in 1967 to 5.4 million tonnes in 1997,
amounting to an increase of around 12% per annum (Casson, 2002). By 1997, Indonesia was already producing 30% of global palm oil (Samsul et al., 2007). This opening for FDI was short-lived however, as foreign investor interest had become so strong that domestic companies had begun to complain about having to compete for land. The Indonesian government was obliged to concur with the requests of these local companies, and closed the oil palm sector to foreigners in 1997 (WALHI and Sawit Watch, 2009).

During Indonesia’s AFC-triggered period of economic crisis and political change (mid 1997 to mid 1999), the palm oil boom subsided, and from early 1998 through to mid 1999, oil palm area expansion slowed significantly (Casson, 2002), with many plantation companies suffering financial difficulties (Interviewee M41, 2010). With International Monetary Fund (IMF) structural reforms demanding the opening of Indonesian markets to foreign direct investment (FDI), foreign investment flowed into the economy, particularly into lucrative extractive and resource-intensive sectors like agribusiness and oil palm plantations (Marinova, 1999). Opening up of forest concessions to foreign companies while offering attractive foreign investment opportunities (Rifin, 2010; World Investment Report, 2009) was therefore part of the conditionality that came with IMF assistance to Indonesia after the AFC (Mathew, 2010). As part of the conditionality, foreign investors could purchase companies for the purpose of salvaging and improving the company concerned with the intention to continue development; to increase marketing or production; to increase exports; and to apply new technology (Rajenthran, 2002).

Hence, Malaysian and Singaporean business interests facing scarcity of land in their home states (Rajenthran, 2002) once again entered Indonesia after the AFC at the invitation of the Indonesian government to help take over failed Indonesian plantation companies (Interviewee M28, 2010). This was encouraged by the low prices of Indonesian firms when translated into foreign currencies, Indonesia’s new openness to merger and acquisitions, and the favourable long-term prospects of the crisis-affected Indonesia (Rajenthran, 2002). An example of such a takeover was Malaysian-based KLK who acquired 95% of PT Adei Plantation and Industry (PT API), which owned 27,760 ha of plantation land in Riau in 1997 (WALHI et al., 2009). As Figure 3 details, by 2004, around 2.7 million hectares of oil palm plantations in Indonesia was held by foreign investors. Total oil palm plantations in Indonesia that year was 3.3 million hectares (FAOSTAT, 2009), meaning that 82% of Indonesia’s oil palm plantations involved foreign investments. Out of that, 25% belonged to either Malaysian or Singaporean investors (WALHI et al., 2009).

By the year 2000, there was already a high level of economic regionalisation and interdependence between local, Malaysian and Singaporean interests in the sector. With the help of these foreign investments, the industry had recovered and production of CPO grew rapidly since then (Nature, 2007). There is now a growing number of highly efficient, modern oil palm companies (both local and foreign) operating in Indonesia, further increasing efficiency and output (Butler et al., 2009). With the collapse of many industries across the country post-crisis, the plantation sector was hailed as the saviour of the Indonesian economy. That year, the total land area of oil palm increased to about 2.2 million hectares, before increasing to 7 million hectares in 2010, effectively tripling within 10 years (Figure 2) (Wicke et al., 2011). By 2011, nearly 11 million hectares of land had been allocated for oil palm plantations (Surya and Akbar, 2010). Now, oil palm plantations represent more than 10% of agricultural land in Indonesia (World Growth, 2011).
Indonesian palm oil output is now growing at around 14% per year (Van Gelder, 2004). The prolific growth of this sector has conferred important economic benefits to Indonesia. This industry has become an important source of revenue, foreign exchange and employment (Ministry of Forestry, 2009; Sandker et al., 2007) to the government, public and private sector of Indonesia. Firstly, in terms of revenue, the flourishing palm oil industry contributes around 5% of Indonesia’s GDP annually, as shown in Figure 4 (iStockAnalyst, 2009). It also contributes substantially to government revenue, with a progressive export tax scheme where the government captures an increasing portion of gains as CPO prices climb (Di, 2011a). Planting oil palm has been estimated to yield net present values of between USD 3835 and USD 9630 per hectare per year (Lee, 2011), compared to the average of between USD 1283 and USD 1416 per hectare per year for other crops in Indonesia (Prasetyo et al., 2009).

Secondly, oil palm has become an important source of foreign exchange. Indonesia exports over 77% of its palm oil production (Jarvis et al., 2010) due to the fact that international market prices have been consistently higher than domestic ones (Chalil, 2008). The CPO industry recorded the highest growth in export revenues among all major sectors in Indonesia, with a growth rate of 93% per year (Chalil, 2008). By 2009, the export value of palm oil amounted to USD 15 billion, representing almost 9% of total export revenue (World Growth, 2011; Ewing, 2011). The main destinations of Indonesian CPO is to other Asian countries, with 80% going to China and India (Moore, 2010; Interviewee I49, 2011). There is also a significant amount of export to Malaysia and Singapore for downstream processing (Rifin, 2010).

Thirdly, the Indonesian government also regards palm oil as a vehicle for social and economic development in rural areas (Samsul et al., 2007), especially in terms of employment. The industry employs about 20 million people (Simamora, 2011); 4.5 million people through direct employment on plantations (900 000 people) and downstream processing (3.6 million people), and the rest through related service industries and remittances (World Growth, 2011). The Director General of Estate Crops reported that because of palm oil, farmers’ incomes have increased from USD 920 per household per hectare per year in 2005 to USD 1607 in 2011, or an annual increase of 12.24% (Caroko et al., 2011). In order to maintain these lucrative returns, the Indonesian government has projected and planned for a continued expansion of the sector, as is detailed in the next section.

FUTURE PROJECTIONS FOR THE INDONESIAN OIL PALM SECTOR

The palm oil industry is a very important sector for the future of the Indonesian economy. Indonesia plans to achieve annual economic growth rates of 7.5% over the period of 2011 to 2015, and expansion of oil palm plantations is among the 22 major economic activities identified by the government to reach this goal (Wibisino et al., 2011). With world commodity prices for oil palm expected to remain above the 1980-2005 average for the
next decade (Butler et al., 2009), and the new and growing demand for biofuels locally and around the world, the Indonesian government has continued to target the oil palm plantation sector for rapid expansion.

According to a Ministry of Agriculture report, Indonesia has identified 21 million hectares of land as ‘very suitable’ for oil palm development, and another 42 million hectares that is ‘suitable’ (Interviewee 149, 2011). Approximately half of all agricultural expansion in Indonesia now is due to an expansion in oil palm production (Wicke et al., 2011), with a planting rate of 400,000 ha annually (Sawit Watch, 2007). The Indonesian government has announced plans to double the area of land planted with oil palm by bringing another 7 million hectares of land under cultivation in the near future (McCarthy and Zen, 2010). Currently, 20 million hectares of new plantation permits in total have already been approved (Tarigan, 2010). Permits for about 1.5 million hectares more are being processed by government authorities, and an additional 2.1 million hectares are at the proposal stage (Caroko et al., 2011), bringing a total of almost 24 million hectares slated for oil palm development already. The government’s goal is to eventually increase its oil palm plantation area to at least 30 million hectares, to reach a CPO output of 40 million tonnes per year by 2020 (Surya and Akbar, 2010, Interviewee 148, 2011).

Indonesia has devised plans and policies to address the demand for biofuels in particular, in the light of local and global (especially the European) demand (Sawit Watch, 2007). Locally, Indonesia’s National Energy Policy 2006 (Caroko et al., 2011) has targeted that biodiesel derived from palm oil will replace 20% of the diesel consumed in the country in the near future (Zhou and Thomson, 2009). To achieve this goal, a task force was established to coordinate biofuel development in the country, called the Timnas Bahan Bakar Nabati (National Biofuel Development Team) (Caroko et al., 2011). Hence, Indonesia has introduced new plans to allocate 6 million tonnes of palm oil to the biofuel industry each year (World Growth, 2011). This policy also seeks to expand palm oil-based biodiesel production capacity from 600 million litres to 3 billion litres by 2017, and the national government has put aside USD 1.1 billion to develop up to 11 additional oil-based biodiesel plants in 2010 for this reason (Rist et al., 2010). To supply these plants, the Ministry of Forestry had identified about 22.8 million hectares of convertible forestlands that could potentially be used for biofuels production purposes (Caroko et al., 2011). In line with this, the government developed further plans in 2006 allocating 4 million additional hectares of land by 2015 to investors interested in planting new crops to specifically boost biofuels production (Greenpeace, 2007).

These projections and plans reflect the Indonesian government’s continued commitment to reap the benefits of this lucrative sector, seemingly at any cost (Interviewee 149, 2011). As argued above, these attitudes towards continued expansion and exploitation can be traced back to the natural resource exploitation trend espoused since the early days of independence in Indonesia (Barber, 1998).

With only 53 million hectares left of ‘frontier forest’ (Fatah and Udiansyah, 2009), Indonesia’s goal to increase oil palm hectarage to 30 million from the current 7 million would mean that upon completion of this expansion, only 30 million hectares of frontier forests would remain. One explanation for the push for rapid expansion is that yield per hectare of oil palm in Indonesia is not increasing, and may in fact be declining due to soil quality degradation (Cooke, 2006), so that in order to make maximum profit, continued expansion of hectarage is necessary (Suharto, 2011). Therefore, plantation companies have to continue to convert new land into plantations to keep up with demand. According to many environmental groups and scholars, this rate of conversion is unsustainable (Harrison et al., 2009; Hunt, 2010; Fatah and Udiansyah, 2009).

Another potential threat to the continued growth of the sector has been research linking commercial oil palm plantations to forest fires and haze. For example, a World Wildlife Fund for Nature (WWF) study showed that 65% to 80% of forested area burned in Indonesia was in commercial oil palm concessions (Saharjo, 1999). Burning is known as the most cost-efficient way to clear land in preparation for planting (Chiew, 2010; Then, 2010; Nesadurai, 2010), and the smoke produced by these fires often travel across national boundaries causing transboundary haze that is hazardous to health. It was widely accepted that the 1997 haze around the South-east Asian region, and the other haze events following that, were caused by smoke coming from deliberate, large-scale commercial burning for land clearance and conversion into oil palm plantations (Fairhurst and McLaughlin, 2009; Tan et al., 2009; Colfer, 2002; Caroko et al., 2011; Casson, 2002).

Environmental groups like Greenpeace and Friends of the Earth have used these arguments of deforestation and air pollution to encourage Western countries like Australia and the countries of the European Union to place various restrictions on palm oil sales there,
causing demand for the product to drop there. However, with the main destinations of Indonesian CPO being India and China (Moore, 2010; Interviewee I49, 2011), these trade restrictions are unlikely to seriously affect the upward trajectory of the Indonesian oil palm plantation sector.

CONCLUSION

Indonesia is currently the world’s largest producer of palm oil, a position that it has held for the last few years. As discussed, the agricultural sector has been an important engine for overall economic growth in the Southeast Asian region. Accordingly, this article has explored the importance of this sector to Indonesia, and explains the significant role of the state in encouraging and directing expansion of this sector. Indeed, Indonesia’s oil palm boom, is a result of a specific policy goal that was formulated by the Indonesian government in the 1980s to replace Malaysia as the world’s largest palm oil producer (Van Gelder, 2004). Furthermore, Indonesia was able to control the market by strategically opening and closing foreign investments in the sector according to need. For example, Indonesia allowed for significant influx of investment in the sector from neighbouring countries during the aftermath of the AFC, which significantly helped Indonesia on its path to recovery from the crisis. Despite concerns about deforestation and haze-causing forest fires caused by industry expansion, the oil palm sector continues to be an important source of revenue, foreign exchange, and rural employment for Indonesia, and Indonesia is currently pursuing an extensive biofuel policy to further fuel the expansion of the sector.

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