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Foreign Labor Shortages in the Malaysian Palm Oil Industry: Impacts and Recommendations

Megan Zellers Crowley

Universiti Malaya, Jalan Universiti, Kuala Lumpur, Malaysia, mzcrowle@asu.edu

ABSTRACT

Malaysia's plantation industry and economy, as a whole, has benefitted from foreign labor and remains crucially dependent upon it. Yet, this dependence can prevent optimum productivity by disincentivizing mechanization and innovation. Furthermore, foreign workers have historically filled gaps left by Malaysians seeking higher education and higher-income jobs, but evolving policies and practices in Malaysia's plantation sector, occurring alongside expansion of Indonesia's plantation sector, are changing the nature of the mechanization-versus-cheap-labor dichotomy that has long affected the industry. While there has been a fair amount of research dedicated to technical advancements in palm oil harvesting, as well as quantitative analyses of economic impacts of migrant labor across multiple industries, the current discourse lacks primary qualitative data on the impacts of recent migration trends on mechanization, productivity, safety, and worker turnover in plantations. This paper explores these questions through interviews conducted with key stakeholders from several levels of Malaysia's palm oil industry, including individuals affiliated with plantation companies, government ministries, non-governmental organizations, and universities/research institutions. Results of this analysis suggest that foreign worker inflows are insufficient to satisfy labor requirements, even as technology and farming best practices are increasingly adopted. Increased focus on genetic innovation and diversification, as well as social and educational program improvement, are necessary to address labor and productivity challenges. Moreover, a focus on replacing foreign labor with local labor is not maximally effective and should instead be shifted to retaining foreign labor and, where relevant, training Malaysians for more technical and managerial positions in the industry.

Keywords: Malaysia, palm oil, plantations, migrant labor

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INTRODUCTION

Since the colonial government began encouraging Chinese and Indian labor migration in the early 20th century, the Malaysian economy has relied heavily on foreign labor to sustain its development. Post-independence, rubber and palm oil plantation cultivation occurring alongside rapid industrialization contributed significantly to rural poverty reduction and advancement from a low-income economy to an upper middle-income economy. The agricultural sector, still a significant contributor to Malaysia's gross domestic product, remains dependent on migrant workers, largely due to labor shortages that have plagued the industry for years. According to the Malaysian Palm Oil Board (MPOB), Malaysia's primary authority on sector data, in 2010, an estimated 69 percent of industry employees were foreign workers (Abdullah, Azman, and Rahman 2011). This increased to 76.5 percent in 2012 (Azman 2013) and 78 percent by 2015, prompting researchers and industry practitioners to assert that "oil palm plantations in Malaysia are too dependent on foreign workers, notably from Indonesia" (Azman, Ahmad, and Sharudin 2015). MPOB reported that the industry was nearly 50,000 workers short of covering the approximately 4.19 million ha of planted land in 2010 (Abdullah, Azman, and Rahman 2011). Plantation land had increased to 5.74 million ha by 2016 with fewer workers seeking agricultural sector employment, further exacerbating the shortage of harvesting labor (Kushairi Din 2017). The perennial problem of labor shortages is only worsening in Malaysia as the wages and working conditions of Indonesia's plantation sector improve, potentially decreasing the motivation of Indonesian migrants to work in Malaysian plantations (Azman, Ahmad, and Sharudin 2015). In theory, labor shortages provide a strong incentive for innovation and mechanization. In practice, however, the plantation industry and the Malaysian economy, as a whole, currently finds itself in a two-pronged paradox, which inhibits its advancement. First, the economy grew significantly because of migrant labor and

remains crucially dependent upon it, but scholars suggest that migrant labor dependence prevents optimum productivity. What is more, traditional mechanization goals may not be maximally productive for palm oil plantations. Second, foreign workers have historically filled the gaps left by Malaysians seeking higher education and higher-income careers; now, in the face of foreign labor shortages, the industry struggles to recruit locals who are averse to plantation work.

In the exploration of these challenges, none can offer more relevant insights than those directly employed in the industry. This paper aims to add the voices of key industry stakeholders to the existing academic literature, analyzing the causes and effects of foreign labor shortages in the plantation sector and proposing practical steps to address them. The stakeholders' interview responses touched upon three primary themes, namely: (a) migrant labor trends and their impacts, (b) challenges with mechanization/productivity, and (c) recruitment of local labor.

Historical Overview

Many factors—including both deliberate interventions and exogenous circumstances—have combined to create the labor-deficient plantation industry seen today. The industry has undergone multiple changes in privatization and organization over time, and with these changes, the employment strategies of different plantation entities have also changed. Furthermore, a long history of migrant labor dependence, disrupted by inconsistent immigration policy, and more recently, by declining rates of Indonesian migration into Malaysian plantations, has left the industry struggling to handle the labor-intensive nature of palm oil harvesting. This combination of factors contributed significantly to changes in labor demographics over time; it is therefore prudent to begin with an overview of the causal factors associated with current labor shortages in order to more clearly understand the effects of these shortages.

The early goal of agriculture schemes in post-independence Malaysia was to increase Malay ownership of agricultural resources,

but subsequent decades saw a shift in worker demographics as the government instituted affirmative action policies and encouraged expansion into other countries to increase their land banks. After independence, the government's primary influence in agricultural management was through the Federal Land Development Authority (FELDA), an agency within the prime minister's department tasked with relocating poor rural settlers to newly developed land. Under FELDA's early programs, the government allotted plots of land to Malay smallholders and aided with oil palm cultivation in an attempt to diversify crops in case international rubber prices fluctuated too dramatically. FELDA's main investment arm, *Koperasi Permodalan*, also launched subsidiaries for processing, manufacturing, and marketing of palm oil and rubber (Aziz, Wan Hassan, and Saud 2012). However, the 1971 New Economic Policy strengthened the position of Malays through positive discrimination programs, and more Malays pursued higher education and higher-skilled jobs, moving to cities and abandoning agriculture (Abubakar 2002). Until that point, many plantations had been either FELDA schemes or foreign interests staffed almost exclusively by indentured Indian laborers.

In the 1980s, the government increasingly allowed large populations of migrants to work in jobs vacated by locals, including agricultural work. In 1984, Malaysia and Indonesia signed the Medan Agreement, which allowed male Indonesian workers to migrate to work in Malaysian plantations; subsequent agreements were signed with Bangladesh and Thailand in 1985–1986 (Abubakar 2002). By the 1990s, poverty reduction programs like FELDA's smallholder schemes were generally regarded as a success, and FELDA shifted its focus away from establishing new settlements (Kaur 2014). By this point, planting, harvesting, and other low-skilled jobs on plantations were primarily done by Indonesian migrants. Furthermore, starting in the 1980s, Malaysia established itself as one of the most significant players in Indonesia's plantation industry; by 2014, Malaysia controlled about half of the plantations in Indonesia (Aidenvironment 2014). Since land

and labor are both limiting factors for Malaysia, expansion into Indonesia allowed the industry to continue to grow where land and labor are more readily available.

Control of the industry continued to change hands in the 1990s and 2000s, and the process of restructuring impacted industry productivity. During Prime Minister Mahathir Mohamad's first term (1981–2003), plantation companies Guthrie, Sime Darby, and Golden Hope were taken over through the government's investment arm *Permodalan Nasional Berhad*. They merged in 2007 as the GLC Synergy Drive, now named Sime Darby *Berhad*. FELDA also launched several private corporate entities, the largest of these being FELDA Global Ventures Holdings (now FGV Holdings *Berhad*) (FELDA 2019). Smallholder land is still managed under FELDA, but now the land is leased to FGV Holdings, a publicly-listed, government-run company. Some analysts regard Malaysian state-owned palm oil interests with their large, complex organizational structures as being mismanaged; higher costs and lower-than-average outputs may suggest that larger firms spend too much time and resources on overcoming bureaucracy issues (Ramasamy, Ong, and Yeung 2005). Furthermore, in 2006, Indonesia overtook Malaysia as the world's highest producer of palm oil, leveraging its more expansive land banks and cheaper labor (Alam, Er, and Begum 2015). Overall, the changing structure and priorities of Malaysia's agricultural sector, including expansion into and competition with Indonesia, has affected the flow of migrant workers into Malaysia's plantations.

Literature Review

The number of foreign workers in Malaysia is naturally difficult to estimate due to the prevalence of irregular migration (including workers who enter the country illegally, individuals who enter legally but are not authorized to work, and individuals who overstay their visas). As a result, population estimates differ significantly among both Malaysian reports and international surveys. For years, a commonly cited statistic estimated two million registered foreign workers in Malaysia, with researchers assuming that the actual number

was at least twice that when irregular migrants were included ([Ministry of Home Affairs 2011](#)). More recent attempts have been made to offer a more accurate estimate. In 2017, Malaysia's Ministry of Home Affairs (MOHA) estimated 1.8 million foreign workers, while the Labor Force Survey estimated 2.26 million and the Department of Statistics Malaysia's Population and Demography estimated 3.3 million ([World Bank 2019](#)). Unofficial estimates, such as one calculation based on the number of subscribers to the mandatory Foreign Workers Insurance Scheme, reported the average number of foreign workers from 2012–2016 as 3.43 million, with higher concentrations in Selangor, Johor, and Sarawak ([World Bank 2019](#)). Of these foreign workers, MOHA estimates that plantations are the second most common sector of employment, after manufacturing ([Ismail and Yuliyusman 2014](#)). In 2014, MPOB tallied 451,507 workers (including office and managerial staff) in the plantation sector, reporting that 352,330 of them (78%) were foreign workers primarily employed in harvesting and collecting fresh fruit bunches (FFBs) ([Azman, Ahmad, and Sharudin 2015](#)).

For decades, Indonesian migrants provided most of this planting and harvesting labor but the increasing success of Indonesia's plantation sector is causing changes in labor flows and will likely continue to do so. A 2010 industry survey reported that an estimated 81 percent of foreign workers in the plantation sector in Peninsular Malaysia were Indonesian field workers; the percentage was even higher in Sabah, at 91 percent ([Abdullah, Azman, and Rahman 2011](#)). The authors argued that migrant worker dependence is a threat to the "security and stability" of the industry but noted that this dependence was not likely to change soon ([Abdullah, Azman, and Rahman 2011](#)). Labor flows from Indonesia to Malaysia have been historically well-established; more recently, however, fewer Indonesians are choosing to migrate to work in Malaysian plantations. For one thing, wages are increasing in Indonesian plantations, nearing the amount Indonesians can make in Malaysia. Furthermore, in most cases, migrant workers cannot bring their families with

them to Malaysia ([Azman, Ahmad, and Sharudin 2015](#)). This combination of factors decreases the motivation to migrate for work when one could make comparable wages without leaving one's family and home country. The decreasing motivation of Indonesian workers to migrate to Malaysia forces companies to look elsewhere to fill labor shortages such as Bangladesh, India, the Philippines, Thailand, Nepal, and Myanmar, with Bangladeshis being the most common after Indonesians ([Abdullah, Azman, and Rahman 2011](#)).

Losing Indonesian workers causes several problems on plantations, notably language barriers and productivity loss. Most Indonesians can understand the national language Bahasa Melayu because of its close similarity to Bahasa Indonesian. This is not often the case for other nationalities, who have no choice but to learn the language quickly or rely on minimal English to communicate ([Alam, Er, and Begum 2015](#)). Many Indonesian workers also have previous plantation experience, which other nationalities rarely have; therefore, cost of training is another concern associated with changing laborer demographics ([Mahbob 2010](#)). Plantations are increasingly seeing Indonesian workers who come for only one visa term or go home during the festival season and do not return ([Abdullah, Azman, and Rahman 2011](#)). This means two things for Malaysia's plantation sector: first, they are moving from hiring workers with previous agricultural experience to training workers with none; and second, Malaysian plantations are essentially training Indonesians in skill sets that they will then take back to their own industry.

Among other factors, these changing migration patterns highlight Malaysia's dependence upon foreign labor. And while this dependence is not a new phenomenon, the benefits of using cheap, foreign labor have grown more convoluted over time. Across multiple sectors, economic studies suggest that migrant labor provides short-term benefits, but companies that rely on low-skilled labor are less motivated to invest in more efficient, capital-intensive methods of production. [Jordaan \(2017\)](#) observed based on manufacturing

industry data that the positive effects of low-skilled workers are pronounced in assembly-intensive and export-oriented industries. In agricultural sectors in particular, employers prefer migrant workers because they do not often ask for time off, even on major holidays, making them highly efficient during peak harvesting (Achim, Rusdi, and Amin 2017). They also tend to accept lower wages and poor working conditions, which can depress wages and decrease the motivation to improve conditions to attract local workers (Narayanan and Lai 2005). However, employment of migrant workers has also been associated with decreased productivity because of added communication and integration costs (Parrotta, Pozzoli, and Pytlikova 2014). Narayanan and Lai (2014) found that unskilled migrant labor in the manufacturing sector helped output expand initially but still showed slowing productivity growth in the period under review. Ismail and Yuliyusman (2014) analyzed data from the manufacturing, services, and construction sectors from 1990–2010 and found skilled and semi-skilled foreign laborers have a positive impact on the short- and long-term output growth but that unskilled foreign labor adversely affects output growth both short- and long-term.

Furthermore, as immigration policy increasingly streamlines legal hiring and industry regulations increase the pressure to employ sustainable and humane practices, it is more difficult to cheaply employ migrants. Irregular migration is more stringently monitored, decreasing employers' abilities to fill gaps with undocumented workers. What is more, the assumptions that foreign workers will tolerate lower wages and poor working/housing conditions becomes less and less relevant as the government requires migrant workers be paid the national minimum wage and amends the minimum housing standards required in dormitories. Although minimum standards are not always adequately enforced, attempts are being made to address exploitative conditions through requirements such as mandatory medical care and individual safes for each employee to ensure they have constant access to their passports (Attorney General's Chambers 2020). Most recently, Human Resources Minister Datuk Seri M. Saravanan

amended the Workers' Minimum Standards of Housing and Amenities Act 1990 in response to the assertion that cramped and unhygienic housing conditions among foreign workers contributes to the spread of COVID-19. In September, the Employees' Minimum Standards of Housing, Accommodations and Amenities Regulations 2020 went into effect, mandating standards such as dimensions of floor area per employee to prevent overcrowding and requirements that employers must arrange (at the employer's expense) for all workers to be immunized against any infectious disease ordered by health authorities (Attorney General's Chambers 2020). With increased fines for violation of minimum standards, combined with the levies and paperwork already built into the hiring process, the costs of employing foreign workers are increasing and the convenience afforded to employers is decreasing.

Considering these developments, it becomes increasingly necessary to consider why employers continue to rely on foreign workers if not simply for cost and convenience. Industry professionals and policymakers assert that locals are largely unwilling to do the work migrants are doing. For example, in response to criticisms of a 2015 decision to bring in 1.5 million Bangladeshi workers, former Minister Datuk Seri Azalina Othman remarked that migrants are still badly needed because "locals can't stand very long or work long hours. They can't...do hard labor as they cannot take the stress" (Balakrishnan 2016). Industry reports go a step further, asserting that not only do locals shun plantation labor, but fewer foreigners are willing to work in plantations because they now have better options, both in other sectors in Malaysia and in their home country's agricultural sector. One study attempted to quantify the consequences of this phenomenon, reporting that a 30 percent decrease in foreign workers in Malaysia could reduce Malaysian palm oil export earnings by RM¹ 10 billion a year (Mamat 2010).

While previous research has investigated various economic impacts of migrant labor on

1 USD 1.00 = RM 3.10 (2010)

productivity and wages across multiple industries, further research is needed to determine how migrant labor in general, and foreign labor shortages in particular, continue to impact productivity and mechanization in an evolving agricultural sector. Furthermore, inferences drawn from the above quantitative analyses should be tested through deeper qualitative investigation to explore the often-divergent motivations and interests of industry stakeholders.

METHODOLOGY

This study employed chain referral sampling up to the point of theoretical saturation, aiming to include as many types of industry actors as possible to identify challenges and possible solutions from different vantage points. In-depth, qualitative interviews were conducted primarily in Kuala Lumpur between September 2018 and June 2019. Interviews were conducted, one-on-one and in small groups of two to four participants, in English, and were semi-structured and iterative. A detailed question set was prepared for each interview with the flexibility to give respondents a role in guiding the conversation, and questions were adapted based on the type of organization in which the respondent was employed. At the request of some respondents, quotes are presented anonymously and where relevant, respondents are identified only by their role in the industry.

Respondents included executives, government personnel, advocates, and consultants from organizations and departments such as the Ministry of Primary Industries, MPOB, The Malaysian Palm Oil Council, the Incorporated Society of Planters, the National Union of Plantation Workers, and the Malaysian Estate Owners Association, as well as academics focusing on economic and agricultural research and representatives from organizations focusing on sustainability. These include the Roundtable on Sustainable Palm Oil (RSPO), Proforest, and the Tropical Rainforest Conservation and Research Centre. Respondents also included individuals either currently or formerly employed in executive

and managerial levels at FELDA/FGV Holdings *Berhad*, Sime Darby *Berhad*, United Malacca *Berhad*, and Kuala Lumpur Kepong *Berhad* (KLK). The categorization employed in differentiating between types of plantation companies was similar to those used by scholars like Ramasamy, Ong, and Yeung (2005) in their own study of Malaysian privatization and productivity. Government-linked companies (GLCs) are companies in which the government or its trusts have significant controlling interests or shares, of which Sime Darby and FGV Holdings are examples. Non-government-owned companies are plantation interests owned by Malaysian companies or individuals, of which KLK and United Malacca are examples. This categorization is of great importance because respondents represented multiple sizes and models of companies in the industry. Through these comparisons, one can observe differences in employment practices and mechanization efforts between smallholders, government-linked companies, and non-government-linked companies, as well as differences between large corporations, medium-sized companies, and smallholder schemes.

MECHANIZATION AND PLANTATION PRODUCTIVITY: CHALLENGES AND RECOMMENDATIONS

While there has been some initiative to mechanize multiple stages of palm oil processing, to better understand industry innovation efforts, it is important to first note the particular challenges faced in growing and harvesting palm oil. These challenges shed some light on the complexity and nuance of decision-making in an industry that has long struggled to mechanize and innovate. Stakeholders identified two primary factors that inhibit productivity in palm oil production, describing the uniquely labor-intensive nature of palm oil harvesting and economic infeasibility of adopting some technology and farming best practices. By understanding these barriers to mechanization, the industry can work toward more sustainable and efficient alternatives.

Harvesting Labor Intensity

Although the issue of labor shortages is logically linked to the need to mechanize, this is easier said than done. To improve productivity in Malaysia's palm oil industry, emphasis is placed on the need to mechanize the fruit harvesting process. Harvesting FFBs accounts for about 60 percent of labor and half of production costs of running a plantation (Sowat et al. 2018). The harvesting process had not changed for decades until recent inventions like the mechanized cutting technology *cantas* and the mini tractor with a mechanical loader *grabber*. In comparison to the use of a manual sickle, *cantas* reduced labor requirements by 50 percent and harvesting cost by 30 percent (Wahid and Simeh 2009). More efficient technology has also been adopted to increase productivity for fertilizing and pest management. Trucks with sprayers are widely used for general spraying (though circular and selective spraying is still largely manual). Some plantations also use drones to monitor trees from above and look for areas of pest infestation (pers. interview, 13 May 2019). However, increased mechanization can also create risks to the health of employees and trees. One company CEO said their workers do not like the mechanical cutters because the vibrations cause numbness in the hands and arms, which can cause nerve and muscular-skeletal damage (pers. interview, 8 May 2019). There is also the potential risk of machinery compacting the soil when moving between trees. Heavy machines and tractors can cause soil compaction at depths that cannot be fixed by tillage, which impedes root penetration (Sowat et al. 2018).

Among the sample of industry stakeholders interviewed, all respondents were largely aware of and amenable to using such technology to increase productivity. Most respondents said they were impressed with technology advancement in the past decade, pointing out that larger plantations have research and development departments and collaborate with universities and government agencies to innovate. Despite technological advancements, harvesting is still a technically challenging and time-consuming task such that automated harvesting technology has not yet met

or exceeded human efficiency. Inventions that remove human cutters from the equation have been attempted, but the physical attributes of palm trees are not conducive to such technology. For example, prototypes of robots that grip a tree and move up the trunk (invented for other types of harvesting) do not work on oil palms because the bark is not smooth and the fronds block the fruit bunches. When asked what kind of technology is needed to make harvesting less labor intensive, one respondent joked that it would require breakthrough technology “like the Iron Man suit,” referring to a full-body suit that increases manual strength and allows the wearer to fly (pers. interview, 9 January 2019). This comment highlights the nature of the mechanization problem—it is not that the motivation to innovate is lacking (at least in larger companies). Rather, the process of harvesting FFBs is such that no tool has yet been invented to overcome all the challenges of the task (pers. interview, 7 February 2019).

Economic Feasibility

Even when new technology is invented, cost is a significant limiting factor in how widely it is adopted. According to one sustainability advocate, the industry has moved past the point where companies are “being lazy” and getting readily available foreigners instead of mechanizing; because of the paperwork and fees associated with hiring foreign workers legally, cheap labor is no longer as easy a solution to harvesting woes (pers. interview, 14 February 2019). Some steps have been taken to mechanize, respondents report, but it is still more feasible to pay laborers than to mechanize fully because current technology does not allow efficient harvesting of fruit 25–30 feet in the air. A company executive described the industry as being in a state of “semi-mechanization;” where there are opportunities to mechanize, they take them, but it is also a question of economic feasibility (pers. interview, 13 May 2019). Lasers, for example, have been suggested as an option for cutting down FFBs, but their cost would prevent most plantations from acquiring them (pers. interview, 13 May 2019).

For smallholders in particular, a lack of follow-through usually comes down to an issue of cost. This is quite significant in Malaysia's industry where about 40 percent of cultivated land is farmed by smallholders who often lack the income and knowledge that makes it easier for larger companies to implement best practices. For example, one of the most detrimental practices that reduces productivity among smallholders is failing to replace unproductive palms. After 25 years, oil palms are both at risk of decreased fruit yields and more difficult to harvest because of their height. Additionally, consistent replanting by sections allows for higher yield varieties to be gradually introduced. While large plantations recognize the value in adhering to this practice and can afford to do so, smallholders who have only a few hectares of land tend to replant infrequently because they cannot afford to lose profits while newly planted trees are maturing. This leaves them with aging, pest-ridden, and diseased palms with lower FFB yields (Murphy 2014).

The Malaysian government has taken regular action over the past decade to attempt to incentivize adoption of farming best practices among smallholders. In 2011, the government launched a program through MPOB offering RM 7,000/ha to smallholders for replanting of palms over 25 years old (Borneo Post Online 2011). Similar programs were enacted in 2013 and 2015, allotting government funding for replanting schemes. Some scholars were optimistic about these programs. For example, Alam, Er, and Begum (2015) asserted that if the government's target was achieved, by 2018, Malaysia would be able to "successfully address the impending danger related to slow growth" with the ultimate goal of "reignit[ing] the national palm oil yield growth rate by 2020" (p. 146). Now in 2020, the growth rate has not been sufficiently reignited, and industry stakeholders remain concerned with replanting and related productivity problems. According to Malaysia's Department of Agriculture, since 2010/2011, the country's palm oil output has increased by 6 percent; however, this output growth is primarily due to increase in land area rather than increase in yield. Planted area was up 27.3 percent in the period under review, but oil

yield was down 16.6 percent (Chu and Das 2020). Some of this yield decrease can be explained by the 2015/2016 El Niño phenomenon, which caused prolonged, lower-than-average levels of rainfall; the stress on oil palms can cause negative consequences for up to 36 months, decreasing yearly production of FFBs (USDA 2019). But it is significant to note that Malaysia is relying on land expansion to sustain output rather than more economically sustainable solutions. With land expansion limited by feasibility and environmental sustainability concerns (capped at 6.5 million ha by 2023) (USDA 2019), the industry must look to other methods if it wants to continue to increase its palm oil output.

Toward Sustainable Innovation

Beyond government investment in the agricultural sector, the industry must look inward to increase the economic feasibility of adopting technology and good agricultural practices. These goals are representative of progress for which Malaysia must strive, not only for the productivity of the plantation industry, but also for the country's continued economic development. Malaysia has affirmed its support of the United Nation's Sustainable Development Goals (SDGs), most recently through the Shared Prosperity Vision 2030, and the agricultural sector provides ample opportunities for progress in the realms of both economic and environmental sustainability (PMO 2019).

As previously stated, smallholder farming practices are a major barrier to sustainability and productivity. Smallholders should be of particular concern for Malaysia under SDGs 8 and 9, which highlight the need to create sustainable job options and encourage entrepreneurship and productive employment (UNDP 2020). Respondents asserted that a promising strategy is to get larger companies more invested in smallholder success. While smallholders have only a small plot of land and are primarily motivated by making money to support their families, larger companies are more responsive to the demands of their supply chains and the international community (pers. interview, 14 February 2019). To incentivize investment in

smallholders, the most recent iteration of RSPO standards includes investment in the productivity and profit of smallholders as one of the three pillars of their membership criteria. One sustainability advocate explained that larger companies “want a good story;” that is, they are motivated to have business models that show investment in sustainability and local agriculture (pers. interview, 11 April 2019). RSPO members like Johnson and Johnson work to link smallholders to the market by buying their crude palm oil and initiating programs focused on smallholder productivity and capacity development (pers. interview, 11 April 2019). Although RSPO membership is voluntary, Malaysian Sustainable Palm Oil (MSPO) certification will be mandatory for everyone in 2020, presenting an opportunity for Malaysia to encourage similar practices that bring together sustainability and productivity. According to a representative of the Ministry of Primary Industries, improving productivity among smallholders and encouraging them to reinvest part of their income in better farm management and mechanization is one of the goals of MSPO (email correspondence 2019).

While increased investment in smallholder mechanization is beneficial, plantation companies are also recognizing that palm oil harvesting is always going to be labor-intensive, and therefore, trying to improve upon human efficiency is, at best, a short-term approach. Malaysia’s industry does not need to clear more land, one sustainability consultant cautioned; to do so will just require more labor that they do not have. Instead, the industry must focus on increasing yields and improving seed varieties (pers. interview, 11 April 2019). On this topic, respondents differentiated between land productivity and harvesting productivity; in terms of land use, palm oil is about 11 times more productive than soybean, 10 times more than sunflower, and seven times more than rapeseed (canola) per hectare per year. Furthermore, oil palms are a perennial crop, so they produce fruit all year for decades without having to be replanted. Yet in terms of harvesting, all other cooking oils are more efficient than palm oil because the plants are small, allowing for

greater mechanization of the harvesting process (pers. interview, 9 January 2019). Therefore, one plantation executive asserted, a longer mechanical harvesting pole may be a short-term solution, but the “long-term solution is a shorter palm tree; the future of the industry is genetics” (pers. interview, 11 February 2019).

Innovations like genetically engineered dwarf palms provide a potential solution to issues of productivity, labor shortages, and sustainability. For example, dwarf palm seedlings of Nigeria’s Clonal Palm Series 2 (CPS2) variety are being bred in a government research center in Johor to be 30 percent smaller at maturity than regular palms. These plants are not without problems; because they are clones, they may not be resistant to pest and diseases. They also cost up to twice that of normal plants, again raising the economic feasibility issue as a barrier to wider adoption. But such innovations show the potential of genetics, both to solve some of Malaysia’s plantation industry problems and to work toward SDGs 12–15, which address environmental sustainability (UNDP 2020). With palm oil coming under fire on the global stage, investment in sustainable planting and harvesting is more important than ever. MPOB asserts that the new variety is an important development in response to labor shortages and limited land availability (Raghu 2018). CPS2 is bred to grow more slowly, adding up to a decade to the economic viability of each tree. What is more, they are reportedly capable of producing about 35.7 MT of fruit per hectare, about two times the current national average in Malaysia (Raghu 2018). Smaller trees and higher yields allow farmers to maximize their land use, thereby increasing the oil yield per hectare and reducing the need to clear more land for planting and protecting against pollution and loss of biodiversity.

Crop diversification is another suggestion that respondents raised as a step toward plantation industry advancement. MPOB encourages diversification among smallholders to supplement their incomes and thereby offset the short-term loss associated with replanting. If smallholders can show that they have committed to livestock

breeding with proper ranch facilities, then MPOB can give them funds for livestock (pers. interview, 23 January 2019). Palm oil growers should also consider other crops that are increasingly in demand in international markets, such as coconut products. One company executive reported plans to diversify into crops like coconut, coffee, coco, and stevia. Currently, India and the Philippines are two of the main growers of coconuts, but both have experienced recent weather disasters, causing crops to be wiped out. Because of this, the respondent was approached about selling coconuts before the company had even started growing, foretelling strong market outlooks (pers. interview, 8 May 2019). The respondent also predicted that Malaysia and Indonesia could become the main producers of stevia in Southeast Asia to serve the demand in the region (pers. interview, 11 February 2019). What is more, with the government's 2019 sugar tax, breaking into the sugar-substitute market is a particularly promising option for Malaysia (Abas 2019).

In sum, migrant labor availability may have created a culture of complacency in the past, but major stakeholders in the sector know that palm oil harvesting is inherently labor-intensive and foreign labor is no longer as cheap, available, or flexible as it once was. Efforts to address labor shortages and productivity challenges provide an opportunity to innovate sustainably and encourage productive work in keeping with Malaysia's commitment to the UN SDGs. However, even with recent increases in technology adoption and innovation, the industry does not have enough labor to operate plantations at maximum productivity, further motivating stakeholders to search for alternatives to traditional mechanization goals.

THE QUESTION OF LOCAL LABOR

Foreign labor availability does not fulfill requirements under the current land-to-labor ratio, leading some industry professionals to consider locals as a possible source of workers. According to Abdullah, Azman, and Rahman (2011), in the 1980s, Malaysia's worker-to-land ratio in the

industry was 1:6 to 1:7 ha, meaning every worker could cover 6–7 ha of land. With the introduction of improved technology, by 2018, the most labor-intensive category, harvesters/fruit collectors, could operate at a ratio of 1:17.19 (Sowat et al. 2018). But while there have been marked improvements in efficiency, labor constraints do not allow for enough workers for even a 1:17 ratio. In response to labor shortages, some authors claim that since young people are currently struggling to find work in areas like public service, it is important to create an environment in the agricultural sector in which they are willing to work. This possibility of recruiting local workforce was discussed extensively with stakeholders, and results show it is not without its challenges.

Negative Perceptions of Plantation Work

An oft-cited issue with recruiting locals is the perception that plantation labor is a dirty, dangerous, and demeaning job ("3 D" job). This argument asserts that young people only hear about the negatives of plantation work and therefore do not conceptualize its economic importance. While it is beneficial to recognize the sector's contribution to Malaysia's economy, an issue arises with the implication that the problem is not that the work "is" dirty or dangerous, but that Malaysians "think" it is and therefore do not want to do it. Kamaruddin, Abdullah, and Ayob (2018) argue that despite negative perceptions of plantation work, young people will consider the career option if wages are commensurate with the "sweat and energy disbursed," citing, for example, the fact that Malaysians are willing to do "3 D" jobs in Singapore where wages are relatively higher (Kamaruddin, Abdullah, and Ayob 2018). Still, agricultural work differs from other "3 D" sectors significantly, which makes recruiting plantation labor a unique challenge. Furthermore, although advancements have been made, perceptions that plantation work is labor-intensive and potentially dangerous are accurate.

The problem is not only convincing locals to join the sector, but also retaining interest among locals currently engaged in the sector. About 40 percent of land farmed in Malaysia is managed

by smallholders with family plots, in part because FELDA schemes regulated the inheritance process to ensure land stayed in families instead of being subdivided or sold to larger companies (pers. interview, 9 January 2019). But beyond FELDA's land inheritance policy, there is nothing in place to keep smallholders engaged in agriculture. In this way, second generation farmers present one of the main challenges associated with maintaining local involvement in Malaysia's industry. Second-generation smallholders may keep the land, but many hire foreign workers to do the labor and pay middlemen to handle operations and sales of the fruit to mills. Essentially, they are not interested in doing anything but holding the land title (pers. interview, 14 February 2019). The challenge of rekindling interest among second-generation farmers is one consideration often overlooked by those who seek to recruit more locals in the plantation industry.

Secondly, Malaysians are not the only ones being deterred by the challenges of plantation life; migrant workers are also increasingly favoring other industries. Respondents asserted that among migrants entering Malaysia, those who have the means and liberty to choose are more particular about the work they do than they used to be. They know that plantation work is harder and often less lucrative, so most migrants would rather work in other areas like the services sector. Additionally, migrants do not want to be far away from towns or cities, so they shy away from work in rural areas. Migrants also hear about cases of poor wages, poor housing, etc. from other migrants, which dissuades them from plantation work (pers. interview, 18 April 2019). These factors make it difficult to argue that locals' perceptions need to be molded by better information, when migrants who have far less flexibility to shape their employment paths are also objecting to the shortcomings of the sector.

Those concerned with local recruitment and foreign worker retention must be aware of the very real potential for exploitation and injury, contributing to these negative perceptions of the industry. It is clear improvements must be made for the sake of decreasing foreign worker

turnover, and, where applicable, retaining second generation smallholders and recruiting more locals in managerial and technical positions; anything else is simply unrealistic in the current state of the industry. To this end, the remaining sections propose several recommendations for industry improvement based on the successes and challenges reported by respondents.

Compensation

Perhaps the most suggested improvement concerns wages and benefits in the plantation sector. Proponents of recruiting local labor assert that wages must be commensurate with the difficulty and potential danger of plantation work before locals will consider the sector as a job option. But while higher wages for plantation workers would be an obvious improvement, it does not appear that the industry in its current state can afford to make this change. The government raised the national minimum wage to RM 1,100 per month at the beginning of 2019, and within two months, multiple sectors were complaining that they could not afford to raise wages. Now the Ministry of Human Resources is discussing going back on the national minimum wage and instead instituting sector-specific wage requirements (Patrick 2019). Furthermore, smallholders who own only a few hectares of land generally cannot afford to pay even the current minimum wage. According to one union leader, if smallholders are held to the same standard as big companies in the absence of programs providing financial assistance, they will just use illegal labor, and the cycle of exploitation and stagnation will continue (pers. interview, 28 February 2019).

At present, it appears some sectors need a more attainable step toward improving the way workers are compensated in the industry. One possible step is for plantations to gradually move away from paying employees in cash. When workers are paid in cash, it is easier for employers to pay less than the minimum wage because there is no proper record of the transaction. Additionally, employers also benefit from electronic compensation because transporting cash via armored trucks, or in some cases, helicopters, is a gross waste of money.

If plantations paid all their workers electronically, there would be increased transparency and reliability, which is crucial if the industry wants to improve working conditions (pers. interview, 23 November 2018).

Another option is to use incentive schemes to retain transient workers. While this may not be financially feasible for some smallholders, bigger companies can use retention and incentive programs to keep workers longer, thereby decreasing the number they must hire and train. One company described an incentive scheme that pays harvesters per ton when they exceed their harvesting quotas, encouraging daily productivity. Cutters are also paid a tall tree bonus for fruit harvested from trees that are over a certain age and therefore harder to reach. With bonuses like these, the respondents said some migrants who previously treated their plantations as a “transit area” on their way to other jobs were expressing satisfaction with the amount of money they could make in the industry. Additionally, the company implemented a retention scheme where they give a lump sum to an employee who has been with them for 3 years, 5, 10, etc. With these programs, the company reported going from 7–10 percent employee turnover down to about 2 percent (pers. interview, 8 May 2019).

Living Conditions

Improving living conditions and addressing social issues on plantations is not only a concern for retaining and recruiting foreign labor and getting Malaysians involved in plantation management; it is also an important aspect of sustainable development affecting the mental and physical health of workers in Malaysia. One union leader, who grew up on a plantation himself, said the “community aspect of plantation labor has broken down” (pers. interview, 28 February 2019). He explained that when he lived with his whole family on a plantation, they were encouraged to keep animals and grow gardens to supplement their incomes. He went to school on the plantation, and when he got older, the company sent him to university so he could ascend to the managerial level in the company. Based on his experiences,

he argued that plantation life need not be so unpleasant if plantations address social issues like recreation and education (pers. interview, 28 February 2019).

Some companies have attempted to do this by building sports facilities on their plantations. One company described an annual inter-estate company games created to bring workers from different plantations together to compete. The company said employees looked forward to the event every year. The company also gives workers seeds to plant and has their oil mills save waste products that make good fertilizer for the workers to use. The workers liked having gardens, respondents said, because they can save money and have fresh produce available where access to markets is limited. The company also organized challenges with prizes for whomever can grow the best vegetables (pers. interview, 8 May 2019). Having facilities and events like these can provide more palatable living conditions and improve worker retention and productivity.

Location is another primary concern because plantations are usually in rural areas, often cut off from major cities and connected by poor roads. Location cannot be changed since the nature of the industry requires large areas of land, but efforts can be made to virtually connect plantations to the rest of society even if it cannot be done physically. If larger plantations could ensure reliable mobile phone/internet connectivity, it would help mitigate the isolating effect of plantation work. One company executive brought up the issue that remote areas, particularly in East Malaysia, do not have enough cellular towers to have service on plantations. In the past, they explained, bigger plantations were approached about using part of their unplanted land to build cellular towers. However, the projects were managed by the Sabah government, and plans to build towers and roads stalled because the process of subcontracting was carried out poorly and money was diverted from the projects (pers. interview, 8 May 2019). This is a valuable perspective for the new government to consider in its goal of righting the financial wrongs of the previous administration. If properly handled, improving cell reception/internet access

on plantations is an attainable goal, which could help with employee retention and recruitment.

Competency

When asked about the potential for recruiting a local labor force, the majority of respondents spoke about entitlement among young Malaysians as a hinderance; specifically, respondents brought up pro-majority affirmative action and the current state of Malaysia's education system in relation to "hirability" of Malaysian youth. Although affirmative action programs have existed in Malaysia since Independence, they really took off after the ethnic conflict-charged riots on 13 May 1969, and policies that followed more directly addressed income disparities between ethnic Malays, Chinese, and Indians. The New Economic Policy of 1971–1990 outlined practical measures toward *Bumiputera* advancement in education and business. In many ways, Malaysia's affirmative action programs are considered a success in increasing *Bumiputera* representation in higher education and managerial and professional positions (Aihara 2009). This paper does not aim to analyze the effectiveness of these policies historically (see, for example, Aihara (2009) and Lee (2012) for more nuanced discussions of the impacts of affirmative action policies); rather, it is addressed briefly here because respondents drew links between the future of education and of plantation productivity. Specifically, many respondents expressed concern about the decades-old trend of Malays being fast-tracked into public service and public education. This issue is related to innovation and productivity across multiple sectors, in general, and the feasibility of recruiting locals particularly into the agricultural sector.

Several respondents expressed that Malaysia's standard of education has fallen, creating a bloated public service and a high rate of unemployment among graduates from Malaysia's public tertiary education institutions. Affirmative action beneficiaries have traditionally been funneled into public institutions that train them in the humanities and send them into careers as low-level bureaucrats. Alternatively, beneficiaries have been placed as teachers in public schools, where they

are ill-equipped to teach and thereby perpetuate a cycle of undereducation (pers. interview, 12 December 2019). Respondents said in the past, Malays were practically guaranteed government jobs, but now those job pools are shrinking (pers. interview, 24 October 2018). The government has stated intentions to reduce the size of the bureaucracy to increase efficiency and effectiveness (Lin 2019). This means that soon, affirmative action policies will either need to be reviewed, or there will need to be a new industry in which to place the beneficiaries of such policies. Since the new government has shown no political will to significantly revise affirmative action policies, the latter option is currently more relevant in the pursuit of sustained educational advancement in Malaysia.

An alternative to funneling Malays into the public service is to build up a vocational education system to diversify the career options available to these individuals. One respondent asserted that Malaysian culture marginalizes vocational workers, but then must hire foreigners to fill jobs that locals do not want to do (pers. interview, 13 May 2019). If Malaysians are trained in technical skills like handling harvesting or milling machinery or trained in agricultural sciences rather than being funneled into the humanities, it will create a more effective cohort of graduates with practical skills. Technical education, which prepares young Malaysians to succeed in fields with future job growth, is an important consideration for a government. It aims to position Malaysia as "a competitive and inclusive high-income nation by making the people one of the most important elements of sustainable economic development" (Annuar 2019).

Studies of Malaysia's vocational education system show that the organization and funding of technical education is scattered and insufficient, with several ministries and all 13 states running separate initiatives. Private sector programs are largely underfunded and disregarded in comparison to government initiatives. Furthermore, the number of Malaysians pursuing technical education is vastly disproportionate to the amount of technical jobs. In 2015, for example, Malaysia's enrollment

in vocational programs was less than 15 percent of tertiary education enrollment even though the job creation predictions at the time estimated that 60 percent of jobs would require technical skills (Cheong and Lee 2016). When compared internationally, Malaysia's vocational system performs poorly, even in comparison to countries that are less developed (Puckett, Davidson, and Lee 2012). As the new administration reviews its policies affecting education and civil service, policymakers must consider the long-term benefits of vocational education in industries with labor shortages.

Regarding the plantation sector specifically, some stakeholders have moved in this direction by creating training programs for technical agricultural work. For example, MPOB created the Malaysia Palm Oil Training Centre (PLASMA) under the Institute of Malaysian Plantation and Commodities to provide skills training for machinery usage in the plantation sector. As of 2017, PLASMA had reportedly trained 2,500 people, 75 percent of which have entered the plantation sector (Borneo Post Online 2017). Although such programs are a good start, vocational education offered at the secondary and tertiary levels could preempt the problem by developing a culture that empowers Malaysians toward educational and professional achievement while also providing options other than a four-year university education.

For individuals who want to pursue university degrees, incentive programs to get students involved in agricultural science are beneficial. One respondent remarked that Malaysians have misconceptions of farming as a "brainless" discipline when, in actuality, agricultural science degrees require four to five years of education (pers. interview, 13 May 2019). To get more young Malaysians be interested in agriculture, one company reported giving scholarships toward degrees relevant to the plantation sector in exchange for three years work with the company. Scholarship recipients are also given the option to work on plantations during long holiday breaks to earn extra money and start training to be future managers. The company also cited other unexpected positive effects of their

scholarship program. For example, they found that many of the scholarship applicants were women, a demographic highly underrepresented in the plantation sector. Having more women in their programs allowed the company to take steps to assess whether young women feel safe on plantations, an issue often raised in relation to female underrepresentation in agricultural work (pers. interview, 8 May 2019).

Overall, practical steps can be taken to improve plantation conditions and use education programs to get Malaysians interested in technical and managerial positions in the plantation sector. To echo the sentiments of one company executive, perhaps a "very small fraction" of Malaysians would labor on plantations if wages improved, but "why would we want them to be laborers when they could get more technical jobs?" (pers. interview, 13 May 2019). Results show trying to recruit locals to labor in plantations is unrealistic and not maximally beneficial; but this does not mean the industry should be allowed to maintain its status quo. Improvements can be made to decrease migrant labor turnover in labor-intensive positions and vocational programs can be improved to track locals into technical and managerial positions.

CONCLUSION

Those who know Malaysia's plantation sector best describe an industry teetering on the brink of great potential—but with a long way to go. Many of the issues plaguing the industry—foreign labor dependence, sluggish growth and productivity, and sustainability concerns—represent challenges the new government has pledged itself to address in keeping with the UN SDGs. Industry stakeholders, from government agencies to NGOs and from company executives to labor union leaders, are aware of the challenges affecting the industry and have their own ideas about how best to address them. Based on stakeholder responses, evolving policies and practices in the Malaysian plantation sector occurring alongside expansion of the Indonesian sector have pushed the industry beyond a mechanization vs. cheap labor dichotomy.

This paper has outlined several related concerns and potential responses raised by respondents, which may incentivize increased investment in productive and sustainable agricultural development.

Past studies show that multiple industries have benefitted from short-term increases in productivity and profit from the import of cheap foreign labor, but as foreign labor becomes more regulated and expensive, continuing to depend on labor-intensive production can decrease the motivation to mechanize and decrease productivity. However, despite efforts to mechanize the palm oil production process, harvesting is still a labor-intensive and time-consuming task. Even for larger plantations that can afford to adopt the newest technology, the current land-to-labor ratio does not match labor availability. Many stakeholders assert that technological advancements in harvesting equipment may only be a short-term solution, while genetic innovation should be the long-term goal. Under the new government, collaboration between plantation companies, universities, and regulatory bodies must be encouraged to continue moving toward an optimal level of mechanization, innovation, and economic efficiency.

Furthermore, although technological advancements have been made, plantation work remains dangerous and remote. Rather than broadly focusing on changing Malaysians' perceptions of the industry, the industry should focus on smaller steps to modernize for existing and future employees. By taking steps like eliminating cash payment of plantation workers, ensuring plantations have reliable WiFi, and encouraging direct links between larger companies and smallholders, employers can increase productivity and quality of work. Education and social programs mandated at the company and policy level can also help to improve plantation living conditions and thereby mitigate problems of productivity, worker retention, and recruitment. These changes must be made to improve retention rates among the current migrant workforce and encourage incoming migrants to see the plantation sector as a destination instead of a transit point towards other industries. For recruiting locals,

eliminating the practice of funneling affirmative action beneficiaries into public service, and instead improving vocational education and scholarship programs, is another step to consider. The above improvements can be used to both increase retention of foreign laborers and attract a more technically skilled demographic of Malaysians to higher levels of the plantation research and management. Malaysia's plantation sector is at a crucial point in its development, and actions taken in the coming years will make the difference between stagnating and modernizing the industry to the benefit of plantation companies, workers, and the Malaysian economy.

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