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Recognising the Value of Oil Palm in the Post-covid-19 World

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During 2020, the global oil palm sector suffered a series of shocks related to the covid-19 pandemic. In this article I survey the immediate effects of the pandemic, and related socioeconomic factors, on the oil palm supply chain, from plantation to plate. Overall, the sector has proved remarkably resilient and prospects for its post-covid-19 performance are generally promising. This can be traced to the key roles of palm oils in two vital areas, namely food security and health care, although prospects in the biofuels area are less certain.

Keywords: *Covid-19, food security, health care, biofuels.*

At the time of writing (August 2020), the long-term impacts of the covid-19 pandemic on the oil palm sector, and indeed on agriculture as a whole, still remain unclear although it is unlikely to be as lethal as the 1918 influenza pandemic. The immediate human mortality due to covid-19 is unlikely to exceed 0.02 per cent of the global population. This means that there will be a very limited demographic impact from the pandemic and therefore overall demand for foods related to oil palm ingredients should not be greatly affected. However, as the virus becomes endemic, its wider socio-economic effects could be both significant and long lasting for the oil palm industry. In this article, I will describe my view that, in the long term, the oil palm sector will remain a key player in the areas of global food security and health provision, although its prospects in the supply of biofuels are decidedly uncertain.

The immediate effects of the covid-19 pandemic on the oil palm industry were felt almost entirely in the supply chain and crop production sectors and were due to the sudden lockdowns that spread globally early in 2020. These lockdowns initially affected trade as activities were disrupted sequentially from January to March 2020 right across the major importing regions of Asia and Europe. Despite an initial shock from the lockdowns, global oil palm supply chains proved to be remarkably resilient. Indeed, millions of tonnes of palm oil continued to be shipped with relatively little interruption from the major producing hubs of South East Asia to a range of import destinations across Europe, China and India. For example, at the key entry ports that serve as entrepôts for palm oil import and transhipment, such as Rotterdam (Europe), Kakinada (India) and Xiamen (China), palm oil was treated as a prioritised strategic commodity. This ensured its prompt offloading and distribution, even while much of the economic activities in such countries was locked down.

PALM OILS AND FOOD SECURITY

The resilience of the oil palm supply chains as discussed above should serve as an important reminder that the two types of palm oil (kernel and mesocarp) fulfil two particularly critical socio-economic functions in food and health

respectively. In the case of food, the mesocarp oil, often simply called palm oil, is a major provider of relatively cheap and nutritious edible calories to billions of people, especially in Asia. Therefore oil palm is one of the key elements in ensuring food security in many regions. At least 3 billion people rely directly on palm oil as a regular part of their diet, and it is a staple cooking oil commonly used in African and Asian food preparation. As global populations increase, the demand for palm oil is likely to continue to rise. Estimates from various industry sources predict that between 93 and 156 million tonnes of palm oil might be required by 2050 (Pirker *et al*., 2016; Frost & Sullivan, 2017).

Palm oil has been a staple food in West African and tropical cuisines for millennia without any reported ill effects on these populations. However, during the 1980s, in some countries including the USA (United States of America), palm oil was replaced by hydrogenated oils from soybean or rapeseed, in many products due to concerns that it might jeopardise heart health. Subsequent research concluded that the trans fats present in such hydrogenated oils actually posed a far greater risk to heart health than the saturated fats in palm oil. As a result, most manufacturers have now resumed use of palm oil, which contains no trans fats. Palm oil contains 50 per cent saturated, 40 per cent monounsaturated and 10 per cent polyunsaturated fatty acids. The major saturated fat is palmitic acid, which contributes to approximately 44 per cent of its calories. It also contains high amounts of oleic acid and smaller amounts of linoleic and stearic acid. The reddish-orange colour of palm oil is attributed to its carotenoid content, particularly ß-carotene, which is a vitamin A precursor.

While oil palm supply chains were relatively unaffected by the covid-19 pandemic, there was significant disruption higher up the supply chain. This occurred in some plantations, due to localised lockdowns and unavailability of sufficient labour. It is estimated that this could result in a reduction in palm oil production of about 10 per cent during 2020 and into 2021 (MPOC, 2020). However, as discussed below, this loss of production will be offset by a greatly reduced demand for palm biodiesel, so supplies for crucial food markets are unlikely to be greatly impacted. Given the likelihood of greatly increased demand for edible oils in the coming decades, prospects are good for the oil palm industry and, if anything, an expansion in production for food use will probably be required. Such an increase in production can be accommodated by two approaches. First, by the use of higher yielding oil palm varieties such as the 'Genome Select' varieties from Sime Darby Plantations. These have a claimed 9.9 tonnes per hectare average yield over five years of field trials under optimum conditions, which could potentially more than double the current average yields (Sime Darby, 2020). The second approach is the further extension of oil palm cultivation onto carefully selected non-forested land in regions such as West Africa and South America.

PALM OILS AND HEALTH CARE

The second key (and largely unrecognised) role of palm oils is in health care. This has a surprisingly long history that dates back well over a century to the beginnings of international trade in palm oil from West Africa. The late nineteenth century was a time of recurrent epidemic diseases such as cholera, smallpox, influenza and typhus. In the absence of medications such as antibiotics, it was recognised that cleanliness and sanitation were important tools to combat the spread of

infections. Indeed, it was a popular saying that 'cleanliness is next to godliness'. During the 1880s, the company of Lever Brothers (now Unilever) in the UK (United Kingdom) used imported palm oil as a replacement for animal fat to produce more effective forms of solid soap, marketed as brands such as 'Sunlight' and 'Lifebuoy'. As shown in *Figure 1*, panel A, Sunlight soap became hugely popular and was even supplied to soldiers like the author's grandfather during the First World War of 1914-18. As a result, my family always used palm-derived soaps at home! Some early versions of Lifebuoy soap were coloured because they used the unrefined red palm oil, which is rich in antioxidants. Other adverts (panel B) extolled the use of scientific cultivation and machinery on the early oil palm plantations in Africa and Asia. In panel C, the Lever Brothers palm-derived soap, Lifebuoy, is being marketed for use during the notorious influenza pandemic of 1918-19, which resulted in an estimated 50 million deaths.

Palm-derived liquid soaps also date from the late nineteenth century and in 1898, the Johnson Soap Company in the USA first marketed a liquid soap based on a blend of palm and olive oils called 'Palmolive'. Today, lauric-rich palm kernel oil (PKO) is the functional ingredient in hundreds of vital cleaning, hygiene and personal care products. These include liquid and solid soaps, detergents and surface cleaners. In these cases, PKO is playing a key role in the promotion of human health and the management of disease outbreaks. In 2019, almost 9 million tonnes of PKO was produced, the vast majority of which was used by the various health and personal care sectors throughout the world. Surprisingly, these health-related functions of palm oil are rarely mentioned when the global importance of the crop is discussed. This is especially relevant today as part of public health measures for the management of the covid-19 pandemic.

Because the covid-19 virus is spread so easily by hand, frequent washing is now required in a wide range of settings from hospitals and workplaces to schools and private homes. The efficacy of any such sanitising product depends on a strong detergent action in order to rapidly solubilise the lipid envelope surrounding active viral particles. The detergent will cause complete and immediate destruction of the virus. Lauric-based cleaning products are among the most powerful biologically based detergents and, unlike some chemically based products, are benign in their effects on the skin. These detergents can even be used inside the mouth and the frothing and cleaning action of most toothpastes is due to the presence of lauric salts derived from PKO. Indeed, oil palm-derived lauric salts are so powerful that they are also key tools used in scientific research into protein and nucleic acids. Separation of these macromolecules in scientific labs is routinely achieved by running them on gels in the presence of sodium lauryl sulphate, also known as sodium dodecyl sulphate (SDS).

This means that there will continue to be a robust demand for PKO in a post-covid-19 world and possibly an increase in requirements for lauric-based products for global health sectors. Because these requirements are so important, the possibility must be considered of whether there might be substitutes for PKO as a lauric provider that could be a threat to the oil palm industry. This possibility has already been confronted in some cases where consumers have sought to avoid oil palm products, e.g. due to misplaced environmental concerns. For an industry reaction we can quote Andrew Jenkins, the sustainable development manager for products at the major pharmacy chain, Boots UK, who stated:

A.

B.

C.

Figure 1 These adverts from over a century ago show the importance of palm oil-derived soaps for human health. Panel A - In 1915 Sunlight soap was supplied to British soldiers, including my grandfather who fought with the King's Liverpool Regiment in the insanitary trench warfare on the Western Front. Panel B - These soaps were made from palm oil imported into Liverpool from Africa and Asia. Panel C - Palm-derived soaps were heavily promoted for use during the great influenza pandemic of 1918-19.

"If palm oil was no longer used, what would the unintended consequences on the environment be of whatever it is replaced with?". "In personal care many of the derivatives from palm could be and are manufactured from coconut instead." But given that coconut plantations yield less than half the oil per hectare than palm, "*you are simply transferring the environmental problem elsewhere*".

On this point, it is also interesting to note that, in July 2020, there were calls for boycotts of coconut products due to its claimed destructive effects on wildlife (Alberts, 2020) and alleged poor harvesting practices involving trained monkeys (BBC, 2020). If heeded, such calls would effectively rule out the only possible (albeit far from satisfactory) replacement for palm kernel oil as a provider of lauric fats for products such as detergents and cosmetics. There is broad agreement from industry that certified sustainable palm oil is the only environmentally responsible solution, but diversification of supply chains is also desirable – although this is not necessarily achievable for lauric products except on a very small scale, due to the low yield of alternative crops such as coconut.

UNCERTAIN FUTURE FOR PALM-BASED BIOFUELS

Over the past decade a growing proportion of palm oil has been used as a biofuel, mostly in the transport sector as biodiesel derived from methyl esters of the oil. Most palm biodiesel is consumed locally in Malaysia and Indonesia. This is due to government-supported mandates that enforce the mixing of palm biodiesel with petroleum-derived diesel. It has enabled palm biodiesel use to rise from 0.25 to 7.2 million tonnes between 2010 and 2019 – an almost 30-fold increase. However, the use of palm biodiesel as a carbon-neutral fuel in the transport sector has proved to be controversial, especially in the European Union (EU) (Lim, 2018). Until very recently, a substantial and growing amount of palm biodiesel, totalling 4.9 million tonnes in 2018, was used in the EU. For over a decade the EU has steadily increased its imports of palm oil for fuel use, while the amount used for food, feed and oleochemicals has declined from a high of almost 4 million tonnes to about 2.7 million tonnes (Muzii, 2019). Recent data show that in 2018 the EU imported a total of 7.6 million tonnes palm oil but only 2.7 million tonnes (36%) of this was for food and personal care use, while the remaining 4.9 million tonnes (64%) was for use as transport biodiesel or fuel oil (e.g. for electricity generation).

Concerns about the environmental impact of oil palm cultivation and the use of food crops for biofuel, coupled with recent advances in electric vehicle (EV) technologies, mean that the EU is now moving away from both crop-based biofuels and from fossil fuels. By 2019, EVs were rapidly increasing their market share in Europe, accounting for as much as half of all car sales in some countries, and this trend has been accelerated by the covid-19 pandemic. Longer term, most European countries are now phasing out carbon-based fuels, with the UK pledging in 2020 to move to a complete ban on sales of new diesel, petrol and hybrid cars by 2035 or earlier (Department for Transport, UK, 2020). This means that, irrespective of tariffs or other trade barriers on palm biodiesel imports, within a few decades there is likely to be no market for it anyway in the EU. Moreover, as vehicle manufacturers continue to move away from models with diesel engines, the entire global market for crop-based biodiesel fuels could disappear by mid-century.

Prior to 2020, the EU had already pledged to phase out palm-based biofuels by 2030, and this timetable will almost certainly be accelerated by the increasing pace of moves away from carbon-based vehicle fuels. Indeed, by April 2020, Malaysian biodiesel exports had already declined by over 90 per cent. Palm biodiesel has also been adversely affected by the worldwide glut of petroleum, which led to a price collapse in early 2020. The likelihood of continuing low petroleum prices over the next few years means that relatively expensive biodiesel is uneconomic, even with government subsidies. For example, in 2020, bio-based aircraft fuel cost US$1.20 per litre, while fossil-based fuel cost less than US$0.10 per litre, making the biofuel over 12-fold more expensive. In line with these developments, Malaysia and Indonesia have recently delayed the introduction of increased levels of palm biodiesel in vehicle fuels (Parmar, 2020).

In the medium-term, as fossil oil use continues to decline and its price remains low, there are few prospects that palm biodiesel will compete effectively on price in international markets. Therefore the only outlet for palm biodiesel, which currently accounts for about 18 per cent of total palm oil production, will be as an expensive, locally-subsidised diesel admixture in the two major producing countries, Indonesia and Malaysia. But it seems unlikely that this would be politically or economically sustainable in the long-term. However, there might be a silver lining here if, as expected, there is a future requirement for increased oil palm production as the global population continues to increase. Corley and Tinker (2015) have estimated that, by 2050, a further 6 million hectares of land could be required to meet oil palm production requirements. But if most of the current palm oil that is diverted to biodiesel is switched to food use, about 3 - 4 million hectares of this additional land would not be required.

CONCLUSIONS

The post-covid-19 prospects for the oil palm industry remain strong, especially with its strategically important twin roles in the food security and human health sectors. There are valid concerns about the impacts on the oil palm industry of a prolonged economic downturn and even a global recession. However, because the food security and human health sectors are so fundamental to human wellbeing, they are unlikely to be affected as much as some of the more discretionary areas of the economy such as leisure and travel. As we discuss in a forthcoming review article, there are additional challenges for oil palm that include the well-known sustainability and environmental issues (Murphy *et al*., 2020). Added to these are the possible impacts of global climate change that could impact on crop yields and accelerate the spread of new pests and diseases. There are also potential threats from emerging reduced freedoms in international trade due to protectionist measures such as tariffs and boycotts. Despite these various challenges, on balance, my view is that the future prospects for the world's most important vegetable oil crop remain very positive for the coming decades.

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