CONSUMER PERCEPTION, PREFERENCES AND BEHAVIOURAL INTENTION TOWARDS CHOICE OF CERTIFIED SUSTAINABLE PALM OIL IN THE KLANG VALLEY, MALAYSIA

SULEIMAN ALHAJI DAUDA

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CONSUMER PERCEPTION, PREFERENCES AND BEHAVIOURAL INTENTION TOWARDS CHOICE OF CERTIFIED SUSTAINABLE PALM OIL IN THE KLING VALLEY, MALAYSIA

By

SULEIMAN ALHAJI DAUDA

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DEDICATION

This work is dedicated to the memory of my (Late) mother Aishatu Liman Baitul Mali

(May Allah reward our parents with Jannah)
Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

CONSUMER PERCEPTION, PREFERENCES AND BEHAVIOURAL INTENTION TOWARDS CHOICE OF CERTIFIED SUSTAINABLE PALM OIL IN THE KLANG VALLEY, MALAYSIA

By

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March 2021

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Faculty : School of Business and Economics

Expansion in the commercial oil palm over the last few decades, because of increase in the global demand for palm oil, has given impetus to rapid infrastructural transformation and socio-economic development in Malaysia. However, despite the importance of palm oil, it was alleged to have negative impact on the environment especially natural forest, through loss of biodiversity, emission of greenhouse gas, displacement of indigenous people etc. The aim of the study is to examine the consumer choice of certified sustainable palm oil. The study objective investigates the consumer perception, determine their preference for sustainable palm oil with environmental attributes and appraise the consumers’ behavioural intention toward the choice of sustainable palm oil. A self-administered interview via structured questionnaire of choice experiment and structural equation model was administered to 322 consumers in Klang Valley Malaysia.

Information on the consumer perception of palm oil, based on its importance, contribution to the economy, and effect on the environment was analysed. The result on the consumer perception information indicates that, knowledge, awareness, and positive opinion of the consumers to support sustainable palm oil in Malaysia is high. Choice experiment was analyzed using Conditional Logit and Mixed Logit Models. Estimate of consumers’ willingness to pay price premium for palm oil with sustainability attributes was obtained, and heterogeneity in consumer preferences was revealed. Results of choice experiment models indicates consumer preference for Mass Balance supply chain model, moderate levels biodiversity conservation and carbon dioxide emission. Education, income, and gender were the main interaction variables that influences consumer choice for the attributes in the models. Conditional logit model result with interaction indicates mean willingness to pay price premium above the stock price for palm oil produced through Mass Balance process at 5.17% while Segregation through process was 1.95%. price premium for Moderate conservation of biodiversity was 3.85% and for moderate emission of carbon dioxide was 0.86%, while high biodiversity
conservation and lower emission was 1.71% and 1.34% respectively. In another vein, result for interaction Mixed logit model has mean willingness to pay price premium above the stock price for palm oil produced through Mass Balance process at 5.10% while Segregation through process was 2.02%. price premium for Moderate conservation of biodiversity was 3.88% and for moderate emission of carbon dioxide was 1.77%, while high biodiversity conservation and lower emission was 1.68% and 1.35% respectively. Structural equation model was also analysed based on protection motivation theory to appraise the consumers’ behavioural intention for their need to protect self or their environment from the effect of unsustainable oil palm expansion.

Findings from the structural equation model indicate, consumers negative threat appraisal and positive coping appraisal on one hand, extension of same model to include Roundtable on Sustainable Palm Oil constructs, the result indicated that consumers felt threatened without the intervention of the sustainable certification of palm oil. However, they perceived strategies adopted for addressing the problems associated with oil palm such as loss of biodiversity and emission of harmful carbon dioxide as inadequate and needs improvement. The outcome of this study indicates consumer willingness to promote and protect the environment through their choice of sustainable palm oil. Finding from this study will guide policy makers to incorporate consumers’ demand-side when setting sustainable palm oil standard. the study recommended that, to promote environmental sustainability vis a vis expansion of oil palm, there is need stimulate consumer support and also put in place enabling institutional mechanism that will balance the trade-off between oil palm (Economy) and environmental attributes (Ecology).
Abstrak tesis yang dikedumakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

PERSEPSI PENGGUNA, KEUTAMAAN DAN NIAT TINGKAH LAKU KE ARAH MINYAK SAWIT LESTARI YANG DISAHKAN DI LEMBAH KLANG, MALAYSIA

Oleh

SULEIMAN ALHAJI DAUDA

Mac 2021

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Perkembangan komersial kelapa sawit sejak beberapa dekad lalu yang disebabkan oleh peningkatan permintaan global terhadap minyak sawit, telah mendorong kepada kepesatan transformasi infrastruktur dan pembangunan sosio-ekonomi di Malaysia. Namun, di sebalik kepentingan minyak sawit, terdapat dakwaan bahawa ia memberi kesan negatif terhadap alam sekitar terutama kepada aspek perhutanan lantaran kehilangan biodiversiti, pelepasan gas rumah hijau, pemindahan penduduk asli dan lain-lain. Tujuan kajian ini adalah untuk mengkaji pilihan pengguna terhadap minyak sawit lestari bersijil. Objektif kajian ini adalah untuk menyelidik persepsi pengguna, mengenalpasti pilihan mereka terhadap minyak sawit lestari berdasarkan atribut persekitaran dan menilai niat tingkah laku pengguna terhadap pemilihan minyak sawit lestari. Temu balas secara bersemuka melalui soal selidik berstruktur Eksperimen Pilihan dan Model Persamaan Struktur telah dijalankan di kalangan 322 pengguna di Lembah Klang, Malaysia.

melebihi harga stok minyak sawit yang dihasilkan melalui proses “Keseimbangan Jisim” pada 5.17% sementara pengasingan melalui proses adalah 1.95%. Premium harga untuk pemuliharaan biodiversiti ialah 3.85% dan pelepasan karbon dioksida sederhana adalah 0.86%, sementara pemuliharaan biodiversiti tinggi dan pelepasan rendah masing-masing adalah 1.71% dan 1.34%. Keputusan bagi model “Logit Campuran” dengan pembolehduah interaksi mempunyai purata kesediaan membayar premium harga melebihi harga stok minyak sawit yang dihasilkan melalui proses “Keseimbangan Jisim” pada 5.10% manakala pengasingan melalui proses adalah 2.02%. Premium harga untuk pemuliharaan biodiversiti ialah 3.88% dan pelepasan karbon dioksida sederhana adalah 1.77%, sementara pemuliharaan biodiversiti tinggi dan pelepasan rendah masing-masing adalah 1.68% and 1.35%. “Model Persamaan Struktur” juga telah dianalisis berdasarkan teori motivasi perlindungan untuk menilai niat tingkah laku pengguna untuk perlindungan sendiri dan perlindungan sekitar daripada kesan perkembangan industri kelapa sawit yang tidak lestari.

Penemuan dari “Model Persamaan Struktur” menunjukkan, penilaian ancaman negatif pengguna dan penilaian positif di satu pihak, lanjutan model yang sama yang merangkumi konsep “Meja Bulat untuk Minyak Sawit Lestari”, hasilnya menunjukkan bahawa pengguna merasa terancam tanpa campur tangan persijilan minyak sawit. Namun, mereka merasakan strategi untuk mengatasi masalah yang berkaitan dengan kelapa sawit seperti kehilangan biodiversiti dan pelepasan karbon dioksida yang berbahaya sebagai tidak mencukupi dan perlu diperbaiki. Hasil kajian ini menunjukkan kesediaan pengguna untuk mempromosikan dan melindungi alam sekitar melalui pemilihan mereka terhadap minyak sawit lestari. Penemuan dari kajian ini akan membimbing pembuat dasar untuk menggabungkan sisi permintaan pengguna semasa menetapkan standard minyak sawit yang lestari. Para penyelidik mengesyorkan, untuk meningkatkan kelestarian alam sekitar melalui persijilan berhubung dengan perkembangan komersial kelapa sawit, ia memerlukan mekanisme institusi untuk mencapai keseimbangan di antara kelapa sawit (Ekonomi) dan atribut persekitaran (Ekologi)
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This thesis was submitted to the Senate of the Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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<th>Description</th>
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<tr>
<td>BIO</td>
<td>Biodiversity</td>
</tr>
<tr>
<td>CE</td>
<td>Choice Experiment</td>
</tr>
<tr>
<td>CFA</td>
<td>Confirmatory Factor Analysis</td>
</tr>
<tr>
<td>CLM</td>
<td>Conditional Logit Model</td>
</tr>
<tr>
<td>CM</td>
<td>Choice Modelling</td>
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<td>CVM</td>
<td>Contingent Valuation Method</td>
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<td>CO$_2$</td>
<td>Carbon Dioxide</td>
</tr>
<tr>
<td>CSPO</td>
<td>Certified Sustainable Palm Oil</td>
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<td>GHGs</td>
<td>Greenhouse Gases</td>
</tr>
<tr>
<td>MLM</td>
<td>Mixed Logit Model</td>
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<td>MSPO</td>
<td>Malaysian Sustainable Palm Oil</td>
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<td>PMT</td>
<td>Protection Motivation Theory</td>
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<td>RP</td>
<td>Revealed Preference</td>
</tr>
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<td>RSPO</td>
<td>Roundtable on Sustainable Palm Oil</td>
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<tr>
<td>SEM</td>
<td>Structural Equation Modelling</td>
</tr>
<tr>
<td>SP</td>
<td>Stated Preference</td>
</tr>
<tr>
<td>TEV</td>
<td>Total Economic Valuation</td>
</tr>
<tr>
<td>WTA</td>
<td>Willingness to Accept</td>
</tr>
<tr>
<td>WTP</td>
<td>Willingness to Pay</td>
</tr>
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</table>
CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Globally, consumers are concerned about their consumption habits and are keener than ever to know about the origins and methods used to produce products. They are curious to know whether products are sustainably sourced and produced. Thus, to a small changes in consumption by individuals or households can contribute immensely toward promoting sustainable resources, consumption, and the optimal allocation of resources (Campbell-Arvai et al., 2014). Initiating behavioural changes in individuals and families, can achieve sustainable consumption and production. Thus, Wognum et al., (2011) noticed that informed consumers are concerned about quality, safety, and environmental conformity of the products they buy. Similarly, businesses have to study consumer behaviour and respond to their preferences by switching to sustainable production processes (Hinkes & Christoph-Schulz, 2019; Hinkes & Christoph-Schulz, 2020).

Many factors have contributed to consumer negative perception of palm oil, its production has been alleged to have posed environmental degradations, deforestations, biodiversity loss, and net greenhouse gas emissions. (Ibrahim et al., 2020). Ecological resources and their values are being threatened due to the expansion of oil palm cultivation. Such ecological or natural resources are not assigned monetary values or returns, and this resulted into market failure, therefore, to address the market failures, resulting from the expansion of palm oil production, and its impact on the natural forest, many consumers got driven to demand for eco-friendly products, which is assumed to have not contributed to the degradation of natural forest (Aguilar & Vlosky, 2007).

In an attempt to introduce sustainable products, like palm oil, markets became flooded with many voluntary/mandatory labelling schemes, especially for products like cocoa, coffee, organic products, fish, tea, vegetables, and palm oil. Aguilar & Vlosky (2007) postulated that each certificate or label is based on differentiated degrees of sustainability, which is seen as a critical issue in eco-labelling and certification. They are used to provide assurances to consumers that the product they consume can be traced back to the global value chain of custody and primary source of production. When certified products made with certified Palm oil are tagged with an eco-label, environmentally conscious consumers can distinguish and make a conscious choice on their preference for such products. Carambas (2007) rightly put it that eco-labelling of products is designed to addresses the market’s failure to provide such information by internalising the environmental impacts of production, which occurs due to asymmetric information.

1
Previous literature suggests premium markets were often created for certified eco-label products, and they often use the conservation of a particular species such as orangutans or tigers as incentives to encourage people to buy eco-friendly products. Using such a flagship is simple and appeals to the emotions of those who want to contribute to saving the species (Zulkifli & Sundram, 2015), which they often believe can be achieved through the conservation of land within oil palm concessions (Bateman et al., 2009). This study uses biodiversity conservation and the reduction of CO₂ emission through the palm oil supply value chain as a means of promoting sustainable palm oil standards. Adequate knowledge of certified palm oil and the consumer preference for its products is low even in many developed countries (Nikoloyuk, 2009; Laurance et al., 2010; Gassler & Spiller, 2018). The process of procurement and the supply chain of certified palm oil provide information on the traceability, quality, and price of the palm oil in the market. Sustainably produced and certified palm oil might incur higher production costs due to the strenuous production process, which makes the product relatively expensive compared to non-certified palm oil.

There has been a campaign against the production of sustainable and unsustainable palm oil mainly from Europe and the USA. Even though, the market for certified palm oil was not fully developed or regulated around the world, especially in Malaysia. Some studies were conducted on the sustainable production of palm oil, which focused on supply factors like technology, eco-innovation, and market opportunities of sustainable output (Pacheco et al., 2017; Vermeulen & Goad, 2006; Ludin et al., 2014). Sustainable consumption needs to be studied from the consumer perspective, and such an approach is mainly rooted in consumer behaviour theory that focuses on the demand side, like preferences for recycling and conservation measures. Therefore, this study examines consumer behaviour to estimate their demand preferences for the supply value chain attributes of the RSPO. Specifically, the relationship with biodiversity conservation and harmful CO₂ emissions, and the psycho-social attitudes that motivate behavioural intention towards certified palm oil. Also, this study ascertains the perception, knowledge, opinion, and awareness of consumers regarding the relationship between palm oil and the environment, biodiversity, CO₂, air and water quality. By conducting successful studies on the demand factors of sustainable consumption in Malaysia, it signals to the world that Malaysia and other palm oil-producing countries are ready to contribute towards the sustainability efforts to produce palm oil.

1.1.1 Overview of Palm Oil Production and Consumption in Malaysia

Palm oil constituted nearly 30% of the global supply of edible vegetable oil, and the was the most important source of income generation, employment, and poverty alleviation in tropical countries according to Carter et al., (2007). Palm oil is efficient and has the highest yield per hectare of all oilseeds. Similarly, Disdier et al., (2013) mentioned that groundnut, sunflower, soy, cotton, and rapeseed oil require 5-10 times more land to produce the same quantity of oil compared to palm oil. Therefore, transitioning from palm oil cultivation to a different oilseed raises the issue of land use (Baryeh, 2001). Table 1.1 shed more light on the claims above, since palm oil was adjudged to have the highest average productivity compared to other major vegetable or crop oils. Its efficiency in production enables it to produce annually per hectare an average of 4,080
kg of palm oil, and 456 kg of palm kernel. Compared to other oil crops palm oil, it is more efficient, economical, and productive.

Table 1.1: Average Productivity of Major Oil Crops in Malaysia

<table>
<thead>
<tr>
<th></th>
<th>2007/2008(^p) oil seed yields Kg/ha/yr</th>
<th>Oil conversion factor (%)</th>
<th>Oil equivalent per ha/yr (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybean</td>
<td>2180</td>
<td>18-19</td>
<td>403</td>
</tr>
<tr>
<td>Cottonseed</td>
<td>1300</td>
<td>18-20</td>
<td>247</td>
</tr>
<tr>
<td>Groundnut</td>
<td>1060</td>
<td>45-50</td>
<td>504</td>
</tr>
<tr>
<td>Sunflower seed</td>
<td>1350</td>
<td>40-50</td>
<td>608</td>
</tr>
<tr>
<td>Rafeseed</td>
<td>1840</td>
<td>40-45</td>
<td>782</td>
</tr>
<tr>
<td>Sesame seed</td>
<td>460</td>
<td>45-50</td>
<td>219</td>
</tr>
<tr>
<td>Palm oil</td>
<td>-</td>
<td>20</td>
<td>4080</td>
</tr>
<tr>
<td>Palm Kernel oil</td>
<td>960</td>
<td>45-50</td>
<td>456</td>
</tr>
<tr>
<td>Copra</td>
<td>560</td>
<td>65</td>
<td>372</td>
</tr>
</tbody>
</table>

\(^p\) Preliminary
(Source: Abdullah and Wahid, 2010)

Despite the availability of high yielding varieties of palm oil, global upsurge in the palm oil demand have eventually translated into many environmental problems associated to palm oil production and consumption. (Statista, 2020) reported that in 2010 a growth rate of -4.22%, it however, rose to 1.83% in 2015 and 4.88% by 2019. Malaysian consumption per 1000 million metric tons in 2010 was 2,204, in 2015 it was 3000, and in 2019 it jumped to 3,675. The total volume of palm oil consumed in Malaysia in 2019 was around 3.7 million metric tons. According to Noor, (2020) there was a shortfall in cooking oil based on 2010 cooking oil allocation and consumption from January to December except during ceremonies like Chinese New Year in January and the Muslim Fasting period in August, which witness high consumption of cooking oil of more than 73,000 0000 tones. During these festive periods, lots of dishes are prepared with high amounts of cooking oil. Table 1.2 shows the amount of cooking oil used in popular Malaysian dishes.

Table 1.2: Top 8 Malaysian Favourite Foods

<table>
<thead>
<tr>
<th>Favourite food</th>
<th>Oil per serving (gram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasi Lemak</td>
<td>10</td>
</tr>
<tr>
<td>Nasi Goreng</td>
<td>10</td>
</tr>
<tr>
<td>Kuew Teow Goreng</td>
<td>15</td>
</tr>
<tr>
<td>Mee Goreng</td>
<td>10</td>
</tr>
<tr>
<td>Chicken Curry</td>
<td>5</td>
</tr>
<tr>
<td>Pisang Goreng</td>
<td>5</td>
</tr>
<tr>
<td>Curry Puff</td>
<td>5</td>
</tr>
<tr>
<td>Roti Canai</td>
<td>10</td>
</tr>
</tbody>
</table>

(Source: Noor, 2020)
Palm oil is used in both food and non-food industries, and there is an increasing demand locally and internationally. Noor and Hua (2016) discovered that palm cooking oil is the most consumed edible oil in Malaysia because it is cheap and readily available compared to other oils, both for cooking and non-cooking purposes. About 40% of palm oil is used for cooking oil, margarine, fats, or oleochemicals. Demand is also increasing further due to its use in industry as an alternative to fossil fuel. In addition to cooking oil, palm oil is found in many everyday household products like cosmetics, confectionaries, soap, ice cream, and shampoo. Figure 1.2 shows household products that contained a reasonable quantity of palm oil.

Consumption of palm oil is on the increase not only in Malaysia, but global demand is also witnessing an upsurge. Malaysian consumption of palm oil has fluctuated between 1964-2017, according to Index Mundi data base, as shown in Table 1.3. Rise in consumers income and population growth were identified by Wahid et al., 2007 as factors responsible for the increase in domestic demand for palm oil in Malaysia, this is true because the total consumption of world palm oil is predicted to reach 43 million tonnes in 2020 (Choong & McKay, 2014).
### Table 1.3: Domestic Consumption of Palm Oil in Malaysia

<table>
<thead>
<tr>
<th>Market Year</th>
<th>Area Harvested</th>
<th>Unit of Measure</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>0</td>
<td>0 (1000 MT)</td>
<td>NA</td>
</tr>
<tr>
<td>1966</td>
<td>11</td>
<td>(1000 MT)</td>
<td>22.22 %</td>
</tr>
<tr>
<td>1968</td>
<td>6</td>
<td>(1000 MT)</td>
<td>0.00 %</td>
</tr>
<tr>
<td>1969</td>
<td>11</td>
<td>(1000 MT)</td>
<td>83.33 %</td>
</tr>
<tr>
<td>1971</td>
<td>10</td>
<td>(1000 MT)</td>
<td>25.00 %</td>
</tr>
<tr>
<td>1973</td>
<td>73</td>
<td>(1000 MT)</td>
<td>247.62 %</td>
</tr>
<tr>
<td>1975</td>
<td>81</td>
<td>(1000 MT)</td>
<td>30.65 %</td>
</tr>
<tr>
<td>1977</td>
<td>130</td>
<td>(1000 MT)</td>
<td>-3.70 %</td>
</tr>
<tr>
<td>1979</td>
<td>359</td>
<td>(1000 MT)</td>
<td>68.54 %</td>
</tr>
<tr>
<td>1980</td>
<td>420</td>
<td>(1000 MT)</td>
<td>16.99 %</td>
</tr>
<tr>
<td>1982</td>
<td>518</td>
<td>(1000 MT)</td>
<td>19.35 %</td>
</tr>
<tr>
<td>1984</td>
<td>506</td>
<td>(1000 MT)</td>
<td>41.74 %</td>
</tr>
<tr>
<td>1986</td>
<td>542</td>
<td>(1000 MT)</td>
<td>-12.44 %</td>
</tr>
<tr>
<td>1988</td>
<td>763</td>
<td>(1000 MT)</td>
<td>10.26 %</td>
</tr>
<tr>
<td>1990</td>
<td>914</td>
<td>(1000 MT)</td>
<td>3.63 %</td>
</tr>
<tr>
<td>1992</td>
<td>1274</td>
<td>(1000 MT)</td>
<td>24.90 %</td>
</tr>
<tr>
<td>1993</td>
<td>1227</td>
<td>(1000 MT)</td>
<td>-3.69 %</td>
</tr>
<tr>
<td>1995</td>
<td>1370</td>
<td>(1000 MT)</td>
<td>17.09 %</td>
</tr>
<tr>
<td>1997</td>
<td>1366</td>
<td>(1000 MT)</td>
<td>-6.31 %</td>
</tr>
<tr>
<td>1999</td>
<td>1566</td>
<td>(1000 MT)</td>
<td>7.33 %</td>
</tr>
<tr>
<td>2000</td>
<td>1571</td>
<td>(1000 MT)</td>
<td>0.32 %</td>
</tr>
<tr>
<td>2002</td>
<td>1565</td>
<td>(1000 MT)</td>
<td>8.38 %</td>
</tr>
<tr>
<td>2004</td>
<td>1846</td>
<td>(1000 MT)</td>
<td>14.94 %</td>
</tr>
<tr>
<td>2006</td>
<td>2264</td>
<td>(1000 MT)</td>
<td>5.55 %</td>
</tr>
<tr>
<td>2008</td>
<td>2688</td>
<td>(1000 MT)</td>
<td>-0.70 %</td>
</tr>
<tr>
<td>2009</td>
<td>2301</td>
<td>(1000 MT)</td>
<td>-14.40 %</td>
</tr>
<tr>
<td>2010</td>
<td>2204</td>
<td>(1000 MT)</td>
<td>-4.22 %</td>
</tr>
<tr>
<td>2011</td>
<td>2150</td>
<td>(1000 MT)</td>
<td>-2.45 %</td>
</tr>
<tr>
<td>2012</td>
<td>2451</td>
<td>(1000 MT)</td>
<td>14.00 %</td>
</tr>
<tr>
<td>2013</td>
<td>2869</td>
<td>(1000 MT)</td>
<td>17.05 %</td>
</tr>
<tr>
<td>2014</td>
<td>2946</td>
<td>(1000 MT)</td>
<td>2.68 %</td>
</tr>
<tr>
<td>2015</td>
<td>2743</td>
<td>(1000 MT)</td>
<td>-6.89 %</td>
</tr>
<tr>
<td>2016</td>
<td>2622</td>
<td>(1000 MT)</td>
<td>-4.41 %</td>
</tr>
<tr>
<td>2017</td>
<td>3238</td>
<td>(1000 MT)</td>
<td>23.49 %</td>
</tr>
</tbody>
</table>

(Source: Mundi, Index 2019)

Malaysia has a plan to expand palm oil production, for food and energy purposes. It aimed at annual growth of 7.1% by 2020, through the establishment of downstream industries and the expansion of plantations in the Eastern Malaysian provinces of Sarawak and Sabah, and in Indonesia. Malaysia has 5 million hectares of land planted with tropical monoculture, which accounts for 70% of the agricultural land. Further expansion of oil palm plantation for food and energy purposes presents imminent negative environmental and social impact (e.g., deforestation, loss of biodiversity, emission of GHG, displacement of indigenous people and low-income families from their lands). The proposed expansion led to criticism from both non-governmental organisations (NGOs) and scientists (Pichler, 2013).
1.1.2 Palm Oil and Its Contribution to the Malaysian Economy

Palm oils constituted about 38% of the value of Malaysia’s agricultural output in 2021, and 3% of its gross domestic product according to Chang, (2021). It remains one of the top agro-industrial commodities, that greatly contributed to the national economy, since it is among the driving forces for the Malaysia’s agro-industry. In the downstream sector of the palm oil industry, it has directly employed more than 441,000 people, most of whom are small landholders, and indirectly employed many. Palm oil have led to poverty alleviation, and equitable distribution of wealth among Malaysian population. Palm oil sector has become a lucrative source of income, especially for smallholders in Malaysia, (Brandi et al., 2015; Alam et al., 2015).

Palm oil have contributed greatly to the socio-economy of Malaysia at large. palm oil has contributed to the growth of Malaysian economy in terms of generating rural employment, and alleviating rural poverty, improving infrastructural facilities which included health facilities and education, as well as revenue generation for the benefit of government and employees. It raises credits for government and facilitates training arrangements and it develops agricultural sector (Shehu et al., 2020). Contribution of palm oil to the Gross domestic product in Malaysia, according to Statista, (2021) was 37.66% in 2017, 37.66% in 2018 and 38.24% in 2019.

1.1.3 Roles of Malaysian Sustainable Palm Oil and Roundtable on Sustainable Palm Oil

Malaysian Sustainable Palm Oil (MSPO) is a homegrown initiative developed by Malaysian standards. It was registered under the governing body of the Malaysian Palm Oil Certification Council (MPOCC) and was approved in 2013 to commence operations in 2015. MSPO has jurisdiction over matters related to, but not limited to, land and wildlife protection, employee working condition, crop protection, environmental safety, and health. (Mansor et al., 2018). Compliance to MSPO is voluntary until 2019. MSPO was established to rival the RSPO, with more emphasis on the sustainability of the national industry than the natural environment. It viewed the RSPO as a protectionist trade barrier that impeded the development of Malaysian palm oil industries. (Marks et al., 2017).

The principles of both RSPO and MSPO are the same, however, their modes of operation and scope differs. While RSPO is voluntary. Table 1.4 below made some comparisons between the principles of RSPO and MSPO that related to the environment.
Table 1.4: Extract of RSPO and MSPO Principles Related to Environmental Issues

<table>
<thead>
<tr>
<th>RSPO Principles</th>
<th>MSPO Principles</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 Commitment to transparency.</td>
<td>P2 Responsible for transparency of information, documents, method of communication, traceability</td>
</tr>
<tr>
<td>P2 Compliance with applicable laws and regulations.</td>
<td>P3 Compliance with legal requirements.</td>
</tr>
<tr>
<td>P3 Commitment to long-term economic and financial viability.</td>
<td>P1 Management commitment and responsibilities.</td>
</tr>
<tr>
<td>P4 Uses of appropriate best practices by growers and millers.</td>
<td>P6 Implement standard best practices.</td>
</tr>
<tr>
<td>P5 Environmental responsibility and conservation of natural resources and biodiversity</td>
<td>P5 Environment, natural resources, biodiversity and ecosystem</td>
</tr>
<tr>
<td>P6 Responsible consideration of employees and individuals and communities affected by growers and mills.</td>
<td>P4 Social responsibility, health safety and employment condition.</td>
</tr>
<tr>
<td>P7 Responsible development of new plantings</td>
<td>P7 Commitment to the development of new planting.</td>
</tr>
<tr>
<td>P8 Commitment to continuous improvement in key areas of activity</td>
<td>Not stated as a specific principle, partly embedded in MSPO-P1</td>
</tr>
</tbody>
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(Adopted from Mansor et al. 2018)

Klang Valley region in Malaysia was chosen as our study area because, according to Kaffashi et al., (2016) Klang Valley is the fastest developing urban settlement, characterised by large population growth, modern industrial activities and developed housing estates. Palm oil in Malaysia is been used for cooking and non-cooking purposes, and its local consumption has been on increase (Noor and Hua, 2016). Some of the popular brands of cooking oil in Malaysia are Saji, Aliff, Seri Murni, Buruh, VeSawit, Knife, Red Eagle. Most of these cooking oils are packed either in bottles or plastic sachets, and are supplied for local consumption (Ibrahim et al., 2020). Certified sustainable palm oil often carries eco-labels. In Malaysia palm oil were mostly certified as Halal products, based on third party certifying agency like Standard and Industrial Research Institute of Malaysia (SIRIM). In contrast non sustainably certified palm oil are those conventionally produced and marketed, without undergoing thorough monitoring, supervision, and authorization by the certifying authority, thus they don’t carry any eco-label.

A recent approach to promote palm oil to Europe and Western consumers, who are critical of the negative impact of palm oil on the environment, is to connect market incentives with the rationale for conservation. This approach has provided an opportunity for consumers to contribute toward conservation efforts by supporting sustainably certified production processes. One of these market-based conservation instruments is the certification scheme known as eco-labelling. In the light of the above,
this study aimed to examine the perception of consumers on issues related to palm oil has been appraised based on their knowledge, awareness, and opinion. Choice experiment via Conditional Logit Model (CLM) and Mixed Logit Model (MLM) presents choice scenario to the consumers using hypothetical market, palm oil attributes with, RSPO 100% certified and RSPO 1-99% certified, with biodiversity, CO₂ and cost of premium are identified. Similarly Structural equation model using protection motivation theory, appraises the consumer perceived threat on exposure to unsustainable palm oil, likewise their perceived coping appraisal techniques.

Eco-labelling, eco-friendly, environmentally friendly, nature friendly, sustainability certifications, and green products are concepts that were introduced in the 1990s. They have since become vital in the formulation of environmental policy (Zhou et al., 2016). Dosi & Moretto (2001) used a market-based approach to examine the reduction of the environmental impacts of production, with the motivation that consumer purchasing behaviour is not just influenced by price, quality, and health standard, but also by environmental considerations. Therefore, any credible information on the eco-labelled product will affect consumer purchasing decisions positively and increase the market share of the certified products (Fischer et al., 2005). The objective of the palm oil certification is to address concerns on the perceived negative impact of oil palm production on the environment, particularly its effect on the loss of biodiversity and emissions of harmful CO₂.

1.2 Problem Statement

The ecological resources that have values, such as threatened or endangered fauna and floras like Rhinoceros, Elephants, Orang utang, Tigers, hornbills, Rafflesia, herbaceous and medicinal plants, also water and air resources found in the oil palm plantation areas, is yet to be captured and translated into cash returns, because no market price has been placed on them. Ecological resources improvement resulting from the implementation of sustainability standards is non-rival and non-excludable. Those who pay for improvements cannot exclude those who did not from benefiting and enjoying the improved resources. This situation is a case of market failure, which arises because of the public nature of ecological goods, and because of non-revelation and non-establishment of consumer preference for such goods. An opportunity for addressing market failure can be established if consumers reveal their preferences by payment of premium on certified palm oil. Consumers that have a negative opinion or perception on non-certified palm oil, or those who are aware and have positive preferences toward certified palm oil would demand certified palm oil and pay a premium (Giam et al., 2016a).

Product price and quality has been identified as the significant factors that influences consumer preferences towards palm oil in Malaysia, other factors such as the role of advertisement, promotion, health related issues and environmentally sustainable attributes attached to palm oil can also influence consumer preferences for the choice of vegetable oil in Malaysia. Palm oil is extensively used for cooking or garnishing food. Even though, its consumption is linked to food safety, health, and environmental
concerns. As a result, concerned consumers increased their demand for information on the quality and safety of their products, especially palm oil (Ibrahim et al., 2020). Identifying the Malaysian consumer factor that influence their preferences and reason for choice among the vegetable oils, and the rationale for linking the consumption of palm oil with its environmental impact will stimulates the consumption of certified palm oil and setting of sustainable standards in palm oil industry.

Global demand and consumption of palm oil are up surging, because of increase in the population and high demand for vegetable oil, to produce many commodities used in both food and non-food industries. Many criticisms have been labelled against palm oil and the impact of its production on the environment, notably from non-governmental organisations such as (Greenpeace, 2007), European markets, and consumer firms. Oil palm plantation started with 400 ha in 1920, but by 1960 land mask for cultivation increases to 54,000, it further increases significantly, in Malaysia by occupying virgin jungles as well as by converting areas that were used for cultivating rubber or other crops. (Ibrahim et al., 2020). Such unprecedented growth in the expansion of the oil palm automatically leads to an increase in the supply of the palm oil. This phenomenon resulted in the cultivation of more land, opening of new plantations, employment of more labour, fashioning of new production technologies, and the exploitation of new markets. However, it has also led to the alleviation of poverty, employment, and income generation for rural farmers or small and medium holders of palm oil plantations. Palm oil demand growth may aggravate the already tainted image of producers because palm oil is often associated with deforestation, child labour, exploitation of the labour force, chemical fertilisers, emissions of harmful CO₂, environmental degradation, and the destruction of biodiversity.

Many countries, from European Union view palm oil producer nations as protectionist and indifferent toward the effects of palm oil on the environment. Malaysia has done a lot to address the issues of sustainability of palm oil in all the supply value chain, apart from being a founding member of RSPO. There are many policies on palm oil promulgated by the Malaysian government. Starting from the first industrial master plan that took up in 1986, with the ambition to move Malaysia from primary producer of agricultural products to the industrial sector. To the second master plan launched from 1996-2005 was designed to develop the industrial sector, and to enhance its linkages, increase productivity and value-added activities as well as sufficient sustainability in terms of imports of raw material. The third Malaysian industrial plan 2006-2020 was aimed at industrializing the oil palm sector, which was achieved through special government recognition under the twelve National Key Economic Areas (NKEA) (Shehu et al., 2020). All the plans have impacted positively toward transforming palm oil industry of Malaysia, through sound policies. Furthermore, Malaysia has developed MSPO as home grown policy formulation and sustainability initiative. Despite the campaigning for the boycott of palm oil from the supply value chain of some consumer nations. Oil palm plantations has been on expansion, therefore, to address its perceived negative environmental impact, and to ensure its sustainability standard, a certification of the entire value chain was voluntarily introduced by the RSPO, and mandatory by the MSPO. Certification enhances the acceptability of palm oil in both the producer and consumer nations.
Final consumers have a role to play in the sustainability of palm oil by adopting CSPO as a norm and by encouraging and strengthening the certified producers through the payment of price premium for the certified products. Premiums incentivise the conservation of biodiversity and reductions of CO$_2$ emissions. In Malaysia, only a few palm oil products bear eco-labelling, and are mostly processed for export to foreign markets that demand such standards. Therefore, lack of labelling palm oil products in Malaysia as “sustainably certified” and lack enough information and knowledge on the certified palm oil products and its environmental sustainability attributes, have the potential to exclude the concerned consumers from contributing to the sustainability of the palm oil by choosing to pay premium on certified cooking oil.

Studies on preferences regarding palm oil products and the impact of certification or eco-labelling on palm oil consumers are scarce. Consumers, especially in palm oil-producing nations like Malaysia and Indonesia, are not aware that their decision to choose CSPO can protect the environment. Nor are they aware that through a more open market for palm oil, the multiplier effect would catapult their economy and create more employment opportunities for smallholder farmers.

Recently, the Malaysian government made it compulsory for all oil palm enterprises to become involved in sustainable production throughout the value chain by adhering to the MSPO scheme. The information on labelling for palm oil is voluntary and mostly not targeted towards sustainability standards like the RSPO eco-label logo. Such palm oil products are certified mainly by third-party certification schemes, like Standard and Industrial Research Institute of Malaysia (SIRIM), among others.

Since palm oil is associated with environmental issues, Consumer’s preferences to protect themselves and the environment when perceived vulnerable and threatened is an instinct, and appraisal of their response through perceived self-efficacy and response efficacy will be stimulate their protection motivation and may lead to the formation of behavioural intention. Consumers naturally have preferences in the choice of products, but conscious consumers make such choices based on rationality. Some consumers based their choice on prices, packages, advertisement, environmental sustainability attributes attached to the product, taste, or fashion etc. In case of products like palm oil, which has credence attributes, when choosing between certified and conventional palm oil products some consumers are indifferent on the effect of palm oil on the environment, however, some are concerned and choose conservation grade palm oil with sustainability attributes. The objective of this study is to examine the consumer preferences in palm oil market. To appraise what really motivates the consumer to protect the environment, is it the fear that an unsustainable oil palm can expose humanity to the danger of environmental degradation, social anarchy, and exploitation? That became the rationale of consumer to perceive the severity of the unsustainable oil palm expansion and develop a coping strategy through choosing certified palm oil.
1.3 Research Questions

i. What is the level of consumers perception, based on awareness, knowledge, and opinion on Certified Palm Oil and its connection to environmental sustainability, and other related issues?

ii. What is the behavioural intention that motivate consumers to protect selves and the environment from the perceived consequences of choosing non-certified cooking palm oil?

iii. What are the consumer preferences and WTP price premium for RSPO certified palm oil, and their marginal rate of substitution for varying credence attributes of the certified sustainable palm oil?

1.4 Objectives of the Study

The general objective to appraise consumer perception, behavioural intention and estimate their WTP price premium based on their preference for RSPO certified palm oil in Klang Valley, Malaysia.

The specific objectives of the study was set:

1. To appraise the level of consumer perception based on their knowledge, awareness, opinion, on certified sustainable Palm Oil and its connection to the environmental sustainability, and other related issues.

2. To examine the behavioural intention that motivate consumers to protect selves and the environment from the perceived consequences of choosing non-certified palm oil.

3. To identify the consumer preferences and WTP for RSPO certified palm oil and to estimate their marginal rate of substitution among varying credence attributes of RSPO certified palm oil.

1.5 Significance of the Study

Widespread campaign against the environmental and socio-economic impact of palm oil, mostly from European countries and environmental non-governmental organizations, have brainwashed some individual to hold a negative perception on the production and consumption of palm oil. Such consumers are not avail the opportunity to know and appreciate the efforts of the producer nations towards setting sustainability standard for palm oil. Moreover, they were made to view producer nations as protectionist towards the travails and the excesses of the palm oil industries, on their citizens and the environment at large. There was clamouring towards green consumerism, and global consumption has shifted towards environmentally friendly products and behaviour. This study will incentivise consumers to prioritise sustainable consumption and thus, compels producers to adopt sustainable production techniques.
Hopefully, it can be a starting point toward the acceptance and introduction of homegrown MSPO standards in the Malaysian oil palm industry.

To the individual consumers, this study will reveal the importance of appraising their preference on the choice of palm oil. Similarly, to the consumer nations and other non-governmental organization sceptical and critics of palm oil, WTP price premium by the consumers in the producer nations will convey a glad tiding, on their readiness to protect environment and its natural resources. Little is known about the willingness of citizens and their efforts towards the sustainability of palm oil. Malaysian oil palm industry is eco-friendlier and more sustainable compared to other vegetable oil producing crops (Ferdous Alam et al., 2015). Consumer preference through choice of sustainable palm oil will increase the supply of sustainable palm oil in the domestic and foreign market. Those who held negative perception about the role of palm oil may have to change, because of the palm oil industry compliance to sustainable standard throughout its supply value chain.

Palm oil industry are faced with difficult task and challenges, to adhere to the value chain by producing certified sustainable palm oil, which may require changes in land use, change in techniques of production, chain in the quality of labour to comply with the palm oil sustainability standard. Revelation of Consumer preferences and WTP price premium for CSPO would equip palm oil industries with additional fund to allocate for the conservation of the biodiversity and reduction of CO$_2$ emission. Premium generated from the consumers will be of benefit industry to address the market failure, which result in habitat loss and environmental degradation.

The adoption of CSPO standards comes with cost implications, which palm oil industry may find it difficult to incur. This study examines the possibility of making the final consumer bear part of the burden by paying a premium on CSPO. Consumer perception based on their knowledge, awareness, and opinion on CPSO will helps ascertain their preferences and expectations regarding CSPO.

The palm oil value chain provides knowledge to firms and consumers, in the palm oil industry, helps them understand how to minimise the costs they bear for complying with sustainability standards. Furthermore, it enables them to regain back costs incurred for compliance to CSPO sustainable standards.

Government and policy makers on the other hand, may find the preferences of consumer towards choosing very useful when formulating policies on the sustainability standard of palm oil, reduction in the emission of CO$_2$ and conservation of wide variety of flora and fauna, through the premium payment by the consumer will reduce the impact of the campaign against palm oil, and stimulate demand of consumers in the European counties.
This study combined consumer perception appraisal, psycho-social behaviour, and preferences to elicit WTP for certified cooking oil in Malaysia. It aimed to unveil their perception, knowledge, awareness of the consumers on CSPO. By presenting consumers with cooking oil attached linked to sustainability attributes, as proxy to other palm oil products to elicit their preferences, such attributes vary each according to their cost of production and value chain mechanism.

1.6 Scope of the Study

The study focuses mainly on the valuation of consumer preferences with regards to certified palm oil with sustainability attributes. It also examines their perceptions and motivation for choosing certified cooking oil. The sustainability attributes of palm oil are attached to the supply value chain mechanism used in most agricultural products. The RSPO categorises the sustainability standard into 100% RSPO certified cooking oil, or 1-99% mixed certified cooking oil, based on the level of biodiversity conservation and CO₂ emissions. Choice experiment is used to examine the customer’s willingness to pay price premium, for improvement in the level of bundles presented in the choice scenario. The scope in the choice scenario in every choice set covers two options, in addition with the opt-out option.

The study conceptualised the PMT approach to appraise the level of consumer perception, vulnerability, and threat associated with sustainable or unsustainable palm oil. Similarly, the method was used to identify the consumer perception of how they apply self-efficacy or response efficacy to mitigate the possible consequences of exposure to unsustainable palm oil.

To convince global consumers of the effort of palm oil producer nations, and the Malaysian preferences for conservation grade palm oil. May requires the study of how Malaysians perceive the threat and their vulnerability to unsustainable practices in oil palm industry, and effort toward pro-environmental consumerism. However, the study estimates the percentage price premium only on attributes because the choice experiment is attribute-based. It evaluates the trade-off between different levels of attributes and establish the mean WTP for each level, but not the mean WTP for the percentage price premium of all palm cooking oil.

1.7 Organisation of the Thesis

The study is categorised into six chapters: chapter one discusses the background of the study and how it relates to the subject matter and problem at hand. Then followed by discussion on the problem statement, which identifies the issues associated with the expansion of unsustainable palm oil and outlines some solutions. Then the significance of the study is discussed, which identified those who will benefit from the study. The chapter also introduces research question, which was derived from the problem
statement and presents the overall study objectives. It then presents the scope and limitation of the study, and finally, the organisation of the chapters.

Chapter two of the study, discussed on the sustainable palm oil certification and its processes, eco-labelling, cross examining and comparison of both principles and criterions of both MSPO and RSPO that relates to the environmental issues. The chapter also discussed the achievements, roles, and obstacles of RSPO, and outlined the supply chain procedure used by RSPO.

Chapter three contains a literature review on the methodology adopted, which was the stated preference (SP) method using a choice experiment. It discusses total economic valuation by identifying two approaches as stated preference and revealed preference techniques. The chapter also discusses various psycho-social theories propounded by environmental psychologists that relate economics, ecology, and human behaviour. Also, in this chapter, the protection motivation theory is introduced and adopted as the theory for the analysis of how consumers protect themselves from the onset or surreptitious encroachment of unsustainable oil palm plantations. Similarly, the hypothesis was developed to test the psychosocial perceptions of consumers regarding their rationale for adopting coping strategy when exposed to threat from the oil palm industry. The chapter also review psycho-social determinants and latent behaviours that activate and motivate consumers to protect themselves and the environment from unsustainable palm oil. The literature on protection motivation theory (PMT), is discussed and related to consumer intent. Also, this chapter reviews the theoretical and empirical frameworks related to the study.

Chapter four of the study discusses and presents the survey design, study area, sampling method and procedure, sample size, development of appropriate attributes, construction of choice sets, design of the structured questionnaire, data collection and estimation techniques, derivation of choice experiment techniques. Also, the construction of the structural equation model is presented and discussed.

Chapter five presents the result and discussion on the main findings of the study. Demographic profile of the respondents was presented and analysed based on descriptive statistics, followed by analyses of the consumer perception, awareness, and knowledge on the palm oil. Descriptive analysis of the consumer perception of the main construct of the psycho-social theory of the Protection Motivation theory was discussed. The chapter also discussed the results of the choice experiment valuations namely, conditional logit model and mixed logit model and the estimate of the mean willingness to pay of the models.

Chapter six makes summary and draw conclusion on the study, also discussed in the study is the policy implication of the main finding as it relates to government, palm oil industries and the consumers. Limitation and recommendation for further studies was also outlined, similarly contribution to knowledge was also acknowledged.
1.8 Operational Definition of Key Terms

1. Sustainable Production and Consumption

In Oslo, the (Norwegian Ministry of Environment, 1994) defined sustainable consumption and production (SCP) as, “the use of goods and services, which helps meet the basic human needs and promote a better quality of life, also reducing the use of natural resources and toxic materials, like the emissions of waste and pollutants over the life cycle of the good or service, not endangering the needs of further generations”.

2. Ecolabeling or Sustainability Certification

The (Global ecolabeling network, 2020) defined eco-labelling as a voluntary method of environmental performance certification and labelling, which is practised around the world. An eco-label identifies products or services proven to be environmentally friendly within a specific category.

According to EOCD (1991), eco-labels are defined as a seal of approval given to products that are deemed to have less impact on the environment than other competitively similar products.

3. Certified Sustainable Palm Oil

(GreenPalm, 2020) defines certified sustainable palm oil (CSPO) and palm kernel oil (CSPKO) as produced by palm oil plantations which have been independently audited and certified against the RSPO - Roundtable on Sustainable Palm Oil standards.

4. Round Table on Sustainable Palm Oil

The (RSPO, 2007) is a non-profit association formed in 2004, to promote the growth and use of sustainable oil palm products, through credible global standards and engagement of stakeholders. The seat of the RSPO is in Zurich, Switzerland, while the secretariat is in Kuala Lumpur, and there is a satellite office in Jakarta, Indonesia. The RSPO unites stakeholders from seven sectors of the palm oil industry. Including oil palm producers, palm oil processors or traders, consumer goods manufacturers, retailers, banks and investors, environmental NGOs, and social or developmental NGOs, to develop and implement global standards for sustainable palm oil.

5. Protection Motivation Theory

(Floyd et al., 2000) defined that PMT is a concept that involves any threat for which there is an effective recommended response that can be carried out by an individual.

PMT’s main contribution is its capacity to predict user intentions to protect themselves after receiving fear-arousing recommendations: “The purpose of
PMT research is usually to persuade people to follow the communicator’s recommendations; so, intentions indicate the effectiveness of the attempted persuasion.

6. Choice Experiment

A discrete choice experiment (DCE) is a quantitative technique for eliciting individual preferences. It allows researchers to uncover how individuals value selected attributes of a programme, product, or service by asking them to state their choice over hypothetical alternatives.
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