

## Abstract

Oil palm industry becomes prevalent thanks to the growing demand for oil and fats in the world. Malaysia is the second largest palm oil producer, contributing about 28 % of the total world production of palm oil after Indonesia. In 2019, palm oil exports revenue contributed to 4.3 % of Malaysian Gross Domestic Product (GDP). Located between the Indian and Pacific Oceans, Malaysia is exposed to extreme weather anomalies. El Niño is a natural phenomenon leading to an extreme hot and dry weather in Malaysia. As such, the production of palm oil in Malaysia could be affected by this event. Extreme episodes in 1997/98 and 2015/16 had resulted in reduction of Malaysian palm oil production, leading to fluctuation and rise of crude palm oil price due to a shortage of palm oil supply. As a result, Malaysia experienced an opportunity loss in palm oil earnings. While El Niño is an important factor in the oil palm yield, there is an underlying factor which haunts the Malaysian oil palm industry for years, the ageing of oil palm crops. The problem gets worse when El Niño hits, as aged oil palm trees could not withstand the stress due to hot weather. With the application of drone surveillance, satellite images processing and data mining algorithm, the impact of El Niño and ageing on palm oil production was explored. The results from trend analyses reflected an immediate impact of El Niño on Malaysian palm oil production. Furthermore, financial and economic impact analyses were carried out to compute the incurred losses due to El Niño and ageing of oil palm. During the 1997/98 El Niño event, at least USD 836 million was lost due to low yield production. Ageing of the oil palm crops contributed 0.62 % of the estimated loss. For the 2015/16 El Niño event, the loss was at least USD 1.77 billion, with ageing loss spiked up to 15.36 %. This alarming percentage shows that ageing of oil palm crops is a worrying threat in Malaysia, if no preventative measures are to be taken. This study computed that in 2020, ageing of oil palm crops would result in a minimum opportunity loss of USD 440 million, which was equivalent to 0.12 % of Malaysian 2019 GDP. El Niño event is a periodic occurrence, but the yield loss due to the ever-growing aged oil palm crops is silently eroding the Malaysian palm oil production every year. Hence, it is advisable for the Malaysian government to implement efficient replanting scheme to ensure that Malaysian oil palm industry's competitive edge in global arena is sustainable.