

THE PALM INDUSTRY NURTURES HUMAN LIFE AND THE EARTH'S ECOSYSTEM

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RESUME

Oil palm has the title of "miracle plant." As a gift from God Almighty to the global community, even though oil palm plantations are only developing in a few tropical countries such as Indonesia and Malaysia, they can provide broad benefits to the global community. The application of products produced by the palm oil industry in the form of 6-F (food, feed, phytonutrient, fine chemicals, fiber, fuel) which are traded internationally is proof that the benefits of the palm oil industry can be enjoyed by the entire world community. The existence of the palm oil industry in the planet's ecosystem is not limited to producing these products. The palm oil industry as a whole also plays an important role in nourishing human life in the planet's ecosystem. There are at least three mechanisms by which the palm oil industry nourishes human life. First, the mechanism of health from within the body through the fulfillment of nutrition contained in palm oil. Second, the mechanism of health from outside the body and the ecosystem through palm oleochemical/biosurfactant products. And third, the health of the earth's air through the role of oil palm plantations as part of the "lungs" of the planet's ecosystem.

INTRODUCTION

Oil palm has the title of "miracle plant." As a gift from God Almighty to the world community, oil palm plantations and the palm oil industry have many advantages that provide broad benefits for the global community.

Oil palm is one of 17 types of vegetable oil plants in the world that produce sources of vegetable fats and oils. With a total area of around 24 million hectares in 2020, the world's oil palm plantations are able to produce oil (CPO) of 74 million tons (Oil World, 2020). The two main palm oil producing countries are Indonesia and Malaysia with their production share reaching 80 percent of total palm oil production.

The development of global oil palm plantations is limited to only a few tropical countries, such as Indonesia and Malaysia. However, products produced by the palm oil industry have wide applications in the form of 6-F (food, feed, phytonutrient, fine chemical, fiber, fuel), thus providing multiple and broad benefits for human life on planet earth. Through downstreaming and trade, the multi-benefits of palm oil products can also be enjoyed by the entire global community.

The existence of the palm oil industry in the planet's ecosystem is not limited to producing the 6-F product. The palm oil industry as a whole also plays an important

role in nourishing human life in the planet's ecosystem. There are at least three mechanisms by which the palm oil industry nourishes human life. First, the mechanism of health from within the body through the fulfillment of nutrition is contained in palm oil. Second, the mechanism of health from outside the body through palm oil-based oleochemical/biosurfactant products. And third, the health of the earth's air through the role of oil palm plantations as part of the "lungs of the planet's ecosystem". This article will discuss how the palm oil industry makes human life healthier through these mechanisms. Various relevant papers or literatures are used to explain these mechanisms.

HEALTHY HUMAN LIFE THROUGH CONSUMPTION OF NUTRITIONAL PALM OIL

The first mechanism of the palm oil industry to nourishing human life in the planet's ecosystem is through the consumption of food contains palm oil. Palm oil is one of the food sources of energy and fat that have been consumed throughout human civilization. The role of providing oleofood ingredients is the main and oldest role of the palm oil industry. Palm oil is consumed in almost all countries of the world, both as food use and for industrial use (Fig.1).

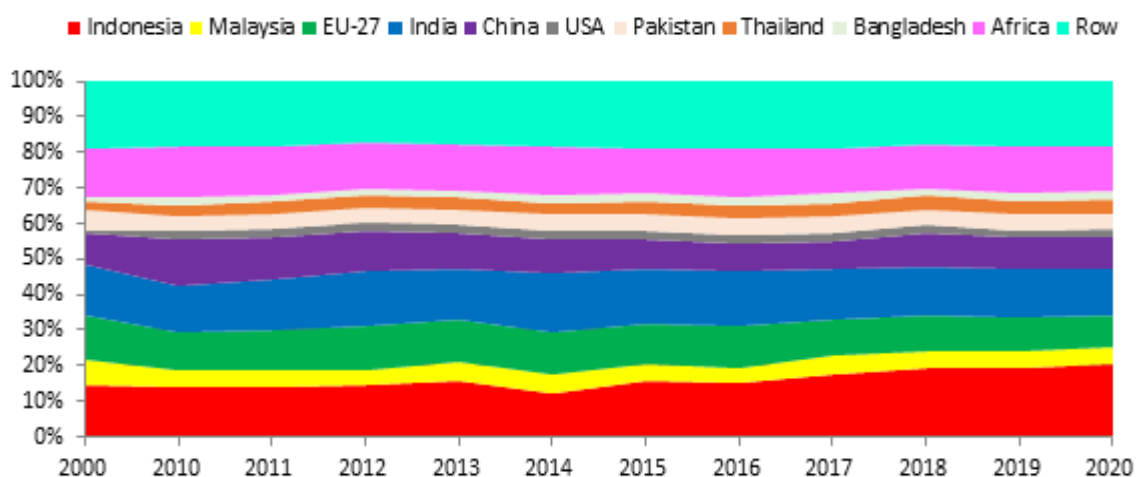


Figure 1. Palm Oil Feeding the World (Source: USDA)

coatings, adhesives, elastomers and sealants, surfactants, cleansing agents, emulsifiers, foams, boosters, degreasers, lubricants, grease and metalworking, and pharmaceuticals and nutraceuticals, and others (Rapilus and Achmad, 2010; Midgley, 2017; Zinc, 2018; Acme-Hardesty, 2021).

Oleochemical/biosurfactant products such as detergents, soaps, shampoos, toothpaste, hand sanitizers and other hygiene products have the function of cleaning and nourishing for the body. Not only that, oleochemical-based hygiene products also help to nourish the environment because its characteristics is biodegradable, non-toxic and renewable.

PALM OIL HAS A ROLE AS "LUNGS" IN THE ECOSYSTEM

Life on planet Earth produces waste carbon dioxide (CO₂) that pollutes the atmosphere and air. The concentration of CO₂ in the earth's atmosphere has led to numerous quality deteriorations in the planet's ecosystems, such as global warming and its impact on global climate change. To

overcome this problem, efforts are needed to recycle CO₂ from the earth's atmosphere.

Oil palm plantations have the ability to recycle and wash away the CO₂. As well as through the process of assimilation photosynthesis, oil palm plants absorb CO₂ from the earth's atmosphere (Hardter et al., 1997; Henson, 1999; Fairhurst and Hardter, 2003; Jansson et al., 2010; World Bank, 2012). Such as the "lungs" of the planet's ecosystems, oil palm plantations also have the ability to absorb CO₂ from the air on the earth, which then stores carbon (carbon sinks) in the form of biomass and produces oxygen into the Earth's atmosphere.

Oil palm trees are an annual plant (perennial plant) with an intensive and large root system, rapid growth, high production, and cropping cycles of 25 years or more, in which the characteristics of these plants make them become "biological machines" absorbing CO₂ large enough from the earth's atmosphere.

Based on the study, Henson (1999), the average amount of carbon sink ability of oil palm plantations on a net basis, reached 64.5 tons of CO₂/ha/year and produced about 18 tons of O₂/hectare (Table 1).

Table 1. Carbon Dioxide Absorption and Oxygen Production from Oil Palm Plantations of Oil Palm

Indicators	Plantations
Gross assimilation (tons CO ₂ /ha/year)	161.0
Total respiration (tonnes CO ₂ /ha/year)	96.5
Net assimilation (tons CO ₂ /ha/year)	64.5
production of oxygen (O ₂ ton / ha / year)	18.70

Source: Henson (1999)

The net uptake of CO₂ in oil palm plantations is greater than in tropical forests. Because tropical forests are generally in a steady state where the rates of photosynthesis and respiration are balanced. On the other hand, the rate of photosynthesis in oil palm plantations is still much higher than the rate of respiration (Hardter et al., 1997; Fairhurst and Hardter, 2003).

With an area of Indonesian oil palm plantations covering an area of 16.3 million hectares, it can absorb carbon dioxide from the Earth's atmosphere by reaching 1.04 gigaton CO₂ and producing about 293 million

tons of O₂ into the Earth's atmosphere. Carbon absorbed by oil palm plantations through the biosequestration mechanism is stored in the biomass, both in the biomass itself (above-ground biomass) and in the underground root system, namely organic carbon and inorganic soil carbon. With such a mechanism of photosynthesis and respiration, oil palm plantations contribute to "cleaning or healthy" the earth's air for life on planet earth.

All human beings on planet earth enjoy health services for life through the role of oil palm plantations as part of the "lungs" of the

ecosystem. The carbon dioxide (CO₂) emissions generated from any human activity in the hemisphere are partially reabsorbed by oil palm plantations. Likewise, the oxygen produced by oil palm plantations can also be enjoyed by anyone on this planet.

CONCLUSION

The palm oil industry plays a role in the health of human life and the Earth's ecosystem. Three ways the palm oil industry makes life healthier are through palm oil nutrition, palm oil-based oleochemicals and biosurfactants, and "lungs ecosystem" services.

Through the consumption of oleofood, the palm oil industry nourishes human life from within the human body. Meanwhile, through the use of palm oleochemical/surfactant products, the palm oil industry nourishes life through health from outside the body and health of the physical environment. With its role as a provider of "lungs," palm oil plantations contribute to healthy life on planet earth through the re-absorption of CO₂ emissions from the atmosphere of the earth, which is then stored as carbon stock and produces oxygen into the Earth's atmosphere.

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