Best Management Practices for the Indonesian Oil Palm Industry to Promote Sustainable Development in Southeast Asia

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April, 2020

Submitted in fulfillment of the senior thesis requirements of the

Department of Environmental Science at Allegheny College

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Acknowledgements

I would like to extend my gratitude to Allegheny College and the Environmental Science and Sustainability Department.

To my grandparents, Paul and Elaine Arden, and my father and mother, Stuart and Eva Arden, I am indebted to you. Thank you for giving me the opportunity to attend college.

To Eric Pallant, I would not have been able to complete the project without your guidance as my advisor. I whole-heartdely appreciate you and all you have done for me, thank you.

To my Professors Caryl Wagget, Sharon Wesoky, Rich Bowden, and Casey Bradshaw-Wilson, I would like to recognize the invaluable assistance that you all provided during my time at Allegheny.

To my counselor Trae, you have guided me through my undergraduate career and have helped me become the best possible student and friend, thank you.

To my brother, Ben, and my friends Grace, Carla, Lawrence, Brian, and Max, thank you for supporting me through the comp process and for standing by my side in life.

To all those left unmentioned, thank you for making the past four years amazing.

Cheers to the future!

Name: Aaron Arden Date: Spring, 2020
Major: Environmental Science and Sustainability
Thesis Committee: Dr. Eric Pallant, Dr. Ken Pinnow

Title: Best Management Practices for the Indonesian Oil Palm Industry to Promote Sustainable Development in Southeast Asia

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Abstract
A major structure within sustainable development and our lives are production and consumption frameworks. One of the largest and most impactful production and consumption industries is the oil palm industry, or more commonly known as palm oil. The past twenty years has seen a growing concern over the sustainability of the oil palm industry. While the industry has driven economic development throughout Southeast Asia, the rapid growth and reliance on the crop for both food and non-food uses has caused severe environmental damage and health issues. Today, Oil Palm is the world's largest agricultural export. As such, it is a key driver of climate change, GHG emissions, human rights infringements, tropical deforestation, loss of biodiversity, and human respiratory issues. All of this is due to the rising prevalence of plantations and monocultures that are responding to a growing global demand. This paper focuses on implementing better management practices for the oil palm industry in Indonesia and improving the sustainable development of Southeast Asia. How can we improve the sustainability of the oil palm industry? NGOs such as The Roundtable for Sustainable Palm Oil, Palm Done Right, J-palm, and Smallholder Acceleration and REDD+ Program are working toward representing, supporting, and improving smallholder farms and management practices. To promote and support sustainable development for Southeast Asia we need to connect producers to traders and consumers through more vertical supply chains, develop community infrastructure (to improve economic distribution, increase opportunities for people, improve idigneous livelihoods, and regulate landscape use), implement contract farming and ecotourism practices through agroforestry and animal sanctuaries, and develop a labor force support system with health initiatives to combat the long term adverse health effects of the haze fires. To align all stakeholders and promote sustainable development based on equity and empowerment, this research proposes the establishment of eco-industrial parks.

Introduction

Sustainability

During the 1987 World Commission on Environment and Development, the Brundtland Report defined sustainability as a concept of living that "meets the needs of the present without compromising the ability of future generations to meet their own needs".[1,2] Environmental protection, regulation, and monitoring are inherent to sustainability. However, five years later during the the United Nations Conference on Environment and Development conference in 1992 (Earth Summit), sustainable development was introduced and defined as striving toward economic development that protects the Earth's environment, nonrenewable resources, and promotes social and intergenerational equity.[3,4] This shifting into economic development transitioned sustainability into being recognized as a systemic issue. Following this, more anthropocentric values such as human satisfaction, needs, and aspirations became the third integration. The three aspects of sustainable development are easier understood as a triangle of 3E's (Fig.1, below).

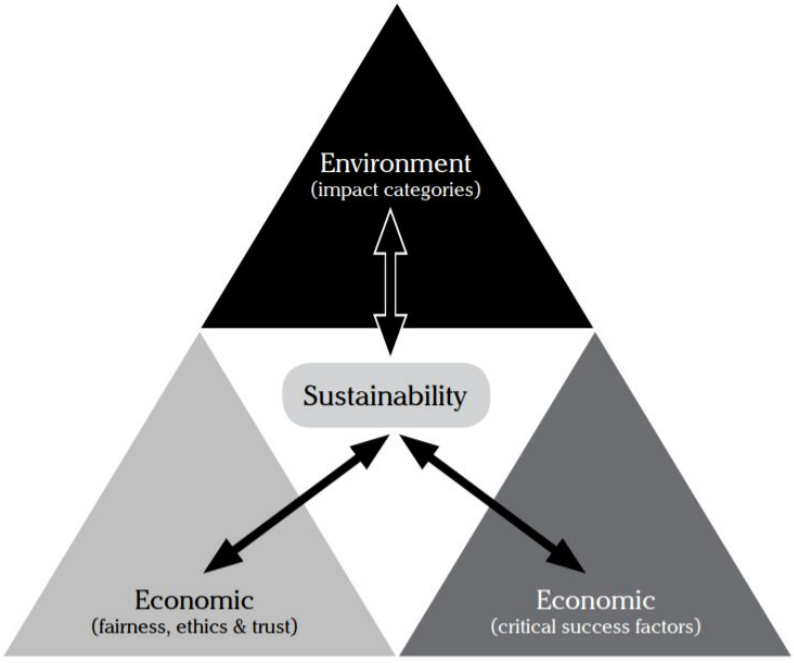

Figure 1. Three aspects of sustainable development[5]

Fritz and Schiefer (2008) developed this concept and describe it as the 3P's, described below.[6]

- Profit- "Success of Economy: the use of financial resources wisely for the welfare of company and for the welfare of community"[7]

- People- “Social Responsibility: to appreciate the human with: appreciating the employee; the practice of fair recruitment, anti-discrimination, nonexploitative; the responsible management toward the risk, idolizing the business ethics and law; appreciating the stakeholders, including the local community, investors, supplier and other; fair dealing with customer”[7]
- Planet- “Responsible for Living Environment: to appreciate the living and the management and use of natural resources wisely covering: Conservation of resources, management and waste prevention, control and restoration of environment risk, lessening the supply chain impact and the collaboration with community”[7]

Sustainable Development advocates for economic development that limits environmental and social sacrifices while transitioning into more equitable and necessity based distributional standards.[4] It “promotes integration of economic, social and environmental considerations so that they are coherent and mutually reinforce each other by making full use of instruments for better regulation”.[5] Sustainability should be understood as a way of building, enhancing, or altering logistical frameworks which are a structural approach to thought processes and thought development. Sustainability is an inherent part of decision making, rather than a means to an end it is a tool to be utilized. How well we can pass the Earth onto future generations includes the physical state of the Earth as well as the socio-economic frameworks that support the systematic boundaries entangled in our societal ecosystems.

Debates over sustainable development have been over the systematic interactions between economic, environmental, and social variables. This includes how countries with differing ideologies use the three dimensions to influence their national development. The ensuing manipulations of these debates has impacted collaborative development projects between countries. Obstacles in international agreements and adoptions of global standards have stained transnational relations. Cooperation is necessary to address global sustainability issues such as climate change.[5] Arguments have been made that cooperation opposes competition, the basis of profit and capitalism. However, sustainable practices can link profit and community welfare. Within organizations there are many opportunities for increased sustainability and improvements in performance. The opportunities to save fuel or other resources and decrease GHG emissions can be found throughout any industry. Capitalist ideologies such as competition or advantage, when done through sustainable practices can be

used to create a healthy innovation dynamic between businesses where they push each other to improve rather than tear one another down. Sustainability is an important strategy to practice in the corporate world.

Shifting to a new systematic framework that promotes sustainable development requires strategic and organized planning and collaboration.[1,5] Major decisions are being made at state, national, and international levels. Institutions, such as the United Nations (UN), are working toward combating issues like poverty, hunger, deforestation, inequality and much more. In 2015, the UN released the Sustainable Development Goals (SDGs). With 2030 in sight, the member states of the UN agreed upon a "...shared blueprint for peace and prosperity for people and the planet, now and into the future".[8] Seventeen goals were created with the foundation that all countries, despite economic level, are going to work toward a global partnership (Fig.2, below).



Figure 2 Sustainable Development Goals[8]

Collaborative support is necessary in achieving the SDGs, and in March of 2017 the Business and Sustainable Development Commission found that the SDGs are potentially worth $12 trillion a year and roughly 380 million jobs. However, an SDG Engagement Survey by PricewaterhouseCoopers in 2015, found that business orientations do not align with people's priorities (Fig.3, below). This disconnect needs to be addressed so we can achieve sustainability.[10,11,12]

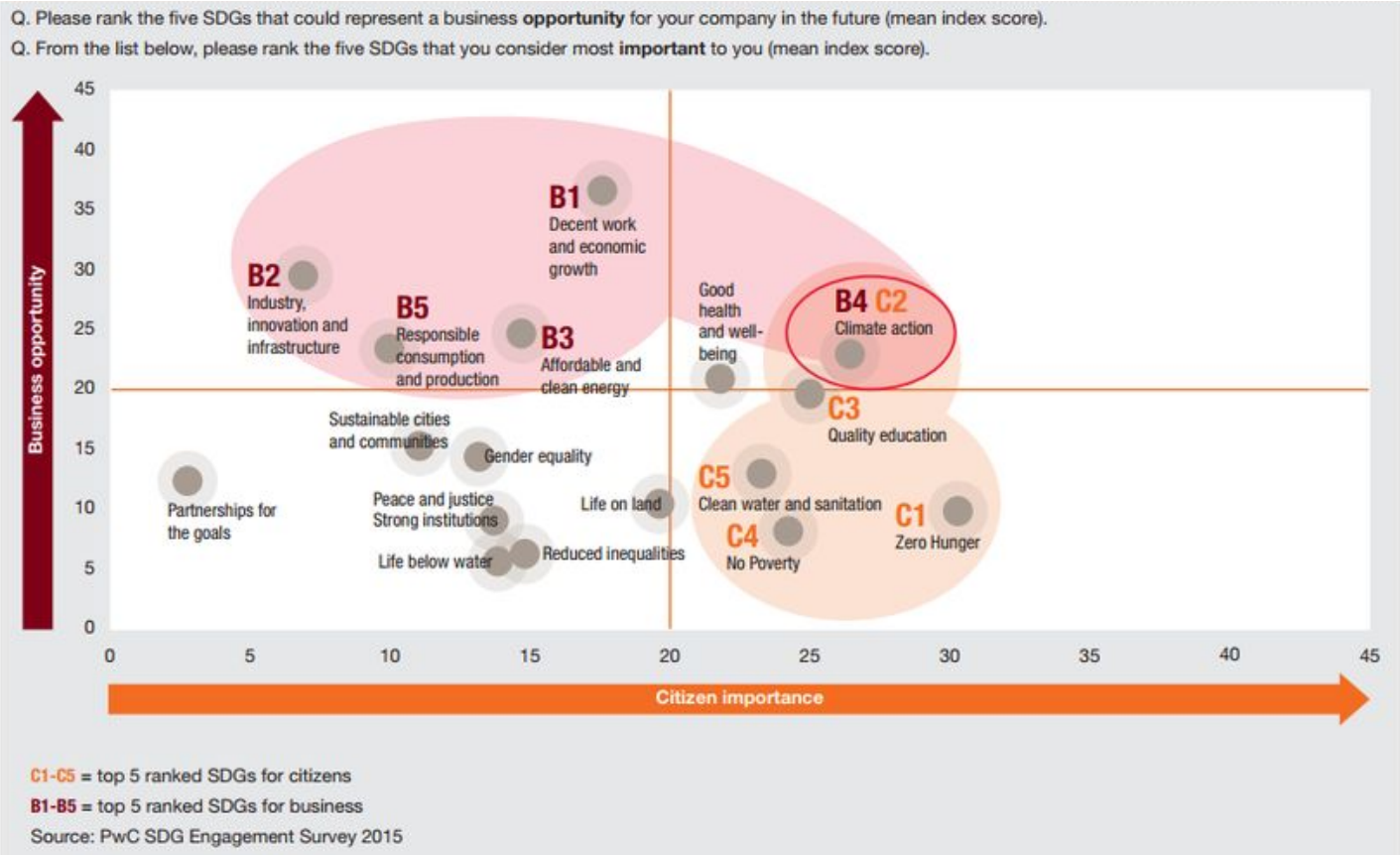

Fig.3 Prioritization of SDGs by business and citizens

A major structure within sustainable development and our lives are production and consumption frameworks. They are the backbone of materialization and waste, intersecting all three aspects of sustainable development. One of the largest and most impactful production and consumption industries is the oil palm industry, or more commonly known as the palm oil industry (Fig.4,below). The current regulation, monitoring, and expansion of the supply chain and industry are of great concern. The oil palm industry (plantation, milling, refining, and manufacturing) and global market have significant impacts on the ecosystem and environment, lives of indigenous populations and low income communities, national economic development and infrastructure, and trans-national relations.

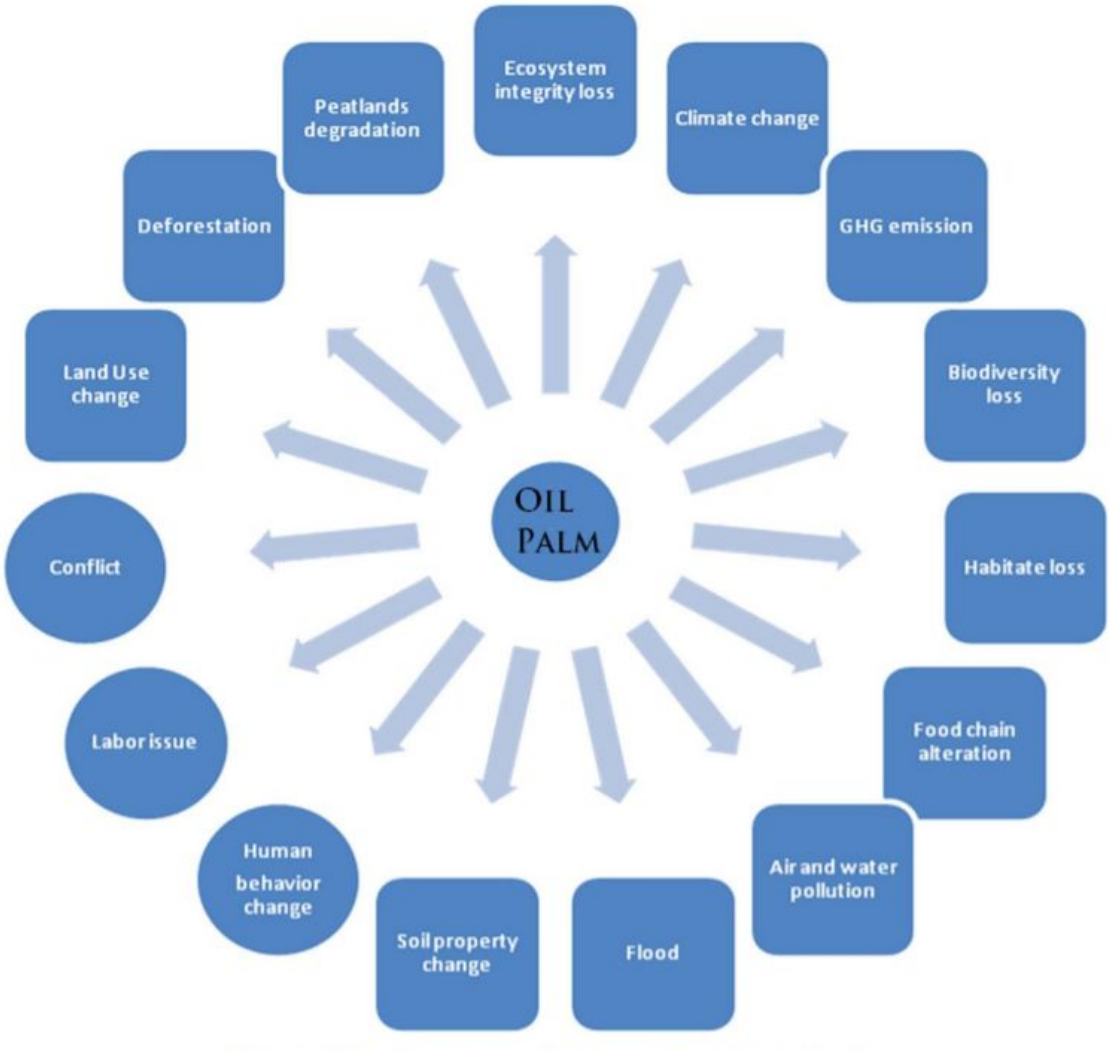

Fig.4 Environmental and Social Implications of the Oil Palm Industry[13]

While there are negative impacts within those such as deforestation, water and air pollution, infringements upon indigenous rights, and poor income distribution, there are potential positive impacts which will be discussed later on. The strategy is to improve the goods and services provided by the ecosystems and landscape within the environment, while decreasing the strain caused by economic development and increase of human capital. Good management practices are necessary to improve ecosystem health (integrity, connectivity and resilience), increase human well-being (emotional and physical health and quality of life), incorporate equitable economic distributions, reduce environmental degradation, regulate and monitor infrastructure

development (increase in human capital, community standing, and opportunities), promote industry advancements, and build preventative frameworks (Fig.5,below).[6,8,13]

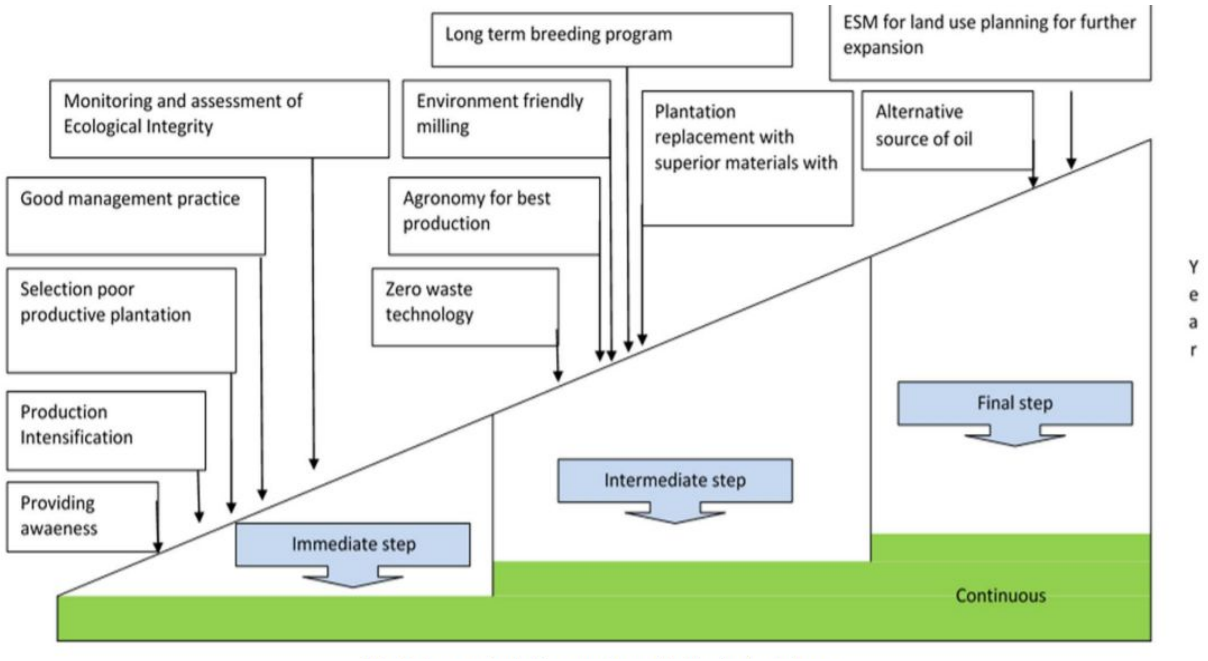

Figure 5. Steps and Activities Towards a Sustainable Oil Palm Industry[13]

There are a large amount of local and global NGOs, agri-businesses, and governmental factions focused on an array of issues, but what are the best management practices to promote sustainable development within the oil palm industry and communities of Southeast Asia? The sustainability priorities of the oil palm industry and Southeast Asia are eliminating poverty and unemployment, sustainable resources management and environmental protection, industry development and education, transnational relations, and environmental health issues, as stated by Mr. Bambang Permadi Soemantri Brodjonegoro at the High-Level Political Forum on Sustainable Development held by the United Nations in 2017.[14,15] These priorities can be translated into supply chain transparency, resource management and environmental protection, infrastructure development for better production practices, environmental health issues caused by the haze fires, and transnational relations to maintain accountability. This information comes from decades of work done by Indonesia, the UN, and other countries and NGOs. However a better understanding of the cultural dynamics of Southeast Asia is needed to incorporate sustainable practices into its economy and social frameworks. The UN is doing a great job guiding the world to a better future, but an understanding of a country's history, culture, and

ideologies are necessary to improve implementation efforts. From here, this work goes into a brief overview on the history of Southeast Asia.

History of Southeast Asia and Oil Palm

For over 600 years, Southeast Asia has been a nexus for trade and culture.[16,17] The center of the Southeast Asian trade dynasty was Malacca, a kingdom named after the special melaka trees that grow along the estruarial rivers of the South China Sea and Indian Ocean.[16,18] Malacca was surrounded by the great kingdoms of early Asia; to the west was the Mughal empire of India, to the south was the Javanese Majapahit Kingdom, to the Northwest was the Thai Siam kingdom, and to the Northeast was the Ming Dynasty of China.[16] Throughout the year, ships would come through the Strait of Malacca bringing an array of goods (Fig.6,below).[19,20] The maritime trading routes jump-started the economy and the cultural diversity that it brought influenced trans-national networks and societal structures such as local governments.[16,19,21] Within 100 years, Malacca became the largest and most influential port city in Asia. Trade evolved into a source of power and national security.[16,21]



Figure 6. Map of Southeast Asia and Strait of Malacca[20]

These monarchies were the ruling polity of Southeast Asia until western colonization began in 1511. The success of Malacca captured the eyes of Portugal, and with the help of Tamil traders and Chinese shipmen, they overthrew the Malacca Sultanate.[16] The local governance was allowed to remain in control which helped the relationship between the appointed Europeans and the local "non-christians". A Eurasian community was created and it led to immense economic success.[16] In 1641, after a devastating five-month siege, the Dutch took over Malacca, or what was left of it, leaving the population diminished from 20,000 to 2,000.[22,23] The justifications of the Dutch tactics served as the "foundation for the principles of international law".[24] Under the Dutch, trade was monopolized through the Dutch East India Company. This led to a transition in Malacca from a trading center to a strategic stronghold. Trade slowly left the area and by 1700 the population of Malacca recovered to a mere 5,000, of which was predominantly Chinese who were viewed as more obedient and laborious.[16,23] An agreement between the Dutch and British in 1795 led to a diplomatic colonization of Malacca.[25] The return to a trading port under the commercial British East India Company resulted in a population boom.[4] Here, according to Anne Booth, European colonialism revealed itself as "developmental rather than extractive" even though Malacca was an advanced industrial society prior to colonization.[16,26] The British did not only rebuild the economic framework of Malacca, from their colonies in Africa they brought over one of the most influential fruits of our time: Oil palm (*Elaeis guineensis*).

The Oil Palm Industry Today

Today, Oil Palm is the world's largest agricultural export.[27] Oil palm production (palm oil and palm kernel oil planting, milling, refining, and manufacturing) is increasing because of its high yield/low production cost and a "promising domestic and international market" which is due to supportive governmental policy across the region. Growing global food consumption and use of products that contain some sort of material that is derived from oil palms is advancing both the local and international market (Fig.7,below).[4,28]

Vegetable Oil	95/96	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14*
Oil Palm	15.8	35.3	37.7	39.4	42.1	44.5	47.9	50.9	54.3	56.3
Soybean Oil	19.7	33.6	35.6	37.5	36	38.3	40.7	41.3	42.5	44.4
Canola Oil	11.2	16.9	17.6	18.3	20.1	22.4	23.5	23.8	23.6	24.5
Sunflower Kernel Oil	8.6	9.8	10.3	9.4	10.6	11.4	11.8	13.1	13.6	14.5
Other	16.4	19.8	20	20.5	20.9	21.2	22.5	23.7	23.9	24.2

* : estimation

Figure 7. Vegetable Oil Consumption from 1995/1996-2014/2015 (in million metric tons)[28]

Ascorbyl palmitate, retinyl palmitate, ethylhexylglycerin, glyceryl stearate and many more come from oil palm, all of which you can find as an ingredient in half the products of your local grocery store.[29] Indonesia is the largest supplier of oil palm. In 2016, the country produced 36 Million tons over 11.9 Million hectares. Of the 36 million tons, roughly 32 million metric tons were exported.[28,30] The power of the international market has greatly impacted the growth of the oil palm market. By 2050, global consumption is expected to be in excess of 93 million tons.[31]

Oil palm production and good manufacturing has a multitude of negative side-effects. The oil palm market is a key driver of climate change, human rights infringements, tropical deforestation, and loss of biodiversity.[32,33,34] The tremendous loss of biodiversity, increases in GHG emissions through deforestation and travel, and human rights infringements are due to the rising prevalence of plantations and monocultures.[32,35] Deforestation is defined as the conversion of forested areas to other purposes such as agricultural, logging, and urbanization.[30,31] Deforestation and land burning contributed significantly to the CO_2 emissions in South East Asia. Indonesia and Malaysia rank in the top 15 producers of greenhouse gasses (GHG: CO_2, CH_4, and N_2O), China and the United States hold first and second. Since 1997 more than 60,000 fires have occurred causing haze problems to the region itself, predominantly occurring from land clearing practices like slash and burning. Moreover, the haze fires also cause respiratory diseases among children and adults. In 2015 a haze crisis caused by illegal slash and burn tactics in Indonesia affected more than 28 million people, causing more than 140,000 respiratory illnesses and 100,00 deaths. A state of emergency was enacted calling for international aid. By the end of the crisis, the forest fires ended up costing Indonesia between

32 billion and 47 billion U.S. dollars (USD). The clearing of tropical forests is also affecting the natural habitats of many species including Sumatran tigers, Sumatran rhinoceros, Orangutans, and Asian elephants.[36,37,38,39,40,41]

The tropical forests of Sumatra are also home to many indigenous people. Their rights to land, territories, natural resources, and giving or withholding free, prior and informed consent (FPIC) are often overlooked by both government and corporations. Indigenous people's rights regarding land and land use are often violated, mainly due to oil palm plantations being established in areas that have been utilized for generations. Indigenous people are forcibly removed through physical violence or habitat destruction. This results in opposition and intra-community conflicts ranging from strikes, petitions to government and non-governmental agencies and blockades to physical and armed attacks. Without such protections, expansion is likely to benefit investors, traders and national elites at the expense of indigenous people, the rural poor, and vulnerable ecosystems.[42,42,44,45,46,47]

Despite these global issues, oil palms are a necessary part of Asian food and culture. The international market provides a source of economic development and empowerment for the people of Southeast Asia and Indonesia. Within Indonesia, roughly 16 million jobs depend directly or indirectly on the oil palm sector.[50,51,] The Straits of Malacca are still one of the most globally important trading routes, with 25% of the world's goods transporting through it annually. It also serves as a foundation for China's One Bridge One Road (OBOR) project as a part of the Maritime Silk Road (MSR).[52,53,] Oil palm is a multifaceted topic and solving the market's systemic issues requires dynamic perspectives. This paper focuses on implementing better management practices for the oil palm industry in Indonesia for supporting sustainable development of Southeast Asia. How can we improve the sustainability of the oil palm industry?

Methods

To improve the sustainability of the oil palm industry, this paper analyzes best management practices (BMPs) for oil palm production and sustainable development for the industry, while maintaining the competitiveness of the market.The objective of this research was to identify and describe elements influencing and obstructing the sustainable development of the oil palm industry in Southeast Asia. I started by doing a literature review on the current state

of the oil palm industry and what work needs to be done. After determining the sustainability priorities of Indonesia and Southeast Asia, I examined four NGOs to build case studies. Examples of sustainable production and responsible management were needed to create a basis for the sustainable development model this paper aims to create. The four NGOs are The Roundtable for Sustainable Palm Oil (RSPO), Natural Habitat, Jpalm, and Sharp. All four NGOs were found through online research. After examining how they understand and incorporate sustainable practices, I then looked to see how I could integrate their practices into the current oil palm industry. My plan aims to utilize their established sustainability frameworks by building off of their practices.

Results and Discussion

Case Studies on Best Management Practice of the Oil Palm Industry

The obligatory dynamic between agriculture, agribusiness and government has played an important role in the development of the oil palm market. Actions taken by all stakeholders have positive and negative effects within the industry. The anti-corporate argument is that since the 1990s, socio-economic strategies have been focused on export based "resource exploitation" and land misuse initiated by state programs. From this perspective, national development has been systematically built upon environmental exploitation through socio-economic productivity and political corruption.[54,55,56] However, these same state led programs, such as the land grab conducted by the government were they centralized 90% of forest land and converted this land from "idle waste" into cash crop agriculture, transformed agribusiness into the country's largest employer, containing 50% of the national employment, and largest source of national revenue.[48,49,50] This increase in national revenue and decrease in unemployment are laudable achievements for a government. The issues lie in how the government improved their socio-economic productivity and performance and the effects it will have on the communities, nation, and region.

To add to the complexity, oil palm is an inherently sustainable and useful fruit. Regarding it's many uses from soaps to cooking to preservation, oil palms make great substitutes for hydrogenated corn or soy oils. Palm kernel oil is high in Vitamin E and antioxidants, improves soap functionality, and is a great alternative for butters or petroleum based cosmetics (Figures

8, 9, and 10 below).[57,58,59,60] Most importantly, oil palms are the highest yielding vegetable oil, producing 3.7 tons of oil per hectare compared to soy (0.4 tons) and canola (0.7 tons) (Fig. 11,below).[61] The issue becomes how to maintain its sustainable characteristics throughout the production and supply chain.

Vegetable Oil, Vegetable Fat, Palm Kernel, Palm Kernel Oil, Palm Fruit Oil, Palmate, Palmitate, Palmolein, Glyceryl, Stearate, Stearic Acid, Elaeis Guineensis, Palmitic Acid, Palm Stearine, Palmitoyl Oxostearamide, Palmitoyl Tetrapeptide-3, Sodium Laureth Sulfate, Sodium Lauryl Sulfate, Sodium Kernelate, Sodium Palm Kernelate, Sodium Lauryl Lactylate/Sulphate, Hyrated Palm Glycerides, Etyl Palmitate, Octyl Palmitate, Palmityl Alcohol

Figure 8. Oil Palm Ingredient Names[59]

Type of Product	Examples	Why?
Food	Baby Food, Premade Dough, Ice Cream, Butters/spreads, Cereal. Chips, Cookies and Biscuits, Drinks, Candy, Chocolates, Packaged Food, Fast Food, Frozen Meals	Texture enhancer (smoothness, shininess, creamy), Preservation, emulsifier, low trans fats, high melting point, no taste
Cosmetics/ Cleaning	Moisturizers, Lipsticks (balms), Laundry Detergents, Tooth Paste, Make-up, Shampoo & Conditoner, Soap	Holds Color, Texture enhnacer (smoothness, shininess), high melting point, no taste, Fortifies natrual oils, refiner, good remover
Energy	BioDiesel, BioFuel	Feed Stock, Lubricant, Oleochemical

Figure 9. Oil Palm Product List [57,60]

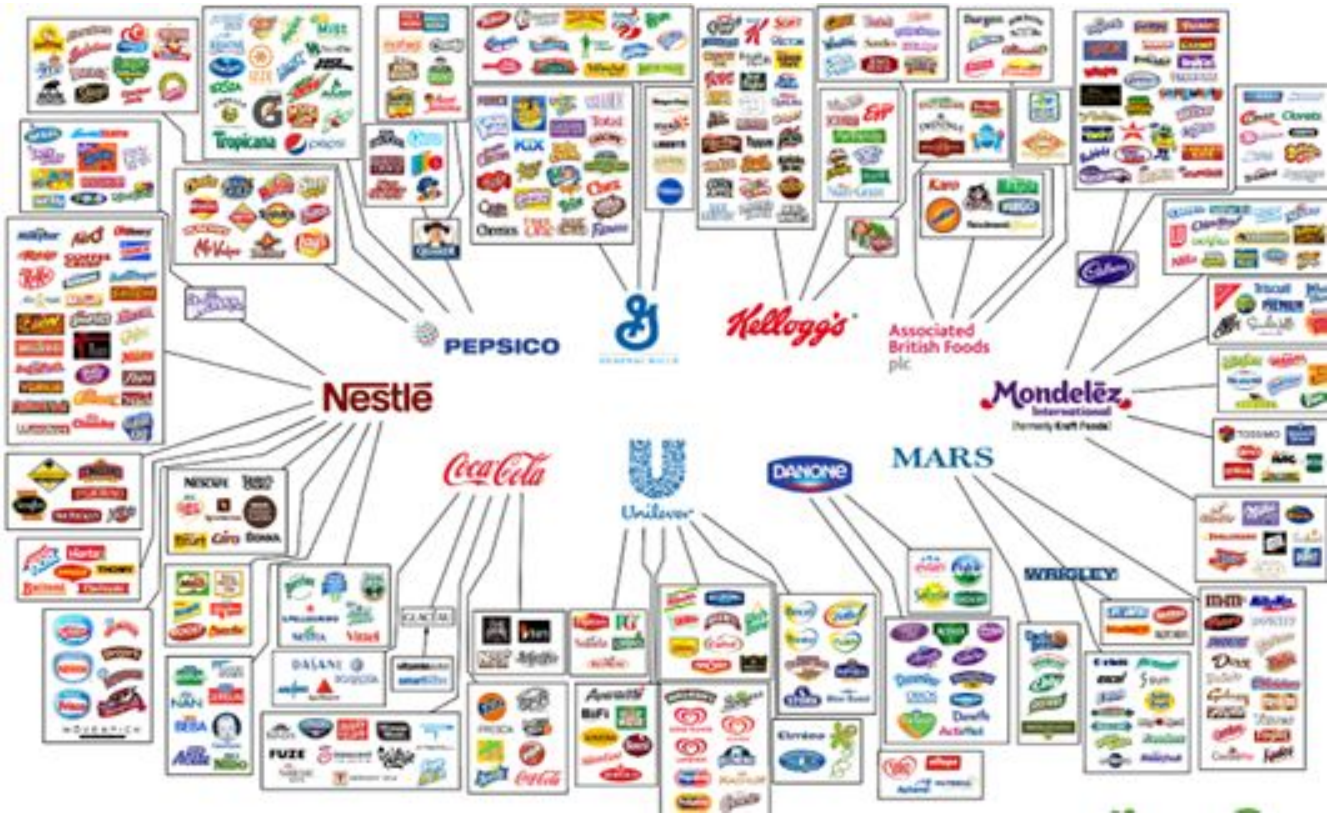

Figure 10, 10 Companies that Control the Food Industry: Pepsico, General Mills, Kelloggs, Mondelez, Mars, Unilever, CocaCola, and Nestle are the major brands preventing sustainable development of the oil palm industry. Not included in the Big 10 are Colgate-Palmolive, Wilmar, Hershey, Kraft-Heinz, Loreal, and Johnson and Johnson.[58]

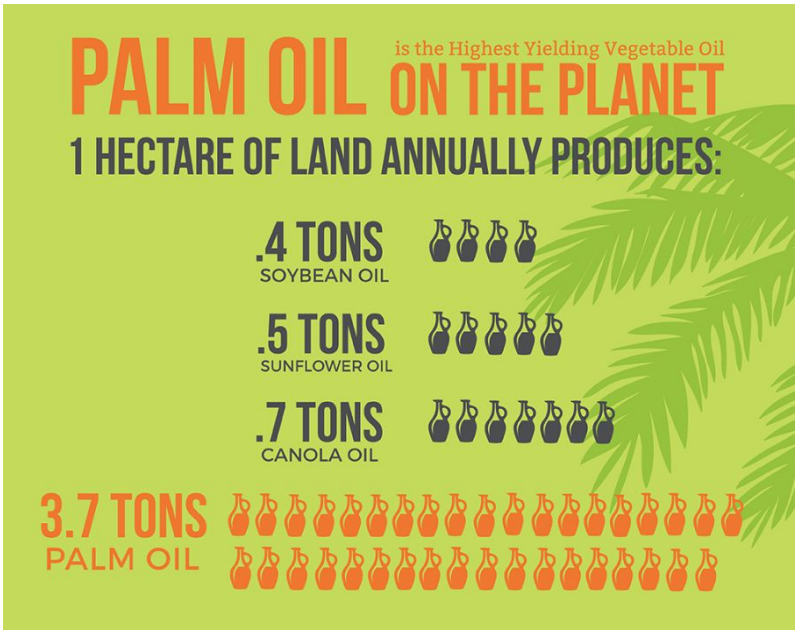

Figure 11, Palm Oil Yield in comparison to Soybean, Sunflower, and Canola[61]

The Indonesian government plans to increase oil palm plantation land coverage to 30 million hectares and produce 40 million tonnes of crude palm oil (CPO) despite their cease on new plantation leases. This increase is anticipated to grow the oil palm market to $88 Billion in 2022.[54,55,56] Considering the current production practices, the expansion of the Indonesian oil palm industry will continue to increase deforestation rates and resource misuse. However, this investment is an opportunity to improve the current practices. Agriculture and agribusiness has much to gain from this expected increase, as does the social welfare of the people of Indonesia. This lucrative relationship between national development, agribusiness, and agriculture is an important productivity framework that can improve sustainable development. Considering the international attention on oil palm production, it comes as no surprise that there are many NGOs working on improving the industry. The most notable of which is the Roundtable on Sustainable Palm Oil (RSPO).

Roundtable on Sustainable Palm Oil (RSPO)

The Roundtable on Sustainable Palm Oil (RSPO), founded in 2004, is the oil palm industry's most recognized sustainable standards and certification system. As of 2019, 19% (14.6 million tonnes) of the global oil palm supply is RSPO certified coming from 3,891,983 hectares of land including refining mills, oil palm area, buildings and infrastructure, and high conservation areas (HCVs).[62,63] RSPO membership continues to grow each year and as of June 2019 there were 4,349 members representing 94 countries.[64] The RSPO's work toward creating a better oil palm industry includes improving the supply chain viability and distribution of benefits to farming communities, reducing poverty and protecting human rights by providing more sustainable employment, and conserving and restoring ecosystems and their services through better consumption, production and management.[62]

Indonesia is the 12th most represented country in the RSPO with 100 members, predominantly in the supply chain. Within those member organizations, Indonesia has 29 certified growers, 197 certified refining mills, and 50 companies producing and refining 7,707,270 tonne on 1,965,209 Ha (1,524,054 Ha for production).[65,66] Recently, questions concerning the credibility of the RSPO certification system have arisen. Particularly, if the RSPO

can ensure the credibility of their oil palm and if the sustainably produced oil and by products can be traced.

The RSPO utilizes a two certification system: the Principles and Criteria (P&C) for ensuring that the oil palm is produced sustainably and the Supply Chain Certification Standard (SCCS) which maintains the accountability and integrity of oil palm refinement and product manufacturing to ensure the oil palm is produced from RSPO certified plantations.[64,65](Fig.12,below)



Figure 12, How the RSPO certification supply chain works[65]

The RSPO P&C cover the environmental and social impacts of oil palm production and can be applied to any palm oil production system that aims to improve their sustainability.[64,65] Within these two systems, the RSPO has four methods for tracking sustainable palm oil production: Identity Preserved (IP), Segregation (SG), Mass Balance (MB), and Book and Claim (B&C). Aiming to encapture the oil palm production and supply chain, these 4 tracking methods divide sustainable oil palm by handling method.[64,65]

In IP, oil palm from a single producer is physically separated during the refinement and shipping process. The refining mill is certified by the RSPO ensuring sustainable production. The SG system combines multiple producers at a refining mill.[64,65] The resulting oil palm is separated from ordinary oil palm during shipping. MB mixes certified and non-certified producers during the refining process. Even though the resulting oil palm is separated from ordinary oil palm during the supply chain it can not be traced back to a single plantation. The B&C system allows manufacturers and retailers to buy credits from certified RSPO producers. This revenue then supports the farmers during implementation of sustainable farming practices.[64,65]

These four systems make up the RSPO Palmtrace which is the system for tracing and ensuring RSPO certification. However, only Identity Preserved is truly traceable because accountability can be held at each step of the supply chain. This means that only IP can ensure sustainability while the other systems, SG, MB, and B&C have too much grey area concerning sustainability. Factoring in the RSPO IP certification into Indonesia, 11 of the 29 growers and 64 of the 197 refining mills can ensure their sustainable practices. Considering IP, production of sustainable oil palm falls from 7,707,270 tonnes on 1,965,209 Ha (1,524,054 Ha for production) to 3,192,349 tonnes on 673,111 Ha .[66,67]

The RSPO has done a lot of work certifying oil palm along the supply chain. They have expanded their reach into smallholder farmers, increasing their influence.[65] However, issues of sustainability permeate throughout the entire supply chain, but organizations like Natural Habitat, J-Palm, and SHARP (Smallholder Acceleration through Responsible Production and Sourcing) are working on improving current oil palm practices.

Natural Habitat

Natural Habitat is an NGO that utilizes a vertical supply chain to produce, manufacture, processes, and trade organic and fair trade palm oil. *Palm Done Right* is Natural Habitat's

sustainable palm oil campaign aiming to increase awareness on the benefits of truly sustainable palm oil. While Palm Done Right is certified IP by the RSPO, the *Palm Done Right* model goes beyond certification of the RSPO P&C, according to Neil Bloomquist the Director of Innovation and Business Development for Natural Habitat.[68,69,70]

Palm Done Right production standards are organic production, natural pest management, multi-cropping and composting techniques, existing agricultural land use, hand picking, and animal transportation within the growing and refining process. Farmers are encouraged to diversify their land with other complementary crops to avoid monocultures and supplement incomes. On plantations, 80% of the land is used for palm oil cultivation, 5% for infrastructure, and the remaining 15% is left as protected conservation areas. A team of agronomists work with local farmers to combine technical knowledge with community farming knowledge. *Palm Done Right* also develops community programs focused on local infrastructure, education, and nutrition.[68,69,70]

Can the *Palm Done Right* business model be implemented at large scales? In 2016, Natural Habitat produced 10,000 tons of palm oil between its two suppliers in Ecuador and Sierra Leone. The volume of palm oil produced by Natural Habitat pales in comparison to the global production. Neil Bloomquist says, “palm oil needs to be priced at sustainable market prices to support a more ethical and sustainable supply chain”.[11] Natural habitat is looking to expand into Indonesia and Malaysia.[68,69,70] How their business method can be implemented into the global oil palm market will be investigated further in this paper.

J-palm

J-palm is an NGO based in Liberia aiming to facilitate responsible oil palm production in the local communities. Oil palm trees naturally grow in the wild throughout West Africa. The trees are owned by the local communities and the production of oil palms is maintained by the resident chiefs and elders. Unlike Indonesia, oil palm production here does not cause deforestation and social infringements. Roughly 220,000 smallholder farms produce the nations oil palm supply.[71,72]

Most of the smallholders are impoverished despite the natural abundance of palm fruit. Issues lie in the refining process. The farmers lack modern processing technologies and rely on manual techniques that were passed down from generation to generation. A lot of the fruit goes un-harvested and there are volume losses in process inefficiencies, the palm kernels go unused or are thrown out. These smallholder communities lack the resources and market for the oil

palm industry. Most smallholder communities lack access to processing machinery and markets for their palm kernels and this lack of access to technology and resources keeps them from economic development.[71,72]

JPalm empowers oil palm smallholders by providing access to modern processing technologies and equipment. They provide mini oil palm mills to the communities, shortening processing times and increasing extraction rates. Once the fruit is harvested, the farmers use the machine and in return they pay Jpalm 15% of the produced oil. Jpalm uses this oil and the oil palm waste from the community and makes beauty products creating an easy market for the farmers. They are also using the palm kernel shells to create “SuperCoal, which are smokeless and more energy-efficient charcoal briquettes made from palm kernel shells.” They plan to introduce this briquette as a wood alternative to reduce deforestation from charcoal production.[71,72]

Jpalm began in 2013 and has created a network of over 500 smallholder suppliers across 5 counties in Liberia. Smallholders have seen an over 200% increase in incomes![71,72] How their business model and practices can be implemented in Indonesia will be explored later.

Smallholder Acceleration and REDD+ Program (SHARP)

Smallholders produce 70% of the world's food supply but sadly they make up 50% of the world's hungry and impoverished. As the global markets shift and their dynamics change, smallholders can be dropped because of their lack of resources and ability to improve their production. The SHARP Partnership – Proforest, ISEAL, Unilever, Olam, Solidaridad and Fauna & Flora International- developed a framework for companies to use to engage with smallholder producers to support their economic development. SHARP is aiming to ensure that smallholders can responsibly remain in the supply chain and that they are receiving fair benefits.[73] The Responsible Sourcing from Smallholders (RSS) framework manages risks created by a shifting global market and helps smallholders improve their production practices to secure their welfare. The RSS was implemented in 2014 with SHARP partners SNV (*Stichting Nederlandse Vrijwilligers* translated to Foundation of Netherlands Volunteers) in Indonesia, Rainforest Alliance in West and Central Africa, and Proforest Brazil in Latin America.[74]

SHARP also has two smallholder focused programs, the High Conservation Value (HCV) approach, and models for sustainable smallholder development. The HCV approach led by SHARP and partners- Proforest, Daemeter,the HCV Resource Network, the World Resources Institute and Blue Rastar- creates incentives for smallholders to minimise deforestation and

provides workshops/trainings on HCV identification and ecosystem services and managing agricultural expansion.[75] The models for sustainable smallholder development support smallholders as they expand their production in a shifting market. These models aim to control and maintain the positive or negative effects of the market changes on production, especially the extent to which companies can influence the market and development of smallholder farms. There are many models of sustainable smallholder development ranging from independent farmers to cooperatives to private large-scale schemes: Models in Malaysia by Wild Asia, Models in Liberia and Sierra Leone by Fauna & Flora International, Models in Indonesia by Daemeter, Models in Cameroon by Elie Hakizumwami, Models in Ghana by Proforest, and Models in Brazil, Colombia and Ecuador by Earth Innovation Institute.[76.]How their business model and practices can be implemented in Indonesia will be explored later.

Improving Current Practices of the Oil Palm Industry

Improving oil palm practices in Indonesia requires active engagement from all actors involved in oil palm production and the supply chain. A system with effective planning and management procedures that target environmental and social risks to ensure human rights are respected, climate change is addressed, communities are built on equal opportunities, provides individuals with healthy working and living environments, and moves toward sustainability is needed.

To promote and support sustainable development for Southeast Asia we need to connect producers to traders and consumers through more vertical supply chains, develop community infrastructure (to improve economic distribution, increase opportunities for people, improve idigneous livelihoods, and regulate landscape use), implement contract farming and ecotourism practices through agroforestry and animal sanctuaries, and develop a labor force support system with health initiatives to combat the long term adverse health effects of the haze fires. The implication of this research is to increase the competitiveness of smallholder plantations while minimizing their social and environmental sacrifices, as well as improve the transparency and understanding of the supply chain. Sustainable development begins with improving the wellbeing of people.

The RSPO, Palm Done Right, J-palm, and SHARP are working toward representing, supporting, and improving smallholder farms and communities by utilizing the global market and

supply chain. They are trying to align the priorities of the people and agribusiness by clarifying the production process environmentally, socially, and economically. The best management practices (BMPs) to create a pathway for a sustainable market and industry is a collaborative approach from all stakeholders in corporate, government, agribusiness, trading association, NGOs, academia, and communities. This research proposes the establishment of eco-industrial parks (EIPs).

EIPs are a cooperative business concept where industry works with the local community to achieve a goal, typically to reduce waste and pollution or efficiently share resources (such as information, infrastructure designs, and natural resources). EIPs aim to achieve sustainable development with the priority of increasing or maintaining economic development while improving the environmental quality in the community. They are an example of an integrated systems approach to sustainable development where all actors are actively engaged and involved. EIPs support effective planning and management procedures that target environmental and social risks to ensure human rights are respected, climate change is addressed, communities are built on equal opportunities, provides individuals with healthy working and living environments, and move toward sustainability.[77,78]

This paper suggests a provincial approach to an EIP dedicated to producing sustainable oil palm. Since 2015, the government of Central Kalimantan in Indonesia has been working to develop a jurisdictional approach for the production of sustainable palm oil. This would transition the current certification process from single plantation or processing mills into land based regional production. Establishing a provincial sustainable oil palm producer would bring government authorities and communities together.[79]

Picture a certified province where ecosystems and agriculture are cultivated together and integrated with the community. Members from all stakeholders would live and work together, deciding on how to set aside land for agriculture (oil palm, food crops, and other commodities), conservation, and infrastructure. Communities are supported by NGOs, corporations, and government. Corporations such as Mars can apply contract farming with the small holders and provide processing equipment for milling and refining. This is just like the efforts by Jpalm with the additional direct support to smallholders and a well established trading process. Palm Done Right and SHARP can provide services and training in mapping high conservation areas, better agricultural practices, and improving community health. WWOOFING

and animal sanctuaries can provide opportunities to improve trans-national relations by bringing people from other countries together and utilize models of ecotourism to increase economic growth for the community. Agronomists, indigenous populations, and low income communities can work together to transfer practices and techniques. Governmental factions can provide support through environmental assessments, system development, and building infrastructure. With the community and environment as the center of the EIP, sustainable development will occur through inclusion and participation. With each actor having a physical place in the community, a multilevel network of information and tangible support is created. All of these combined improve human capital, promote sustainable development, and maintain economic growth while creating a shared sense of value and responsibility (Fig.13,below).[4,13]

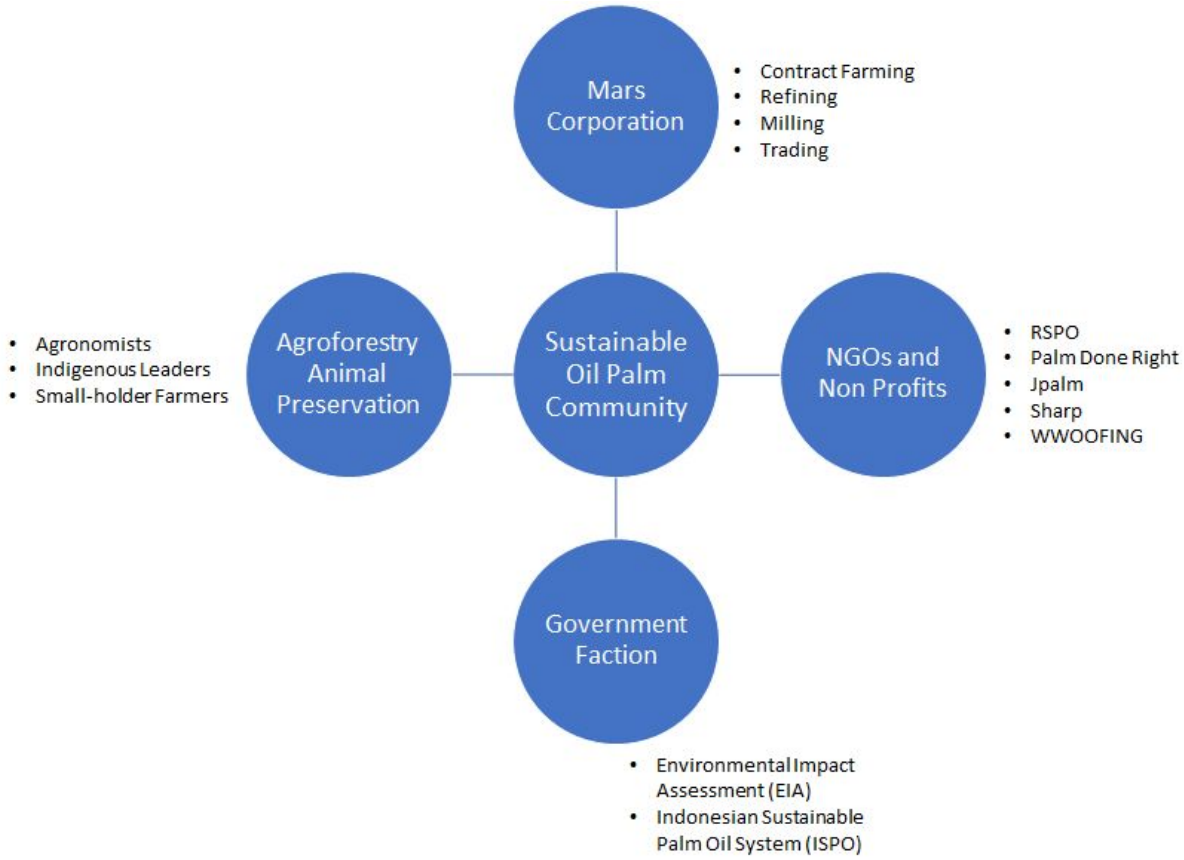

Figure 13. Eco Industrial Park

However, historically governmental factions and multinational corporations have not worked well with NGOs and communities. There have been a multitude of accusations regarding smallholder mis-representation, human right infringements, and poor land management and land acquisition practices. Government agencies and corporations have a

hard time maintaining accountability within themselves. This comes from the pre-existing growth-oriented alliance between the state and people which can be seen during the Asian Social Miracle following the Asian economic crises in the 1990s. Public policies that support education, industry, “cheap credit”, and innovation were implemented and worked through subsidies, established infrastructure, and state led coordination. These policies were part of a top-down project that’s primary goals were socio-cultural integration and internal development. The economic success of Asia comes from their individual level drive for social stability, community growth, and innovation.[16]

These values come from the regional philosophies of Confucianism and Buddhism that were integrated into the culture and socio-economic practices before colonization. Confucianism and Buddhism are philosophies that guide us to live in this world. Central concepts to Confucianism and Buddhism, such as humaneness and virtue, are based on human psyche and interpersonal relationships; Two concepts that directly impact political, economic, and social success. It pushes people to act toward social stability and wanting to “conserve the delicate equilibrium that exists between people themselves and between those inside social and political organizations”.[80] The alignment of confucian and buddhist values with regional identity and governance can be seen in the cultural beliefs of character development, internal balance, harmony within the state, and generational piety, that developed the social contract between the society and state as seen in the Asian Social Miracle.[81,82]

Considering the foundation of confucian and buddhist ideals, establishing a provincial EIP is feasible. Governmental factions and corporations, once placed into a community development focused living system, will be able to interact with smallholders and community leaders, as well as collaborate with NGOs to improve their practices. By listening to the needs of people, a better sense of community and responsibility will be created and an exchange of ideas and knowledge can occur. A certified sustainable oil palm province will help Indonesia and Southeast Asia move toward sustainable development, showcase the region's prosperity, and prove it’s importance as a global leader.

What Can We Do and Why is this important?

Creating a solution in Indonesia, while good, perpetuates the idea that it is their problem to solve. This is counter intuitive and negatively affects our globalised perspective of ‘us’. A

suggestion on the consumption side or western side is also needed. We could try to clear up ingredient labels or strike against irresponsible production methods, but that will either not happen nor constructively better the world. We lack community based ideologies, that can be found in confucianism and buddhism, that are necessary to create a supportive and health/happiness based work-performance dynamic. We work to satisfy our own needs or ensure our individual happiness, not to help our neighbor. We're trapped by a sense of "bridled freedom and selfish individualism".[83]

The western lack of understanding regarding the complexities of national aspirations and cultural differences needs to change. We need to understand that there are different cultures and that there is no one set of values. There is an idea called cultural appropriateness, which is the awareness of how other groups differ from their own and the implications of those differences in the development of social, economic, and political frameworks. Inter- cultural arguments guise the true debate of how different societies, especially western ones, want to run the world. This can be seen by the western use of industrialization as an indicator for modernity or the current survivalist crusade of democracy and good governance against the east.[83,84]

We need to achieve a common understanding of each other and our interactions with the world. This can be done by questioning our current social, economic, political, and environmental frameworks and then respectfully interacting with each other with the aim to incorporate ourselves into the changing global dynamic. We should also question how our values and frameworks have influenced global institutions from the International Monetary Fund (IMF) to the World Bank, the G-7, Nobel Peace Prize, and the UN. Do these institutions emulate and perpetuate westerm values? Do they truly work toward a global good? Is there such a thing as global good?

Sustainability is grounded in the daily choice to preserve the environment and improve the lives of the community. Making that decision requires a sense of awareness and mindfulness. Two things that come from daily practices, thoughts, and questioning of the normal. We should operate through persistence not force, like nature. A perspective founded in mindfulness will help us challenge and improve our current thought process, response framework, and ability to engage with the present. Continuing to mimic nature, we have to come to understand our lives as a complex system where every moment influences all the others. Mindfulness practices can help us be aware of our actions and the effects we have within

ourselves and our community. Eventually our ideologies and culture will line up with nature and we will achieve a deeper understanding of the world and all that its landscapes have to offer.

Hopefully this paper improved the understanding of sustainability, created a better sense of the global community, characterized the complexities of trans-national relations, and created a path for people to incorporate sustainable thinking into their lives. Sustainability lies in every decision we make and how we treat ourselves and each other. My goal and inspirations lie in tearing down the systemic boundaries that exacerbate wealth disparities, perpetuate inequality, and prevent sustainable living in order to improve the lives and wellbeing of all people. What are your goals?

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