

# The Demise of the Forest People:

## Malaysian Palm Oil and the Threat to Orangutans

by

Katherine A. Kurth, Tomika M. Haller, and Annalisa L. Sharkey  
Center for Conservation Medicine  
Cummings School of Veterinary Medicine at Tufts University

“What we are doing to the forests of the world is but a mirror reflection of what we are doing to ourselves and to one another.”

Chris Maser, *Forest Primeval: The Natural History of an Ancient Forest*

### Part I – Economic History of Malaysian Palm Oil

You could hear the sadness in their voices. It wasn't as if we could speak the language nor did we know what they were saying, but it was almost as if the sounds of desperation in their voices could tell their story better than the words itself. Hope and I listened to the loud wailings of tired fisherman singing throughout the entire night, often wondering if this form of acoustic punishment would ever stop. This was our first night in Kampung Belungkor, a small fishing village situated on the southeastern tip of peninsular Malaysia. We had just arrived earlier that day and we would remain here for the next three weeks to study the mangrove forests. The owner of the local restaurant told us that they sang karaoke every night and that we were welcome to attend if we wanted to. We didn't think much of the offer until that first night as we lay awake realizing that as long as there was karaoke, we would not sleep. Behind the restaurant we laid in the darkness of our tiny bungalow wondering about the secrets of this forgotten little town, and what about it made all the men sing sad songs over an empty river to an empty audience.

Groggy and tired, we reluctantly set off in the morning on our first boat tour of the mangrove forests given by a fisherman named Abang Ma'hid. As is customary in these rural parts of Malaysia, the men of the village were all referred to as “Abang,” meaning brother. Abang Ma'hid was to be our local guide during the rest of our stay. Hope and I were here to study the mangroves but more importantly, to understand the threats to forests from the perspective of the locals.

As we sat on the boat, I began to ask Abang Ma'hid all about the villagers and the jungle and his opinion on how to preserve the land. He started by bringing us to his fishing spot, showing us how the changing tides helped to funnel fish that were sheltered in the mangrove roots into the cages. He described to us the delicate balance between the forests and fishing, how his way of life and the rest of the villagers were entirely dependent on the forests to provide them with fish they ate and sold. “Fishing has been the way of life for all of us for centuries. This fishing net was built by my great grandfather and I still use it today. Unfortunately, I fear I will be the last one of my kind to use it.” Seeing the bewildered look on our faces, he continued on, telling us how the oil palm



Figure 1. Boat ride. Credit: Katie Grassle.



plantations surrounding the village were destroying the forests and polluting the rivers so much that the red snapper that was once plentiful had since disappeared. I recalled the vast fields of oil palm we drove through on our way to the village just the previous day. As far as the horizon, all anyone could see was oil palm. I was reminded of how the neat matrices of leafy trees occupied every stretch of land from Kampung Belungkor all the way to the next closest town an hour away. Abang Ma'hid went on to say how much the land had changed in his lifetime, how the jungles that he played in as a child were no longer. "Everywhere you look are plantations. These men that work on the plantations are not Malaysian. They are from Indonesia or Nepal and paid less than Malaysian workers. We cannot afford to work those jobs. These people do not share the same values of this land and they destroy it by cutting down the forests to plant oil palm. They think oil palm will make us rich by building roads and making jobs, but they do not care to know what makes us rich. From these forests we are wealthy; without them we are nothing."

With those last words, I looked at Abang Ma'hid and noticed the weathered wrinkles on his face and the tiredness in his eyes that seemed to tell this same story. I came to realize that the songs they were singing must be of some relief to these villagers that feel hopeless in their own land. That through song, they could somehow live in the echoes of their past before the oil palm plantations destroyed their land. It was as if their songs could somehow carry their messages to ancient relatives that stood guardian to this town and to their way of life for so many years. Before long, I had concocted images of spirits living amongst the roots and leaves of the jungle that paralleled many stories of native folklore I had heard throughout my lifetime.

As we sat there, baffled and troubled by the words of this wise old fisherman, he smiled and said, "But you have come here now and you will help us save the forests."



## Background

Located on the Malay Archipelago, Malaysia is the only country with territory located on both mainland Southeast Asia and on the islands between the Asian continental mass and Oceania. It is comprised of two major physical regions whose landscape and climate favorably predispose the land to intense agricultural development. The influences of a tropical equatorial climate and ample rainfall supported the cultivation of traditional crops such as rice and rubber for centuries prior to the introduction of oil palm. The advent of oil palm would not come about until the late 1950s, the same time Malaysia was granted independence from British rule.

### *Agricultural Development Era*

Through the leadership provided by Dutch and British colonization, Malaysia had long since been established as a dominant producer of agricultural products in the world market. However, due to the financial costs of a Second World War and invasion by the Japanese, the British were forced to withdraw troops from Malaysian territory and ultimately grant the country its independence. At the same time, recurrent fluctuations of rubber prices in the world market had immediate and widespread effects on incomes and employment, leading to hardship for many smallholders, or farmers/owners of land typically smaller than 50 acres (Fan *et al.*, 2013). This sudden change in the investment climate prompted concern over Malaysia's viability and led to the creation



Figure 2. Boat ride. Credit: Katie Grassle.



Figure 3. Map of Malaysia.

of the First Malaysian Plan in 1956. Under the provisions outlined, the plan invested 15.9% of the Malaysian total budget into programs designed to provide opportunity for agricultural and rural development throughout the country (Bank, 1986; Yahya, 2001). Joint committees of inquiry were formed between government authorities and private estate owners that reviewed prospects for diversification in several sectors of Malaysia's agriculture. Reports found diversification of tree crops as promising and promoted the expansion of cocoa and oil palm. By 1965, the agricultural sector had undergone an unprecedented boom and generated the most substantial contributions to the national gross domestic product (GDP) during this period (Bank, 1986).

Seeing the importance of agriculture to the development of rural areas, a major conference was led in 1969 where then Deputy Prime Minister, Tun Haji Abdul Razak, strongly emphasized the need for agricultural diversification as a national policy (Bank, 1986; Olaniyi & Abdullah *et al.*, 2013). The link between agriculture and rural development was thought to help improve the economic and social wellbeing of remote citizens as well as rectify the economic imbalance between urban and rural areas. This national policy ultimately led to the formation of the Malaysian Agricultural Research Development Institute (MARDI) and the Agricultural Credit Bank of Malaysia. These authorities were created to support federal and state programs that promoted the expansion of crops other than rubber. Diversification programs continued to expand well into the 1980s where generous subsidies were given to farmers to produce crops such as vegetables, groundnuts, tea, fruit, rice, tobacco, cocoa, and oil palm (Bank, 1986; Yahya, 2001). Additional government intervention was focused on the risk to smallholders that regularly endured extreme misfortune during market recessions. It was therefore decided that farms deemed un-economic in size would be modernized and consolidated through local land development. These programs were funded through the creation of the Agricultural Marketing Authority (FAMA) and the National Agriculture Policy (NAP), which gave producers an alternative to private traders in exchange for their lands (Bank, 1986; Olaniyi & Abdullah *et al.*, 2013).

### *Pre-Industrial Era*

Many of the policies created during this time were directed towards increasing productivity and the need for the agriculture sector to be efficient to sustain growth in the long run. By 1985, agriculture accounted for 23% of the GDP with the greatest growth in tree crops due to the comparative advantage in Malaysian climate and soil suitability (Lai & Ee, 1988). Production in rice, pineapples, vegetables, fruit, tobacco, tea, pepper, groundnuts, and coconut did not meet with the same success as oil palm and continually declined throughout this era (Yahya, 2001). Upon analysis of failed regimes, the Malaysian government decided it could no longer continue to afford to fund large scale diversification programs if its agriculture sector wished to remain competitive. The focus shifted to tree crop production exclusively. With this revelation, oil palm production intensified while natural resource suitability fell to the wayside as economic factors and institutional support took higher precedence in national policy making. As promised, government programs that funded oil palm production helped fulfill the mission of readdressing economic and social imbalances. Oil palm production created numerous downstream supporting industries such as mills, refineries, and manufacturers that aided in reducing poverty levels from 49% to 18% by 1984 (beginning in 1970) (Olaniyi & Abdullah *et al.*, 2013). The economic factors that favored oil palm production were the regular income and relative income stability. Additionally, the continued expansion of oil palm was supported by the regular demand for labor as well as institutional benefits that produced financial, research and marketing services readily available for further development (Bank, 1986).

In the first half of the 1980s, palm oil and timber production rose by 60% and 12%, respectively, while all other leading exports fell drastically. The world recession in 1980 had greatly impacted the Malaysian economy due to its large export sector (Bank, 1986; Olaniyi & Abdullah *et al.*, 2013). The effects of the recession created highly unfavorable conditions for the agricultural industry and priorities were given to Malaysia's manufacturing section that appeared to withstand market fluctuations better. The outflow of resources from agricultural programs resulted in labor shortages as more people moved to cities to follow job opportunities in manufacturing. The associated effects of urbanization began to deepen the challenges in the agricultural sector as increasing wages and competition for land marginalized smallholders who greatly depended on a large government presence (Bank, 1986).

In the wake of the 1997 Asian financial crises, the Malaysian government responded with the formation of a new National Agricultural Policy (NAP) in 1998. The plan replaced the second NAP that was made to address the efficiency, competitiveness, and productivity of Malaysia's industries. In this new plan, Malaysia would become a top income nation in the next few decades by maximizing income through the optimal utilization of its resources (Olaniyi & Abdullah *et al.*, 2013). The plan would increase the contributions of its agricultural sector to the national income and increase earnings by substantially reducing exports in rubber, rice, coconut, and coca in favor of oil palm (Bank, 1986; Yahya, 2001; Olaniyi & Abdullah *et al.*, 2013).

## Questions

1. How will Abang Ma'hid's life change as more native land is converted to palm oil plantations?
2. Why has palm oil production increased?
3. What are some of the negative and the positive aspects of palm oil production?
4. Given that the need for oil palm has steadily increased over the past few decades, how do the policies enacted by the Malaysian government threaten their economic viability and susceptibility to future market crashes?



## Part II – Corporate Stakeholders and Smallholders

Evans looked over the boardroom, running his hands through his hair in frustration.

“Well people, what are we going to do to save this company and the jobs of 20,000 people?”

Alexander Evans had very little time until the large agricultural conglomerate Jenkins, Vincent, & Miller Incorporated (JVM Inc.), which he ran as CEO, went bankrupt. He had gathered the board members that day to pitch last ditch business proposals. Evans needed something drastically more efficient to bolster his company. After hearing a monotony of similar ideas all morning there was only one pitch left.

“Don’t worry Mr. Evans, I have an idea that will rid us of our worries.” Evans wearily motioned for the board member to continue. “Palm oil. Oil palm is one of the most profitable crops. We can make six times the profit of other crops. That kind of revenue could easily save this company.” Evans looked up, his interest piqued while the board member continued. “We can also be a part of an association called the Roundtable for Sustainable Palm Oil. That will allow us to present a ‘greener’ image to the public,” he emphasized with finger quotes.

“Let’s not get ahead of ourselves,” Evans admonished. “Show me the numbers and let’s go to work establishing our first plantation. We can worry about the finer details after our crops are in the ground. We have jobs to save.”



### Background

Corporations and agricultural conglomerates have invested in palm oil for various reasons. Oil palm is one of the most profitable crops. Companies average \$528–\$790 USD per hectare revenue (Nantha, 2009). By comparison, corn profits in the United States at their peak were \$138 per hectare (USDA, 2011). This discrepancy is due to the demand that palm oil has garnered for both food and fuel. Oil palm production stimulates public and political support because of its economic benefits. Due to this support, expansion is probable (Acrenaz *et al.*, 2014). In Southeast Asia, demand is projected to continue to increase for the next four years as a result of biodiesel consumption mandates. This will require palm oil to be produced on an even larger scale than currently, necessitating more plantations (Mukherjee & Sovacool, 2014).



Figure 4. Mature palm fruit.

### Smallholders

Larger corporations and agricultural conglomerates also have the opportunity to control smallholders’ land in exchange for supporting them. Smallholders can choose to cooperate with the private sector. This means smallholders must give away a large portion of their ability to make decisions in terms of profit and land use in exchange for support (Mukherjee & Sovacool, 2014). Companies support smallholders through technical assistance, distributing seeds, fertilizers and pesticides. These are given on a loan basis and the supporting corporate investors take a large profit margin of the smallholders’ yields. Most contracts are binding for at least 15 years and smallholders are frequently granted no land rights. Supported smallholders often remain in these agreements due to fear of losing their land, not understanding the terms of agreements, and unreasonably high costs of land reclamation (Vermeulen & Goad, 2006). Popular belief is that smallholders are treated as indentured servants who are incapable of overcoming their debt (Block, 2016).

In addition to human rights conflicts, palm oil production also comes with financial risk. By combining multiple markets, food and fuel, producers are vulnerable to changes in the global market. This includes potential boom and bust

cycles, which are varying periods of high and low economic activity (Ancrenaz *et al.*, 2014; Neilson, 1954). In other words, the palm oil market is vulnerable to bottoming out, or being at the lowest market price (Ancrenaz *et al.*, 2014).

### Questions

1. What is Alexander Evan's stakeholder position?
2. What are the financial aspects of palm oil production?
3. What should businesses presented with the opportunity of the palm oil industry do?

## Part III – Palm Oil and the Global Market

The line at the airport McDonald's flowed out the door and around the corner. My stomach growled loudly in protest. Looks like fast food is out, but I'd promised Hope I would return with sustenance. I wandered away from the food court toward the rows of shops selling local snacks, sodas, and terrible books. I gazed absentmindedly at the rows of sugary snacks trying to transform them into a hamburger and fries, but alas the gummy bears remained gummy bears and the red vines remained red vines. I was shaken from my daze by a light tap on the shoulder. I whirled around to find a girl behind me—she couldn't have been older than 19. Her bright red hair was coiled on top of her head and her blue eyes sparkled.

"Having trouble deciding?" she asked.

"Am I that obvious?" I replied. She shrugged and giggled a little. "There are just so many options and the last few weeks have taught me that I have a lot to learn about the world," I said, sheepishly.

"Can I make a suggestion?" she offered. I nodded and she reached up for a Cadbury's Dairy Milk Bar and Delba Pumpernickel Snacks. "Here, try these. They aren't made with palm oil. You never know where that stuff comes from. Oh! That's finally my flight being called! I'm headed to Sumatra and I can't wait!" She handed me the snacks and with a little wave she was gone.

"Thanks!" I shouted after her. I headed to the register and back to Hope. She would never believe this, not after our time with the fishermen in the mangroves!



## Background

In 2015, nearly 50% of all Malaysian palm oil was exported to three primary consumers: India, the European Union, and China (MPOB, 2015). These nations are representative of the fastest growing populations worldwide as well as having the three largest shares of the current world population. But what specifically about these nations is driving the market demand for palm oil?

In terms of agricultural land use for oilseed production, oil palm accounts for only 5.5% of the total 258.9 million hectares of land planted in 2012 (MPOB, 2012). Concurrently, palm oil and its derivatives support the greatest proportion of vegetable oils produced at 32% of the total 186.4 million tons worldwide (MPOB, 2012). Palm oil is, therefore, the most efficient oil seed available on the market today.

## Poverty and Food Security

Measured by the number of individuals living with less than \$1.25 per day, the greatest numbers of people living in absolute poverty reside in China and India (Roser, 2016). In a report by the World Bank, India has nearly 300 million people living in absolute poverty while the two next countries, Nigeria and China, have 107 million and 85 million, respectively. This extreme economic disparity is one of the biggest drivers to palm oil consumption for many developing nations. Food security is often cited as the leading issue for many people in India and China since financial limitations preclude impoverished citizens from purchasing higher quality oils (Damodaran, 2015).



Figure 5. House in Malaysia. Credit: Anna Sharkey.

## Health and Nutrition

Estimates by the World Wildlife Fund have reported that as much as 50% of all packaged products contain palm oil. The advantages of using palm oil in manufactured goods are primarily based on the high levels of saturated fatty acids, roughly 50%, that make additional hydrogenating processes unnecessary as with other oil types (Edem, 2002). Hydrogenated oils, in turn, help to lengthen the shelf life of food products making the relative usefulness of palm oil a highly cost-effective ingredient for food manufacturers (Edem, 2002; Sundram, 2016). Additional compositional benefits include high amounts of antioxidants, beta-carotene, and vitamin E compounds that provide much needed nutritional support for the billions of people in poorer nations who may otherwise succumb to malnutrition (Sundram, 2016).

Several reports have proven numerous health benefits of palm oil consumption. Diets rich in unprocessed palm oil may decrease the risk of cardiovascular disease through reduction of the following (Edem, 2002; Odia *et al.*, 2015):

- endogenous cholesterol;
- arterial thrombosis and atherosclerosis;
- platelet aggregation; and
- blood pressure.

In 2015, the World Health Organization listed stroke and ischemic heart disease as the third and fourth, respectively, leading causes of death in low-income countries. In all other countries listed, from lower-middle income to high income, death due to ischemic heart disease and stroke were the top two listed causes of death (WHO, 2017). Due to this increase in prevalence of cardiovascular disease worldwide, the benefits of palm oil consumption may go beyond just financial incentives. Unfortunately, a sizable amount of commonly used palm oil occurs in the oxidized state, which can pose serious risks to the biochemical and physiological functions of the body (Edem, 2002). The reactivity of oxidized palm oil has been shown to induce adverse lipid profiles and has been linked to reproductive toxicity and toxicity of the kidney, lung, liver, and heart (Edem, 2002). Since palm oil consumption in India has increased in “poorer households, especially in states like Odisha, Chhattisgarh, Jharkhand and West Bengal,” the associated health risks can lead to potentially devastating medical issues that disproportionately affect the poor (Damodaran, 2015).

## Biofuels

In order to meet the needs of a growing population, China and India are likely to remain dependent on the availability of cheap palm oil for food and consumable goods. However, projections of the annual total population for each far surpass the next largest consumer of Malaysian palm oil, the European Union (Figure 6). While the majority of palm oil is primarily used for consumption, biodiesel sourced from palm oil has increasingly become more prevalent throughout the European Union (EU). From 2007–2008, the EU increased production substantially from 7,377 million liters to 9,164 million liters, making it the world’s leading producer of biodiesel (Sorda & Banse *et al.*, 2010). An estimated 4.9 million tons of biodiesel were produced in 2006, of which 80% were sold in three countries: Germany (63%), France (14%), and Italy (5%) (Kutas & Lindberg *et al.*, 2007).

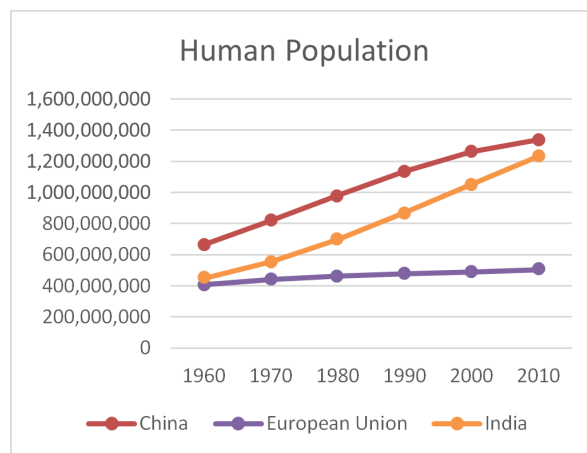


Figure 6. Total population. Data from World Bank, <http://data.worldbank.org/indicator/SP.POP.TOTL>.

The popularity of biodiesel in many of these countries originally came about through adoption of government policies, such as the Renewable Energy Directive 2009/28/EC. The directive promoted increased use of renewable fuels in order to offset greenhouse gas emissions due to fossil fuels (Council, 2009). The directive specifically “sets targets for all EU countries with the overall aim of making renewable energy sources account for 20% of EU energy and 10% of energy specifically in the transport sector by 2020.” In Germany and France, the top two producers of biodiesel, meeting specific quotas from biofuel production are incentivized by specific tax reductions or exemptions (Sorda & Banse *et al.*,



2010). Additionally, “crude palm oil for industrial use” is the only vegetable oil used for biodiesel production free from any import taxes (Kutas & Lindberg *et al.*, 2007). All other imported oils, including crude soy, sunflower, and rape oil, have a 3.2% most favored nation (MFN) bound tariff while tariffs on ethanol are considerably high: €19.2 per hectoliter (or 63% ad valorem equivalent in 2004) (Kutas & Lindberg *et al.*, 2007). While currently the most common feedstock for biodiesel production is rapeseed oil, estimates in Germany have proven the cost efficiency of palm oil biodiesel is less than a third of the production cost of its oil counterpart (Kutas & Lindberg *et al.*, 2007). Therefore, it is anticipated that palm oil consumption in these countries will increase as long as there are policies intended to increase biodiesel production (Kutas & Lindberg *et al.*, 2007; Sorda & Banse *et al.*, 2010).

## Questions

1. Why is palm oil usage so widespread?
2. How likely is it that you consumed or used a product containing palm oil today?
3. Do the individual health and economic benefits outweigh the global detriment caused by palm oil production?  
Why or why not?

## Assignment

In order to understand how your consumer choices are contributing to the global demand for palm oil, complete the **assigned worksheet** and answer the following questions.

1. Out of the products you use each day, how many contain palm oil?
2. For each product containing palm oil, find an alternative that does not contain any palm oil products.
3. Have a family member or friend complete the worksheet. Use your knowledge of the palm oil industry that you've learned so far to educate your peers about making sustainable consumer choices.
4. Write a small reflection piece of your findings through this assignment. What surprised you the most? How did your family/friends react to this assignment? Brainstorm some solutions on how to educate the public about products containing palm oil.

## Part IV – The Environment and Threats to the Orangutans

Ellie collapsed into her bunk. She was exhausted, frustrated, homesick, and downright angry; her mind raced back to when it all started. Ellie had been five-and-a-half years old when her mother decided they could no longer stand watching a singing mermaid. That fateful day Ellie's favorite cartoon had been replaced by her mother's favorite—*The Jungle Book*. From the moment Ellie saw King Louie, the resident orangutan and swing music aficionado, she was hooked. Today she was working her dream job, or so she had thought.

“Go to Sumatra,’ they said. ‘Work with orangutans,’ they said. ‘It’ll be fun,’ they said.” Ellie mumbled under her breath as she knotted her bright red hair on top of her head, her blue eyes flashing in the sun. She recounted the last 14 days of her life. She’d suffered through an overnight layover in Kuala Lumpur and then her flight touched down at Minangkabau International Airport and she’d been swept up in a flurry of orientation slideshows, names, and faces. Before she knew it she was thrust into a tropical rainforest looking for the elusive orangutan. They had been tracking a mother named Siti and her offspring all over a section of forest. Usually they wouldn’t be so dogged, but they believed Siti had given birth earlier in the week. They were honing in on the telemetry signal when they got the warning; fire had broken out just outside the border of the sustainable oil plantations. They would have to wait until tomorrow to make sure the orangutans were okay. On the way out of the forest she couldn’t help but stare at the blazing sign that read “Future Home of JVM Incorporated,” and a trickle of rage went up her spine. Another company to strip the forest clean.



### Background

#### *The Fires of Malaysia and Indonesia*

Slash and burn farming is defined as a method of agriculture in which existing vegetation is cut down and burned off before new seeds are sown, typically used as a method for clearing forest land for farming (EcoLogic, 2014). The purpose of this type of land clearing is to imbue the land with nutrients, albeit short lived (Thomaz *et al.*, 2014). The fires burning in Indonesia cause devastation to prime orangutan habitat. Between 1997 and 1998 fires were estimated to have killed roughly 1/3 of the orangutan population. These fires alone released one billion tons of carbon dioxide into the atmosphere. The fires are typically worse during El Niño years because of the abnormally warm and dry seasons (World Bank, 2015).

The burning of the fires also has far-reaching human health consequences. It is estimated that the smog from the fires is responsible for 500,000 cases of severe respiratory disease leading to 100,000 premature deaths each year. The debris from the fires affects people across Malaysia, Indonesia, and southern Thailand. The Indonesian government estimates the disease and loss of production cost the country \$47 billion USD in 2015 (World Bank, 2015).

#### *The Plight of the Orangutan*

Translated from the Malay and Indonesian words meaning “man of the forest,” orangutans are categorically a class of great ape. Orangutans are elusive creatures that spend the vast majority of their time in the dense canopy of the peat and tropical forests of Malaysian Borneo and Sumatra. They have a long lifespan (35–45 years), do not reach maturity until around 15 years old, and can take up to eight years between offspring (Tisdell, 2011). According to the World Wildlife Fund, in the last century orangutan numbers have plummeted fourfold to about 50,000 individuals remaining in the wild as of 2006. This drop occurred at the same time as the destruction of orangutan-suitable habitat through agriculture-necessitated deforestation and rampant forest fires. In the last two decades roughly 5.5 million hectares of

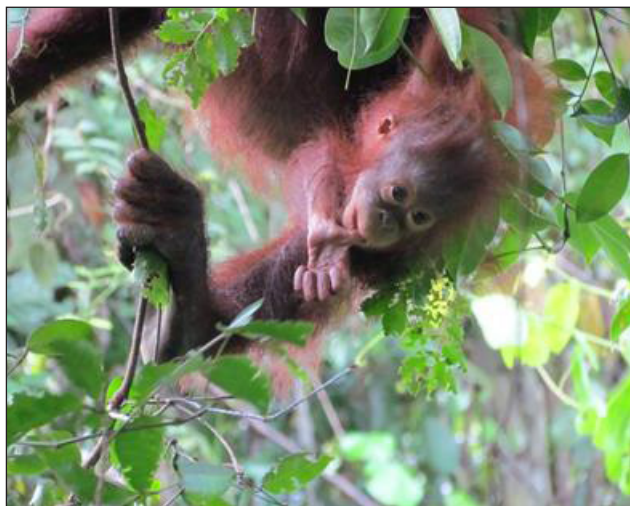


Figure 7. Juvenile orangutan. Credit: Katie Grassle.

prime orangutan land have been lost (WWF, 2016). Deforestation is not solely to blame for the loss of thousands of orangutans. They are also greatly valued in the illegal pet and bush meat trades (WWF, 2016).

It is important to remember that orangutans act as an umbrella species in the Malay Archipelago (Tisdell, 2011). Preserving orangutans will, in turn, help preserve less charismatic plants and animals. Because they tend to be solitary, it can take a large area to sustain multiple animals (Nantha, 2009). Conserving the land necessary for a sustainable population of orangutans will also protect valuable forest land for some of the area's other endangered species including the Sumatran rhinoceros, the Borneo pygmy elephant, and the Malayan tiger—all of which are on the IUCN Red List of Threatened Species as endangered or critically endangered (IUCN, *n.d.*).

Biodiversity refers to the variety of life. In the context of the Malay Archipelago, it refers to ecological biodiversity or the myriad of ways animals/humans interact with the environment in which they live. A more difficult idea to conceptualize is the economic worth of biodiversity. The orangutan, and the other endangered animals of Borneo and Sumatra, do not carry inherent monetary value (Nantha, 2008). They are not useful as work animals, they cannot earn money for themselves—how can their value be demonstrated to an impoverished population? According to Nantha and Tisdell (2008) the value of the orangutan, specifically, can be broken down into two categories—direct value and ecological value.

As discussed, the orangutan has qualities that make observing it in the wild difficult. The bulk of orangutan tourism dollars are spent on visits to orangutan sanctuaries and rehabilitation facilities (Nantha, 2008). In addition there are tourism companies that take visitors on expeditions to track and view orangutans in their natural habitat. One company, Red Ape Encounters in Sabah, earns roughly \$45,500 per year. They are able to funnel ~56% of this back into the community. Aside from tourism there is no direct value of the orangutan that preserves its numbers in the wild. Hunting for meat and poaching for illegal trade bring revenue into the community but don't conserve the species (Nantha, 2008).

Ecological value is much more difficult to quantify. The ecological value of orangutans stems from their natural function in the ecosystem (Nantha, 2008). Their frugivorous diet makes them excellent seed dispersers. This directly maintains healthy forests, which in turn provide innumerable benefits to the tropical ecosystem. What Nantha and Tisdell point out though is that such ecological value is dispersed over the world population while the brunt of the cost is heaped on the local people. This makes it very difficult to explain the benefits of conserving even the most charismatic of species.

### Questions

1. Discuss why orangutans as an “umbrella species” are important to the overall biodiversity of the Malay Archipelago.
2. Why would the long gap between offspring have such a major effect on orangutan population numbers?



## Part V – Moving Forward

The fire control efforts continued through the night and into the next afternoon. With every passing hour Ellie lost a little more hope that Siti and her babies would be ok. They had learned the fire was set on purpose, part of a slash and burn campaign by a non-sustainable palm plantation. The campaign had managed to destroy 1,200 acres of old growth peat forest in a matter of hours with this fire alone. Ellie clenched her fists as they pushed through the brush, driven by the beeping of the telemetry receiver. They came to the edge of the decimated area and were met with a gruesome site. Siti and her infant (a little girl) hadn't made it out of the forest. The site of her, charred beyond belief, was almost too much for Ellie. Behind her she heard her bunkmate sob, grown men were sniffing, nobody said a word. That's when the realization hit her—Siti had another daughter as well. Ellie's heart stopped. Was there a chance for one of them? That's when they heard it, a small noise and movement in the brush. There, buried under a dense layer of wet foliage and mud, the tiny face of Siti's other daughter, the twin to the now lost infant. The little survivor was freed from her little cave and rushed to the staff veterinarian. She suffered minor burns, mild hypothermia, and shock—but all in all she was a fighter.

She was named Ubah, which is Malay for change, before being relocated to the Bohorok Orangutan Center to grow up with her kind. Her mother and her baby sister Sayang were removed from the forest and buried under a durian tree on Bohorok's grounds. Their tree, and the legacy of Ubah, would serve as a reminder that change is necessary if we are to conserve biodiversity and save the orangutan, the man of the forest.

## Background

International non-profit organizations, companies, and governments are making attempts to mitigate the dire situation in Malaysia and the surrounding countries of Thailand and Indonesia. The United Nations has established a collaborative program on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries with the addition of sustainable management of forests (REDD and REDD+). They are working all over the world to reduce deforestation and build a sustainable future (UN-REDD Programme, 2017).

In 2007 the World Wildlife Fund secured commitments from Indonesia, Malaysia, and Brunei to establish protected and sustainably-managed forest habitat called The Heart of Borneo. This refuge is protected from both illegal logging and hunting. It may serve as a life raft for the endangered species in the area (WWF, 2016).

Finally, the Roundtable on Sustainable Palm Oil (RSPO) has set out to change the way palm oil is manufactured. They have gathered a variety of key stakeholders in the palm oil conversation in an attempt to transform current un-sustainable palm oil production (RSPO, 2016). While far from perfect, the RSPO is a good first step toward a more sustainable future.

## Policy Changes Ahead

The previously mentioned programs have established a framework for building conservation policy. What they lack is enforcement of said policies. According to each of the key conservation groups, the governments in the impacted countries have been very cooperative in establishing protected areas and sustainable palm oil practices. The disconnect between corporation and conservation appears when it comes to enforcing the established policies. To assist in enforcement it is proposed that the local government in the Malay Archipelago consider the following:

- Incarceration and fees for those caught hunting and/or poaching.
- Incarceration and fees for those caught in slash and burn deforestation.
- Steep taxes and fees for companies who do not adopt sustainable practices and who are not certified through the RSPO.
- Alternative employment in the form of park rangers or similar employment to provide income as well as to police forested areas for poaching and burning.
- Consider implementation of community based forest management, giving the people ownership and responsibility over portions of forest with the goal of re-establishing habitable grounds.
- Mandatory labeling of palm oil in products.
- Indication of sustainable and non-sustainable sources.

## Question

1. What policy changes (listed or other) would be effective in this situation?

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