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Environmental Sustainable Design ARC1413

PROJECT 2: NATURE AND US

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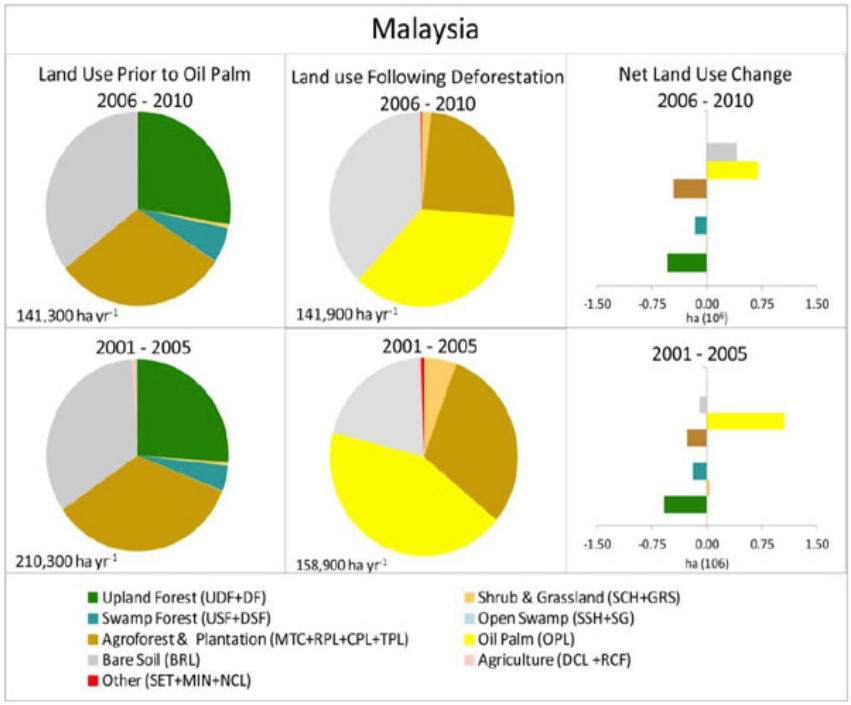
Getting Back to Nature or Getting Nature Back?

The Earth has always been a giving planet. Everything we humans need to survive and thrive is provided by the natural world around us; food, water, materials for shelter**.** Scientists term such gifts as 'ecosystem services'. Yet we are so disconnected from nature as we live in urban areas which is easygoing and expedient for us. But the Earth remains giving even as its resources is vanishing day by day. While the Earth itself regulates greenhouse gases in the atmosphere, which is crucial for the age of climate, we are clear cutting forests to release our economic tension. We are neglecting the fact that the global economy is underpinned by the environment. Without the fertile soils, clean drinking water, healthy forests and good climate, the world's economy would face disaster. According to a research published in *Science,* the global worth of total 'ecosystem services' could run between $40-60 trillion a year. Today we are paying increasing attention to the importance of nature conservation. The National Parks movement has protected many areas around the world. Taman Negara Pahang is one of these protected nature reserves in Malaysia. But are the nature reserves working? Human populations have grown sharply around the protected areas, consequently ratcheting up environmental pressures. Rivers are depleting gradually due to high temperatures. Farmers and loggers are marching right up to the borders of reserves. The truth is that we cannot simply set aside nature reserves and neglect their surroundings. We need to promote environmental sustainable design and bring back nature.



Stretching out from the equator on all Earth's land is an extensive belt of forests of remarkable diversity. Tropical forests include dense rainforests, where rainfall is abundant all year-round. Unfortunately, tropical forests of all variety are disappearing rapidly. Humans clear the Earth's natural landscape for various reasons, including to make room for agriculture, to harvest timber for construction and fuel, and to build roadways and urban areas. Although deforestation meets human requirements, it also has profound, sometimes devastating, consequences, such as social conflict, extinction of animals and plants, and climate change.

Figure1 Land use changes in Malaysia

Malaysia's land surface was once almost entirely covered with forest. However, with the current rate of deforestation, it is believed that these forests will disappear few decades later.

WWF Malaysia launched programs like 'Forest for Life' aims to increase the coverage of forest protected areas, improve the management of production forests for the supply of sustainable timber, and restore degraded areas. However, ecotourism will eventually deny the diligent intension of the organization.

Because of their location in environmentally sensitive areas, ecotourism operations that fail to fulfill conservation ideals can have very serious environmental penalties. Tourists represent an increase in population, however temporary, and their demands on local resources require the installation of additional infrastructure. Using national parks as an example, an immense region of forest had been removed in order to construct Mutiara Taman Negara National Park Resort because of increased population demand, which produce large amounts of waste and pollution, and further the degradation of the fragile ecosystems. Although deforestation gives convenience for the sake of ecotourism, the consequences to the animals are overlooked. Animals are forced to abandon their habit and thus, threatening the very existence of their species.

Figure 2 crowded speed boats in taman negara river

Ecotourism also causes overcrowded human population within a particular area. When tourists are having a night walk in Taman Negara's forest, the forest is truly overwhelmed by them which cause heavy and dense footsteps and loud noises throughout the walk. People often assumed that they are careful and sensitive enough to observe and not interrupting the wildlife's habitat, but their irresponsible actions clearly deceives their generous thought. The noise generated by the tourists may seem like a trifle, but the potential of destruction is immeasurable. Some shy and harmless animals might be driven off their habitat due to the unforeseen noise. Besides noise, light projecting out from every tourists is a significant threat too. The light rays that reach every corner of the jungle will further interrupt animal mating, with addition of flash photography that frightens animal away from their breeding ground.

Besides interrupting the ecosystem, an increase in human population also inevitably increases waste production. Littering is one of the turndown in Taman Negara as tourists are unaware of the fact that animals are clueless about the things they eat as long as they can devour them.

These irresponsible activities clearly reflect the inability of tourists to participate in conservation efforts, which lead to undesired pressure towards the ecosystem.

Moreover, human activities are changing the natural greenhouse on earth. Humans produce greenhouse gases such as carbon dioxide, methane and nitrogen oxides which are responsible for the rise in global temperatures. For instance, the ecotourism promotion in Taman Negara

has increased transportation within the area. Transportation accounts for the highest percentage of carbon dioxide emissions. This is the most contributing factor to global warming and climate change.

Focusing on the construction industry, researches have shown that the cement sector alone accounts to 5% of global man made carbon dioxide emissions. Mining and manufacture of materials has the highest impact. Chemical process and electricity accounts for the major portion of the construction sector carbon dioxide emissions. While onsite construction has a relatively low impact, the maintenance of buildings has a much higher impact towards the environment due to significant energy use.

These impacts can be quantified by Life Cycle Assessment (LCA). It is the most thorough way to determine the environmental impact of a design. LCAs can measure global warming potential or other things like human health, water and land use impacts, especially in nature reserves like Taman Negara, LCAs are crucial for sustainable construction.

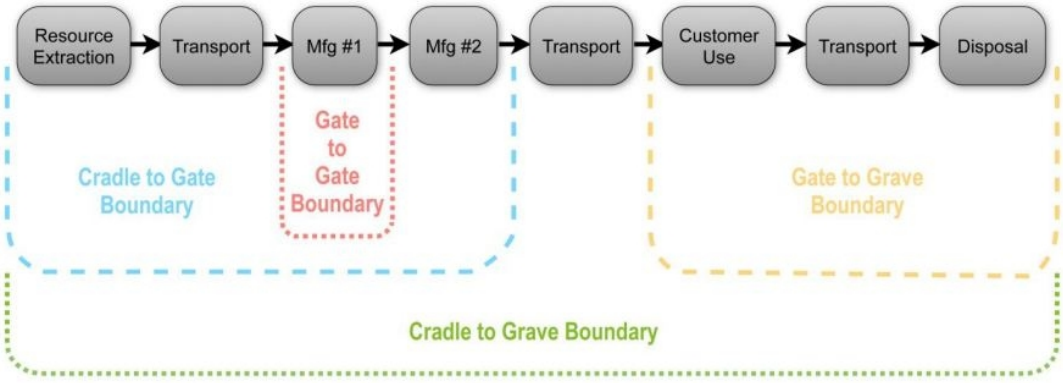


Figure 3 Common Boundaries for LCA

Figure 4 Timber Chalets in Taman Negara

Occasionally, LCA can be very costly and is not yet extremely prevalent. However, there is always the option of using recycled materials. Buildings in the surrounding areas of Taman Negara should use recycled materials and design construction for recycling as well, to reduce the impact to the environment. Materials can be only recycled if the value of the materials is greater than the cost to separate them. Therefore our construction should be designed for disassembly. Our designs should involve fewer kinds of materials with undoable fasteners and larger assemblies with greater value rather than small pieces. The timber houses in Taman Negara are good example of this strategy.

Furthermore, climate change is influencing our water resources. These changes will affect the plants that maintain the quality of water resources in Taman Negara. The growing number of speed boats in Taman Negara river must be controlled to reduce water pollution as each individual boat is capable of releasing small amount of pollutants. When multiplied, they cause distinct water quality problems in the river. Small oil spills released from motors and refueling activities contain petroleum hydrocarbons that tend to attach to waterborne sediments. These oil spills persist in aquatic ecosystems and harm the bottom-dwelling organisms that are at the base of the marine food chain. Moreover this will cause irreversible damages to the aboriginal village settling near the river, which solely depend on the water resources from the river. There are several ways boaters can reduce pollution from the boats. Careful fueling, recycling used oil can prevent needless petroleum spills. Keeping boat motors well-tuned prevents fuel and lubricant leaks. These simple things can not only keep the river clean, but also keep boats running smoothly.

Figure 5 Dry Shoreline in Taman Negara River

The relationship between water and global warming is significant. As temperature increases evaporation also increases, resulting even in droughts. This is evident from the water level shown in rivers of Taman Negara years back. As temperature rises, water temperature rises also, especially in shallow areas. The increase in temperature will disrupt the ecosystem in the river and may result in loss of species diversity. The recent water rationing incident in Malaysia is evident that there is a direct link to our water resources due to climate change. Also, it caused a spike in the use of polystyrene cups/storages which again increases littering rate and caused direct damage to nature.

Assuming the government did not make any adjustment to encounter these problems, our country will soon face multiple environmental crisis. Our rivers will dry out, intolerable hot sunlight will incinerate the ground, air will not be clean enough to breathe and animals will face rapid extinction. Our future generation may need to refer a book to imagine the beauty of nature that once existed within our society. The worst case scenario is people will have to struggle for clean food, drinkable water and breathable air. If everything falls apart, war might be unleashed between countries for the sake of survival. Our peaceful lives will soon come to an end

Clearly not a single being in this biosphere is looking forward to the destruction of the Earth, so in order to effectively protect nature, to get nature back to us, we must act in this instance. We can start off by raising our self-awareness towards nature and think about the bigger picture, understand the consequences of our actions and reunite with nature, appreciate and love them. The government should have decent organization and commitment to conservation goal. They can create more adequately trained tourism departments to finance responsible development efforts. Moreover, ecotourism in preserved forest such as Taman Negara should limit the flow of tourist money into the country, thus setting a quota for the number of tourist into the forest. With such regulations, development will never exceed sustainable levels in Taman Negara.

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