



**TAYLOR'S UNIVERSITY**

Wisdom • Integrity • Excellence

SCHOOL OF ARCHITECTURE, BUILDING & DESIGN  
Bachelor of Science (Honours) In Architecture

ENVIRONMENTAL SUSTAINABLE DESIGN  
ARC 1413 / BLD 60203

**PROJECT : NATURE & US (REFLECTIVE ESSAY)**  
**DEFORESTATION : IMPACT ON ANIMALS,  
HUMANS & BUILT ENVIRONMENT**

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Growing up in Malaysia, I have had the privilege to be constantly surrounded by many types of trees and greeneries. Almost everywhere I go, the presence of nature is noticeable. I should be grateful for the fact that Malaysia still preserves a huge portion of its forests as compared to other countries like Singapore and Indonesia- whose woodlands are almost non-existent due to constant developments and urbanization. However, over the past few years and as I get older, it saddens me to see how rapid the rate of deforestation is growing and how careless people are when it comes to urban planning and development. Forest clearance is being done on a massive scale to cater to people's needs for housing and agriculture, with very little thought given to the impact on the ecosystem. Very little thought has been put into the impacts that it may bring to the future. Hence, in order to know how to put deforestation to an end, we must first fully understand what biodiversity is and what importance does it bring to our lives as human beings.

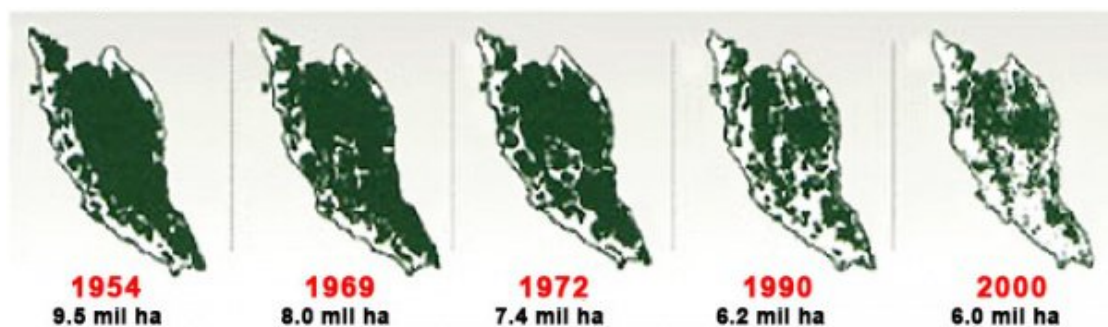
Biological diversity, or biodiversity is the variety of species of inhabitants on earth that co-exists to support one another. From things as tiny as microorganisms, to the highest mountain on earth- every single thing that exists on this planet plays an important role in order to maintain our ecosystem as it is. Change in biodiversity can lead to serious change in the environment because it is a direct reflection of the health of the natural environment. Slowly as the world ages, we can see the changes that are happening to it- caused by none other than humans themselves. These changes are considered as a loss. Biodiversity Loss is the change in rate or numbers of the species that lives on the earth. It causes major defects to the environment and an imbalance to the ecosystem. Although biodiversity loss may take place eventually through the course of evolution, humans have definitely accelerated the process by 1000% (Adeel, 2005).



Figure 1. Deforestation for palm oil in Malaysia  
(source : <http://news.mongabay.com/2014/0402-klk-conflict-palm-oil.html>)

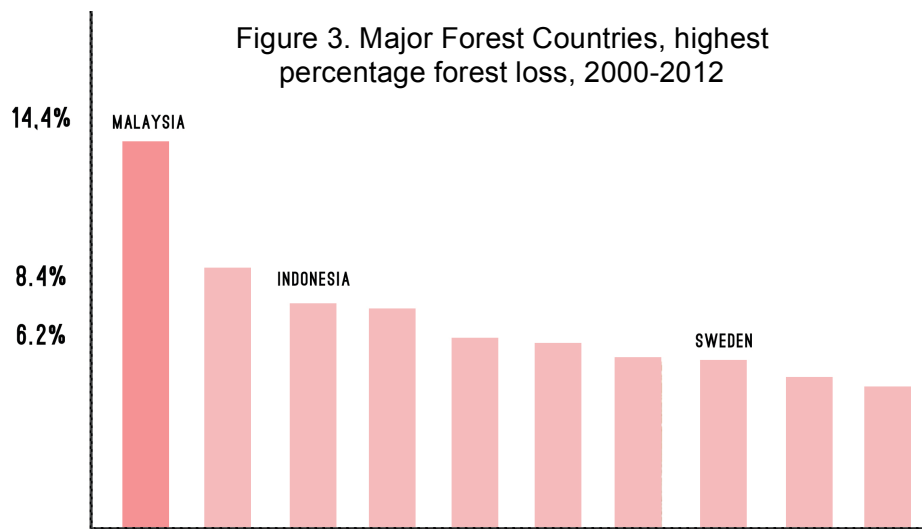
Biodiversity loss occurs due to a number of different reasons. Water, air and even noise pollution contributes a massive amount of defect to the environment. This causes instability to the earth's temperature which then leads to other environmental impacts such as climate change or the depletion of the ozone layer. The change in temperature and weather conditions will then affect humans and animals of all kinds, causing them to live uncomfortably, and some even unable to survive. It's always a slippery slope, a domino effect. However, one of the biggest cause of biodiversity loss is the overexploitation of resources caused by deforestation. Deforestation is the clearing of the Earth's forest on a major scale- resulting in serious damage to the ecosystem such as global warming, climate change, and extinction. The main cause of deforestation are often money or profit related. People cut down forests for real estate or agricultural purposes to make room for their buildings and crops. Loggers from major companies are also cutting down trees, both legally and illegally to produce wood, paper or any other profitable item to be brought in the market. Southeast Asia has the highest rate of deforestation of any major tropical region, and could potentially lose 3/4 of its forests by the year 2100 and up to 42% of its biodiversity (Sodhi & Koh, 2004). The bearings of deforestation can be seen through the course of history, dating back to almost 8000 years ago when most of Southeast Asia's woodland was under forest covers (Laurance 1999; Achard *et al.* 2002) . Then in the 1800s, agricultural expansion happened and there was an increasing demand for rice, rubber and oil palm. Knowing that these resources were valuable and are of high demands, people began clearing the forests to make room for planting crops of their own. During the 1950s, there was suddenly an increasing demand in the market for Asian timbers. This happened because people discovered the diverse and unique species of trees in Southeast Asia. Again, people took advantage of this opportunity to start cutting down a huge chunk of the forest in order to keep the market alive.

Figure 2. Fragmentation of natural forest covers in Peninsular Malaysia



(source : [http://malaysiafactbook.com/Encyclopedia\\_of\\_Malaysia](http://malaysiafactbook.com/Encyclopedia_of_Malaysia))

Although Malaysia is well known for its forests and resources, numbers are showing that the amount of forest loss in our country is gradually increasing. Geographer Matthew Hansen, from the University of Maryland in partnership with Google Maps, released a tool that reveals the extent of forest loss and gain on a global scale. According to Hansen (2013), Malaysia is leading the race with a total of 14.4% of total forest loss from the year 2000 to 2012. The deforestation happening here is much worse than other countries such as Sweden, Portugal, Cambodia, and even Indonesia. The loss is equivalent to 47,278 square kilometers, which is an area larger than Denmark (Hansen & Potapov, 2013).

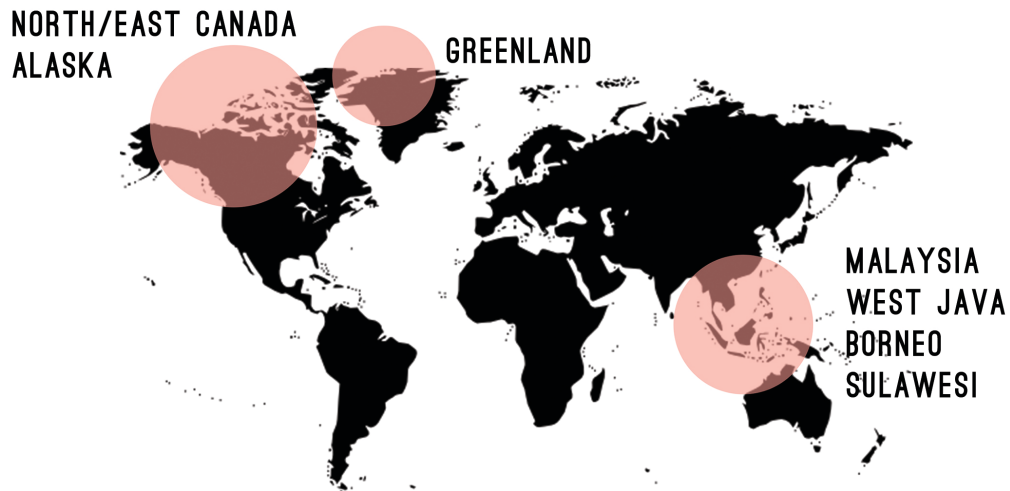


(Recreated from : <http://news.mongabay.com/2013/1115-worlds-highest-deforestation-rate.html>)

According to these petrifying figures in the chart above, the reality of it should be a warning sign to all of us, proving that our earth is on the verge of destruction. Deforestation causes so much harm to both humans and animals. It strips the habitats of animals and converts them into farming and housing areas, resulting in possible extinction to these species. It also causes a lot of environmental harms such as rise in temperature, climate change, soil erosion, flood, drought, and so many other daunting possibilities that will eventually lead to human discomfort and health issues.

Animal extinction is one of the more protuberant effects of deforestation. It happens due to a couple of reasons. First and for most, the clearing of forests will cause loss of habitats through the wiping out of territories these animals are residing in. Creatures like the Malayan tiger, Orang Utans and Tapirs will have no place to stay and will also be exposed to other threats such as harassment from loggers, extreme climates, and such. Besides that, clear pathways of forests will provide easier access for hunters. It paves way for other people to enter the forest with ease. Hunters and collectors will take the opportunity to capture these exotic animals for commercial purposes, such as poaching of the Sumatran rhinoceros. Some of these animals will be brought into new habitats like exhibition spaces or zoos, while others will be sold or transformed into accessories, clothing, and carpets. Furthermore, loss of habitat will cause animals to migrate to urban areas- which they don't belong. When these animals lose their original habitats, they will have no choice but to migrate to other areas in order to survive. Most of them will migrate to the nearest concrete jungle consisting of buildings and people and will expose them to even more threats and dangers. Eventually, the inability to adapt to these unusual circumstances will cause them to die and finally go extinct. According to a map developed by Dr. Greg Anderson and Dr. David Harrison of the *Living Tongues Institute for Endangered Languages*, Malaysia alongside Sumatra, West Java, and most countries from the Southeast Asia are labeled as the predicted extinction hotspots (2006).

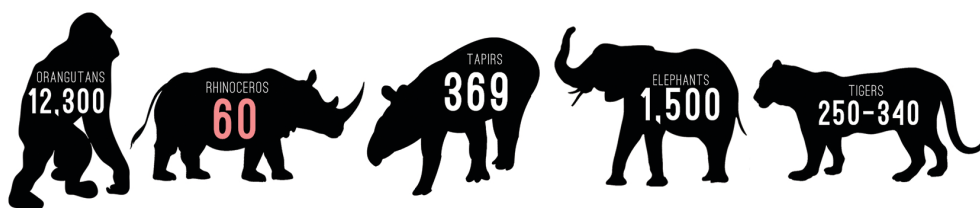
Figure 4. Predicted Extinction Hotspot, 2006



(Recreated from : <http://www.enn.com/wildlife/article/39116>)

The decline of the number of animals in Malaysia is a major loss as we have one of the most unique species in the whole world. Some of our most valuable species includes the Malayan tiger, the Sumatran rhinoceros, tapirs, the Pygmy elephants, mouse deer and the orang utan. These animals are extremely crucial as some of them are symbolic to the nation. The Malayan tiger for example, is the national animal of Malaysia, and is the face of our own football team. Losing this precious species would be equivalent to losing part of the nation. Another example would be the mouse deer, which is a very historical animal- involved in the naming of one of our own states, Melaka. The table below shows the specific details of the condition of these endangered animals and the reason behind them.

Figure 5. Types of endangered animals and its specifications



Type	Number	Status
Malayan Tiger	250-340	<ul style="list-style-type: none"> <li>Critically Endangered</li> <li>90% located only in : Pahang, Perak, Kelantan, Terengganu</li> </ul>

		<ul style="list-style-type: none"> <li>• Loss of habitat causes inbreeding, which reduces expansion</li> <li>• Overhunting for commercial purposes</li> <li>• Attacked by humans</li> </ul>
<b>Sumatran Rhinoceros</b>	Less than 60 (rate of death higher than birth)	<ul style="list-style-type: none"> <li>• Critically Endangered</li> <li>• Last Surviving Species of Rhinoceros</li> <li>• Endangered due to poaching, isolation and inability to breed</li> </ul>
<b>Pygmy Elephants</b>	Less than 1,500	<ul style="list-style-type: none"> <li>• Endangered</li> <li>• Loss of habitat due to forest conversion and logging</li> </ul>
<b>Orang Utan</b>	12,300 in Sabah & Sarawak (population decline by 40%)	<ul style="list-style-type: none"> <li>• Endangered</li> </ul>

(Recreated from : [http://www.wwf.org.my/about\\_wwf/what\\_we\\_do/species\\_main/](http://www.wwf.org.my/about_wwf/what_we_do/species_main/))

Besides having a colossal impact on animals, deforestation also greatly affects humans and the environment in general. The loss of forests will create an imbalance to the ecosystem and disrupt its cycle. Climate change is one result of the disruption of the cycle. Lately we have been seeing reports on unpredictable weather changes such as monsoon and drought happening at times when it is not supposed to happen. Rise in temperature is another direct result of deforestation. The trees that act as natural shades are long gone to logging companies and are no longer there to cool the earth. Without these vital source of shade, the earth will heat up and causing the temperature to rise. If matters were to get worse, environmental issues such as drought and haze will prolong and cause serious health issues and discomfort. In Figure 6 below shows that the API reading for urban or developed areas are higher and more concerning than those of rural areas. The index in Selangor was at its highest, with a reading of 322, causing a lot of health risks and deaths. Furthermore, the absence of vegetation will cause the soil to disassemble, as the trees were the main element that holds the soil together. Reduce in topsoil will allow water to be collected faster- instead of being absorbed to the ground by the topsoil. Water build up is what's causing flood to happen. Recently, the massive flood that took almost the entire country by storm is one of the environmental impacts of deforestation.

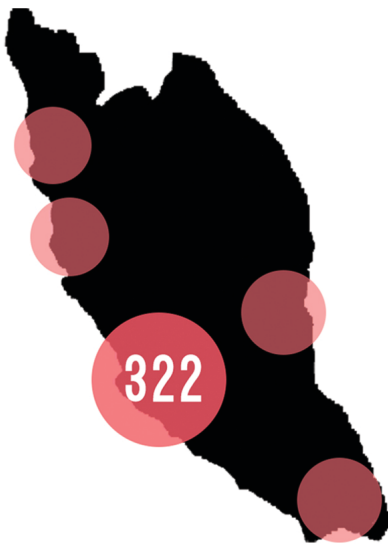


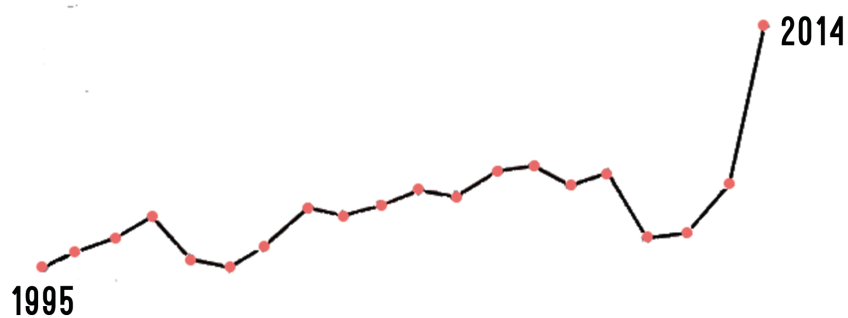
Figure 6. Malaysia air quality index, 2014  
(Recreated from : [http://google.org/crisismap/weather\\_and\\_events/](http://google.org/crisismap/weather_and_events/))



Figure 7. Areas threatened with flood, 2014  
(Recreated from : <http://acicn.org/map/malaysia/>)

According to Figure 7, a lot of areas were affected by the flood due to the loss of forests and vegetation. Almost half of the nation were destroyed, homes were wrecked, people were killed and live stocks gone. Catastrophes like these should leave people with better awareness about the importance of taking care of the earth and preserving its contents. Like I've stated before earlier in this essay, everything is a slippery slope. All of the issues mentioned above will eventually affect the most dominant species on earth- humans. Health issues are what's to come if we were to continue to live this way. The most recent disease that struck the nation was dengue, and it is definitely on its peak these past few years. People should be taking better precautionary steps in order to protect and fight these diseases and what better way to start than from your surrounding

Figure 8. Dengue cases in Malaysia, 1995-2014



(Recreated from : <http://www.themalaymailonline.com/opinion/khairie-hisyam-aliman/article/dengue-is-our-responsibility>)

Last but not least, deforestation is taking away almost all of our natural resources. Water, soil, wood, plants, habitats and everything else that are vital to us are now being easily traded off in the markets. The scarcity of these materials will definitely hamper the needs of humans to live a comfortable life. The decrease in resources, and the increase in demand will create a great deal of chaos in our future years. The construction industry too, will suffer if deforestation does not come to a stop. Our forest is packed with rich sources of wood and other construction materials that are deemed as valuable at an international level. Wood species like *cengal*, *meranti* and *damar* that are staple construction materials will soon come to a halt if people don't stop cutting them down. Without having access to these materials, we will have to rely on imported goods that are more costly and energy consuming. Besides that, the loss of these local wood species will also affect the value of our entire rainforest in general. The production of buildings in Malaysia, without these homegrown materials wouldn't make a building 100% local and sustainable.

There are many ways we can stop deforestation, or at least slow down the process. Sustainable land use is a must in order to preserve the land we live in. Proper planning of urban, suburban and even rural areas are crucial in order to not waste the land that is already scarce. According to the Brundtland Commission of the United Nations' World Commission (1987), sustainability should be seen as meeting the needs of the present without compromising the ability of future generations to meet their own needs. Development should also be done within control, and not out of greed. I have seen many housing projects that are being done without thorough research before sacrificing thousands of acres of forests, resulting to an abandoned show house positioned in the middle of bare land. Besides that, the 3R's should also be practiced religiously. Construction industries should use more recycled materials rather than producing millions of new materials each day. Things like concrete, timber, glass can easily be recycled and will reduce the energy needed to produce new ones. Anything that is reusable on the construction site should also be paid attention to. Materials should be stored in a reusable container, rather than plastics or boxes that will only crowd the landfill. Moreover, people should also adopt the habit of giving back to nature and returning what you have taken from it. More and more awareness campaigns are being held for the sake of protecting the earth and we're seeing a lot of green buildings taking place in the architectural field.

In conclusion, the future of our nation lies completely in our hands. This piece of land granted to us should be treated as a responsibility rather than an indulgence or privilege. According to Roosevelt (n.d), "the future generation too, will need a place to live in and just imagine what it would be like to see our children and grandchildren to not be able to experience grass and tree barks like we did. In conclusion, In conclusion, the future of our nation lies completely in our hands. This piece of land granted to us should be treated as a responsibility rather than an indulgence or privilege. The future generation too, will need a place to live in and just imagine what it would be like to see our children and grandchildren to not be able to experience grass and tree barks like we did."

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