

Marissa Menard

Dr. Anita Duneer

First-Year Writing Honors

31 March 2020

### Killing Trees Is Killing Us

Do you think we could survive without trees? The answer is no. How big of an impact do you think trees have on human life? In fact, trees have an enormous impact on human life and are essential to life as we know it. Trees combat climate change, remove carbon dioxide from the air, produce oxygen to allow us to breathe, conserve energy, save water, help prevent water pollution, reduce soil erosion, and block ultraviolet rays. Without trees, the important benefits that they provide would no longer exist and the Earth would suffer. In recent years, more and more trees are being cut down. This significant loss of trees is quickly becoming a reality. The controversial practice of clear-cutting removes all the trees from a section of forested land and converts it into farmland. This damages forest biomes immensely as they are a balanced and intricately intertwined set of ecosystems. The community of trees, plants, animals, insects, and fungi all work together in a symbiotic system (Whitmer). This finely tuned relationship is disrupted by cutting down large amounts of trees and needs to be stopped.

The memoir *Lab Girl* by Hope Jahren showcases her life as a geobiologist. She has studied trees, flowers, leaves, seeds, and soil and she is a great inspiration for empowering others to do everything they can to help the environment and not hinder it. What stood out to me was how she closed the book by asking everyone to plant one tree: “Every single year, at least one tree is cut down in your name. Here’s my personal request to you: if you own any private land at all, plant one tree on it this year” (Jahren 280). After reading this, I realized how beneficial it

would be to the environment if this was accomplished, which led me to research this topic in great detail. Cutting excessive amounts of trees down is negatively affecting the environment by contributing to climate change, displacing animals, and fragmenting forests. However, the best way to counteract this problem is by planting numerous trees in order to reverse these negative effects.

The most concentrated and detrimental deforestation occurs in tropical rainforests. One rainforest in particular facing harmful damage is the Amazon Rainforest. This rainforest faced the biggest spike in deforestation in over a decade: “About 39 million acres of tree cover disappeared in 2017 – an area the size of Bangladesh” (Ingber). Another rainforest also facing extreme deforestation is the Congo Rainforest. In the Democratic Republic of the Congo, the amount of forest being lost is breaking records every year and continues to increase at unbelievable rates. The increase was caused by logging, agriculture, and charcoal needs to supply the demand in Kinshasa (Ingber). Deforestation occurs for multiple reasons: trees are cut down to be used for building or sold as fuel, sometimes in the form of charcoal or timber. Also, the cleared land is used as pastures for livestock, farmland for growing crops, and urbanization. The ever-growing human population requires more and more space to expand and urbanize. This is the biggest cause of forest destruction due to the vast amounts of resources, products, and services that we continue to take from it. Forests cover about one third of the world’s land area, and if the current rate of deforestation continues, rainforests will no longer exist by the end of the next century (O'Brien 140-141). The excessive amount of trees being removed in these rainforests are causing many negative effects to the environment, which needs to be counteracted.

Deforestation is one of the major causes of global climate change. It is a big problem in

the world today, with hundreds and even thousands of vulnerable forests being cut down both for wood and for farmland. The loss of these forests is having a devastating effect on the climate. Climate change is mainly caused by excess carbon dioxide in the atmosphere due to the lack of trees and the fires made to burn the trees down: "The blazes have counteracted Brazil's decline in deforestation-related carbon emissions since the early 2000s" (Ingber). Due to the cutting and burning of forests, extreme amounts of carbon dioxide are released into the atmosphere. Forests all over the globe remove carbon dioxide from the atmosphere and convert it into oxygen. By cutting down huge areas of forests without replacing the trees that we remove, we are causing a negative change in the amount of carbon dioxide in the atmosphere, which can have a huge impact on the rest of the world. The amount of uptake of carbon dioxide from the atmosphere by trees is continuously decreasing: "By the last decade, that amount had sunk to about 25bn tonnes, or just 6% of global emissions" (Harvey). This means that more and more carbon dioxide is building up in the atmosphere. There are many ways that the climate and the environment is impacted by the reduction of trees and large amounts of carbon dioxide in the Earth's atmosphere.

The extreme loss of trees causes global warming, changes weather patterns, alters the water cycle, and causes ocean acidification, due to excessive carbon dioxide in the atmosphere. Carbon dioxide is a greenhouse gas, which means that it traps infrared rays from the sun and keeps heat in the Earth's atmosphere. More and more carbon dioxide in the atmosphere means more and more heat is being trapped, raising the average temperature of the world, which is otherwise known as global warming. Water vapor is another greenhouse gas that keeps heat from the sun trapped in the Earth's atmosphere and helps maintain a temperature at which life can flourish on our planet. However, deforestation also affects the amount of water vapor in the air.

Over just a few years, the amount of water vapor present has increased. Besides increasing the temperature of the Earth's surface and atmosphere, this also affects weather patterns. The water cycle is very important for humans, animals, and plants all over the globe. Trees contribute a great deal to the water cycle, and forests are particularly useful for regulating the way that rain is recycled back into the atmosphere to be rained down once again many miles away. Trees play a vital role in controlling climate. By chopping down hundreds of thousands of trees every year and never replacing them, we are affecting the natural water cycle of the world. This means there will be an increase in the pollution present in the water that now rains down on places all over the world. Besides causing problems in the waterways because of an increase in soil and pesticides, for instance, deforestation has also been directly linked to ocean acidification, or the increase in the average pH of the oceans (O'Brien 150-151). Oceans become more acidic when more carbon dioxide is present. Fewer trees are available to convert the carbon dioxide into oxygen, and the processes involved in deforestation burn many fossil fuels and release additional carbon dioxide. This greenhouse gas gradually seeps into the oceans, raising the average pH, which kills off many species of plant and animal life. Tropical forests like the Amazon rainforest promote a cycle of evaporation and rainfall. The loss of rainforests could result in warmer and drier climates near the tropics which could destroy ecosystems that many animals and plants depend on.

Deforestation also negatively affects forests by fragmenting them, which displaces animal species that live there. Forests are vital for human and animal lives as they are home to millions of species. Removal of all the trees from an area reduces forest health and degrades the physical habitats of many species of wildlife. Cutting trees can result in the loss of habitat for animal species, which can harm ecosystems. Woodpeckers, hawks, owls, bats, and flying

squirrels are some of the forest animals that lose their homes and hunting grounds as a result of deforestation. The majority of animals and plants that live on land inhabit forests, and many cannot survive the deforestation that destroys their homes. The biodiversity of animal species is decreased by the removal of mature trees. Fragmentation increases isolation between forest communities of trees and animals and it increases edge effects. When a forest becomes isolated, the movement of plants and animals is inhibited. This restricts breeding and gene flow and results in long-term population decline. Edge effects alter growing conditions within the interior of forests through drastic changes in temperature, moisture, light, and wind (Ewers 3298-3300). This causes negative effects on the health, growth, and survivability of trees, flowers, and ferns, which in turn affects the animals who depend on these trees and plants for food and shelter.

Forest fragmentation causes certain plants and animals to have difficulty breeding and reproducing. The removal of trees and other types of vegetation reduces available food, shelter, and breeding habitat. Habitat fragments can cause a small group of species members to be isolated from the rest of the main population. If the isolated animals are separated for a long enough period of time, they will no longer be able to freely breed with individuals in the main population. This will then cause them to become their own species. Animals may also encounter dangerous situations such as increased human-wildlife conflicts and being hit by vehicles when they attempt to migrate between habitat fragments in order to breed. One example of this was a case study performed to view the effects of forest fragmentation on bat pollinators, their mating patterns, and tree reproductive success. The bat pollinators depend on the bombacaceous tree species to regulate their mating patterns. The bat pollinators' response to the forest fragments was likely a consequence of the flowering pattern of each tree species and the availability of other resources. Most of the bats visited flowers in fragments significantly more than in the

forest. Trees in fragments produced more flowers than trees in the forest, but fruit production was lower in fragments. It is likely that pollinators in isolated trees cause self-fertilization of the trees, which results in reduced fruit production. Pollination with compatible pollen is hindered in fragmented habitats, thereby limiting the ability of individuals to achieve high levels of fruit. This causes fragmented trees to produce a lower amount of fruit than unfragmented trees (Quesada 131). Therefore, this study shows that cutting down excessive amounts of trees, which fragments forests, causes a significant dilemma in plant and animal reproductive success and survival. If forests cease to exist, humans and other species will be unable to survive. Therefore, killing trees is killing us.

Is there a solution to this deforestation problem? In fact, there is. Put simply, plant trees! There are actually many foundations working hard to accomplish just that. One foundation, The Green Belt Movement, is an environmental organization that empowers communities located in Kenya to conserve the environment and improve livelihoods. This foundation was founded by Professor Wangari Maathai in 1977 in response to Kenyan women who reported that their streams were drying up, their food supply was less secure, and they had to walk further and further to get firewood. This movement encouraged the women to work together to grow seedlings and plant trees to bind the soil, store rainwater, provide food and firewood, and receive a small monetary token for their work. They have planted more than 51 million trees on farms, schools, and churches, along rivers, and in the countryside (The Green Belt Movement). Today, the Green Belt Movement's work has continued to evolve, with the goal of furthering their efforts in planting trees and reducing climate change. Another foundation working to combat excess deforestation by planting trees is The Bonn Challenge. This movement is a global effort to restore 150 million hectares of the world's deforested and degraded land by 2020. They also

aim to restore 350 million hectares by 2030 in biomes around the world. This global effort is now backed by 48 nations (Carrington). The Bonn Challenge uses the forest landscape restoration approach, which aims to restore ecological integrity at the same time as reducing climate change.

Planting large amounts of trees in order to combat deforestation can have a multitude of positive effects on the environment. The act of planting trees can reverse all of the negative effects caused by an extreme loss of trees, such as global warming and climate change. Trees can make a huge impact on the environment when planted in urban areas where air pollution is high. Trees affect the concentration of pollutants in the air by directly removing pollutants or emissions from the atmosphere. In a case study, it was determined that the trees with a large leaf surface area and a wide dense canopy provided the most benefits (Isaifan and Richard 1). Also, mature trees tended to be more beneficial than smaller trees for improving environmental conditions. Trees act as natural air filters and improve air quality by trapping carbon dioxide and other particles from the atmosphere and providing us with oxygen. They also reduce ozone levels in busy urban areas. Air pollution in urban areas is extremely poor due to the rapid increase in industrialization and transportation, leading to degraded air quality (Isaifan and Richard 1). This deterioration in air quality has been shown to adversely affect human health and the environment in urban cities. It is estimated that if a worldwide tree planting program was initiated, it “could remove two-thirds of all the emissions from human activities that remain in the atmosphere today, a figure the scientists describe as mind-blowing” (Carrington). When located near air pollution sources, trees and bushes can also increase air dispersion and improve local air quality (Isaifan and Richard 1). Trees are essential for combating the global warming effect being created by excess carbon dioxide in the atmosphere by removing gaseous pollutants.

Cutting down and burning excessive amounts of trees is negatively affecting the environment by contributing to climate change, displacing animals, and fragmenting forests. However, the best way to counteract these problems is by planting numerous trees in order to reverse these negative effects. We all have the ability to fix this problem, if we all just plant one tree. In fact, planting a tree is somewhat simple. All you have to do is: bend down, push your finger into the soil about 1 inch in depth, drop the seed in, stand on the hole to close it over, and water it once a week. You can plant this tree seedling on the side of the street, in your garden, in the park, or next to the woods. You can plant a tree anywhere that has space and light. Planting large amounts of trees is immensely efficient and effective: “The most effective projects are doing restoration for 30 US cents a tree. That means we could restore the 1tn trees for \$300bn” (Carrington). Trees have many benefits including: storing stormwater runoff, stopping erosion, saving energy needed for air conditioning, and regulating temperature by providing shading. They are even responsible for the ongoing existence of many springs and the even flow of rivers. Most importantly, trees combat climate change, remove carbon dioxide from the air, produce oxygen to allow us to breath, help prevent water pollution, and block ultraviolet rays. Planting seedlings to offset trees that are cut down is important in maintaining tree populations for a sustainable future. Smart land management practices should be in place to ensure that viable forest resources will remain in the future. For example, wildlife corridors can be created to help connect wildlife populations in a fragmented landscape (Fowler 303-306). We know that deforestation is a serious problem on Earth. Therefore, it is our responsibility to do what we can to prevent the issues caused by excessive deforestation from creating a lasting impact on our planet. As individuals we need to make it a priority within our communities to work towards a sustainable future for ourselves, our children, and the Earth. If we don’t start planting trees to

combat this problem, forests will disappear forever and humans and other species will not be able to survive. Therefore, killing trees is killing us.

## Works Cited

- Carrington, Damian. "Tree Planting 'Has Mind-Blowing Potential' to Tackle Climate Crisis." *The Guardian*, Guardian News and Media, 4 July 2019, [www.theguardian.com/environment/2019/jul/04/planting-billions-trees-best-tackle-climate-crisis-scientists-canopy-emissions](http://www.theguardian.com/environment/2019/jul/04/planting-billions-trees-best-tackle-climate-crisis-scientists-canopy-emissions).
- Ewers, Robert M, et al. "A Large-Scale Forest Fragmentation Experiment: The Stability of Altered Forest Ecosystems Project." *Philosophical Transactions: Biological Sciences*, vol. 366, no. 1582, 2011, pp. 3292–3302.
- Fowler, Catherine S, et al. "Caring for the Trees: Restoring Timbisha Shoshone Land Management Practices in Death Valley National Park." *Ecological Restoration*, vol. 21, no. 4, 2003, pp. 302–306.
- "The Green Belt Movement." *The Green Belt Movement*, Cstraight Media , 26 Mar. 2020, [www.greenbeltmovement.org/](http://www.greenbeltmovement.org/).
- Harvey, Fiona. "Tropical Forests Losing Their Ability to Absorb Carbon, Study Finds." *The Guardian*, Guardian News and Media, 4 Mar. 2020, [www.theguardian.com/environment/2020/mar/04/tropical-forests-losing-their-ability-to-absorb-carbon-study-finds](http://www.theguardian.com/environment/2020/mar/04/tropical-forests-losing-their-ability-to-absorb-carbon-study-finds).
- Ingber, Sasha. "Tropical Forests Suffered 2nd-Worst Loss Of Trees On Record Last Year." *NPR*, NPR, 28 June 2018, [www.npr.org/2018/06/27/623895283/tropical-forests-suffered-second-worst-loss-of-trees-on-record-last-year](http://www.npr.org/2018/06/27/623895283/tropical-forests-suffered-second-worst-loss-of-trees-on-record-last-year).
- Isaifan, Rima J, and Richard W Baldauf. "Estimating Economic and Environmental Benefits of Urban Trees in Desert Regions." *Frontiers in Ecology and Evolution*, vol. 8, 2020, doi:10.3389/fevo.2020.00016.
- Jahren, Hope. *Lab Girl*. Vintage Books, 2016.
- O'Brien, Karen L. "Tropical Deforestation and Climate Change: What Does the Record Reveal?"

*The Professional Geographer*, vol. 50, no. 1, 1998, pp. 140–153.

Quesada, Mauricio, et al. “Effects of Forest Fragmentation on Pollinator Activity and Consequences for Plant Reproductive Success and Mating Patterns in Bat-Pollinated Bombacaceous Trees.” *Biotropica*, vol. 36, no. 2, 2004, pp. 131–138.

Whitmer, Phil. “Negative Effects of Clear-Cutting.” *Sciencing*, Leaf Group Media, 22 Nov. 2019, [sciencing.com/negative-effects-clearcutting-8194063.html](https://www.sciencing.com/negative-effects-clearcutting-8194063.html).