

Deforestation by the Self-Interested Man

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Earth's organic decomposition of pollutants, such as carbon dioxide, relies on forests throughout the world, an unrestricted "commons" to mankind (Hardin, G., 1968). Unfortunately, in the past century, forest coverage has depleted significantly, posing an immediate threat to the purity of our atmosphere and the safety of the land. Without immediate change, it is projected that over 64% of global forests will be eliminated by the year 2065 (Choi, Suk-won, et al, 2011). Every hour, over 28,000 hectares of tropical forest are destroyed (Floyd, B.N., 1982). The inability to naturally clean our atmosphere will cause increases in temperature, possibly killing thousands of species dependant on Earth's climate and threatening man's food supply. Additionally, deforestation uproots soil, leading to dangerous landslides; decreases biodiversity, shocking the food chain; and depletes the soil's nutrients, a key source of vitamins and minerals. In order to prevent the complete destruction of Earth's carbon cycle, mankind must impose international regulations on forestation industries via trade agreements or economic restrictions. Additionally, specific reconstruction efforts must be included in those restrictions, such as the planting of multiple trees per tree cut, banning controlled forest burning, and protecting specific acres of forests.

Garrett Hardin in *The Tragedy of the Com-*

mons presents an interesting perspective on mankind's inability to solve the issue of overusing shared resources via technological means. Man's innate decision making is derived from his own self-interested motives; every choice is from a computed cost-benefit analysis. This directly applies to what Hardin describes as a commons. Hardin defines that a commons is a shared, unregulated, and limited resource, where the benefits for the user are high while his costs are low and evenly distributed over all. The overuse of a commons, such as forests throughout the world, is recognized as dangerous, however, people hesitate to "relinquish the privileges they enjoy" (Hardin, G., 1968) to prevent further destruction. Additionally, only a few people fighting for a collective interest cannot prevent the tragedy of the commons because "the result of the individual interest is at odds with the collective interest" (Hardin, G., 1968). This individual interest is embedded in the outcome of the rational, self-interested man's cost-benefit analysis. The individual refuses to acknowledge that their actions make an impactful difference. However, when multiplied by the theoretically "unlimited" users of the commons, it truly is a tragedy in itself. This collective interest is constantly in competition with the individual interests. Hardin disagrees with the majority of scientific papers that state the commons' depletion can be solved with

a purely technical solution. He argues that the only solution is through mutually agreed upon coercion. Man must essentially be persuaded, either by reward or force, to act in a certain manner. But in order for mutual coercion to truly be effective, all must recognize its necessity, which is a difficult task in itself. This compelling means of authority transforms an unrestricted commons to one with restrictions, essentially removing the commons; a commons by definition must be unrestricted. Thus, the only way to eliminate the tragedy of the commons is by the elimination of the commons itself.

As in economics, a rational man will choose an option that is certain today, in the present, rather than waiting for an uncertain option in the future. For example, a man would take \$20 now rather than waiting a year for \$40 (Maskin, et al., 2005). This hyperbolic discounting in regards to uncertainty is the same rationale that influences the deforestation problem around the world. Lumber industries, working like a highly-oiled machine, are composed of self-interested, rational men who are making decisions. Their decisions are based on *ceretis paribus*, where the positive benefit they gain today is not diminished by the possibility of events in the future (Maskin, et al., 2005). But furthermore, they do not consider (or refuse to consider) the global impact of those actions. To understand Hardin's argument, man must assume the forests as a commons; although in some respect they are restricted through government borders and lumber companies. Even more importantly, the Earth's tropical rainforests are key sources of lumber, an integral material to our society. But they are also home to ecologically diverse wildlife, players in the recycling of atmospheric pollutants, and sources of important nutrients. Additionally, forests prevent erosion and help maintain

the structural integrity of the land (Hamilton, Lawrence S., 1992). Without heavily forested areas, especially tropical rain forests, our natural lifestyle is severely threatened, even to those who live far away. These effects on distant communities will be examined later in detail, however, they are impacted more than you may think. Thus, it is in humanities best interest to ensure the preservation of these areas.

As a society, we must ask ourselves, "if everyone sees something as bad, why can't we stop it?" The answer to this question lies in tradeoffs. Lumber is important – buildings, furniture, paper, among others – and it is extremely hard to remove or replace its utility. It also requires more than just one nation to slow down this problem. Countries in the Amazon River basin in South America and along the Congo River in Africa, rely heavily on the export of these materials. Their economy depends on it. The banning of logging in these countries would be immediately more damaging to the nation than the negative long-term effects of deforestation. Additionally, as population growth skyrockets, more land is needed for crops, livestock, and even housing. The myopic fix is to cut down more trees. Adding to that nearsightedness, these countries also do not have the education that promotes environmental conservation or the consequences of climate change (Chang, Chew-Hung, et al., 2017). It is much easier for democratic countries, such as the United States and Canada, to warm-up to the idea that deforestation is bad for the world but much harder in countries where censorship and a lack of education is dominant. Normally, third world countries are the ones lacking environmental education. Particularly, farmers and ranchers in these countries are heavily impacted due to forests providing a natural sunshade for water retention in areas that normally would be

deserted. Ranchers rely on these sources of moist soil and water to be able to tend to their herds while farmers rely on the environment it creates for plant growth. It is very easy to compare the desirability of land near a well-inhabited rainforest with animals, plants, and people compared to the undesirability of a barren desert.

The scope of this problem is global. Deforestation has been determined to be one of the largest negative impacts on our environment (Bala, G., et al. 2007). Over 80% of the Earth's terrestrial biodiversity stems from tropical forests (Iqbal, S.). Additionally, without heavy tree coverage, many populous forests quickly will become barren deserts due to water retention issues and huge overnight temperature swings. Pollutants in our atmosphere decompose in many different ways, however, one of the most important is the recycling of carbon dioxide. Plants provide a natural solution to the build-up of CO₂ in our atmosphere where an abundance leads to greenhouse effects and global warming. Relating back to third world countries, the effects of global warming will be more immediately catastrophic (Floyd, B.N., 1982). Warmer temperatures lead to more difficult agricultural processes – ones that less technologically advanced countries cannot implement. Global warming would easily dry out the soil, making it incapable of sustaining crop growth. Also, in many of these countries, water is transported manually or through an outdated and inefficient system (Curtis, Val., 1986). These farmers rely on a natural water cycle and soil retention attributes. But looking more specifically at tropical rainforests, a high percentage of the world's trees are concentrated in those few areas. Removal of these forests would directly impact the Earth's ability to remove carbon dioxide as well as an unintentional negative ripple effect. The canopy level,

acting as a parasol, would be removed - killing the plants on the forest floor, as well as other layers of the rainforest. Although they were not killed purposefully, "non-timber products such as tree nuts, rubber, and fruits" would be eradicated (McDonald, K. et al., 1995).

Man cannot purely just plant more trees. This is a technical solution, one which Hardin argues would be ineffective in preventing the effects of deforestation. Planting more trees just allows the lumber industry to cut down more. This is ineffective because the rate of deforestation does not decrease by an order of magnitude. Looking at it mathematically, if deforestation occurs exponentially, a linear (or constant) reduction does not decrease the absoluteness of the occurrence. Additionally, there are important distinctions to be made between national policy to reduce deforestation and international policy that is deemed to be optimal. But, the appeal to conscience is ineffective. Either one must obey the rules and be known as a "simpleton who is mocked for following the rules while the others exploit the commons or to be openly condemned for acting irresponsibly." (Hardin, G., 1986) Another solution that is ineffective is based on a reduction of demand for lumber or land. These demands continue to grow proportional to population growth, and we cannot force one (or more) countries to reduce their production of lumber or to minimize their total land available for agriculture. The attempted solution would be for countries to slow deforestation by appealing to the conscience of man by reducing the number of trees cut down. This is completely ineffective because a global equilibrium must be obtained to meet international demand. If one country slows down, another will have to increase. This does not improve the global situation. Even if all countries agreed to reduce wood production or slash-and-

burn techniques by some percent, the imminent tragedy of deforestation still continues but has been prolonged.

The above examples show solutions that do not work. Therefore, temperance must be created through mutual coercion mutually agreed upon (Hardin, G., 1986). More specifically, an economic coercion that stems from a legislative body composed of man, who enact policy favoring the well-being of the collective. But if these policies are non-specific, they become blankets, generalizing solutions to all issues but effective at none. Hardin gives the example that the same policy that may have worked in frontierlands would be ineffective in an urban setting. Thus, economic coercion must be specific to take all factors into consideration. Legislative temperance through fixed fines and penalties would be amortized across the many numbers of trees and become irrelevant. And especially in third-world countries, many nations positively incentivize lumber companies in order to boost their GDP and would rather trade nature-for-debt (McDonald, K. et al., 1995). While other nations such as the US, the economic benefit of reducing deforestation is so small that it rarely is on the docket as a pressing issue. In these two cases, there is the difference between direct negative impacts versus perpetual indifference where both lead to no positive action. We can never do nothing (Hardin, G., 1986).

Internally, nations must recognize their global impact of deforestation. Hardin proposes that one solution is to sell lands off as private property. This would not reduce the issue at hand. The self-interested owner gains free will to destroy the former commons in any way he deems necessary. Thus, economic temperance enacted by the general populous must tax lumber produced in a non-eco-friendly manner so that it

is economically unadvantageous to be a “dirty” timber company. For example, in the United States, a regulatory body composed of generally elected officials must be given the duty to investigate logging companies and analyze their net impact on the environment. Their impact would be based on the number of trees planted per tree cut, unnecessary wastes of land, and violations of protected areas. Larger companies that benefit more from economies of scale have a greater economic cost to the planet and must be taxed on a tiered system. They have a higher ability to burn cash to change towards a more green methodology. A linear system would be ineffective because small companies may be forced out of business due to the inability to quickly change their production methods and even so, their environmental impact is much less than larger companies. A multi-tiered system penalizes larger companies more and gives the economic incentive to practice cleaner techniques while not forcing small companies out of the industry prematurely. Self-imposed tax credits should also be used to slightly make it less expensive to use green manufacturing techniques over traditional methods that contribute to the removal of forests. Examples of such techniques are indoor, multi-level agriculture facilities that make use of less water, space and remove the need for acres of land. More so, corporations are inherently more obligated in today’s political atmosphere to protect the environment (ie. Starbucks banning plastic straws). Corporations then can make an obligation to minimize their environmental impact on deforestation through ensuring their supply chain is green and environmentally-friendly. Cutting ties with suppliers that do not follow these standards are economically incentivized to change their practices or risk losing large corporate customers. These “carefully biased options”

force some action determined by coercion of the individuals composing the collective interest.

But to solve the global impact of deforestation, an international body whose interests are determined by a general wellbeing, such as the United Nations, must condemn trade that violates specific policies enacted to preserve our forests (Tarlock, A. Dan., 1992). The UN's condemnation must be pushed further to make it economically infeasible to violate restrictions in place. Countries with a large negative environmental impact relative to their percentage of GDP that comes from the logging industry must be initially reprimanded. An example of a country that must practice cleaner techniques is Brazil. The government of Brazil has ultimately decided to favor the rich over the poor through policy that emphasizes capital-intensive industries and urban concerns instead of the problematic externalities that contribute to forested land exploitation (Myers, 1990). Brazil does not regulate their forestry industry nearly as much as other nations do nor would Brazil consider to implement higher internal economic taxes. Thus, it is the job of a global body to ensure that health of the world is prioritized over the health of the nation. Complete trade sanctions on lumber may be too extreme, however, it may be necessary for countries that refuse to take steps towards change. It is important to recognize that these UN trade sanctions are economical and would enforce high taxes on countries that do not meet certain criteria in their logging practices.

The issue of deforestation has been one hot topic, especially with the growing concern that the health of our planet may be irreversible if drastic changes do not occur soon. That being said, this crisis can be mitigated through careful economic sanctions, as Hardin's Tragedy of the Commons suggests. The depletion of forests

worldwide, especially rainforests, easily fits into the general outline of this tragedy. The individual interests of the rational man are constantly in conflict with the collective interests, forcing everyone's actions to be made via a cost-benefit analysis. In this issue of deforestation, or more generally in regards to all commons, the only way to solve this future threat is to convince the rational man to recognize that enforced mutual coercion is the only solution.

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