



The School for Ethics and Global Leadership

Deforestation in the Amazon Rainforest: A Comprehensive Solution

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Introduction

This is the work of 24 high school juniors who attended the School for Ethics and Global Leadership, a semester long program, in Washington D.C. for the fall semester of 2017. The School for Ethics and Global Leadership aims to provide intellectually motivated high school juniors who represent the diversity of the United States with the best possible opportunity to shape themselves into ethical leaders who create positive change in our world. Students begin the semester by investigating international conflicts in order to enhance their international awareness. Ethics and leadership is integrated throughout the school's curriculum. Students go on to write a collaborative policy document, in which they create a realistic policy to resolve an international issue, to be shared with the public after its completion. This year, the fall semester students chose to write a policy document to address the deforestation in the Amazon Rainforest.

We would like to thank Dr. David Ettinger at the Gelman Library of George Washington University, as well as other professionals that have helped us in our research.

Students:

Background: Sarah Baker, Ella Gates, Cameron Janssens, Adrian Ramos

United States: Nejat Ali, Benjamin Awtrey, Ethan Parker, Rocco Patel

Amazon Basin Countries: Lillian Breier, Michael Francalangia, Cece King, Anabelle Lubin

Corporations: Adam Berns, Tamiya Fowler, Cameron Marcus, Chloe Sun

NGOs: Bradley Gonmiah, Eunsoo Hyun, Alexandra Lehman, Palmer Lessenberry

Indigenous People: Vikram Aldykiewicz, Valeria Gonzalez, Lana Kalfas, Marie Roc

Executive Summary

We are a world of consumers that will soon consume ourselves. To satisfy our incessant hunger for products, we strip our environment of its natural resources at an unsustainable rate. We choose to burn down miles of forests and bulldoze football fields' worth of our world's last resources as if we have the luxury of an endless supply. Without immediate action, the Amazon Rainforest will fall victim to these destructive practices and be too far gone to save. Across the world, there is no greater resource than the Amazon, which acts as a home to indigenous people, a sponge for carbon in the atmosphere, and an economic gem providing for millions.

The United States must take on an active role in preventing further deforestation in the Amazon Rainforest. The economic and environmental repercussions of deforestation reach far beyond the borders of Amazon Basin countries and directly affect the United States and its citizens through events such as superstorms and droughts.

Historically successful programs to combat deforestation include the United States-Peru Environmental Work Program, remote-sensing technology created by the State Department, and debt-for-nature initiatives. The United States-Peru Environmental Work Program has been successful in combating deforestation. However, it's limited by the fact that it is restricted to Peru only, and must be expanded. In the past, governments that were in debt have negotiated debt-for-nature exchanges with their creditors to allow the indebted nation to protect their natural resources. We recommend that Congress resume appropriating funds to debt-for-nature programs, and continue the U.S. State Department's remote-sensing technology program. In addition, one of the biggest factors in the rapid deforestation of the Amazon Rainforest is the demand for hydroelectricity, because trees must be cleared to create space for hydroelectric dams. U.S.-subsidized nuclear energy will reduce deforestation by reducing reliance on hydroelectricity. The U.S. must use its global influence to implement these policy recommendations to fully support the international movement against deforestation.

While United States involvement is essential, the Amazon Basin countries play a more direct role in stopping deforestation, as their governments have the power to enact laws and regulations within much of the Amazon rainforest. Despite recent efforts by these countries to prioritize conservation, the rainforest continues to lose forested land to cattle ranching, illegal logging, and unsustainable agricultural practices. Incentivizing ranchers to move out of the Amazon Rainforest into the Cerrado region will reduce cattle ranching within the Amazon, which accounts for three-fourths of deforestation in Brazil. To combat illegal logging, the Amazon Basin countries must enact a comprehensive policy that requires tracking timber to ensure its legality, increasing the number of permits for local loggers to limit large-scale illegal logging, and giving tax breaks to companies that purchase their timber from legal sources. Furthermore, in order to promote an environmentally friendly means of reaping economic benefits from the rainforest, countries should both allocate subsidies to farms that employ sustainable agro-forestry and support the ecotourism industry.

Because the Amazon Basin countries contain almost all of the Amazon Rainforest, they have both a unique ability to preserve this resource and a unique stake in doing so. Much of the activity in the rainforest is within their control and much of their economy relies on the continued existence of

the Amazon. These countries have an economic, environmental, and cultural stake in the Amazon Rainforest, and they must act now in order to preserve the forest and these interests.

Indigenous groups that live in the Amazon Rainforest have perhaps the greatest stake in its conservation, and yet they have been left in the dust by major government policies and corporate deals. Native peoples are defenseless without rights to their own land and representation in the political process. State governments, therefore, are able to take over vast swaths of indigenous territory in conservation efforts and debt-for-nature swaps, which prevent natives from hunting, farming, and living on their own land. We recommend that indigenous people be given rights to land and the resources on it, as well as continue to be supported by international and local bodies. Without a sound means for inclusion, indigenous groups will continue to be ignored and their problems will only persist as deforestation threatens their homes and livelihoods.

Corporations are the main drivers behind the deforestation occurring in the Amazon Rainforest. American and multinational corporations flock to the Amazon, drawn in by the natural resources and valuable land. Currently, soy and cattle moratoriums have been effective in reducing soy and cattle production. These efforts by corporations have been largely successful, but in order to ensure sustainable use of Amazonian land and resources, corporations should implement a zero-deforestation policy. This policy will not only guarantee sustainable use of the resources that the Amazon provides, but will also benefit publicity and public relations for consumer brands. In accordance with the reform, corporations will utilize blockchain technology to track the route of products and raw materials to ensure products come from a sustainable source. Doing so will allow corporations to legally label their products as not contributing to deforestation. Lastly, we recommend that corporations incentivize farmers that sell materials to them up-front so they can finance the transition to a zero-deforestation operation. These policies lay out a clear path for corporations to curtail deforestation while still maintaining profits.

Another key factor in limiting deforestation is the active participation of non-governmental organizations. Through sweeping governmental reforms at the national level, Amazon Basin countries often prioritize the goals of the country over those of the people, leaving many indigenous groups voiceless as their homes are destroyed by deforestation. NGOs fill this gap between the state and the people, acting as negotiators in politically-charged situations. Both international and local NGOs working in the Amazon have unique strengths in combating deforestation. To maximize the efficiency of their work, international and local NGOs must collaborate to give immediate help on the ground while maintaining a global audience. We recommend that NGOs diversify their sources of funding, and focus on establishing sustainable methods of support to ensure that the money directed toward these NGOs is used appropriately in order to have the greatest positive impact on the rainforest.

Millions of lives and livelihoods depend on the fate of the Amazon Rainforest. Without collective action to stop deforestation in the Amazon, we will lose this precious resource and the prosperity it brings. This policy outlines how the United States can use its international influence to balance and include the interests of corporations, indigenous groups, nongovernmental organizations, and Amazon Basin countries in a productive plan for the future.

Background and History

We humans will be the cause of our own destruction. We will choke on noxious gases of our own creation, lose our coasts to rising waters, and suffer more frequent and intense natural disasters.¹ As we continue to deplete our natural resources through high expenditure of fossil fuels, increasing food and water consumption, and unsustainable agricultural practices, we limit the possibility that our planet will ever recover. As we hack away at a precious natural resource, the Amazon Rainforest, we are approaching the point where our actions become irreversible. Each day, people cut down huge swaths of vegetation in the Amazon. The Amazon is crucial as it takes up only five percent of the world's landmass, yet absorbs more than ten percent of all carbon consumed by land vegetation.² Currently, rates of deforestation have plateaued at an alarming 1,974,125 acres per year, which is equivalent to more than the entire area of Grand Canyon National Park.³

Deforestation And The Greenhouse Gas Effect

Many Americans do not show concern at the mention of deforestation in the Amazon Rainforest due to the fact that the problem is happening thousands of miles away. Deforestation, however, has lasting effects on the entire world. This is not just an Amazon Basin problem. Deforestation puts millions of lives at risk. When people slash and burn through dense jungle, carbon that was previously stored within the trees is released into the atmosphere. The CO₂ gas rises up into the ozone layer, where it traps heat from the sun in our atmosphere. Earth, in turn, warms up. According to the United States Environmental Protection Agency, the global rise in temperature can cause ocean levels to rise, crops to die, diseases to spread, and ecosystems to collapse.⁴ Cutting down the Amazon is only one of the beginning steps to the demise of our world. People will die from more intense natural disasters, ravaging diseases, and the collapse of our farming industry. It is imperative that we stop the wave of death before it arrives.

Economic Value of the Amazon Rainforest

Many people argue that potential profit is more important than conserving the rainforest itself. Corporations cut down the Amazon to make room for soybean farms, oil wells, cattle pastures, and gold mines. In Brazil, soybeans account for ten percent of all vegetable exports. The total soybean export value adds up to 24.19 billion USD.⁵ In addition, many Amazon Basin countries, such as Ecuador, Colombia, Venezuela, and Brazil, have vast oil reserves underneath the rainforest. The

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² Rebecca Lindsey, "Escape from the Amazon," NASA Earth Observatory, Accessed November 13, 2017, https://earthobservatory.nasa.gov/Features/LBA_Escape/.

³ INPE - National Institute for Space Research, "New study from the Brazilian Institute of Space Research (INPE) quantifies the role of deforestation and forest degradation in the CO₂ emissions until 2050," INPE - National Institute for Space Research, Last modified November 9, 2015, http://www.inpe.br/ingles/news/news.php?Cod_Noticia=380.

⁴ United States Environmental Protection Agency, "The Signs of Climate Change: Higher Temperatures," EPA, August 30, 2016, <https://www3.epa.gov/climatechange//kids/impacts/signs/temperature.html>.

⁵ The Observatory of Economic Complexity, "Country Profile: Brazil," OEC, <https://atlas.media.mit.edu/en/profile/country/bra/>.

total export value of crude petroleum from these countries combined is 47.7 billion USD. Also, the clearing of land for cattle pastures in the Amazon Basin contributes to deforestation. In order to create grazing pastures for their cattle, farmers cut down and burn areas of rainforest. According to the Council on Foreign Relations, a nonpartisan think tank, over 60 percent of deforested land is turned into pastures.⁶ While these numbers may seem compelling, the benefits of having a healthy rainforest on earth outweigh all of them. The rainforest has a plethora of natural resources that can be turned into and used as medicine. 25 percent of all Western medicine is derived from rainforest plants.⁷ Furthermore, the Amazon Rainforest is an important stabilizer of the earth's climate. Millions of gallons of water are cycled through the rainforest in a process called evapotranspiration. The rainforest controls the amount of water that plants transfer to rivers, which in turn determines the current patterns of the ocean.⁸

REDD+

The international community has established certain transnational agreements to protect the Amazon Rainforest. Reducing Emission from Deforestation and Forest Degradation in Developing Countries (REDD+) is a program developed by various parties in the United Nations Framework Convention on Climate Change. They aim to stop the destruction of rainforests around the world. This program offers result-based payments to countries that take action to reduce carbon emissions in their forest regions.⁹ In other words, if a country implements policies that combat deforestation, REDD+ will give the government a certain amount of money based on the anti-deforestation policy's results. Brazil is one of the most active countries in REDD+. From 2005 to 2012, the national government of Brazil enacted climate change policies and successfully reduced deforestation of the Amazon by 80 percent.¹⁰ Thus, transnational agreements like REDD+ play a significant role in preventing deforestation.

Indigenous Peoples

The 400 different indigenous tribes residing in the Amazon have much at stake in the fight against deforestation: their livelihoods. Bolivian researchers and archaeologists have determined, through unearthed evidence that indigenous people have built their lives around the Amazon Rainforest for 10,000 to 11,000 years.¹¹ Indigenous communities have a lengthy and rich history with the rainforest that could vanish if deforestation continues. Illegal loggers and ranchers often enter native land and disregard the government-protected conservation land. Brazil's government has failed to prevent illegal logging of hardwood in the Amazon, as loggers are difficult to track. In response, some indigenous tribes have taken the initiative to save the Amazon Rainforest

⁶ The Council on Foreign Relations, "Deforestation in the Amazon," CFR Infoguide, <https://www.cfr.org/interactives/amazon-deforestation/#/en>.

⁷ Positive Med, "Rainforest Plants Used in Medical Treatments," April 13, 2015, <http://positivemed.com/2015/04/13/rainforest-plants-used-in-medical-treatments/>.

⁸ World Wildlife Fund, "Why is the Amazon Rainforest Important," WWF, http://wwf.panda.org/what_we_do/where_we_work/amazon/about_the_amazon/why_amazon_important/.

⁹ UN-REDD Program, "What is REDD+," United Nations, October 6th, 2017, <http://www.unredd.net/about/what-is-redd-plus.html>

¹⁰ The Council on Foreign Relations, "Deforestation in the Amazon," Introduction, <https://www.cfr.org/interactives/amazon-deforestation/#/en>.

¹¹ Yale School of Forestry & Environmental Studies, "History of Settlement in the Amazon Basin," Global Forest Atlas, <https://globalforestatlas.yale.edu/amazon/land-use/history-amazon-settlement>.

themselves. For example, the Ka'apor and Guajajara tribes in the Brazilian state of Maranhao have formed their own militia to stand up against illegal loggers.¹² Increased violence and tension between loggers and indigenous communities have put a strain on relationships between local governments and natives. Therefore, it is of the utmost importance that the governments of the Amazon Basin countries do more to preserve the land rights of indigenous peoples.

Non-Governmental Organizations

Non-governmental organizations (NGOs) play an important role in advocating for environmental protection, indigenous rights, and policy reform. Both international and domestic NGOs are heavily involved in the fight against deforestation. These organizations act as a bridge between local people in the Amazon Basin and their governments. Without NGOs, there would not be a bridge, as many people living near or around the rainforest are skeptical of the government officials who make policies, sometimes thousands of miles away. For example, according to the Organization for Economic Co-operation and Development (OECD), only 26 percent of Brazilians have faith in their government.¹³ In order to combat the lack of communication between people and government, some NGOs, mostly international ones, focus on awareness through social media, utilizing their wide audience. On the other hand, local NGOs do work, usually on the front lines, concerning communities directly affected by deforestation.

Corporations

Many different corporations flock to the Amazon Rainforest in pursuit of potential economic profit. These corporations are the main drivers of deforestation.¹⁴ For example, soybean and cattle companies clear large plots of rainforest for their farms and pastures. There is hope, however, for the future of the rainforest. Many companies have signed pledges to make sure their supply chains are free of unsustainable practices that contribute to deforestation.¹⁵ It is difficult for corporations to accurately track their supply chains, but progress is being made to ensure the protection of the Amazon Rainforest.

¹² Jonathan Watts, "The Amazon Tribe Protecting the Forest with Bows, Arrows, GPS, and Camera Traps," *The Guardian*, September 9th, 2015, <https://www.theguardian.com/environment/2015/sep/09/amazon-tribe-protecting-forest-bows-arrows-gps-camera-traps>.

¹³ Niall McCarthy, "Which Countries Have the Most and Least Confidence in Their Governments," *Forbes Business*, July 13, 2017, <https://www.forbes.com/sites/niallmccarthy/2017/07/13/which-countries-have-the-most-and-least-confidence-in-their-governments-infographic/#4d58c869652d>.

¹⁴ Mark Kinver, "Corporate Growth Still Driving Deforestation, CDP Shows," *BBC News*, December 5th, 2016, <http://www.bbc.com/news/science-environment-38210577>.

¹⁵ Paulo Adario, "The Soy Moratorium, 10 years on: How One Commitment is Stopping Amazon destruction," *Greenpeace (blog)*, July 27, 2016, <http://www.greenpeace.org/international/en/news/Blogs/makingwaves/the-soy-moratorium-10-year-anniversary-stopping-amazon-destruction/blog/57127/>.

United States of America

The United States has a vested interest in deforestation of the Amazon Rainforest. The effects of deforestation in the Amazon will extend far beyond the tree line in Brazil or any of the other Amazon Basin countries. The deforestation of the Amazon will directly lead to El Niño storms on the West Coast of the United States, which will result in droughts across the Pacific Northwest, destroying a \$17 billion industry and affecting produce prices across the country.¹⁶ Through increased carbon dioxide levels in the atmosphere, climate change will cause sea levels to rise and periods of extreme weather to occur more frequently. Consequently, cities such as Boston, New York City, and Los Angeles will flood and become unsuitable for habitation within the next seventy-five years.¹⁷

The United States-Peru Environmental Cooperation Work Program

The United States-Peru Environmental Cooperation Work Program has been one of the most influential initiatives by the United States in the Amazon Basin. Originally established in 2009, the program has pledged both countries to invest in “biodiversity conservation” and other environmental solutions to preserve the Amazon Rainforest. The major goals of the program are to: successfully implement the Annex on Forest Sector Governance in order to conserve Peruvian sections of the Amazon, ensure sustainable management and protection of natural resources and the rainforest, increase public participation in environmental decision-making, and improving environmental performance in the productive sector.¹⁸

The United States and Peru are working to achieve these goals through a multi-faceted approach that would attack deforestation in the Amazon in many directions. First, the government supports law enforcement within the Amazon region, combating the illegal deforestation market. Second, starts conversation to help end the International Trade in Endangered Species of Wild Flora and Fauna. Third, implementing the National Anti Corruption Plan on Forest and Wildlife sector, regulating and enforcing illegal lumber trade issues.¹⁹

The effects of this program have been widespread, since over 5.5 million acres of the Amazon Rainforest has been protected in Peru, and the Cooperation Work Program has pushed for a large portion of that new conservation land.²⁰ The successes of The United States-Peru Environmental Cooperation Work Program can be used as a model for future U.S. State Department programs.

¹⁶ David Medvigy and Robert L. Walko, “Simulated Changes in Northwest U.S. Climate in Response to Amazon Deforestation,” American Meteorological Society, Published October, 2013; State of Oregon Agriculture: Industry Report from the State Board of Agriculture, published January, 2017, Salem, OR, 5; Washington State Department of Agriculture, “Agriculture: A Cornerstone of Washington’s Economy,” last updated Nov, 2, 2017, <https://agr.wa.gov/aginwa/>.

¹⁷ National Aeronautics and Space Administration, “Global Climate Change: Vital Signs of the Planet,” NASA November 7, 2017, <https://climate.nasa.gov/>.

¹⁸ The Environmental Cooperation Commission, “United States-Peru Environmental Cooperation Work Program (2015-2018),” last accessed November 5, 2017, <https://ustr.gov/sites/default/files/US-Peru-ECA-Work-Program-2015-2018.pdf>.

¹⁹ Ibid.

²⁰ Nature and Culture International, Amazon Rainforest Protected in Peru, accessed November 8, 2017, <https://natureandculture.org/places/peru/5-million-acres-of-amazon-rainforest-protected/>.

Satellite Imaging of the Amazon Rainforest

During the 2003 Open Forum on Deforestation in Washington, D.C., Secretary of State Colin Powell stated what the United States Government had identified as the negative effects of deforestation. In his opening remarks, Secretary Powell declared that a correlation exists between deforestation and the illegal drug trade in the Andes Mountains, part of which is in the western region of the Amazon.²¹ Cocaine cultivators cut down acres of trees to create laboratories and landing strips for planes, which only adds to the deforestation in the rainforest. Secretary Powell followed this statement up by saying that “illegal logging and bad environmental management equate to billions of dollars each year in lost revenue” for the United States government because its citizens were paying high prices for Andean cocaine.²² Secretary Powell also revealed to the forum a State Department-led initiative that would help to reduce deforestation of the Amazon Rainforest. Using NASA-supported satellite imagery, the State Department would be able to accurately map deforestation in the Amazon Rainforest.²³ Further communication between the State Department, the private sector, and Amazon Basin countries will then allow for illegal logging to be pinpointed in the rainforest and dealt with in an effective manner.

Debt-For-Nature Swaps

Since the late 1980s, debtor and creditor governments have created debt-for-nature initiatives in order to restructure debt of developing nations. Through direct negotiation between debtor and creditor governments, debt can be restructured so that the debtor government either owes less money to the creditor government, or the debtor government is able to pay back the debt over a certain amount of fiscal years. Direct government debt-for-nature agreements can generate significant amounts of money to fund conservation programs in countries that may otherwise not be able to. Additionally, debt restructuring negotiations mitigate the economic risk or loss of a creditor government.

The Tropical Forest Conservation Act (TFCA) of 1998 provides a model by which debt-for-nature swaps involving the United States are carried out, and creates grants in developing nations that “will support activities to conserve protected areas,” and “improve natural resource management.”²⁴ This act was supported by President George W. Bush, who utilized the TFCA to continue debt-for-nature initiatives with South American governments. Nearly \$178 million has been produced by debt-for-nature exchanges for conservation funds. Swaps authorized by the TFCA have been shown to be largely successful for developing nations; a study demonstrated that debt-for-nature swaps correlate to a lower rate of deforestation.²⁵

Recently, debt-for-nature swaps have become less used among debtor and creditor governments. It is not apparent why this decline has happened, although some experts speculate that it has to do

²¹ U.S. Department of State Open Forum, *Deforestation: Global Consequences and Challenges*, 22 April 2003, Proceedings, State Department Archives, Washington, D.C. <https://2001-2009.state.gov/s/p/of/proc/21051.htm>.

²²Ibid.

²³Ibid.

²⁴ United States Department of State, “Debt-for-Nature Agreement to Conserve Brazil's Tropical Forests” News release, August 12, 2010. <https://2009-2017.state.gov/r/pa/prs/ps/2010/08/145943.htm>

²⁵ John M. Shandra, “Do Commercial Debt-for-Nature Swaps Matter for Forests? A Cross-National Test of World Polity Theory,” *Sociological Forum* 26, no. 2 (2011): 381.

with less debt in developing nations and a lack of appropriations from Congress. Given the proven success of debt-for-nature agreements and the minimal economic risk involved, the U.S should resume appropriating funds to debt-for-nature programs and initiate discussions with Amazon Basin governments about possible debt restructuring. The TFCA has not been funded since fiscal year 2013 and must receive more funding in order to continue protecting rainforest land. In the past, indigenous people of the Amazon Rainforest have been denied access to their homes when they are located in protected land. This has been perpetuated by debt-for-nature swaps, which have allowed conservation organizations to protect rainforest land. To avoid disenfranchising the native Amazonians, the United States must add provisions to future debt-for-nature agreements that give land rights to indigenous people.

Renewable Energy Supported by the United States

Seventy-five percent of Brazil's energy supply is from hydroelectricity, a harmful mechanism in destroying the Amazon²⁶. The adverse effects of hydropower are evident; multiple studies demonstrate that the construction of dams is detrimental to the environment.²⁷ Deforestation becomes a step in the construction of dams due to the process of clearing trees or plants to build a foundation. Flooding of nearby lands which causes rotting of trees also contributes to the problem. As mentioned before, deforestation has an extreme environmental effect on our country. As of right now, there are 48 dams in the Amazon Basin, and 150 are under construction to be built and in operation over the next two decades.²⁸ According to the University of Washington Intergovernmental Panel on Climate Change, roughly 1.3 percent of greenhouse gas emissions are from the construction and operation of these dams.²⁹ An alternative method would be using nuclear energy. According to the Hoover Institution, nuclear power releases less radiation and greenhouse gas emissions in comparison to other forms of energy.³⁰ Nuclear energy does not create the same land damage that hydropower does. In conclusion, the United States should encourage Brazil and other Amazon Basin countries to avoid further construction of hydropower dams while building safe nuclear plants to supplement their country's energy needs.

Recommendations for the United States

- Expand the Environmental Cooperation Work Program to Bolivia in order to combat illegal deforestation
- Continue its partnership with NASA to map the Amazon Rainforest and share the information it collects with Amazon Basin countries and private companies so that illegal logging can be pinpointed and dealt with effectively

²⁶ Kevin Lillis, Hydropower supplies more than three-quarters of Brazil's electric power, U.S Energy Information Administration, last modified June 17, 2014, <https://www.eia.gov/todayinenergy/detail.php?id=16731>.

²⁷ "Environmental Impacts of Dams" *International Rivers*, accessed November 14, 2017, <https://www.internationalrivers.org/environmental-impacts-of-dams>

²⁸ International Rivers, Fundación Proteger, and ECOA. Dams in Amazonia, accessed on November 8, 2017, <http://www.dams-info.org/>.

²⁹ DeWeerd, Sarah. Dam Greenhouse Gas Emissions Really Add Up. University of Washington Conservation. last modified October 11 2016.

[http://www.conservationmagazine.org/2016/10/dam-greenhouse-gas-emissions-really-ad](http://www.conservationmagazine.org/2016/10/dam-greenhouse-gas-emissions-really-added/)

³⁰ Ellis Jr, James and Shultz, George P. The Benefits of Nuclear Power. Hoover institution. Last modified August 9, 2017. <https://www.hoover.org/research/benefits-nuclear-power>

- Appropriate funding to the TFCA in order to recreate debt-for-nature initiatives between the United States and Amazon Basin countries
- Subsidize nuclear energy companies in replacement of hydropower in the Amazon Rainforest to decrease greenhouse gas emissions

Amazon Basin Countries

The Amazon Rainforest is an invaluable resource to the slowing of climate change and for the Amazon Basin countries. Each acre of the Amazon Rainforest absorbs two tons of CO₂ every year, and with about 1,974,125 acres being cut down every year, nearly four million tons of CO₂ is not absorbed and remains in the atmosphere.³¹ In an effort to curtail deforestation and protect the environment, many Amazon Basin countries have been working to limit unsustainable practices in the rainforest through programs such as REDD+, and separate national efforts.

Collaborating with the United States

Since 2006 the United States and Peru have been a part of the United States-Peru Environmental Cooperation Agreement.³² Therefore, we believe that it will also be successful in other Amazon Basin countries such as Bolivia. With help from the US government, Bolivia will be able to combat illegal deforestation by creating a block-chain tracking system that would follow all trees from the moment they are cut down to the moment they are sold to a larger corporation. This tracking system will be created alongside a tax break to incentivize companies to buy the easily trackable, legally forested wood. Bolivia is the best country in which to begin these talks due to how similar the political and geographic climates are.³³

Permits

A large problem in Peru is illegal logging, accounting for 80 percent of Peru's wood.³⁴ To address the root cause of this problem, we believe that Amazon Basin countries should increase the allowance of permits within the Amazon Basin for smaller farmers. This increased allowance will be created in tandem with the corporations' creation of a block-chain system to track timber. This would ensure that when a large company buys timber from small local farmers, the small farmer would be able to present larger companies with government issued documents proving that the wood has been legally logged. Therefore, companies will not feel forced to buy illegal timber, decreasing the demand, and giving the government control over the number of permits allocated—and by default, the demand for illegal wood. This would also give more stability to loggers that do have permits, decreasing the likelihood that they will exceed their permits' quotas.

³¹ "Amazon Facts," *World Wildlife Fund*, November 5, 2014, <https://www.worldwildlife.org/places/amazon>; Rhett Butler, "Calculating Deforestation Figures for the Amazon," *Mongabay*, January 26, 2017, https://rainforests.mongabay.com/amazon/deforestation_calculations.html; Becky Oskin, "Amazon Rainforest Breathes In More Than It Breathes Out," *Live Science*, March 20, 2014, <https://www.livescience.com/44235-amazon-rainforest-carbon-cycle-measured.html>.

³² Bureau of Oceans and International Environmental and Scientific Affairs, "U.S.-Peru Environmental Cooperation Agreement," <https://2001-2009.state.gov/g/oes/rls/or/2006/69627.htm> (accessed November 15, 2017).

³³ Central Intelligence Agency, "The World Factbook: Peru," *The World Factbook*, last modified November 6, 2017, <https://www.cia.gov/library/publications/the-world-factbook/geos/pe.html>

³⁴ Smith, Julian & Schwartz, Jill, "Deforestation in Peru," *World Wildlife Magazine* 8, no 1 (2015), <https://www.worldwildlife.org/magazine/issues/fall-2015/articles/deforestation-in-peru>

Tax Breaks and Lumber Tariff

After creating the new permit system, it is also necessary to create a system to incentivize the purchase of legal wood. Corporations that buy 100 percent legally logged wood will be incentivized with tax breaks, and, with the new tracking system, it will be much easier to ensure what wood is truly legal. There will also be an increase in the amount of legal wood available due to the larger number of permits allocated. This increased availability combined with tax breaks, will incentivize companies to buy legal wood. However, Amazon Basin countries still need to offset the money lost to tax breaks. Therefore, we suggest the creation of a comparable tariff on all lumber exported out of Amazon Basin countries. Due to the comparative nature of the tariffs and tax break programs, only companies that aren't buying 100 percent legally will be affected because these companies would be paying tariffs without receiving the benefits of the tax breaks. The ultimate effect of this program would benefit small logging companies because they would be able to continue their business with large corporations while disadvantaging corporations that don't support legal logging.

Relocation to the Cerrado

According to Yale's Global Forest Atlas, cattle ranching accounts for over 75 percent of all deforestation in Brazil.³⁵ A lack of land for cattle feed is one of the main reasons for this destruction. This feed is usually soybeans that, traditionally, have only be farmed in the Amazon's climate. However, recently, farmers have begun to create new farms in Brazil's arid northeast region called the Cerrado.³⁶ This has been so successful because scientists have been able to create soybeans that can grow in the arid Cerrado climate. This new farmland is now available to soybean production, meaning that farmers can move to this new region and grow soybeans instead of cutting down trees in the Amazon for farmland. This also allows cattle to be moved into the Cerrado region because their new source of food can now be grown outside the Amazon. This region has been quite successful in the past, currently accounting for 70 percent of Brazil's farm output.³⁷ To encourage the movement of Brazilian farmers as well as larger agricultural cattle ranchers to the Cerrado region an economic incentive should be implemented by the Brazilian government.

Ecotourism

We recommend the expansion of the ecotourism industry due to the Amazon's large yearly attendance of tourists.³⁸ We encourage the development and continued used of ecolodges whose missions are to educate their guests while causing little impact on the surrounding areas. These ecolodges would only be built in areas in the Amazon with no native tribes or disputed land, to ensure that no lodges or tourists interfere with native life. Apart from environmental conservation, one of the cornerstones of ecotourism is benefiting the local community. Ecotourism seeks to employ locals to help the community as well as providing the industry with the real culture of the

³⁵Boucher, D., Elias, P., Lininger, K., May-Tobin, C., Roquemore, S., & Saxon, E. (2011), The root of the problem: what's driving tropical deforestation today?. *The root of the problem: what's driving tropical deforestation today?*

³⁶"The Miracle of the Cerrado." *The Economist*, Last modified August 26, 2010. Accessed November 8, 2017. <http://www.economist.com/node/16886442>.

³⁷Ibid.

³⁸ Carole Simm, "Advantages of Ecotourism," USAToday, November 15, 2017, <http://traveltips.usatoday.com/advantages-ecotourism-61576.html>

area. By employing locally, these communities have more money coming in to invest in important necessities like electricity, clean water, and health clinics.

Sustainable Agriculture: Dynamic Agroforestry

The governments of the Amazon Basin countries should subsidize farmers who use dynamic agroforestry to incentivize this sustainable farming practice that minimizes the need for deforestation. Dynamic agroforestry involves planting trees around a diverse variety of other crops that vary based on climate and are rotated year round to model the natural ecosystems of the surrounding area.³⁹ Planting trees to model natural ecosystems bolsters forest canopies and biodiversity, revitalizing the topsoil in already deforested areas; this reduces the need to deforest more land to get good quality soil.⁴⁰ The additional trees planted to model natural ecosystems will also store more carbon, helping to offset other carbon emissions and supply alternative timber to the timber deforested in the Amazon Rainforest.⁴¹ Bolivia uses dynamic agroforestry, mainly in cocoa plantations, and this system reduces ecological and economic risks of farms in Bolivia; this system should be expanded to the other Amazon Basin countries because it is beneficial to economies and the environment and can be used in many climates with diverse crops.⁴² Farmers will learn about dynamic agroforestry from local NGOs such as Espacio Compartido en Sistemas Agroforestales (ECOSAF) and Ecotop Consult. Government subsidies that counteract the expenses of new equipment and labor necessary to implement this system coupled with the long term economic benefits of this system will incentivize farmers to implement dynamic agroforestry. Dynamic agroforestry is more profitable because it reduces risks of farming and allows more variety of crops to be harvested and sold.⁴³ Farmers manage the climate of their farms, tailoring it to meet the needs of their crops, reducing the risk of crop failure and increasing the likelihood of a strong yield.⁴⁴ Crop diversification also reduces the risks of farming because one crop failing does not have as great an economic impact when multiple crops are grown.⁴⁵ The eventual increase in profit for the farmers will eventually boost local economies and offset the cost of the subsidies.

Recommendations for Amazon Basin Countries

- Beginning with Bolivia, Amazon Basin countries create environmental cooperation agreements with the United States
- Allow more logging permits for small scale logging companies

³⁹ U.S. Department of Agriculture National Agroforestry Center, *USDA Agroforestry Strategic Framework—Fiscal Year 2011–2016*, authorized by Secretary Thomas J. Vilsack, (Lincoln, NE, 2011), 4-6. Accessed November 13th, 2017

⁴⁰ Eva Perroni, "Five Indigenous Farming Practices Enhancing Food Security," Food Tank, August 14, 2017, <https://foodtank.com/news/2017/08/celebrating-international-day-of-the-worlds-indigenous-peoples/>; Accessed November 13th, 2017

Florencia Montagnini, "Ecology Applied to Agroforestry in the Humid Tropics," in *Race to Save the Tropics: Ecology and Economics for a Sustainable Future* (Washington, DC: Island Press, 1990), 49-56.

⁴¹ Akong Minang, Peter, and F. Bernard. "Agroforestry in REDD+ Opportunities and challenges." The REDD Desk. Last modified 2011. http://www.ecotop-consult.de/what_is_ecotop/13/.

⁴² Lichtfouse, Eric, ed. *Sustainable Agriculture Reviews*, Vol. 19, (Dijon, France: Springer International, 2016) 135.

⁴³ Brenda B. Lin, "Resilience in Agriculture through Crop Diversification: Adaptive Management for Environmental Change," *Oxford Academic: BioScience* 61, no. 3 (March 1, 2011): 183-193.

⁴⁴ Johanna Jacobi, comp., *Dynamic Agroforestry Systems*, technical report no. 513 (n.p., 2016), https://qcat.wocat.net/af/wocat/technologies/view/technologies_513/.

⁴⁵ Lin, "Resilience in Agriculture through Crop Diversification,"

- Create of a block-chain tracking system accessible to large and small logging companies alike, with the support of the United States
- Implement a tariff on all trees exported out of Amazon Basin countries in conjunction with tax breaks for corporations that buy 100 percent legally logged wood
- Create of an incentive program for people and corporations that move their cattle into the Cerrado region in Brazil
- Develop sustainable revenue for citizens of the Amazon Basin region through expansion of the ecotourism industry
- Subsidize farmers who practice dynamic agroforestry

Corporations

The Amazon Rainforest is a crucial part of the world economy, providing resources such as timber as well as farmland for cattle and leather production. Work in the rainforest has also allowed for infrastructure development and job creation in the Amazon Basin countries. Over 3,000 square miles of rainforest were cut down between 2015 and 2016, up 29 percent from the year before.⁴⁶ If deforestation rates continue increasing, the vital resources that the Amazon provides will be depleted. In order for the Amazon to continue to serve as a unique resource in the future, corporations should partake in sustainable non-deforestation practices. These include the implementation of zero-deforestation policies, increased product accountability, and the incentivization of smaller farmers and ranchers to use non-deforestation practices.

Public Relations

It is in the best interest of corporations to join the fight against deforestation. Many large companies are consumer driven, meaning they create products that are purchased by consumers. This gives the consumers the ability to decide who and where they buy from. As a result, companies strive towards a positive public image so consumers choose to purchase their products. By pledging a zero deforestation policy, corporations are improving their public image. In the day of social networking and mass media, information is readily available and reaching a larger audience than ever before, creating greater transparency in business practices. This, coupled with the already existing benefits of good public relations, makes it extremely important to be an ethical and trustworthy brand. This ensures the best opportunity for a consumer to choose your product over another brand. Because of this, corporations are making efforts to pledge zero deforestation policies not just because it will help the environment, but because it will increase sales and profits.

Soy and Cattle Moratoriums

In order to minimize deforestation, moratoriums on soy and cattle production should be supported and expanded in the Amazon. In 2006, The Soy Moratorium was signed by Brazilian Vegetable Oil Industry Association (ABIOVE) and National Association of Cereal Exporters (ANEC). They pledged not to buy soy grown on land deforested after the agreement was signed. As a result, soybeans grown on land recently deforested dropped from 30 percent in 2004 to 1.25 percent in 2014.⁴⁷

Additionally, major ranchers and slaughterhouse owners have made similar agreements to stop sourcing from recently cleared lands.⁴⁸ The Brazilian Association of Supermarkets (ABRAS) announced a ban on beef linked with deforestation in the Amazon.⁴⁹ Additionally, shoe companies

⁴⁶ "PRODES estimates 7,989 km² of deforestation per shallow cut in the Amazon in 2016." National Institute for Space Research. November 29, 2016. Accessed November 08, 2017. http://www.inpe.br/noticias/noticia.php?Cod_Noticia=4344.

⁴⁷ Paulo Adario, "The Soy Moratorium, 10 years on: How one commitment is stopping Amazon destruction," Greenpeace (blog), July 27, 2016.

⁴⁸ Jeff Tollefson, "Stopping deforestation: Battle for the Amazon," *Nature* 520, no. 7545: 20-23.

⁴⁹ Janet Pelley, "Beef Ban to Protect Rainforest," *Frontiers in Ecology and the Environment* 11, no. 4 (2013): 172.

like Adidas, Nike, and Timberland have pledged not to buy leather from the Amazon.⁵⁰ Efforts from the cattle and soy industry have helped to decrease deforestation in Pará, one of the most heavily logged areas in Brazil by 57 percent from 2009 to 2015.⁵¹ With these efforts, companies are combating deforestation and preserving the Amazon Rainforest.

In addition to the beneficial impact these moratoriums have had on the environment, production has also seen an increase in both industries. Soybean production grew from around 6 million tons in 2006 to 11 million tons in 2015, and cattle production went from 50 to 60 million heads in the same time period, showing how moratoriums do not impede business.⁵²

However, despite these efforts, corporations are still making a huge impact in deforesting the Amazon. Cargill and Bunge, major corporations in the soybean industry, have been linked with farmers who deforest large plots of land in order to grow soybeans.⁵³ Cargill's chief executive affirms that the company will look into these allegations and is still dedicated to upholding the target of eliminating deforestation from agricultural commodities by 2020, as it signed onto in the New York Declaration of Forests.⁵⁴ In order to help major companies like Cargill achieve these goals, it is important to know where their products come from.

Blockchain Technology

One way to trace where products come from and their route to the consumer is through blockchain technology. Illegal logging on deforested land is a major problem, with 80 percent of the logging in Peru being performed illegally.⁵⁵ In order to counteract this, a blockchain works as an online ledger that companies can use to be more accountable for tracing their products.⁵⁶ Blockchain technology has received investment from major corporations such as Microsoft and IBM.⁵⁷ By knowing where their products come from, companies can strengthen their commitment to zero deforestation and know that their products are coming from legal, non-deforestation practices. This allows for accountability that ensures only corporations that truly have products that do not contribute to deforestation to be labeled as such.

⁵⁰ "Shoemakers pledge to avoid Amazon Leather." *Ends Report* 415 (2009): 24. "Shoemakers pledge to avoid Amazon Leather." *Ends Report* 415 (2009): 24.

⁵¹ Tollefson, "Stopping deforestation: Battle for the Amazon," 20-23.

⁵² *Ibid.*

⁵³ Hiroko Tabuchi, Claire Rigby, and Jeremy White, "Amazon Deforestation, Once Tamed, Comes Roaring Back," *New York Times*, February 24, 2017.

⁵⁴ *Ibid.*

⁵⁵ Schwartz Julian Smith & Jill, "Deforestation in Peru," WWF, 2015, accessed November 8, 2017, <https://www.worldwildlife.org/magazine/issues/fall-2015/articles/deforestation-in-peru>.

⁵⁶ Elizabeth Goldman, Macy Harris, and Thomas Maschler, "Predicting Future Loss In the Democratic Republic Of the Congo's Carpe Landscapes," Accessed November 2, 2017. <https://www.wri.org/sites/default/files/predicting-future-forest-loss-democratic-republic-congos-carpe-landscapes.pdf>.

⁵⁷ "How to Slip Some Blockchain Exposure Into Your Portfolio." NASDAQ.com. June 09, 2017. Accessed November 10, 2017. <http://www.nasdaq.com/article/how-to-slip-some-blockchain-exposure-into-your-portfolio-cm801471>.

Non-deforestation Agreements between Corporations and Farmers

Another way that zero-deforestation can be reached is by signing contracts between corporations and small farmers in which corporations agree to pay upfront for non-deforestation produced cattle, soybeans, and other goods. In this system, major companies would pay for products for an allotted number of years given that the small ranchers and farmers that they buy from are using non-deforested land. This would be in the best interests of both companies and local farmers. It benefits local farmers because it provides financial assistance when they need supplies, farming equipment, land improvements and advertising.⁵⁸ Additionally, it allows farmers to apply for credit at banks with the financial security and backing these corporations provide. Banks will also be in favor of supporting these farmers because it means backing green, eco-friendly initiatives. This also benefits large corporations because they can ensure they have a supply of non-deforestation products. This way, farmers and ranchers have the means to partake in zero deforestation policies while companies can ensure that they are sourcing from non-deforested land.⁵⁹

Recommendations for Corporations

- Utilize blockchain technologies to provide product accountability by tracking from who and where they buy their products
- Continue and expand soy and cattle moratoriums
- Pay upfront for products from non-deforested land

⁵⁸"10 Ways An Agricultural Loan Can Help Farmers Grow." Accion. November 11, 2017. <https://us.accion.org/resource/10-ways-agricultural-loan-can-help-farmers-grow/>.

⁵⁹ Josh Rogol. "Deforestation in the Amazon Rainforest." Telephone interview by author. November 14, 2017.

Non-Governmental Organizations

Non-governmental organizations (NGOs) are an integral force in the fight for social, economic, and environmental justice in the Amazon rainforest. Both international and domestic NGOs provide funding and infrastructural support, generating awareness and action in the fight against deforestation. South America has undergone rapid democratization and political transformations in recent decades. NGOs bridge the disconnect between internal processes and global politics, working more effectively than slow-moving bureaucratic governmental systems.⁶⁰ Since the 1980s, support from NGOs has been the “principal source of financing for organized parts of civil society in most South American nations.”⁶¹ Non-governmental organizations not only facilitate communication, but also provide a platform for underrepresented populations to voice their concerns to an international audience.⁶²

According to Richard Larkin, Technical Director for Nonprofit Accounting at Binder Dijker Otte, there are three ways in which a non-profit can measure its success:

- 1) Identify the ways in which resources, both financial and non-financial, are spent.
- 2) Analyze statistics of direct reach (e.g. the number of students enrolled in a program).
- 3) Determine general impact of an action (e.g. overall rates of deforestation slowing).⁶³

These guidelines serve to assess the scope of impact an organization is achieving, thus helping NGOs develop strategies for action.

Areas of Concern

The unique features of NGOs that allow them to thrive can also hinder their capabilities and discredit their mission.⁶⁴ Foremost, an excess of organizations in a concentrated subject can be harmful. “The plethora of NGOs often leads to unhealthy competition among them, overlapping and duplication of services, and waste,” reports George Kaloudis of Rivier University.⁶⁵ “Desire for survivability” further exacerbates this competition.⁶⁶ Functioning within the third sector, NGO operations raise issues of trust, accountability, and credibility, which, “are being increasingly linked to their resource base.”⁶⁷ NGOs are traditionally dependent on large donors; thus, the desires and

⁶⁰ Shandra, John M. "International Nongovernmental Organizations and Deforestation: Good, Bad, or Irrelevant?" *Social Science Quarterly* 88, no. 3 (2007): 665-89. <http://www.jstor.org.uprep.idm.oclc.org/stable/42956216>; Simon, Karla W., and Nasira B. Razvi. "International Non-governmental Organizations." *The International Lawyer* 41, no. 2 (2007): 525-39. <http://www.jstor.org.uprep.idm.oclc.org/stable/40708173>.

⁶¹ Chernela, Janet. "The Politics of Mediation: Local-Global Interactions in the Central Amazon of Brazil." *American Anthropologist* 107, no. 4 (2005): 620-31. <http://www.jstor.org.uprep.idm.oclc.org/stable/3567380>.

⁶² Villanueva, Ricardo J. "NGOs and Indigenous Community Organizations in Peruvian Amazon Basin Partners, Asset Providers or Bridge Builders?" January 24, 2013. <https://ssrn.com/abstract=2206590>; Chernela, "The Politics of Mediation", 620.

⁶³ Larkin, Richard. "Using Outcomes to Measure Nonprofit Success." *Nonprofit Quarterly*. Last modified July 2, 2013. November 7, 2017. <https://nonprofitquarterly.org/2013/07/02/using-outcomes-to-measure-nonprofit-success/>.

⁶⁴ Kaloudis, "Non-Governmental Organizations: Mostly a Force for Good", 81.

⁶⁵ Ibid.

⁶⁶ Ibid.

⁶⁷ Amagoh, Francis. 2015. "Improving the credibility and effectiveness of non-governmental organizations." *Progress In Development Studies* 15, no. 3: 221-239. *Academic Search Complete*, EBSCOhost (accessed November 1, 2017).

interests of said donors can have a large role in the functionings of an NGO.⁶⁸ Aside from obligations towards donating individuals and entities, NGOs have historical track records of misuse of funds and impropriety, ultimately calling into question their legitimacy.⁶⁹ These issues undermine the important work being achieved by NGOs, and demand to be addressed.

Local vs. International NGOs

The relationship between local and international NGOs is a source of both conflict and potential. While both categorizations of NGOs work toward a similar goal, they operate under different and sometimes discordant circumstances. International NGOs (INGOs)—such as World Wildlife Fund, Greenpeace, and Rainforest Alliance—take a more “top-down” approach, helping with funding, the collection of data, and increasing awareness. On the other hand, local NGOs have a more focused approach, emphasizing education, consulting indigenous populations, and maintaining biodiversity.⁷⁰

Local NGOs often go unnoticed and unappreciated in discussions about the role of NGOs in combating deforestation, because of the international attention drawn by large multinational NGOs.⁷¹ In 1993, several INGOs, in association with the timber trade, created the Forest Stewardship Council with the aim of improving forestry worldwide.⁷² The FSC represented a newfound sense of collaboration among the NGOs. However, over time this has created a single minded, “understanding of sustainability with an emphasis on the economy...many of the reasons for the absence of success or limited success are connected to inadequate consultation with the local communities.”⁷³ Many international NGOs focus solely on the illegal mahogany trade and the labeling of “green certified” products, completely ignoring local issues that can’t be solved through the same “top down” approach.

International Awareness and Campaigning

The impact of the deforestation in the Amazon Rainforest extends beyond the geographic borders of Amazon Basin countries, affecting us all.⁷⁴ INGOs mobilize environmental activism, using non-violent confrontation to fight for issues such as deforestation, and exposing and protesting against corporations that violate environmental codes.⁷⁵ Often, pressure from the global community is more efficient in changing corporate practices than governmental intervention, particularly from organizations with high-profile, globally-respected reputations.⁷⁶ These INGOs amplify the voices

⁶⁸ Ibid.

⁶⁹ Kaloudis, "Non-Governmental Organizations: Mostly a Force for Good", 81; Amagoh, "Improving the Credibility and Effectiveness of Non-Governmental Organizations", 221.

⁷⁰ "Pronaturaleza." Pronaturaleza. Accessed November 8, 2017. <http://www.pronaturaleza.org/>.

⁷¹ Shandra, John M. "Non-Governmental Organizations and Deforestation: Reconsidering The Crossnational Evidence" *International Review of Modern Sociology*, Vol. 34, No. 1 (Spring 2008), pp. 109-132. JSTOR, (accessed 05-11-2017)

⁷² Zhouri, Andréa (04/01/2004). Global-Local Amazon Politics: Conflicting Paradigms in the Rainforest Campaign. *Theory, culture & society*, 21 (2), p. 69. (ISSN: 0263-2764)

⁷³ Kaloudis, "Non-Governmental Organizations: Mostly a Force for Good", 81.

⁷⁴ Greenpeace International. "Solutions." Greenpeace. Accessed November 5, 2017. <http://www.greenpeace.org/international/en/campaigns/forests/solutions/>

⁷⁵ Ibid.

⁷⁶ Ibid.

of indigenous communities to speak out about their personal experiences. However, some face criticism for their methods, which are condemned as extreme and at times illegal. Critics also question the effectiveness of campaigns as a method of educating the public.⁷⁷

Legislature

Legislative measures are spurred by NGOs to combat deforestation in a formalized manner. Making it “profitable to protect nature,” NGOs such as the Environmental Defense Fund push for legislation incentivizing multinational companies to cut losses and pull out of Amazon Basin countries.⁷⁸ NGOs work to organize advocacy in a streamlined and weighty approach.

Economics and Consumerism

Another approach taken by NGOs develops self-reliant and eco-friendly economies in the Amazon through the creation of sustainable job opportunities. Strategies like that of the Rainforest Alliance work to conserve land through collaboration with local, indigenous groups to create positive, sustainable economic growth.⁷⁹ Furthermore, these NGOs train the local communities in sustainable livelihoods, including agriculture, fish farming, non-timber products, ethno and ecotourism, and crafts.⁸⁰ These local NGOs’ strength lies in their thorough understanding of their location, both geographically and anthropologically.

Another method of economic stimulation takes the form of financial grants given to aspiring entrepreneurs with eco-friendly plans for business, like those provided by Greengrant.⁸¹ For example, with the help of a \$5000 Greengrant, the Achuar, an indigenous group from Ecuador, began developing a solar-powered river transportation system, the first of its kind in the Amazon basin.⁸² The boating system was developed and executed by indigenous people in the region and can carry up to 18 passengers on trips throughout riverways of the rainforest.⁸³

Despite Rainforest Alliance’s and Greengrant’s status as international organizations, they work closely with indigenous people within the Amazon Basin and strive for strong relationships. The work that economics focused organizations have made has proven effective, but if implemented on a larger scale, these groups could create an even larger impact.

⁷⁷ Shaiko, Ronald G. "Greenpeace U. S. A.: Something Old, New, Borrowed." *The Annals of the American Academy of Political and Social Science* 528 (1993): 88.

⁷⁸ Ibid.

⁷⁹ Rainforest Alliance. "A Sustainable Indigenous Forest Economy." Rainforest Alliance. Last modified July 5, 2016. Accessed November 5, 2017. <https://www.rainforest-alliance.org/articlesforests-boots-tres-islas-indigenous-sustainable-forest-economy>.

⁸⁰ "Medios De Vida Sostenible." ACCA. <http://www.acca.org.pe/nuestros-programas/empresa-sostenible/>.

⁸¹ Global Greengrants Fund. "Latin America." Greengrants. Accessed November 8, 2017. <https://www.greengrants.org/where-we-work/latin-america/>.

⁸² Ibid.

⁸³ Ibid.

Art Activism

Education allows for the creation of a collective understanding around the issue of deforestation. However, limitations of traditional education must be transcended to effect an integral transformation of consciousness.⁸⁴ NGOs work on the ground and overseas to use art and multimedia to spread the message of rainforest preservation.⁸⁵ The three core pillars - activism, education, and protection - are by the Amazon Aid Foundation (AAF). They bring together scientists, artists, global citizens, governments, and other NGOs in a “unified alliance” to generate content conveying the urgency of the situation in the Amazon.⁸⁶ Notable projects done by the AAF have included “Anthem of the Amazon,” a viral song with thousands of views performed by 500 children from 50 different countries; “River of Gold,” an award winning film discussing illegal gold mining in the Amazon; and “Artists for the Amazon,” a collective of artists, musicians, and entertainers working to bring attention to the “beauty and destruction” of the Amazon.⁸⁷ The AAF supplements their creative projects with educational curricula and a coalition comprised of distinguished scientists, ecologists, and activists.⁸⁸ Amazon Aid Foundation demonstrates the potential of unconventional, creative education in laying the groundwork for effective activism.⁸⁹

Scientific Innovation and Education

Harnessing and exercising technology serves as an additional method of understanding and countering deforestation.⁹⁰ Closely tracking the cutting down of trees and recognizing larger-scale deforestation patterns allow for corporations to be held accountable and better action plans to be developed.⁹¹ The Andean Amazon Project (MAAP), a local NGO, uses a seven step method to process the data they collect:⁹²

- 1.) Analyze Deforestation Alerts (Global Forest Watch, CLASlite, terra-i)
- 2.) Verify Critical Alerts with Landsat and Sentinel-2 Technology (NASA product that allows soil to be analysed)
- 3.) High Resolution Imagery to Identify Drivers (for example, Digital Globe)
- 4.) If there are Clouds, use Radar (Sentinel-1)
- 5.) Synthesize Data and Draft a Report

⁸⁴ Haigh, Martin J. "Promoting Environmental Education for Sustainable Development: The Value of Links between Higher Education and Non-Governmental Organizations (NGOs)." *Journal Of Geography In Higher Education* 30, no. 2 (July 2006): 327-349. *Academic Search Complete*, EBSCOhost (accessed November 1, 2017).

⁸⁵ "Mission." Amazon Aid Foundation. <http://amazonaid.org/about/mission/>.

⁸⁶ Ibid.

⁸⁷ Ibid.

⁸⁸ Ibid.

⁸⁹ Adams, J. "Exiles, Art, and Political Activism: Fighting the Pinochet Regime from Afar." *Journal of Refugee Studies* 26, no. 3 (December 17, 2012): 436-57. doi:10.1093/jrs/fes041.

⁹⁰ Monitoring of the Andean Amazon Project. "Methodology." MAAP. Accessed November 8, 2017. <http://maaproject.org/methodology/>.

⁹¹ Ibid.

⁹² Ibid.

6.) Review the Process (by Articulaci3n Amaz3nica, a network that aims for the conservation and sustainable use of Amazonian ecosystems and their biotic and cultural diversity and to promote the welfare of its inhabitants⁹³)

7.) Publish the Findings on the MAAP.⁹⁴

Local NGOs can also facilitate research and actively conserve biodiversity through fieldwork and teaching.⁹⁵ "Well-preserved spaces for scientific research," such as the Association for the Conservation of the Amazon Basin's (ACCA) biological stations, conduct scientific monitoring and offer educational workshops to local communities.⁹⁶

Recommendations for NGOs

- Increase transparency within NGOs regarding the use of funds through watchdog agencies and codes of conduct
- Generate long-term fiscal plans to sustain and diversify funding for NGOs while decreasing dependency on donors
- Partner with Amazon Basin countries and native communities to implement education about deforestation in school systems
- Develop a more sustainable economy through the creation of specialized jobs for indigenous peoples of Amazon Basin countries
- Establish clear-cut pathways of impact to bridge the divide between awareness and action
- Facilitate a network of collaboratory efforts between NGOs in order to avoid redundancy and improve efficiency
- Create comprehensive terms of engagement between international and domestic NGOs, ensuring individual autonomy while fostering collaboration

⁹³ Attune Development. "Articulaci3n Regional Amaz3nica." Attune. Accessed November 8, 2017. <http://www.attuneteam.org/content/articulaci3n-regional-amaz3nica>.

⁹⁴ U.S. Geological Survey. "Sentinel-2." USGS. Last modified March 8, 2017. Accessed November 8, 2017. <https://eros.usgs.gov/sentinel-2>.

⁹⁵ "Ciencia Y Educaci3n." ACCA. <http://www.acca.org.pe/nuestros-programas/investigacion-cientifica-y-educacion/>.

⁹⁶ Ibid.

Indigenous Groups

Oftentimes, the discussion surrounding deforestation in the Amazon Rainforest solely focuses on its environmental repercussions. However, deforestation also directly threatens people's lives—and that must be recognized. They are the primary subjects of the destructive aftermath of deforestation. The influence of corporations and diminishing forests pose a threat to the culture and communities of indigenous peoples. In seeking solutions to combat deforestation, indigenous voices provide invaluable perspectives, including methods of preserving the environment and respecting the land they live on. However, such perspectives go unrecognized without inclusion in governments and legal rights to their land. Indigenous groups may only represent about 4 percent of the world's population, but they live on and care for almost 80 percent of the planet's biodiversity, which makes their participation in protecting the Amazon Rainforest from deforestation indispensable.⁹⁷

Governmental Advocacy Bodies

The inclusion of indigenous voices in policy making within Amazon Basin governments is crucial. The National Indian Foundation (FUNAI) in Brazil can serve as a model for the incorporation of indigenous perspectives and promotion of indigenous priorities within the Amazon. FUNAI is a governmental body that identifies indigenous concerns and crafts policy such as the National Policy for Territorial and Environmental Management of Indigenous Lands, which includes the registration of indigenous land in the Amazon, the protection of newly-contacted tribes, and conservation of the environment within indigenous lands.⁹⁸ Their policies are implemented by the GATI Project which uses intercultural dialogue to train indigenous managers how to carry such policy out.⁹⁹ Another Amazon basin country, Colombia, ensures indigenous representation in their government by having a quota that legally guarantees indigenous people 2 positions in Congress and other governing bodies.¹⁰⁰ In Peru, indigenous peoples have their own political party, the Indigenous Movement of the Peruvian Amazon (MIAP), through which they try to be represented.¹⁰¹ This push for representation of indigenous perspectives and promotion of indigenous priorities must be continued throughout all Amazon Basin countries. Furthermore, such representational bodies such as FUNAI and MIAP should be acknowledged and encouraged by the Brazilian and Peruvian governments, not undermined. (Currently, conservative legislatures in Brazil are attempting to promote “a neoliberal, pro-development agenda” without consideration of indigenous rights.)¹⁰² Amazon Basin countries must listen to indigenous perspectives and include them in the policy-making process.

⁹⁷ Victoria Salinas Castro, Richard Bilborrow, “Household Lifecycle and the Environment of Indigenous Peoples in the Ecuadorian Amazon,” *International Union for the Scientific Study of Population*, November 1, 2017.

⁹⁸ Somos, *Fundação Nacional de Índio*, <http://www.funai.gov.br/index.php/a-funai> (accessed 8 November 2017).

⁹⁹ O Que É O Projeto GATI?, *Fundação Nacional de Índio*, <http://www.funai.gov.br/pngati/> (accessed 15 November 2017).

¹⁰⁰ “Indigenous Representation in Latin America,” *Prospect Journal of International Affairs at UCSD*, 27 August 2012, <https://prospectjournal.org/2012/08/27/indigenous-representation/> (accessed 8 November 2017).

¹⁰¹ Ibid.

¹⁰² Future of Funai: Indigenous Rights or Agribusiness Paramountcy, *Council on Hemispheric Affairs*, <http://www.coha.org/future-of-funai-indigenous-rights-or-agribusiness-paramountcy/> (accessed 15 November 2017).

In Brazil, Davi Kopenawa, a shaman and spokesperson of the prevalent Yanomami tribe, has been a proponent for indigenous peoples' representation and rights in the Amazon for many years.¹⁰³ Kopenawa discusses and advocates for indigenous groups' rightful control over their land in the rainforest. Despite this movement, governments within the Amazon basin continuously negate indigenous rights to land. Data collected from the Peruvian Amazon shows that lack of land titling incentivizes outside parties to exploit the natural resources of indigenous land within the Amazon by,

... enabling landless migrants to colonize frontier areas, by strengthening land managers' preferences for productive activities that provide quick but unsustainable returns, by creating incentives for squatters to clear forests to establish use rights or block competing claims, and by preventing land managers from participating in payments for environmental services and reducing emissions from deforestation and degradation initiatives.¹⁰⁴

Citizenship

Further, the treatment of indigenous peoples stems from the fact that the indigenous people struggle to attain citizenship.¹⁰⁵ Without the rights guaranteed by citizenship, claims to land can not be made under government-controlled territory, thus the rights to surface and sub-surface resources in that territory are reserved by the state.¹⁰⁶ Moreover, until 1974, indigenous peoples were unable to apply for citizenship status in Peru. Once indigenous people were allowed to become citizens after 1974, indigenous voting rates rose. However, given the extreme distance from the political center of Peru, indigenous people have remained disconnected from the political process.¹⁰⁷ Hence, as a result of minimal political involvement, indigenous demands have not been considered within the political process, making the creation of governmental bodies that represent indigenous groups, such as FUNAI, even more important.

Debt-for-Nature Swaps

Similarly, indigenous groups have come into conflict with conservation organizations negotiating debt-for-nature swaps. For example, the World Wildlife Fund purchased \$650,000 worth of Bolivian debt for a \$100,000 loan from international banks on the condition that protected areas of the Amazon would be maintained and expanded.¹⁰⁸ As a result of conservation expansion, conflicts over right to ownership of the land ensued as indigenous peoples were unable to use and live on the land they had prior to the swap.¹⁰⁹ In order to implement successful debt-for-nature swaps,

¹⁰³ Lauren Mitten, 1997, The human cost of deforestation, *Peace Review* 9, (4) (12): 549-553, <http://proxygw.wrlc.org/login?url=https://search.proquest.com/docview/217521474?accountid=11243> (accessed November 1, 2017).

¹⁰⁴ Allen Blackman, et al, "Titling indigenous communities protects forests in the Peruvian Amazon," Proceedings Of The National Academy Of Sciences Of The United States Of America 114, no. 16 (April 18, 2017): 4123-4128. Academic Search Complete, EBSCOhost. accessed November 1, 2017.

¹⁰⁵ Elizabeth D. Junkin, "The Monte: Why the Indigenous People of the Amazon Basin Want to be Part of Saving the World's Largest Rainforest," *Buzzworm*, July, 1990, 32.

¹⁰⁶ Ibid.

¹⁰⁷ Raúl L. Madrid, "Ethnic Proximity and Ethnic Voting in Peru," *Journal of Latin American Studies* 43, no. 2 (2011): 267-97, <http://www.jstor.org.ezproxy.nobles.edu/stable/23030621>.

¹⁰⁸ Junkin, "The Monte," 32.

¹⁰⁹ Ibid.

indigenous groups must maintain the right to practice traditional cultural methods on such land, including hunting, gathering, and fishing. Thus, if debt-for-nature swaps were negotiated with indigenous input, including provisions to continue accessing protected land, both indigenous people and the Amazon will benefit by halting deforestation within newly protected regions. If indigenous peoples continued to not be involved, the problem of denied access would persist. As a result, indigenous peoples are incentivized to gain representation and participate in the political process.

REDD+

The way payment works for the underdeveloped countries is that they are provided with carbon credits from REDD+. The carbon credits are then sold on a voluntary market where corporations or different countries purchase the credits.¹¹⁰ REDD+ has worked on a smaller scale with indigenous groups in the past. The Juma project was the first project funded by REDD+ in the Amazon. The project was aimed towards protecting a reserve while also educating the people on climate change, and teaching them how to farm with sustainable methods.¹¹¹ The largest threat to the Amazon Rainforest is illegal logging. Despite this threat, some indigenous groups allow loggers to work on their land provided that the company pays a fee.¹¹² The fee is usually a few dollars in comparison to the thousands that the wood itself is worth. Indigenous people tend to take part in the illegal logging because they are seeking a way to create some financial stability for themselves. Although this system provides fast cash for the indigenous people, the loggers are doing more harm than help to the people. REDD+ will play a major role in reducing deforestation within the Amazon rainforest because it will replace the income that certain natives were making from illegal loggers to enter their territory. REDD+ supported the Surui Project, launched by the Surui chief, Almir Surui, in 2012. The Paiter-Surui people, a group living within the rainforest, collectively voted against engaging in logging, and instead moved towards planting trees. The group plans on using their carbon credits for a 50 year development plan to create a sustainable economy. The 50 year development plan will go towards creating an economy that based upon farming, and fishing. The success of REDD+ is dependant upon indigenous tribes possessing land titling rights so that they are provided with the appropriate credits for preserving the rainforest.¹¹³

Along with participation in national governing bodies, it is crucial that indigenous groups are represented on an international level. Through advocacy and involvement in groups such as the United Nations Permanent Forum on Indigenous Peoples, indigenous people are able to express concerns and suggestions for programs such as REDD+, as previously mentioned.

¹¹⁰ “Redd+ initiatives in the Amazon Basin”, *Yale School of Forestry and Environmental Studies*, (Accessed 13 November 17) <https://globalforestatlas.yale.edu/amazon/conservation-initiatives/redd>.

¹¹¹ Luiz Fernando Furlan, Virgílio Viana, Fundação Amazonas Sustentável, “Juma Sustainable Development Reserve: The First REDD Project In The Brazilian Amazon”, *The Redd Desk*, Published 2008, (Accessed 13 November 17)

¹¹² Christopher Pollon, “Indigenous People explore many shades of REDD”, *Huffington Post*, Published 5 June, 2015, (Accessed 30th October 2017) https://www.huffingtonpost.com/forest-trends/indigenous-people-explore_b_7520046.html

¹¹³ Jacob Olander, Beto Borges, Almir Narayamoga, “The Surui Project: Building Indigenous Peoples’ Capacity for Informed Engagement with REDD Finance”, (Accessed 7 November, 2017) <https://behrself.berkeley.edu/wp-content/uploads/2010/06/The-Surui-Project.pdf>

Sustainable Agriculture

Another method of preventing the destruction of indigenous land—as well as the general preservation of the Amazon Rainforest—is the promotion and continuation of sustainable agriculture within indigenous communities. For hundreds of years, indigenous communities in the Amazon have practiced environmentally sustainable farming methods, such as shifting cultivation and rotational crop growth.¹¹⁴ Shifting cultivation and rotational crop growth entail planting different crops on the same plot of land to maximize the soil's productive capacity, which prevents plots of land and soil from dying and becoming virtually useless.¹¹⁵ These sustainable practices allow for land plots to be reused, minimizing indigenous communities' need to deforest in order to have arable land. Therefore, continuing the employment of such practices is a necessity to benefit both the Amazon and the indigenous people. For indigenous communities that do not practice sustainable agriculture, governmental bodies like FUNAI can be helpful in training indigenous leaders to implement practices such as shifting cultivation and rotational agriculture.

Recommendations for Indigenous Groups

- Suggest that Amazon Basin countries include indigenous perspectives within their governing bodies in making policy and solutions to deforestation, using FUNAI in Brazil as a model
- Recommend that governmental bodies, NGOs, and indigenous activist organizations assist indigenous leaders in seeking land titling rights from national governments (by legally granting land rights and providing border-surveillance equipment)
- Advocate for provisions within debt-for-nature swaps to allow indigenous peoples' full usage of protected land by inclusion in the policymaking process
- Suggest the implementation of organizations, such as REDD+, that pay with carbon credits to plant trees only after land titling rights are granted to indigenous groups
- Promote the implementation and continuation of sustainable farming practices in indigenous communities, such as rotational agriculture to replenish land

¹¹⁴ “Traditional Land Use and Shifting Cultivation,” *Global Forest Atlas, Yale School of Forestry and Environmental Studies*, Accessed 7 November 2017. <https://globalforestatlas.yale.edu/amazon/land-use/traditional-land-use-and-shifting-cultivation>

¹¹⁵ Ibid.

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