Distributing REDD+ Benefits Among Indigenous and Rural Citizens in the Peruvian and Brazilian Amazons

Lauren Miller
University of Wyoming
History of Economic Thought - Dr. Jason Shogren

Abstract -

The Brazilian and Peruvian Amazon Rainforests host some of the most biodiverse habitats in the world which hold present and future monetary and intrinsic value to local and international communities. However, they are threatened by high rates of deforestation. The REDD+ Program by the UN provides compensation for the preservation of developing countries' forest stocks. While beneficial, many rural and indigenous citizens are negatively affected by REDD+ due to job loss tied to deforestation reduction and tenure issues. This can lead to illegal, increased deforestation rates. The REDD+ payment allocations are regulated through a system of seven "Safeguards", essentially policies. While a few current Safeguards address rural and indigenous people, the Safeguards are relatively ambiguous and may not be effective when implemented in a developing economy with possible political corruption. By improving the current Safeguards and more heavily monitoring payment distribution, REDD+ can be more effective. Two alternatives to consider are implications with indigenous and rural land tenures and potential financial gains from cultural Intellectual Property rights.

Keywords: REDD+, conservation incentives, deforestation mitigation, indigenous and rural rights

1. Introduction

The Amazon is one of the most biodiverse environments on the planet. An assumed minimum of 10% of global biodiversity lives within the Amazon Rainforest (Rodrigues, 2013). The Amazon Rainforest itself lies over several different countries, with the largest portions being in Brazil and Peru respectively. Many species of animals and plants residing within the Amazon have not been scientifically classified. For this reason, the value of preserving biodiversity is very difficult to quantify, as the benefits are largely unknown (Daly 2000). However, there are many possible benefits such as pharmaceutical profits, epidemic prevention, and intrinsic value preservation, among others.

Deforestation is one of the largest threats to biodiversity in these regions. Deforestation and the subsequent forest degradation account for 17% of global carbon emissions (United Nations, 2019). An increasing global interest towards climate change mitigation has led to incentives to stop deforestation and preserve forest stock. This necessitates interventions such as the REDD+ program, which intrinsically also have massive benefits for biodiversity protection. The REDD+ program (which stands for Reducing Emissions from Deforestation and Forest Degradation in Developing Countries) is a UN program which aims to connect funds from stakeholders in developed countries with an interest in mitigating climate change to governments in developing countries that have high rates of deforestation. The stakeholders (typically developed nations, although could be NGOs and nonprofits) then pay the developing countries for improved carbon stocks, which has been shown to slow rates of climate change advancement. However, these programs can often overlook the impacts they have to rural and indigenous populations, which are often the most affected by the policy decisions, and also who have the greatest chance of causing a country to be excluded from the program due to high illegal

deforestation rates (Andersson et al., 2018). By spending more time matching funds to rural and indigenous people, countries can reach greater efficiencies in the program as well as potentially seeing longer lasting benefits.

This paper will examine how the current REDD+ system lacks sufficient regulations for benefit allocation requirements for indigenous and rural people, as well as how the current Safeguards can be improved in order to better help those negatively affected by REDD+. Current REDD+ endeavors have been criticized and have been publicly opposed by both local and rural citizens. One of the biggest ambiguities for REDD+ legislation is insecure land tenures which leads to confusion among distribution and unequal division of benefits (Larson et al., 2013). Historically, agreements with indigenous people and international agencies and companies can cause short-term harm while payments and benefits take several years to be enacted (King et al., 1996).

REDD+ guidelines are well-defined as far as distribution and risk among stakeholders. However, the actual process and guideline for benefit sharing among different demographics in REDD+ countries has not been clearly defined (Torpey-Saboe et al., 2015). As ecosystem and climate change mitigation-based incentives become more prevalent in developing countries, “co-benefits”, most notably sustainable development goals as well as local costs are expected to be considered (Sills et al., 2017). One study found that wealth inequality was directly linked with high levels of tenure insecurity and that wealthier individuals tend to receive more benefits than poor citizens. In this study, external benefits were found to benefit poorer individuals which lends hope that programs such as REDD+ can still benefit rural and poorer populations (King et al., 1996). Part of the issue with establishing benefit sharing guidelines is the definition of what constitutes a “benefit”. The definition of what constitutes a benefit ranges from direct cash

benefits to development assistance (Luttrell et al., 2013). For this paper, benefits will be restricted to economic stimulus, infrastructure improvement, rural job security, and land titling and tenure, non-market benefits as well as costs will not currently be considered.

2. Current Situation

2.1 Biodiversity in the Amazon

There are many reasons for the economic value of preserving biodiversity. The field of pharmaceuticals relies on the discovery of "new" chemical compounds, found in these largely unexplored but biodiverse areas in plants and fungi. This could clearly lead to financial benefit and the ever increasing push for the valuation of the intrinsic aspect of biodiversity, most especially when species recognition may not have occurred, such as in many areas of the Amazon (Tupper 2009). Deforestation threatens biodiversity as clearcutting results in destructions of habitat niches, which could potentially wipe out an entire species. While deforestation may affect certain species more so than others, it has a clear negative effect on overall biodiversity, which makes program that focus on climate change mitigation also beneficial for biodiversity preservation, so long as they reduce clearcutting (for further ecological analysis and significance see Appendix A).

2.2 Land Tenure and Associated Issues

Land tenure and land use policies are convoluted in developing countries. In the particular case of the Amazon, this is more prevalent in the Peruvian portion of the Amazon. Land use issues can be observed across many sectors (Alston et al. 1999). One such example is the rise in palm oil production. The rise in demand for palm oil has led to a push for cultivation and production of palm oil which has resulted in clear cutting in many tropical areas. Those most affected in terms of land tenure are smallholders. These citizens can have informal land rights,

which are easily revoked. In some cases, even well-defined land tenure agreements are often in jeopardy of losing their land in favor of large corporate cultivation, which is often governmentally endorsed. Tenants are also more at risk if they do not support the cultivation of the crop of the moment, which in this case is palm oil (Bennett et al., 2018). Land tenure disputes have historically and are currently occurring in the Peruvian Amazon in regards to rights between indigenous citizens and those of oil companies (Orta-Martinez et al., 2018). There are many reasons why land tenure issues may impede REDD+ goals, however two main impediments include ambiguous responsibility of forest custodianship and an inability to make property excludable to deforesting entities (Sunderlin 2014).

Land tenure and titling include a bundle of various rights, which can be ambiguous or completely undefined in countries such as Peru and Brazil. Rights to forest products are rarely defined and land tenures rarely formally include harvesting rights (Brown et al. 2008). Harvesting rights, essentially the designation of using cropland/forest areas for the cultivation of specific crops, are unclearly defined. This leads to smallholders being harmed as large corporations can overtake the majority of an area and stake claim to products (Torpey-Saboe et al., 2015). Clarity on tenure and harvest rights has been highlighted as a flaw within the current REDD+ system. The current ambiguity lends to disadvantages for smallholders and has to be addressed at both a local and national level (Sunderlin et al., 2015). While this is not of direct concern to the REDD+ Program, vague property rights can lead to ambiguities in benefit distribution. Whether more defined land rights should be a stipulation for whether a country is allowed to participate, or whether this issue is outside of the scope and incentives of the REDD+ Program, it clearly is an issue that needs to be addressed in order to make REDD+ more successful.

Land tenure issues are often an issue in developing countries due to various governmental issues. Some of the instability found within developing countries leads to serious issues such as those with land tenure. Other issues that arise are due to things such as high poverty and wealth disparities, government corruption, and instability (Blackman et al., 2008). These governmental issues can result in problems such as unfulfilled promises, insecure funding, and private pocketing of funds that were allocated for public use. These are some of the key issues which REDD+ faces.

2.2 Indigenous People

Indigenous people are not the target of REDD+ incentives, but are clearly an intrinsic aspect of the REDD+ program, as the people most affected by land use changes are typically in areas populated by rural and indigenous peoples. These communities often do not have say in what is occurring in programs such as RED+. For example, communities in the REDD+ Programs in the Ucayali region of Peru largely consist of indigenous people of the Shipibo Conibo communities (Rodriguez-Ward & del Aguila, 2014). While REDD+ representatives gather the input of these citizens and try to respond to concerns, there are many issues, such as job market improvements without deforestation and the market losses that these local markets will see without the added revenue streams from those employed through deforestation, which remain unaddressed. The initiative looked at development factors such as education, agriculture, and infrastructure, however it did not directly address how the local economy may be directly impacted and how to mitigate these impacts (Coombe 1998). This illustrates how although indigenous people are considered and included in the Safeguards, there is still a plethora of ambiguity and issues with the way indigenous-specific issues are identified and addressed.

Developing countries can often overlook the needs of the indigenous and rural people, often because of the disparity between the levels of wealth in these countries. However, these populations are key part of the success of these initiatives. If the rural and indigenous populations are not compensated for damages, they have no motivation to not continue lowering levels of deforestation (Cromberg et al. 2014). While the large scale deforestation operations will likely be reduced because of participation in the program, if clearcutting for sustaining activities such as agriculture and timber happen on a wide enough scale in rural and indigenous communities, it could cause a participating country to not be able to receive their payments for the year and could ultimately lead to their REDD+ program being discontinued. From a United Nations perspective, improving the Safeguards for improved indigenous and rural benefits should be a priority, as indigenous as well as general human rights are some of the important principles which drive UN actions and programs.

2.3 REDD+ Current Operations & Distributions

As stated earlier, REDD+ stands for "Reducing Emissions from Deforestation and Forest Degradation in Developing Countries" and focuses on carbon sequestration for climate change mitigation. The program was created to help establish a framework for connecting funds from parties interested in climate change reduction and countries with large forest stocks. The idea is that deforestation causes significant greenhouse gas emissions and that by reducing the amount of trees, the amount of carbon dioxide which can be sequestered by the forest is thus reduced. The program is reliant upon seven Safeguards which act as rules to be abided by in the participating countries and the developing country must report its compliance through data collection in a Safeguard Information System (SIS) which is available to the UN and stakeholders (United Nations 2018).

REDD+ has, to date, around 320 million USD in commitments and around 310 million USD in deposits, although this is not representative of the whole program as it can also act as a framework and directly connect funds with developing countries. The rate at which these funds are growing has begun to slow in the last five years, however the accounts are still seeing positive change. Currently, both Brazil and Peru have active REDD+ programs. The allocation of funds which is received by each country is determined by the tons of Carbon dioxide which are prevented from emission and/or sequestered (United Nations 2018). While Brazil has been utilizing REDD+ Programs for much longer, the Peruvian REDD+ Programs have a longer projection into future values. Because each country develops their own SIS this could be due to a lack of reporting and is not necessarily significant. Currently, both Brazil and Peru are receiving payments directly from Norway.

Currently REDD+ still has a lot of ambiguities in terms of required benefit sharing structures. REDD+ has seven Safeguards in place (Duchelle et al., 2014). These Safeguards address several issues including indigenous peoples and sufficient planning and regulation; however the Safeguards are very vague and leave space for misunderstanding (see Table 1 for Safeguards as well as explanations of successes and failures within each).

2.4 Operations Similar to REDD+

REDD+ is not a pioneering program for setting up payment or benefit systems for ecosystem services. There have been several other companies or programs which have attempted to provide compensation in exchange for decreased deforestation rates (among a variety of other ecosystem services), some to a much greater success than others. These can help to provide insight into ways in which REDD+ can be improved in order to maximize the overall benefits. Two such projects which will be examined include a Payments for Ecosystem Services (PES)

project in Vittel, France and an Conditional Cash Transfers (CCTs) in Red de Proteccion Social in Nicaragua.

The PES project of Vittel (a French component of Nestlé Waters) is an example of a project which successfully utilized a PES scheme in order to mitigate an environmental issue. In this particular case, farmers were incentivized to change agricultural practices in order to lower nitrate levels in the water supply. The process of reaching a functioning outcome took a total of ten years. The program largely relies on a strong public-private partnership which allows farmers to receive benefits while Vittel can maintain the water quality which they desire. The overall satisfaction in varying demographics as well as environmental benefits resulting from the program are thought to be rooted in the transparency of the program and the trust that was built in the public-private partnership (Perrot-Maître, 2006).

The Vittel and other PES projects have some distinguishing features. For example, this endeavor was privately funded, and while having environmental benefits, also had a strong profit driven motive (assurance of safe water for corporate sales). PES projects are rather diverse and there is not necessarily one system or way of conducting the payments. This variability is largely the reason that some projects are successes and some are failures. This system really only necessitates that a private entity receives payments for the preservation and/or restoration of an ecosystem service (clean water, carbon sequestration, etc.). Another large issue with PES is the fact that PES typically requires total participation but since it is privately funded (most often), the likelihood of "hold outs" is much higher and can greatly impact the desired results (Wunder et al. 2008). Additionally, because it is privately funded it does not necessarily need to consider every possible effected party and the Vittel PES occurred in a country with already strict environmental standards (although there have been other successful PES programs in developing

countries). Overall, the PES system relies on common goals between all parties and a system of trust and transparency to be successful. However, the scale of this project was significantly smaller than that of REDD+ and relied upon private funding of a relatively low amount.

The Conditional Cash Transfers (CCTs) in Red de Proteccion Social (RPS) in Nicaragua are another example of a system of distributing benefits, but in this case it is a tiered system in which citizens are paid based upon their action (in this case more socially based instead of environmentally based). This particular project is much broader than the Vittel program. The program is also much more organized and structured. A CCT relies on the actions of citizens or organizations to be completed in a specific way in order to receive the cash incentive (García-Amado et al., 2013). In this example, the cash incentive was distributed to impoverished citizens based off of markers such as school attendance and healthcare monitoring.

One of the interesting aspects of the RPS is the fact that the program works in phases. The payments first go to some of the poorest members of the country (typically rural citizens) through targeted demographics. These citizens receive financial compensation which helps short term poverty reduction while also slowly building up local government and infrastructure to ensure long term success and poverty control (Maluccio & Flores, 2005). While the RPS program focuses on social development and not environmental benefit, it still is applicable to environmental situations and has many innovative aspects.

3. Policy Proposal

The current issues which the lack of enforcement of benefit distribution have produced could be largely fixed through amendments to the current Safeguards. These changes can still prevent deforestation but more thoughtfully consider impacts to rural and indigenous citizens of the Peruvian and Brazilian Amazons. While the Safeguards probably have room for

improvements throughout, the two Safeguards which have the most room for improvements and potential impacts for benefit distribution changes are Safeguard 3 and Safeguard 4.

Currently, Safeguards 3 reads, “Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples” (United Nations, 2019). While this Safeguard includes indigenous people, it is rather vague and does not include many specifics about obligations that a REDD+ country has in regards to benefit sharing. This should be amended to add at the end of the Safeguard, “Any transaction or indirect costs to indigenous and rural citizens directly from REDD+ benefits need to be valuated and compensated for, either directly through REDD+ funds or through other domestic benefits”, as well as adding clarifying language (see Table 1). These additions force REDD+ countries to look at potential job loss, transaction costs, and any other costs which may affect indigenous or rural people and to provide just compensation. This is arguably the most important change that is needed. By adding a stipulation that a valuation of damages for rural and indigenous people must be performed and compensated for, Brazil and Peru are forced to address these benefit allocation issues.

Safeguard #4 reads, “The full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities, in the actions referred to in paragraphs 70 and 72 of this decision” (United Nations, 2019). Paragraph 70 refers to which activities should be undertaken in order to mitigate emissions and manage forest stocks, and paragraph 72 refers to addressing drivers of deforestation (including land tenure issues). The suggested change for this Safeguard would be that participation be replaced with “majority consent”. Currently,

indigenous and rural communities are only allowed to be at the table and not to have a real voice in issues. By calling for a majority consent (most likely decided upon by a vote of representatives from the effected communities), rural and indigenous peoples are able to have a say in the decisions that will largely be affecting them. This is also important, as communities which largely oppose REDD+ regulations could be ones which heavily rely upon deforestation and would continue illegally deforesting after the program started.

4. Economic Rationale

4.1 Modeling Marginal Costs and Marginal Benefits

When deciding whether the effort of spending the extra time, energy and resources on matching funds to rural and indigenous people is "worth" the additional effort, it is important to look at associated benefits. When considering the benefits which indigenous and rural citizens are obtaining, this is seen through compensation for damages, or, in some cases, possibly avoidance of an additional REDD+ program when damages seem to be too significant. The main issue within the current Safeguard system is that it fails to have a component which requires a valuation of damages done to rural and indigenous population be required. This would mean that whenever a REDD+ program occurs in a rural or indigenous community, the impacts related directly or indirectly to REDD+ actions such as job loss, infrastructure deterioration, etc. must be quantified and the proposal for the allocation of benefits must include how distribution will make up for the damages. There's a variety of ways in which these damages can be mitigated. Whether through direct fund transfers, property titles, infrastructure improvements, etc., there must be a quantifiable benefit value which matches or exceeds that of the damages related to REDD+.

Currently, the amount of time that is spent on REDD+ does not seem to be at an optimal point. The marginal cost of distributing additional benefits to rural and indigenous citizens

experienced by the country participating in a REDD+ program is at a steady slope. A certain amount of cost is most likely to be fixed, then the cost will rise as additional communities are reached since many of these communities are remote and difficult to reach as well as the fact that a consensus for REDD+ to even occur in these areas may be more difficult to reach. There also are marginal benefits which are decreasing at a slower rate. The marginal benefit will initially be quite high as accounting more closely for the damages seen in these communities will at first be quite impactful then it will slowly start to diminish, as it is more likely that the initial benefits will be more substantial and the longer that is spent on distribution, the more likely it is that an agent is spending a significant amount of time trying to distribute a smaller amount of benefits, making out marginal benefits decrease over time.

The natural equilibrium of these two curves would result in a substantial number of hours being used for distributing benefits to rural and indigenous citizens, however this is not the situation that is occurring. A quite small number of hours is being spent on looking at benefit distribution (or time spent matching funds). For this reason, there must be some type of constraint on the system which is causing the equilibrium of hours spent matching funds to not settle at the point where marginal costs equals marginal benefits; this can be observed in Figure 1. This constraint can be called the Developing Country Constraint (or C_{DC}). This constraint results from a variety of issues – most significantly, corruption within the governments of developing countries which causes funds to be misdirected as well as a significant disparity between the wealthy and poor citizens (often found in rural and indigenous communities).

By adding the Safeguard revisions, this constraint can be relaxed. When the developing countries must consider the welfare of the rural and indigenous people, the system will move to its natural equilibrium where marginal costs is equal to marginal benefits (Figure 2). This will

allow the optimal number of hours spent on matching funds to be met. This allows the original area that represented a deadweight loss to now be representative of captured benefits.

The Safeguard revisions also could possibly cause shifts to either the marginal benefits curve, marginal cost curve, or both. If the regulations are changed such that communities that would experience large damages under REDD+ regulation are taken off the table along with general consideration of the needs of these communities could lead to an outward shift of the marginal demand curve (Figure 3), which would result in additional benefits (shown by the blue area). There also is a chance that the marginal cost curve could shift as well as decrease in slope. If a better system for evaluating and compensating for indigenous and rural needs is created, this could help the process be more efficient and lead to a downward shift for the marginal cost curve. Because the UN helps establish Safeguard Information Systems and helps countries with efficiency, the added regulations could mean that the country could be more efficient in spending its resources which would lead to a decreased slope in the marginal benefits curve (Figure 4). This shift would also lead to additional captured benefits (seen in the orange area). If both of this shifts are observed simultaneously, the blue and oange additional benefits would both be observed as well as

4.2 Areas of Concern

As with any policy proposal, there are potential issues which may arise with the suggested changes. In regards to the policy proposal regarding Safeguard #3, there are a few potential issues. Valuation of costs to local and indigenous peoples can add cost to the project, potentially slow the project down, and in the case of extremely high costs, may ultimately stop the project. However, if a project has high enough costs for indigenous and rural peoples that it outweighs the benefit, perhaps it should not be enacted.

In regards to the policy change to Safeguard 4, there are also a few things that could potentially go awry. For example, if local communities are choosing to dissent to the decision not because of high costs but because of an ethical or other difference, this can potentially slow the momentum of REDD+ and lead to more deforestation. In addition, how a representative is chosen and which communities should get to vote in each issues also needs to be considered.

5. Policy Alternatives

There are alternatives to the proposed Safeguards which could also help mitigate REDD+ damages to rural and indigenous people. One prominent alternative would be the increase of titling of land to indigenous peoples. Indigenous peoples in both Brazil and Peru are stuck in ambiguity as they live on federally or state owned lands. These peoples often have formed very sustainable land management practices due to the fact that they have been reliant on the land for such a long time, that they have learned how to take but also give as far as natural resources are concerned. By titling land to indigenous people, both the instances of clear cutting as well as general disturbances decrease (Blackman et al., 2017). There are two clear possible ways which this could be incorporated into the REDD+ Program. The stipulation that a certain number of acres per certain amount of funding be titled to indigenous people could be added to Safeguard 3 “Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples” (United Nations, 2019). By adding this stipulation in, developing countries would be held responsible for aiding indigenous peoples while also still reducing overall deforestation and emissions from deforestation. Additionally, this could be addressed by a REDD+ specific program (or similar program by the UN) which

titles land to indigenous people in direct exchange for valued carbon sequestration/emission reduction benefits. While this method has the advantage of removing the intermediary of the developing countries' government, it poses specific problems. Most especially, the timeline for adding a UN funded program or a new sector to the REDD+ program could be inefficient due to the fact that deforestation is often a time sensitive issue. Carbon here, row crop agriculture, "plow print", areas that could be at risk for

Indigenous practices are quickly becoming commonplace in western society as interest in homeopathic and natural cures and remedies are sought. These practices have often been used for hundreds of years by indigenous people and even often require specific herbs, plants, fungi, etc. from the region. One such example can be seen in Ayahuasca. This is a traditional drink of certain indigenous people of the Amazon region. The drink is an entheogen, so it causes psychoactive responses in the body. Traditionally used for healing and ceremonies, it's slowly becoming more widely spread across Brazil and is an increasingly common draw for tourists (Tupper 2009). The increase of this practice is just one example of indigenous practices in which intellectual property rights may come into play. This however can be tricky to exactly implement and make profitable.

There are many other examples outside of Ayahuasca where the potential for cultural intellectual property rights may be claimed. The practice of taking indigenous knowledge and practice and using it for corporate gain without financial compensation is known as biopiracy (Tupper 2009). Although this act has largely been overlooked and not viewed as a criminal act, it is gaining attention as requiring a just compensation to the indigenous people from where the knowledge originates. The benefits that some pharmaceutical companies are offering include a long-term and short term reciprocal benefits, which can consist of immediate aid and financial

assistance as well as profits for the medicine as it becomes commercial. However, this strategy may not be as reliable. Some companies who have attempted this such as Shaman Pharmaceuticals have ended up folding (King et al. 1996).

One benefit of this approach is that as biodiversity decreases, the value of these IP rights rapidly increases (Brush, 1993). Most cases have at least some legal backing and precedent for financial claims to indigenous knowledge. The Universal Declaration of Human Rights contains the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural rights, which are two separate entities which help provide legal foundation for indigenous knowledge intellectual property rights (Coombe 1998). This use of Intellectual Property rights can be incorporated into REDD+ regulations, also through a revision of the third Safeguard. By requiring countries to support and help facilitate IP laws and rights claims for their indigenous people, current REDD+ practices can be managed while adding benefits for indigenous peoples.

These alternatives could also provide solutions to the current REDD+ issues, however they still have flaws. The biggest problem with both proposed alternatives is that while they help the indigenous populations, they do little to nothing for rural populations who are also affected negatively by REDD+ implementations. In addition, these regulations could be much more difficult to enforce than the proposed policy solution.

6. Conclusions

REDD+ has potential to mitigate emissions and negative impacts of deforestation such as biodiversity loss; however, there are many effects to rural and indigenous citizens which must be considered in order for the program to be socially and environmentally sound. In addition to this moral reasoning, the program may end up failing due to illegal deforestation if these populations

are not compensated for losses that they experience from direct and indirect damages done by implementing REDD+ programs. While there are many issues which could be addressed within the Safeguard system, the most pressing alterations that need to be done are to Safeguards 3 and 4. These changes would allow for a greater voice to be given to indigenous and rural people which could allow for more close and transparent collaboration in turn providing higher welfare to rural and indigenous people as well as increasing the overall success as well as the longevity of the program.

6. Further Research

Moving forward, there is further research and actions which would allow the overall success of the program to be greater. Firstly, to test the new Safeguards (most importantly the implementation of a damage valuation as well as the mechanics of a community voting on consent of implementation of the program), a pilot program would need to be create. Both Brazil and Peru have sites which could be ideal for this type of testing. Moving forward, other related topics which could be examined include – effectiveness of benefits for rural and indigenous people of varying communities within one nation as well as the similarities and differences of benefits of rural and indigenous people in different countries.

Tables and Figures

Safeguard	*Definition*	*Target*	*Successes/Failures*
1	That actions complement or are consistent with the objectives of national forest programmes and relevant international conventions and agreements	Harmony between UN and regional or national programs	This is mostly successful in cohesion within state and UN.
2	Transparent and effective national forest governance structures, taking into account national legislation and sovereignty	Organized forest programs, limit corruption	This is effective in helping to mitigate some issues with corruption but still leaves many issues unaddressed.
3	Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples	Protect indigenous peoples	This is effective in at least bringing about the significance.
3R	Respect for the knowledge and **intellectual as well as physical property rights** of indigenous peoples and members of local, **especially susceptible rural**, communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples. **A valuation of impacts needs to be done and actions need to compensate for this.**	Protect **rural and** indigenous people	Ideally this will allow for indigenous and rural people to be justly compensated for the damages that they may have observed by implementing REDD+ programs in their communities.
4	The full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities, in the actions referred to in paragraphs 70 and 72 of this decision	Prevent local opposition and overlooking local concerns	This is effective in making sure that community members are at the table but it doesn't necessarily mean that they have a say in the process.
4R	The full and effective participation and **majority consent** of relevant stakeholders, in particular **all** indigenous peoples and local communities **affected by REDD+ regulation changes**, in the actions referred to in paragraphs 70 and 72 of this decision	**Ensure local participation and consent.**	This regulation would enable communities to essentially deny efforts that will cause large amounts of harm to their community.

Table 1 (continued next page)

5	That actions are consistent with the conservation of natural forests and biological diversity, ensuring that the actions referred to in paragraph 70 of this decision are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits, taking into account the need for sustainable livelihoods of indigenous peoples and local communities and their interdependence on forests in most countries, reflected in the United Nations Declaration on the Rights of Indigenous Peoples, as well as the International Mother Earth Day	Protect biodiversity and push conservation while accounting for social issues.	This does a good job of ensuring the environmental goals of the program, helping to prevent biodiversity loss. Somewhat effective in protecting indigenous rights, but again, quite vague.
6	Actions to address the risks of reversals	Prevent reversals	Mostly effective but vague, does not provide a clear basis for evaluation.
7	Actions to reduce displacement of emissions	Prevent displacement of emissions	Overall effective, however displacement of emissions from producers who are left without work is not necessarily accounted for.

Table 1 continued

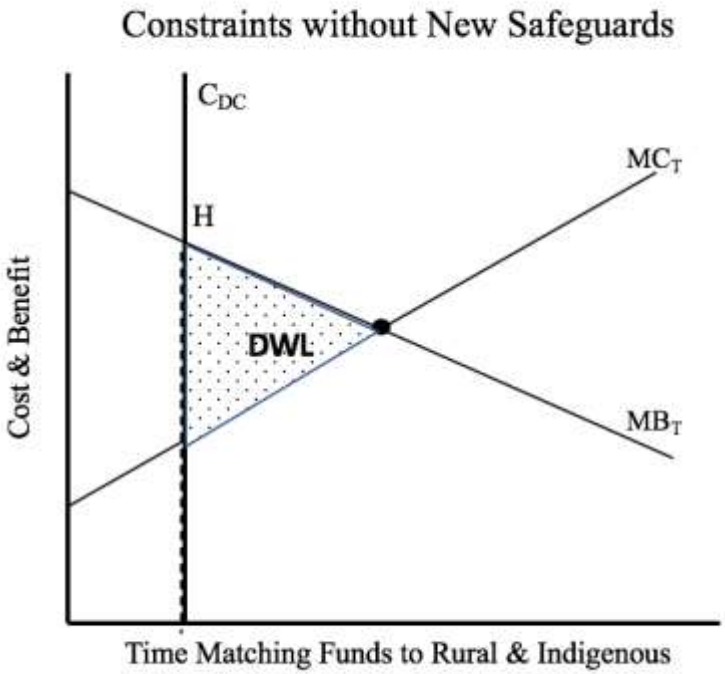

Figure 1.

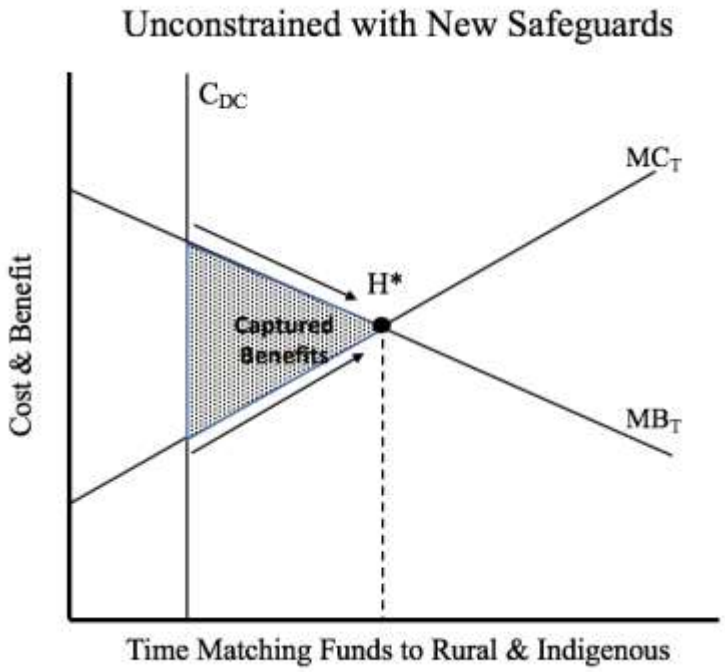

Figure 2.

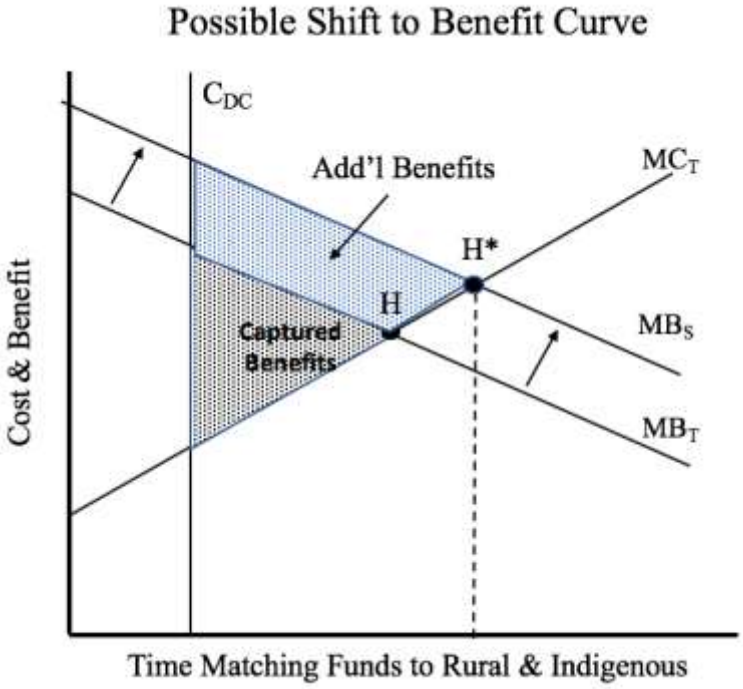

Figure 3.

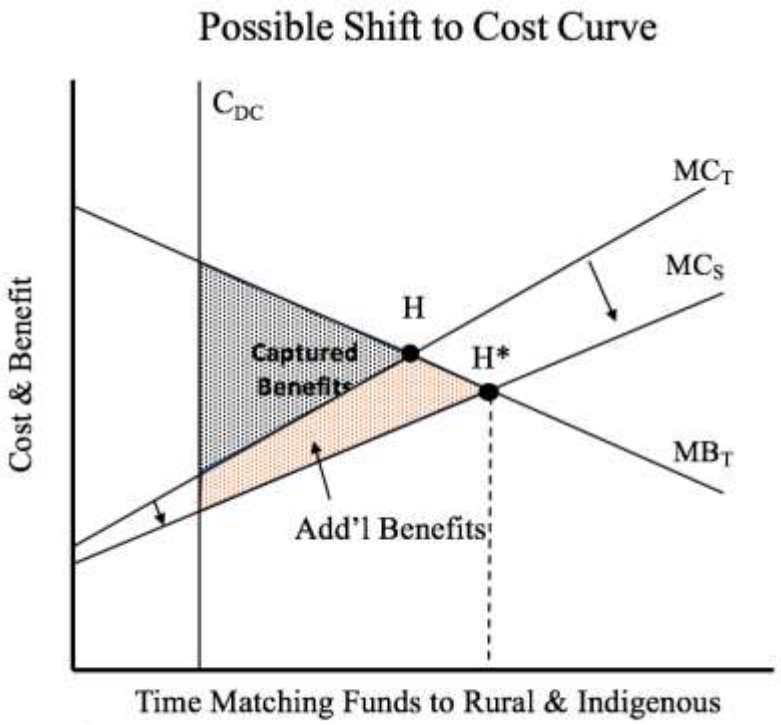

Figure 4

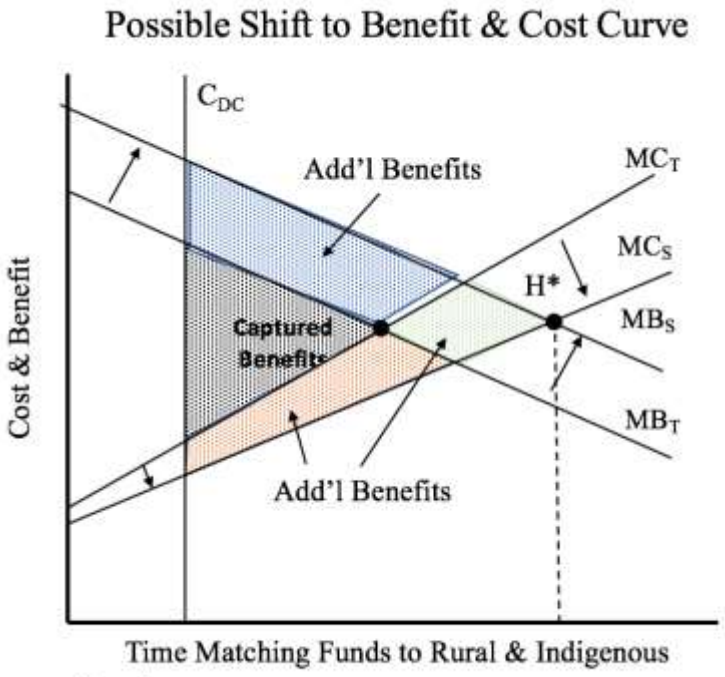

Figure 5

Appendix A

Biodiversity can apply to all aspects of life, including bacteria, fungi, plants, and animals. Deforestation can often change the biodiversity of an area through habitat loss and land use change. One such example is that clearcutting for agriculture has largely led to a decreased level of biodiversity within soil communities in the Amazon (Rodrigues, 2013). While this may not immediately seem like a pressing issue, due to the moisture and warmth of the tropics, the soil communities are typically teeming with life. These bacteria and fungi living in the soil often serve very important functions and often have symbiotic relationships with local flora. Through biodiversity reduction, not only the soil community is affected but also the plant community. This in turn can affect animal consumers and thus an entire chain of life is affected.

The Amazon is one of the most important areas in terms of biodiversity. This area is thought to contain roughly ten percent of global biodiversity (essentially of all known species in the world, ten percent reside within the Amazon). Most of the deforestation done in this area is done through clearcutting, the method with the highest environmental impacts. Clearcutting destroys entire habitats and has the possibility of destroying whole species populations (Hopkins 2007). While there are many reasons for reducing the rates of deforestation in the Amazon, biodiversity is one of the most compelling, as much of the importance of biodiversity is not yet known and may not be known until in the future when it may be too late.

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