Necessities And Possibilities For Conservation Of Cloud Forests

Background

Montane cloud forests are arboreal areas characterized by? ?the frequent presence of clouds and mist (?Hamilton et al., 1995?). Despite only accounting for 2.5 percent of the total area of worldwide tropical forests, cloud forests represent 34.6% of the world's total carbon in forest biomass. (?Leija-Loredo et al. 2018).? This plays a crucial role in global carbon cycling, allowing the planet to both support and endure the emissions of its rather uncompassionate inhabitants. However actions of deforestation and temperature variances due to climate change have placed cloud forests under extreme pressure. In Mexico, ?researchers estimate that 68% of the cloud forests could vanish by 2080, resulting in a complete wipeout of natural ecosystems (Ponce-Reyes et al. 2012). This is mainly a consequence of the intricate relationship between ethical land usage and supplying the needs of local and global markets. The case in Mexico is similar across many nations, ?as approximately 43% of cloud forests are found in Asia, 41% in the north and south America, and 16% in Africa (Toledo-Aceves). If current trends continue, cloud forests could eventually become extinct everywhere, resulting in a catastrophic shift in carbon cycling and eventually throwing off ecosystems all over the planet. This cynical course of events is one that must be avoided at all costs, and if proper conservation tactics are taken immediately the cloud forests will stand a chance against the current and future abuse of its occupants.

The Issue

Cloud forests are both sophisticated and ?complex ecosystems that depend upon predictable, frequent, and prolonged immersion in cloud layers (Lawton). This means they are extremely sensitive to changes in moisture and temperature, as if the height of the cloud layer is altered, much of the ecosystem will suffer. For example, recent studies in the costa rican monteverde cloud forests have shown a reduction in moisture input of cloud water throughout the region, leading to an increase in cloud base height, and leaving much of the forest exposed.

Researchers hypothesize that this behavior is a result of increased sea surface temperatures linked to global climate change (Nair). However, climate change is not the only culprit behind the rapid shift in cloud forests, as deforestation plays an even bigger role. The same study of the Monteverde forests also suggests that deforestation in the local area results in warmer, drier air, further influencing the base height of orographic clouds banks (Nair). This is a major issue across ?Latin America as 54% of its emissions come from deforestation. Considering that this continent has a quarter of the world's forests, which represents 34.6% of the world's total carbon in forest biomass, deforestation is a rather large issue that must not go unchecked (?Leija-Loredo et al. 2018).? Other forms of land usage must also be monitored more closely such as agriculture and grazing. ?In Mexico, estimates indicate that more than 50% of the original cloud forests have been replaced by forms of land use like cattle grazing, annual crops, and coffee (Lawton). Land use for tourism like hotels, casinos, and even golf courses also add to the reduction of cloud forests. The Fraser's hill golf resort in Malaysia forced large amounts of forest loss during construction and also ruined waterfalls popular among tourists in the area.

This lead to the decline of forest-dependent birds as with 20% of the montane forest canopy cover cleared, only less than a third of these species remained (Peh). Eventually, the whole resort ended up going bankrupt due to low numbers in visitors. All of these activities threaten the extinction of cloud forests, as despite their ecological importance, cloud forests are one of the most threatened ecosystems, due to land cover conversion to agricultural uses and human activities such as illegal logging (Hamilton 2012). Additionally, they are extremely vulnerable to climate change, owing to its restricted climatic requirements and narrow distribution ?(?Leija-Loredo et al. 2018). With these facts in mind, maintaining sustainable cloud forests is practically a losing battle, as growing deforestation efforts and rising sea temperatures force conservation attempts to be small scale and futile.

Stakeholders

As with any environmental issue, there are many stakeholders both involved in and influenced by decisions regarding the conservation of cloud forests. On one hand major environmental groups like the Community Cloud Forest Conservation Group out of Guatemala, strive for the immediate protection of forests due to their high levels of biodiversity and influence on global carbon cycling (Cahill). Organizations like these are common in countries with threatened forests, such as the Monteverde Conservation League in Costa Rica or the American Forests organization in Mexico. These groups work with legislators to lobby environmental policies that benefit both cloud forests and surrounding rural communities.

Other stakeholders like farmers and loggers whose paychecks rely on regular resources from cloud forests argue a more cornucopian perspective, seeing past environmental issues in order to support their own livelihoods. Commerce from forest-based products and agriculture directly affect over one billion people living in extreme poverty. This also impacts global economic health, as trade from forest-based products generate over $186 billion annually in keeping up with the demand of growing consumers across the world (World Wildlife). Varying perspectives and interests in the use of resources from cloud forests leads to legislative standoff and red tape, as the world reliance on these products cannot be argued. The truth of the matter is that resources will always be taken from the forests, there are far too many people whose lives are dependent upon it. However, these resources can be taken and monitored responsibly, in order to ensure their sustainability for future dependents to come.

?Existing Policy

Developing policy in aims of conserving cloud forests is a tough but necessary process. Despite economic reliance, deforestation practices and agriculture have stretched forest resources far too thin and must be regulated. One example of a successful policy already in place is Malaysia's national physical plan. This plan details strategic policies on the physical development and conservation of state and federal forest lands in peninsular Malaysia. It also identified environmentally sensitive cloud forests, making development forbidden above 1000m and on slopes with an incline of more than 25° (Peh). Additional plans have also been proposed in aims of sustaining forest ecosystems such as the implementation of agroforestry. This involves integrating tree species into existing agricultural lands in order to promote the regrowth of original canopy species, thus forming a harmonious relationship between agriculture and conservation. Efforts of agroforestry have been successful accomplished in Malaysia leading to the regrowth in sectors of endangered forests (Peh). Other successful feats of policy include

placing limitations on where and how much logging can occur during felling seasons. This way accurate calculations of trees leaving forests can be computed, aiding in the drafting of plans and quotas for future conservation (Yude).

Tourism could also be a major aid in conservation, as the popularity and visitation of cloud forests has increased greatly in recent years. Revenues from tourists can aid in the costs of rebuilding and maintaining forests, leading to improvements over time. However these attractions must be carefully managed as increased visitation could lead to further environmental problems like ?pollution? from littering and trail erosion (?Bruijnzeel).? Another type of policy is the involvement of local communities in the conservation of cloud forest parks. This has been successfully piloted in Uganda where citizens and policy makers have combined in forming the Bwindi impenetrable forest conservation trust. This group works to support park management, build community projects, and overall improve rural livelihoods. They also instituted a revenue-sharing policy in which 20% of park entrance fees are paid back to local governments. These funds work to support local infrastructure like schools and roads (?Bruijnzeel).

In response to long-term deforestation in Costa Rica, the government encourages landowners to protect forests through forms of grants or cash payments to those who sign contracts with the Ministry of the Environment. Owners who sign these contracts agree to extract only a certain number of trees from the forest and prevent illegal deforestation by promoting ecological integrity. Under these agreements, The FONAFIFO (National Forestry Financing Fund) also pays landowners certain dividends based on their environmental services to the land. This means owners are literally getting paid to conserve and use less forest. Money speaks in the motivation of action and this policy is genius in encouraging responsible land use (GoVisit). Overall smaller scale actions towards conservation such as agroforestry, logging regulations, or the forming of trusts could begin now in all nations with threatened forests. This would pave the road to future bigger projects and also raise further awareness of the issue globally.

?My Policy

If I were to develop a policy in aims of protecting the world’s remaining cloud forests I would first develop an international committee of all countries with cloud forests. It is the responsibility of these nations to protect these ecosystems, and it must begin on the national level. Conferences have been held in the past, such as the 1993 and 2004 cloud forest symposiums, in which over 20 nations with impacted cloud forest met and discussed conservational policy. However these meetings proved ineffective as deforestation efforts and climate change continue eliminating forests. I would ensure that in this new symposium to create actual guidelines and tactics that each country will agree to and must pledge to follow. I would also require this newly formed board to meet annually in order to evaluate its progress as well as revise guidelines to changes accordingly. I would ensure the cooperation of this board through the offering of incentives similar to the national forest forestry financing fund in Costa Rica, however on a global scale. Incentives could include tax breaks for logging companies abiding by sustainable protocols, as well as compensation for agricultural enterprises who engage in eco-friendly practices like agroforestry. I would also stress the importance of eco-tourism and its ability to renourish both cloud forest reserves as well as surrounding communities. Due to its alluring cloud cover and diverse wildlife, cloud forests are gaining in popularity and becoming a hot travel destination for people all over the world. This rise in attendance must be taken full

advantage of, as tourists offer communities invaluable funds to support local infrastructure as well as future aid to cloud forest parks. However this rise in popularity must be attended to carefully as the increase in traffic will bring about other environmental concerns like pollution and erosion from trail overuse.

Another major component of my plan would be to forbid further land use on already majorly impacted areas of cloud forests. This could be measured by loss of overall biodiversity per square mileage of forest floor. If an area is to be measured at a 70% loss of biodiversity or greater, the area would be off limits for further land use enterprises. Any existing agricultural practices of the area would be grandfathered in and encouraged to reduce their individual impacts through incentives. It is critical to not allow already endangered cloud forests to be threatened further. Many species within the forests are still being discovered constantly, and some of which could potentially contain invaluable compounds for human health. Some species are even going extinct before researchers have the chance to reach them. Based on this I would place more emphasis on the discovery of new species within cloud forests. This would aid science and medicine, and also bring about more attention on forest based issues to the general public.

Overall, my policies would be difficult to begin as well as enforce. It would require the constant teamwork and attention of different conservation groups across various nations. Coordinating a comprehensive plan that is appealing enough for all countries to agree with is quite unrealistic. Instead, policies should be created at a regional or national level, one in which dictates standards specific to the needs of impacted areas. In this way, the conservation of particular forests can be specialized, leading to an overall optimized protection of cloud forests worldwide.

Conclusion

If such powerful and dynamic ecosystems were to disappear it would be a major loss for all life on earth, and quite frankly a shame, as humankind would mainly be responsible for its collapse. We must reconsider our influences on climate change, as well as rethink proper uses of land and practices of deforestation. Only then can the cloud forests begin to be conserved and enjoyed properly for all. Recent trials in policy have proved effective for conservation and raising overall awareness of the severity in forest based issues. It is also important to remember the socioeconomic consequences related with the altering of the agriculture industry. However if policy is created carefully through a connection of all parties of interest, then reasonable agreements can be made in motion of putting the protection of forests first. Overall there is still hope for sustainable cloud forests, however its fate rests on the shoulders and decisions of humankind.

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