

# Humans in a Cloud Forest: A Case Study on the Impact of Ecotourism upon Ecological Stability

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The advent of ecotourism in recent years has had a huge impact upon the economies of tropical nations as well as the mindsets of tourists [1]. At first glance, the idea of ecotourism seems to have no down side. The International Ecotourism Society (TIES) describes ecotourism as “responsible travel to natural areas that conserves the environment and improves the well-being of local people” [2]. In regards to the ecological aspect of this definition, ecotourism is often viewed as the green alternative to traditional travel, which is typically associated with pollution and habitat degradation [3].

The definition given by TIES is broad yet points ecotourism in a direction that is strikingly different from traditional tourism in its regard to the environment. Many ecotourism programs donate a portion of the cost of the trip to offset various unavoidable ecological costs. This is seen in the purchasing of carbon credits to offset the pollution of jet aircraft, or using tourists’ money to buy and preserve forest near the area that the tourists are exploring. Ecotourism at the core also involves practicing a low impact form of traveling that often does not allow for many of the comforts to which typical American tourists are accustomed. Ecotourists are focused on experiencing nature as it was before human development caused a drastic change to the environment of this planet. As such, for a tourist to truly qualify as eco-friendly, he or she must forgo comforts such as automobiles and indoor plumbing.

“ Ecotourism is viewed as a green alternative. ”

This is where ecotourism agencies may run into a situation that will set the principles of ecotourism against the desires of a mostly urban clientele desiring to experience nature. These tourists often have little knowledge of surviving in the wilderness where they will find the natural beauty they seek. This paradox has led to a new form of human development in the rain forests of Central America. Where the forests were once leveled to make way for cattle and crops, now they are being encroached upon by world class resorts that use the proximity of a tropical rain forest as an additional draw for clients. These resorts sometimes provide a large portion of the income for small native communities near rain forests that were once sustained by farming. As these programs grow and develop the areas around forests, the question is often posed: do ecotourism programs that lead to urbanization truly follow the requirement of TIES to “conserve the environment”?



This urbanization through ecotourism is displayed in the small town of Monteverde in the mountains of Costa Rica. This small community has grown at a tremendous rate over the past 15 years due mainly to the growth of a local ecotourism industry. The area that surrounds Monteverde is composed of a significant amount of primary tropical cloud forest, one of the rarest and most delicate ecosystems found in Central America [4]. As the levels of ecotourism increased in the area, there was a higher demand for paved roads and larger resorts to house the thousands of Ecotourists per month that would travel from around the world to simply walk through these forests.

While this growth did not clear large tracks of land as was done in the past, there was still a significant level of fractionization of the surrounding forests as well as a greatly increased number of private and industrial vehicle traffic. Forest fragments are formed when a portion of cleared area (usually a road) effectively separates one part of the forest from another. The continuity of tropical forest has been linked strongly to the maintenance of species richness and diversity [5].

A recent study conducted in the forests in and around Monteverde used the relationship between forest trees in fruit and their dispersers (e.g., birds, bats, other mammals) to gauge the impact of ecotourism driven urbanization upon forest health [6]. Symbiotic relationships such as this have been used previously as a gauge for the health of that particular portion of the ecosystem [7,8]. The study determined that, overall, the symbiotic relationship between trees and the birds and other animals that distribute their seeds is significantly and negatively affected in forest fragments that are not connected to a continuous forest [6]. In fact,

the percentage of fruit removed from trees in continuous forest was nearly double the amount removed in forest fragments that had been isolated by ecotourism growth. This disruption of an important tropic interaction may have a strong impact upon the stability of the forests that are being fragmented [1]. Because of the amazing levels of diversity and concentration of species in these tropical forests, much specialization has evolved. As relationships between species are disrupted, it is frighteningly easy for species to fall into extinction, further threatening the stability of the local ecosystem [9].

While this is only one example, it prompts important questions about the long term impact of ecotourism in tropical forests. The situation in Monteverde shows that even the supposedly “green alternative” to traditional tourism may still have a direct impact upon the health of the forests that are exposed to new tourists. It is important to realize that the modern way of life that developed nations are accustomed to over the past century is blatantly damaging to the ecosystem of these tropical forests. This is evident in many aspects of modern life, from driving automobiles to using artificially manufactured detergents to wash clothes. Once this recognition is made, it is essential to find a way to limit the impact of all human activity upon forests.

Several theories have been proposed to increase forest stability in the face of human interaction. One such theory proposes that greenways or forested corridors that connect forest fragments could be constructed to provide some connection between forest fragments and continuous forests [10]. While this has been implemented successfully to some extent in North America, the vast amount of species diversity and richness that is prevalent in Central America may not allow for such impressive results.



Can tourists really limit their impact on tropical forests? Reproduced from [14]



Fragmentation may damage forest stability. Reproduced from [13]

It is apparent that the only way to truly preserve the delicate tropical forests of Central America is to leave them alone entirely or experience them in the ways that humans would have thousands of years ago. While ecotourism provides a lower impact upon the environment than other forms of vacation, it does not solve the problem. This utterly unrealistic expectation of total human removal is rather

“ The goal of ecotourism is not to create a profit. ”

representative of the dilemma facing conservationists around the world. It is a fact that humans have changed the face of the planet and will continue to change it in the future. In light of this, it is important to be realistic and realize that there is a certain level of environmental degradation that is inevitable [11].

With this in mind it is important to note that ecotourism and other “eco-friendly” pastimes bring attention to the issue of continuing human impact upon the environment. However, they do not provide a solution to the problem. As in Monteverde, ecotourism gone awry may even be contributing to the problem. As ecotourism grows, it is important for tourists and tourism providers to understand that no matter how lucrative it may become, the goal of ecotourism is not to make a profit, but conserve the environment and provide for the local people. It is this level of constant awareness that will allow ecotourism to do the most good, while keeping the environmental harm to a minimum. ■

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#### References:

- [1] Peres, C. A., J. Barlow, and F. W. Laurance. 2006. Detecting anthropogenic disturbance in tropical forests. *Trends in Ecology and Evolution*. 21:227–229.
- [2] The International Ecotourism Society [Online]. 1990 Aug 16 [cited 2009 March 13]; Available from: URL: <http://www.rarediseases.org/>
- [3] Lukashina NS, Amirkhanov MM, Anisimov VI, Trunev A. Tourism and Environmental Degradation in Sochi, Russia. *Annals of Tourism Research* 2006. 3:654
- [4] Nadkarni NM. Monteverde: Ecology and Conservation of a Tropical Cloud Forest. 2000. Oxford University Press, Oxford.
- [5] Cordeiro NJ, and Howe HF. Forest fragmentation severs mutualism between seed dispersers and an endemic African tree. *PNAS* 100 2003: 14052-14956.
- [6] Derge DC. Comparison of fruit removal in tropical tree species between forest and urban areas – Monteverde, Costa Rica. Institute for Tropical Ecology and Conservation. Monteverde, Costa Rica. 2008.
- [7] Jurado E, Flores J, Endress AG, Flores M, Estrada E and Pando M. Seed removal rates under isolated Trees and continuous Vegetation in Semiarid Thornscrub. *Restoration Ecology* 2006.14: 204–209.
- [8] Wang BC, and Smith TB. Closing the seed dispersal loop. *TRENDS in Ecology and Evolution*. 2002. 17: 379.
- [9] Worm B, and Duffy JE. Biodiversity, productivity and stability in real food webs. *TRENDS in Ecology and Evolution*. 2003. 18: 368.
- [10] Henderson SPB, Perkins NH, and Nelischer M. Residential lawn alternatives: A study of their distribution, form and structure. *Landscape and Urban Planning*. 1998. 42: 135-145.
- [11] Mckinney ML. Urbanization, Biodiversity, and Conservation. *BioScience Article*: pp. 883–890. 2002.
- [12] Belum Rainforest Resort by Dominic Wong. Flickr under CC-BY. Available from: <http://www.flickr.com/photos/ah-wong/2710115022/>.
- [13] *Alectryon tomentosus* by Tatiana Gerus. Wikimedia Commons under CC-BY. Available from: [http://commons.wikimedia.org/wiki/File:Alectryon\\_tomentosus\\_-\\_Hairy\\_birds\\_eye\\_%282882164870%29.jpg](http://commons.wikimedia.org/wiki/File:Alectryon_tomentosus_-_Hairy_birds_eye_%282882164870%29.jpg).
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