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ENVIRONMENTAL IMPACTS OF TOURISM IN CUYABENO WILDLIFE RESERVE, ECUADOR

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ABSTRACT

The Cuyabeno Wildlife Reserve, one of the 50 protected areas of Ecuador. This is considered a good strategic place for hosting unique and representative ecosystems of the Amazon region. It is located in the provinces of Orellana and Sucumbios. This current research study determined the main environmental impacts of tourist in the reserve´s publicly used paths, which will provide a management tool for managers to avoid environmental actions that could threaten conservation, sustainability, and level of satisfaction of the visitors. The main environmental impacts of tourist presence were determined. The methodology was based on field observation and interview with interest groups of the reserve. The main impacts identified in the areas of public use of the Reserve are affections geological (Increase in runoff and Deterioration of substrates in flooded areas). Aquatic (Alteration physical and chemical conditions). Vegetal (Root mismatch). Fauna (disturbance); and Social (Impact local communities).

KEYWORDS: Cuyabeno Wildlife Reserve, tourism, public use impacts, environment.

I. INTRODUCTION

International tourism represents 7% of the world's exports in goods and services, tourism has boasted virtually uninterrupted growth over time, un ever-increasing number of destinations worldwide have opened up to, and invested in tourism. In the past six decades, tourism has experienced continued expansion and diversification to become one of the largest and fastest-growing economic sectors in the world, many new destinations have emerged in addition to the traditional favourites of Europe and North America (UNWTO, 2017).

Natural environment is of crucial importance for social and economic life. We use the living world as resource for food supply, energy, recreation, medicines, natural resources for industrial products. The clearest manifestations of the degradation of the natural environment are reduction and fragmentation of habitats and landscapes and loss of species of fauna and flora. Tourism and recreation impact in various ways on the natural environment. On the one hand, natural areas form the very basis of many touristic attractions by highlighting scenic value or exceptional encounters with fauna and flora. However, some forms of tourism can be extremely detrimental to ecologically sensitive areas, resulting in habitat degeneration or destruction, in the disturbance or hunting even rare or threatened species (Mowforth & Munt, 2016). Tourism is both a major contributor to global, regional and local economies and a contributor to human stress on the environment. Tourism can promote public awareness and support for the conservation of natural areas and attractions. However, when uncontrolled or overdeveloped, tourism can endanger natural resources, cause visual or cultural pollution, and destroy the very resource on which it is based. Terms like nature-based tourism, adventure tourism, ecotourism and sustainable tourism denote forms and approaches of tourism which are often kept apart from mainstream tourism. Eco-tourism should not be viewed as a panacea, but as an alternative for land use and management of protected areas, particularly in a country like Ecuador. The appropriate use of natural resources that are in near pristine quality must take into account the funds needed to develop, maintain, and administer tourism services that minimize

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negative environmental impacts. The analysis of eco-tourism activities and its impacts should be concentrated on the protected areas and local communities (Tribe, 2016).

Protected areas are essential for biodiversity conservation. They are the cornerstones of virtually all national and international conservation strategies, set aside to maintain functioning natural ecosystems, to act as refuges for species and to maintain ecological processes that cannot survive in most intensely managed landscapes and seascapes. Protected areas act as benchmarks against which we understand human interactions with the natural world. Today they are often the only hope we have of stopping many threatened or endemic species from becoming extinct (Dudley et al., 2006). Current protected area systems are experiencing a deepening crisis associated with four factors: (i) the pristine areas are degrading around the world and converted to other uses as human populations expand, become more prosperous, and consume more natural resources (Balmford, Green, & Jenkins, 2003). Most of what remains as natural habitat is accounted for by protected areas, and the latter may be expected to account for almost all remaining relatively undisturbed habitat within the next few decades as unprotected habitat succumbs to development (Watson, Dudley, Segan, & Hockings, 2014). (ii) Protected areas grow in importance as oases of biodiversity, reduced government financing world-wide erodes their capacity to perform critical ecological functions and injunction (Eagles, 2003; Watson et al., 2014). (iii) Increased operational reliance on visitor-based revenue despite the potential of increased visitation to further undermine the vital ecological functions of protected areas (Eagles, 2003). Most of this income is allocated to the management and satisfaction of visitors rather than environmental stewardship. (iv) Parallel growth in demand for rural outdoor and nature-based recreation from increasingly urbanised societies (Frost, Laing, & Beeton, 2014; Tribe, 2016).

Protected areas and nature protection in developing countries are often seen as a luxury since there are generally few opportunities to earn income from them (Tisdell, 1999). In addition, governments in developing countries are finding it increasingly difficult to provide sufficient funding for the maintenance of their national parks (Krug, 2000).

Tourism development can put pressure on natural resources when it increases consumption in areas where resources are already scarce. Negative impacts from tourism occur when the level of visitor use is greater than the environment's ability to cope with this use within acceptable limits of change. Water, and especially fresh water, is one of the most critical natural resources. Uncontrolled conventional tourism poses potential threats to many natural areas around the world. It can put enormous pressure on an area and lead to impacts such as soil erosion, increased pollution, discharges into the sea, natural habitat loss, increased pressure on endangered species and heightened vulnerability to forest fires. It often puts a strain on water resources, and it can force local populations to compete for the use of critical resources.

Studies focused on perceptions of the environment have found that tourists generally have limited perception of wear and tear impacts but are more sensitive to the direct impacts resulting from litter, human waste, and vandalism etc. (Lucas 1979; Marion and Lime 1986:229). More recent work (Hammitt, Bixler and Noe 1996:60) showed that tourists are still most observant of the direct impacts of other participants (trail use for more than one activity, litter, etc.) but that they may also be growing more aware of other impacts on the environment (like trail erosion). The suggestion of increased awareness and sensitivity to environmental impacts over the past decades (Lucas 1985; Hammitt et al 1996) highlights this issue in planning for a sustainable tourism industry into the future.

Tourism for recreational purposes in Wild Areas includes activities such as walking, observing, camping, sailing, among others; In recent years, it has increased worldwide. Planning must be rigorous to achieve conservation objectives. It is intended that visitors have a quality experience and can meet their expectations. For this it is necessary to establish load capacities in public areas. (McColl & Lime, 2001; Tuyunen & Petrov, 2009).

The term “protected area” (or “park”) embraces highly diverse entities ranging under the nomenclature of the International Union for the Conservation of Nature and Natural Resources from highly restrictive Strict Nature Reserves: I Strict protection (Ia) Strict nature reserve and (Ib) Wilderness area, II Ecosystem conservation and protection (National park), III Conservation of natural features (Natural monument), IV Conservation through active management (Habitat/species management area), V Landscape/seascape conservation and recreation (Protected landscape/seascape), VI Sustainable use of natural resources (Managed resource protected area) (Dudley, 2003; UICN, 2016). Our present working emphasis is on Conservation of natural features (III), which are characterised by protected areas are generally centred on a particular natural feature, so that the primary focus of management is on maintaining this feature, whereas objectives of Ia are generally aimed at a whole ecosystem and ecosystem processes. We focus in the Cuyabeno Fauna Production Reserve (CFPR) which owing to sufficient accessibility and amenity attract high levels of visitation.

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II. MATERIALS AND METHODS

Materials

The Cuyabeno Wildlife Reserve (Spanish: Reserva de Producción Faunística Cuyabeno), is one of the most important protected areas in Ecuador (Balslev, Valencia, Paz y Miño, Christensen, & Nielsen, 1998; Valencia, Balslev, & Paz y Miño, 1994). It is located in the northeast of the country, in the Putumayo Canton in the Sucumbíos Province and in the Aguarico Canton in the Orellana Province. It has a 603,380 ha lowland tropical rainforest in the Amazon region of Ecuador with some of the highest biodiversity on earth. The altitudinal that goes from 200 to 280 above sea level. The average rainfall is 3000 mm / year. The average annual temperature is 24ºC. In the RPFC inhabit the indigenous nationalities Siona, Secoya, Cofán, Kichwa and Shuar. The Cuyabeno Wildlife Reserve is an important nature reserve in Amazonia with rather unusual ecological characteristics. Located at the foothills of the Andes, it is different from any other Amazon protected area in the world.

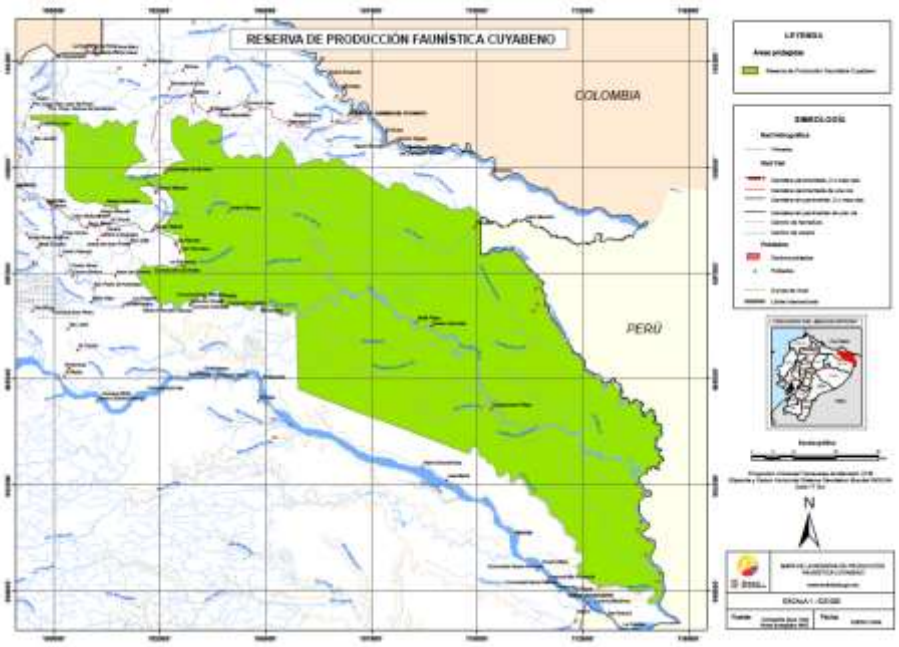

Fig. 1. Wildlife Reserve the Cuyabeno location map.

Methodology

Our study of the environmental impacts of tourist in Cuyabeno Wildlife Reserve, Ecuador, is designed to respond to the need for methodological innovation. The result is a multi-method natural experiment. The beginning of tourism in Cuyabeno Wildlife Reserve is naturally occurring change that allows for the population to be compared between a pre-tourism, and post-tourism time-frame. The setting also allows us to separate control towns that did not experience the change in conditions from those that did. The ideal data would be longitudinal, but due to a number of issues and characteristics regarding the populations, such methods were nearly impossible to implement. Thus, cross-sections from different periods were used to compare the effects of the natural experiment. This method still provides for a clean comparison of pre-tourism baseline survey data with post-tourism survey data and also a comparison of affected towns with control groups of towns that are unaffected by the change in conditions.

This natural experiment was part of a multi-method study in that it includes qualitative and participatory elements such as direct observation in public use area, interviews and stakeholder focus groups. The qualitative elements were used in understanding stakeholder concerns, designing the interviews, providing context and nuance to the quantitative data, and aiding in data interpretation. Following Bennett et al. (2012), this project was based on the application of interviews associated semi-structured were designed to measure five types of means, categorized as geological, aquatic, vegetable, fauna and social. The main environmental impacts of tourist presence were determined, classifying them into critical, moderate and low levels Table 1. The main impacts identified are presented in a table, identifying the environment, appearance and intensity of impact.

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Table 1. Qualitative Assessment Environmental Impacts.

Critical	Those that are incompatible with conservation. His presence would raise the prohibition of use or substantial modification of the system of visits.
Moderate	Those that can be compatible with conservation, after adoption of management measures.
Low	Compatible with conservation and susceptible to natural regeneration in the absence of tourist use.

III. RESULTS AND DISCUSSION

The data obtained on the quality of the environmental impacts of tourist in Cuyabeno Wildlife Reserve are shown in Table 2.

Table 2. Qualitative Assessment Environmental Impacts.

	Mean	Aspect	Impact	Affectation
Environmental impacts	**Geologic**	**Erosion and Compaction**	Lost organic soil	Moderate
			Increase in runoff	Critical
			Deterioration of substrates in flooded areas	Critical
			Decrease in macro-porosity	Moderate
			Alteration to edaphic fauna	Moderate
		Modification of trails	Widening of trails.	Low
			Appearance shortcuts and new trails	Low
	Aquatic	**Water pollution**	Alteration physical and chemical conditions.	Critical
	Vegetal	**Disturbance**	Change plant populations	Moderate
			Decrease in cover and plant biomass.	Low
			Introduction and dispersion of allochthonous flora	Moderate
			Root mismatch	Critical
	Fauna	**Disturbance**	Modification of Habitat	Moderate
			disturbance	Critical
			disturbance in food areas	Moderate
			conduct alteration	Moderate
		Introduction allochthonous fauna	Modification micro-ecosystems.	Moderate
	Social	**Decrease quality visit**	Litter	Moderate
			Massification and Conflict between users	Moderate
		Impact local communities	Activities	Moderate
			Food	Moderate
			Language	Critical
			Clothing	Critical

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The main impacts identified in the areas of public use of the Reserve are affections geological (Increase in runoff and Deterioration of substrates in flooded areas). Aquatic (Alteration physical and chemical conditions). Vegetal (Root mismatch). Fauna (disturbance); and Social (Impact local communities).
The environmental impacts of the geological environment with critical affectation correspond to increase in runoff and deterioration of substrates in flooded areas. The effects are caused by lack of maintenance on the trails and policies on aspects of carrying capacity. Water pollution is occasioned by canoes that transport tourists, outboard motors release fuels and oils that end up in the water bodies of the reserve. The correct way to combat this problem it should be based on the change of management policies of the reserve and require tour operators and indigenous communities to use environmentally friendly engines. In the mean vegetal there is a critical affectation to the roots, the high traffic of tourists has caused its dehulling. The management plan of the reserve does not estimate a load capacity of tourists in public use areas, which allows controlling their use. At present, the tourist carrying capacity is being marked by the lodges, according to the capacity of their beds. In recent years the sighting of fauna has been reduced significantly, the problem lies in the acoustic disturbance produced by tourism activity, the tourists do not perceive the change since most visit the reserve only once. The impacts of tourism on the social aspects of indigenous communities affected language and clothing. The presence of tourism began to give economic returns to the communities. This motivated the indigenous people to leave their villages and move to the city to discover something new. The rejection and mockery perceived by the natives in the city forced them to change their clothes and speak a new language the Spanish. Currently, only one family speaks the native language of the Siona communities.

IV. CONCLUSION

In the Cuyabeno Wildlife Reserve The tourist activity not only affect the physical environment, but living organisms and their natural cycles are also altered. Ecosystem disturbance can lead to destruction in the long term. Poor building regulations and land use planning can also alter the aesthetic appeal of the local environment. This puts a strain on both the natural environment and indigenous structures of the area. The indigenous communities have been severely affected in aspect as clothing and language. The trails present problems of erosion and compaction due to the high traffic of tourists, causing runoff and loss of organic soil layer. The roots of vegetal species are severely affected by the high traffic of tourists on the trail. The contamination of the water is critical is observed remains of fuels in the water bodies. The management in the Cuyabeno Wildlife Reserve is today especially related to the use for tourism purposes rather than for the environment conservation. Moreover, it is necessary recommended that the managers and administrators of the Cuyabeno Wildlife Reserve act on the impacts and avoid the degradation of the protected area.

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