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Landscape patterns for emerging mountainside ecotourism

Case study of Monterrey and Lejanias-Mesetas

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Abstract: Characterized by rich natural resources, pristine and unspoiled landscapes, Colombia has never fully developed its eco-tourism potential mainly due to a complex interrelation of factors, such as geographic and eco-systemic complexity, a deficit in infrastructure, state oversight, social-economic issues, and, to a large extent, its five-decade armed conflict. Progress and development have mainly been focused on the Caribbean coast and its main ports and some specific spots in the mountains, where the main capital and other important cities are located, but the plains (llanos) and the jungles, particularly remote regions, have been marginalized and prioritized less, having little or non-existent infrastructure. The primary focus of the study is the Piedemonte llanero of the eastern mountain ranges, located in the Orinoquia region. The framework of this research will discuss the theoretical approach for ecotourism and the different elements used for the definition of landscape patterns: the corridor, and those to be applied in terms of policies to the areas of study. This paper, in particular, aims to examine the landscape component in relation to the environmental factor of the areas in focus which are Monterey, Casanare and Lejanias, Meta. After some visits, recognizing these as attractive study cases, and a detailed planimetric study, the importance of the landscape in relation to the existing series of spatial patterns of Piedmonte llanero, where ecotourism could become an opportunity for the local communities along the jungle's marginal road, a transnational connection, is recognized. The first case to be studied is the whole hydrological complex of the Algarroba waterfalls in Monterey and the Guejar River in Lejanias, Mesetas, describing, characterizing and comparing two nodes of interest along the route. After this research, a conclusion is drawn to compare and highlight the role of the different landscape patterns and the possibility to use other tools in the planification of the territory.

1. INTRODUCTION

To research ecotourism along the foothills of the plains and jungles, assessment of the potential between the Casanare River and Guayabero River, and the strategy for their use, a group of researchers has carried out fieldwork along the Colombian hillsides analyzing four different aspects: economic, social, landscape, and infrastructure, and evaluating their possibilities for the development of ecotourism regarding those aspects.

In Colombia, the effects of war have permeated different areas of the country and the various lives of the people. Consequently, the people's lack

of knowledge on the relationship of the negative effects with the territories and landscapes results in some territories remaining unexplored or unknown.

This lengthy war has displaced a huge number of people from rural areas to urban centers, driving the population of the cities to increase tremendously. Colombia's population has congregated to only five cities with the capital having 8 million people and with the four other cities having one or two million inhabitants. These populated cities are mainly located along the Caribbean coast and the Andean mountain range, but 50% of Colombia, the marginalized territories, is in the plains, jungles, and a great portion in the Andean mountain ranges. The majority of these city inhabitants are detached or at the least do not place so much importance on issues concerning the environment or ecosystems. For example, the Sumapaz National Park, an area no more than 30kms from the main capital, has been one of the areas of concentrated conflict and definitely has suffered environmental consequences, among others.

The zone that is the focus of this study has two boundaries which are the Andean mountain ranges and the jungle marginal pathway. Few low- density human settlements exist in this marginal part of the country.

Ignorance about the natural wealth leads to missed opportunities, and as the conflict has reached an end, it is crucial to become aware of biodiversity, capacities, landscapes, and the whole range of possibilities within the territory.

2. ECOTOURISM

2.1 Different authors and definition

The term ecotourism started with sustainability and an "eco" or "bio" wave in the '70s, with the local communities associating it with sustainable methodologies that are friendly to the environment. Analysis of this term from the perspective of different authors will be discussed. Williams & Fennell defined ecotourism as: "Natural resources-based tourism that focuses primarily on experiencing and learning about nature and that is ethically managed to be of low impact, non-consumptive and locally oriented" (Fennell & Malloy, 1999; Williams & Lew, 2014). In the Latin-American context, Ceballos-Lascurâin (1987) designed the Mexican program of ecotourism. His definition for ecotourism is: "travelling to relatively undisturbed or pristine natural areas with the specific objectives of studying, admiring and enjoying the scenery and its wild plants and animals, as well as any existing cultural expressions (both past and present) found in these areas.".

On the other hand, Agüera (2014) mentions six aspects: tourist preferences, different activities, destinations, infrastructure, eco-touristic guides, and the stakeholders (accommodation, transportation, restaurants, etc.) to be taken into account for ecotourism. For ecotourism to have a considerable impact on the social wellbeing of the local communities, improvements in infrastructure, healthcare, transportation, and education must be undertaken. Other authors such as Wearing and Neil (2009) assert that "The mission of ecotourism is fostering mutual respect and knowledge about other cultures, by establishing relationships between the communities and tourists, that benefit them all". Visitor centers, educational spaces, signed routes, and publications that clearly report on the features of the locations and activities are necessary elements for ecotourism (Agüera, 2014).

For those reasons, ecotourism necessitates planning to firmly establish how to be guided by the carrying capacity of the ecosystem, where the negative impact and their entropy could be reduced to a minimum and thus make the right cultural exchange. It is important to acknowledge intercultural factors, conservation, and respect for natural resources by the local inhabitants as well as of the floating population.

Another author to mention is Monica Perez-las-Heras from Spain whose publication *Guía de Ecoturismo de Mónica Pérez-de-las-Heras (*Pérez de las Heras, 2003*)*, talks about ecotourism as a tool for the conservation of nature in countries where there is already a strong awareness of the great potential of their landscapes and natural resources. The basic requirements are:

- Maximum tourist satisfaction
- Minimum negative environmental impact
- Maximum respect for the local culture
- Maximum economic benefit for the country

To fulfill these requirements, the carrying capacity of the place must be calculated. The ecological aspects to be considered are environmental impacts, the number of persons for each activity, the infrastructure, the equipment, and the services. This carrying capacity has three dimensions:

- Territory: ecosystems that are present and their risks
- Quantity: knowing the maximum number of persons that could be in the place, limiting them as much as possible
- Climate: understanding the weather, the seasons and the cycles knowing what are the right moments to go and the time to leave the ecosystem to recover

For the local population, the obvious benefits are the following items: foreign currency, jobs, national income, economic diversification, and the equipment and facilities that could be used by the local and floating population. According to Pérez de las Heras (2003), these are the considerations for selecting the place:

Endemic or rare species
Physical aspects
Biodiversity
Landscape
Weather
Exceptionality of the place
Socioeconomics aspects
Proximity to an urban center
Accessibility
Compatibility with existing activities

Those aspects have to be taken into consideration in the practice of ecotourism. From the article *Ecotourism and the development of indigenous communities: The good, the bad, and the ugly*, the authors, Coria and Calfucura (2012), focus on four aspects for the implementation of ecotourism. These are:

- Direct economic benefit for the specific population and a fair distribution
- Safe ownership of the land by the local community
- Promotion of social and political justice
- Possibility of influencing and having an impact on territorial decisions

Likewise, some experts have realized the importance of having protected areas that are different than the rural ones for farming. Quoting the text,

*"ecotourism can benefit the conservation of biodiversity and the surrounding local communities if it is at small scale and locally operated or owned" (*Coria & Calfucura, 2012*),* Coria and Calfucura (2012) show the importance of four key factors that ecotourism must have for capital redistribution to be perceived by local communities as a real effect on equity.

2.2 Synthesis and Definition

Ecotourism as defined by different authors has its essence related to the environment, which is the foundational element of this type of alternative tourism. Its primary objective is appreciating, understanding, and enjoying the biodiversity of plants and animals, thus strengthening the link between humans and nature. The possible activities should be contemplation and participation in the culture of the local inhabitants, activities that are pro-conservation and have no, or at least minimum, impact on the environment.

The presence of biodiversity is equated with rich natural resources. The native species or endemic flora and fauna are the main aspects considered to evaluate the location or area. In this sense, maintenance and conservation, as well as the carrying capacity of the ecosystem and the weather conditions become crucial in ecotourism. For this, the planification of the territory must reveal the boundaries and the different types of soil used; to have clarity about the areas destined for conservation, the links between ecosystems, and the possibilities for people to have agricultural activities for maintenance, should be considered.

Sustainability is implicit in the idea of ecotourism and should be the basis to understand the case studies. Another aspect worth discussing concerning the research is the scale of the work: the scale of the landscape and the place itself. Additionally, tourist experience and satisfaction, if achieved, could lead to the maximum gain for the communities and associations present in the territory.

In this type of tourism, the processes of learning and the wide range of essential information that locals engage in would create a difference in its sustained success. Nevertheless, visitors must also have the necessary environmental education, knowledge about the local ecosystem and its unique attributes, to understand the importance of respecting the place.

A scientific alliance between the different disciplines related to the environment and the existing indigenous and ancestral cultures must be a priority. It is necessary to have the right respect for ancestral knowledge as a basis of local culture. The work with local communities is important. The economic benefit that results from this work could sustain continuous improvement.

Another important issue that must be weighed is the redistribution of land, especially in the Colombian context. Up until this current time, the same powerful families have had claim over a vast amount of territories, thereby provoking inequality and resentment. The role of the Colombian National Lands Agency is critical to ascertain the return of property to its rightful owners, assuring overall equity.

Ecotourism has to complement the local economic activity in the area. This alternative to traditional tourism would not be the only way to gain employment. Subsistence farming ("pancoger") supports most of the communities, so regulations on protection and farming have to be balanced.

This research has consolidated its own definition that ecotourism is a type of tourism based on real experience with nature, resulting in its preservation developed through the realization of the environment's value and importance.

In sum, the environmental, social, and economic dimensions are interrelated in their roles to guarantee the sustainability of the territory, benefitting the local community by acknowledging their identity, their culture, and history, all with the ultimate purpose of searching for a collective goal: the communities' overall good and the protection of the environment.

3. LANDSCAPE PATTERNS

The pattern of the landscape gives us the possibility to understand the physical background. Based on the definition of Troll (1971), "Landscape is a complex ensemble formed by the weather, water, land, plants, animals and cultural phenomena". Also, "we can find the unities of landscape, where the conditions are homogenous".

Pillet and del Carmen Cañizares (2010) describes the unities of landscape in the book as, "Some areas with a particular physiognomy that could be easily perceived as different and that have visual differences where we can see a specific combination of elements, such as relief, hydrologic disposition, real state property and the structure of the land property, systems of human settlements, infrastructure, soil uses and visual configuration… Taking into account the similarities and analogies the territorial unities are organized by space-types and each of them has a landscape–type". From those two approaches, the case studies will be analyzed based on those components and some specific unities of landscape related to the pattern of the corridor will be examined.

Additionally, in Forman's book *Land Mosaics*, the case studies focus on one of the landscape pattern categories, named river corridor. In both study cases, the riparian corridor is one of the most important patterns and the unity of landscape is highly observable. Quote, "The distinctive patterns are what we see in a landscape. They result from four dynamic processes: hydrologic flows, particle flows, animal activities and human activities. These processes are now presented separately, but in the landscape are highly intertwined" (Forman, 2014). This statement summarizes the elements discussed in our case studies and examines the significance of the pattern in those hillside landscapes.

To understand the geographical context, this study will discuss the elements of this pattern, particularly the river corridor, that plays a crucial role in the spatial organization.

- Water structure
- Historic meanders
- Type of river
- Place in the mountain or plain
- Management of the flood level
- Limits, boundaries and their width
- Riparian forest: characteristics
- Effects of the river depending the seasons
- Landscape changes over time

In the following case studies, Tua and Guejar rivers are riparian corridors that are necessary to inform a general approach and understanding of a specific place.

Those characteristics are going to inform the next description of the two study cases, where ecotourism should be a great opportunity to be put in place, as defined before.

4. STUDY CASES

The two case studies are located in the Piedmonte llanero (foothills of the plains) and have comparable characteristics. The first one is part of the Casanare department, the most important Colombian department for oil exploration. The second is in the Meta department. Both of these locations are part of the Llanos (plains) and the Orinoco regions and are ecosystems that belong to the East gradient of the Andean mountain chain. Both zones have similar altitudes above sea level.

The characteristics under discussion are related to their tourist-attraction potential, landscape, and other features that could transform these sites for ecotourism.

4.1 Monterrey Casanare, Vereda La Tigrana

Weather: warm and humid ("perhumedo"); Temperature: 27 degrees; Relative Humidity: 80 to 85%; MASL: 500m (see *Figure 1*, The altimetry where Monterrey is shown as a rectangle); Pluviometry: 3000 to 4000mm; CorpOrinoquia: national entity that regulates this zone.

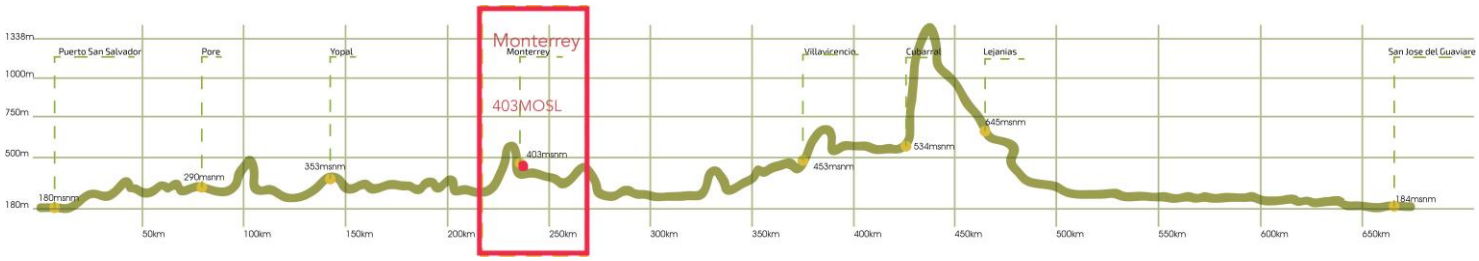

Figure 1. Altimetry of the route: Monterrey. Source: Research group.

In Monterrey, oil exploration is a major economic activity, and some of its viaducts traverse the two case study areas. 10% (SIAC, 2014) of the territory would have an important impact on climate change. Those areas are related to the higher mountains: El Porvenir, in the municipality, nearby the urban pole city, and related to the oil storage belonging to the Ecopetrol infrastructure. In the next figure shown, more than 60% of this territory still has the possibility to be explored and exploited for its hydrocarbons (red hatch), thereby actions posing considerable risks for the general habitat. The red spot is the location of the most important streams according to the general area of Monterrey municipality.

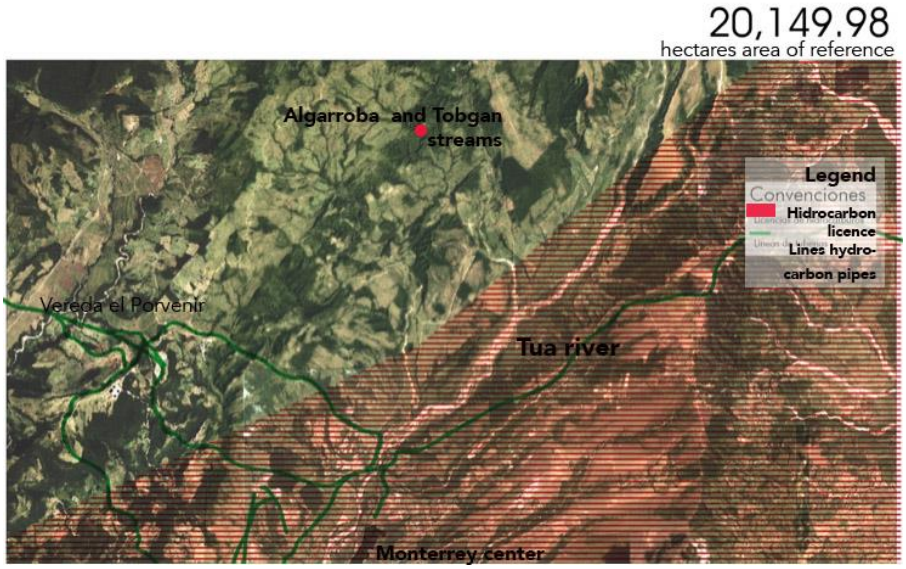

Figure 2. Plan of Monterrey, petrol exploration in red hatch. Image base from google maps, data SIAC. Source: research group

4.1.1 Principal Ecological structure - Protected areas

Reserva forestal protectora de la cuenca del rio Túa (Protective forest reserve of the Túa river basin) is the only area that is protected. This is limited to only 6,680 hectares of the municipality, following regulation No. 045 from 2008 (Secretaria de obras publicas Gobernacion de Casanare, 2010). Even with the protective regulations in place, the local people still use the river in this place named Vereda la Tigrana for the extraction of raw materials for construction.

From the planimetry figure of the wood forest, 28% or almost one-third of the territory has this wooded ecosystem. The woods are mostly localized in the higher-level part. The area corresponds to the low multilayer forest with a great variety of arboreal and bushy species, and with a high degree of deforestation. The predominant trees have a trunk diameter of 20 to 50 cm. This area is located in the higher parts of the municipality, nearby the riparian wood, and there exist some patches of secondary forest that have been cut down for grass and cultivation (*"Un bosque multiestrato bajo, con gran variedad de especies arbóreas y arbustivas, con un alto grado de deforestación, en donde predominan árboles con DAP entre 20 y 50 cm. Estas áreas se presentan hacia las partes altas del municipio en zonas aledañas al bosque de galería y algunos relictos de bosque secundario que se ha venido interviniendo para formar zonas con pastos y algunas áreas con cultivos"* (Jaramillo, 2013)).

From the Development of Tourist Plan of the government of Monterrey, the local government acknowledges that the place has some resources, such as the flooded savannah, the wetlands, the moriches (palms), fauna, and a great number of birds (Alcaldia municipal, 2016). The objective of this plan is to make a strategic link between the different biomass wood and the protected zone because of the importance of water, rivers, and water sources.

4.1.2 Hydrological system

The importance of the body of water is all the more highlighted because of the presence of the mountain ranges and hills. The case studies focus on La vereda la Tigrana where the springs of Carrabalera and Algarroba are located at the red spot, and the bigger river is the Tua river, as shown in *Figure 3*, below.

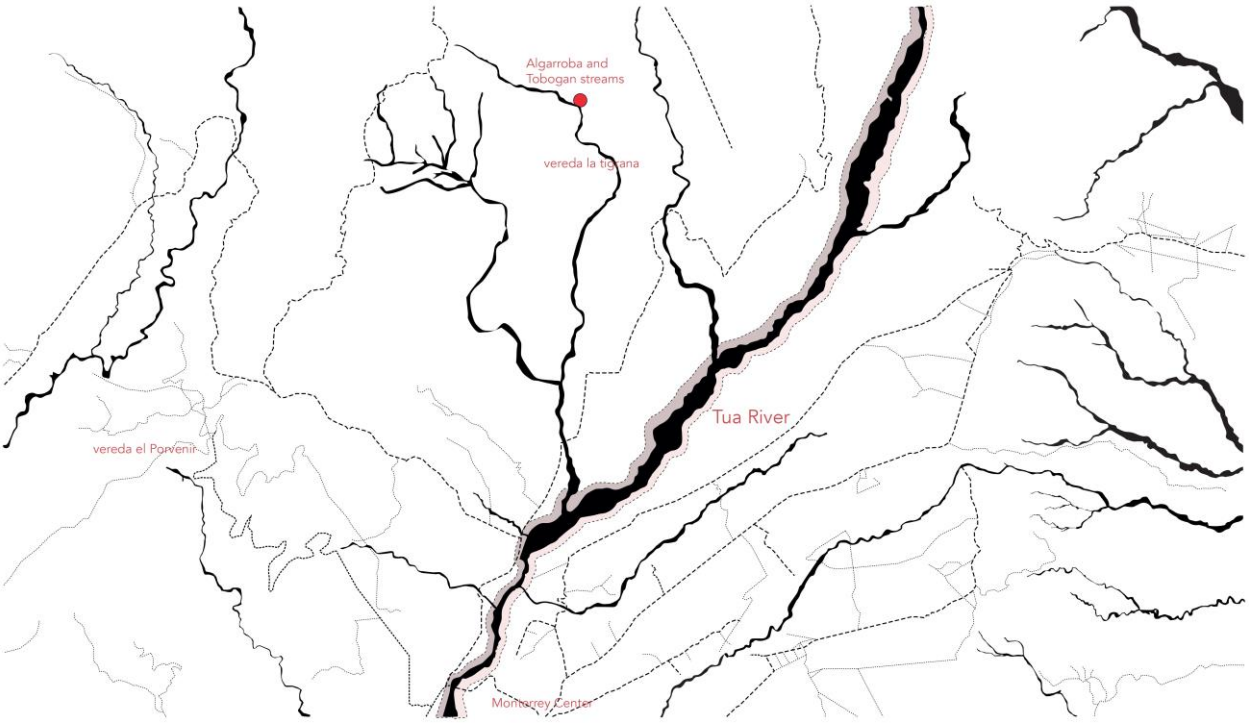

Figure 3. Hydrologic plan of Monterrey. Image base from *google maps*, data SIAC. Source: research group

The Tua River is the most important one in this zone. At this altitude, this river is braided. The more obvious characteristics of this braided zone are the number of beaches in between the arms all along the river and their shallow depth. For the local people (Regiomontunos), people who live in the Monterrey area, the rivers are a clear mark of their culture, because they use this beachfront for the December festival, when the drought starts.

86% of the land area has suffered soil degradation caused by erosion. There are various reasons for this phenomenon, such as agricultural production with no real restrictions, and the strong winds and rain characteristics of the piedmont, having an effect on the sudden growth of the upstream volumes. Other aspects are the high inclination of slopes, which causes erosion, and the high rate of earthquakes in this zone.

Regarding the ecosystem and biodiversity, this place is a piedmont from the united eco-geographical features of the Orinoco (Rangel-Ch & Minorta-Cely, 2014). Because of different levels of altitude and the whole range of slope, the ecosystem is different per area. This biodiversity increases, specifically at the higher elevation, because of the union of different ecosystems as shown in *Table 1*.

Table 1. Tua River biodiversity and wealth.

	WEALTH				
Taxonomic group	in Colombia	In the Orinoco Basin	Porcentage (%)	In the Tua River	porcentage (%)
Amphibian	791	48	6	17	35
Reptiles	577	107	19	34	32
Birds	1897	475	25	111	23
Mammals	500	198	40	78	39

Source: Tourism Plan made by the Municipio de Monterrey table made by Acosta-Galvis (2015); Castaño-Mora et al. (2004); Uetz (2015); Ramirez-Chaves & Suarez-Castro, (2014); Solari, Muñoz-Saba, Rodriguez-Mahecha, Defler & Ramirez-Chavez (2013); Cemex (2002); Monterrey (2004).

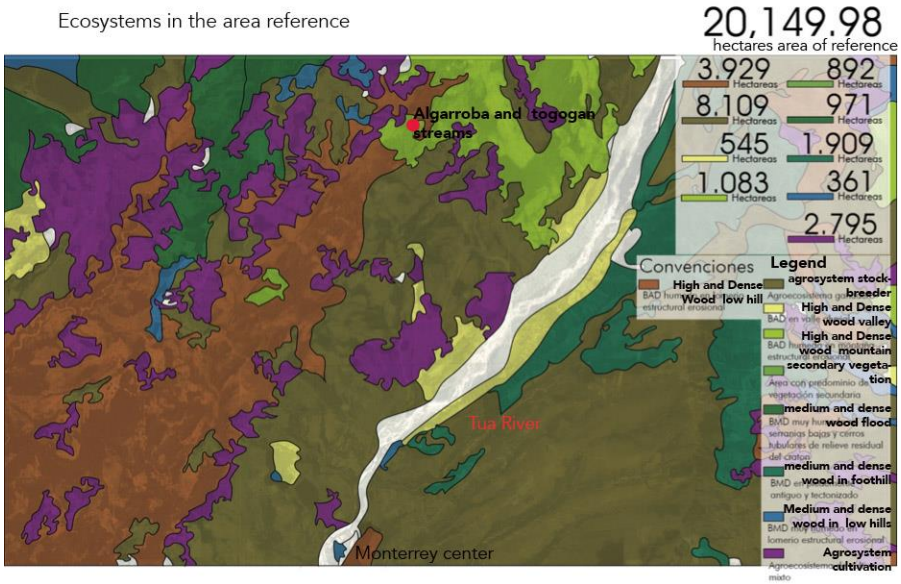

Figure 4. Ecosystems of Monterrey. Image base from google maps, data SIAC. Source: research group

30% of this area is pasture for stockbreeding, shown as the olive-green color in *Figure 4*. This is an alarming condition; pastures are at risk, especially in places of water and biodiversity where the water and landscape are so important for the biodiversity, but currently, there is no tool, and no regulation to protect this area. More than half of the area, approximately 54%, including the 30% for stockbreeding, is dedicated to agricultural activity. As seen in *Figure 4* if the olive green and the purple patches shown in the plan below are added together.

Despite this high percentage of 54% for stockbreeding, etc., the whole system has great potential for ecotourism in terms of flora and fauna that exist in this special place.

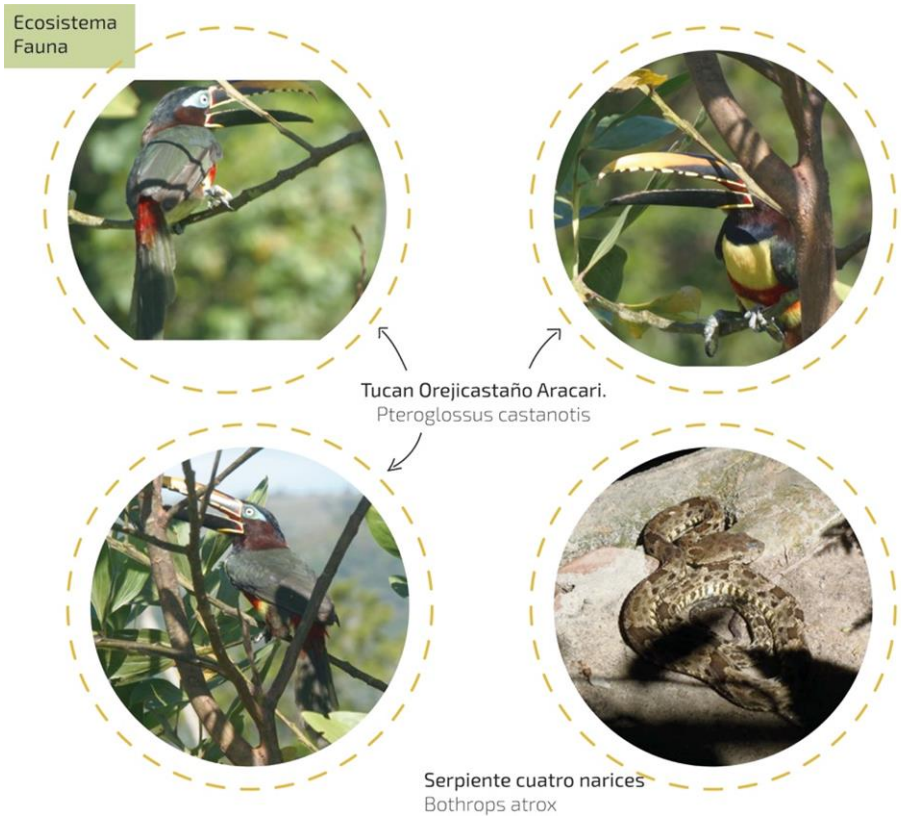

Figure 5. Representative Monterrey fauna. Source: research group

Although the local government knows about the rich natural resources (see *Figure 5* and *Figure 6*), there are no measures for their protection.

4.1.3 Landscape features

Algarroba and Tobogan streams and their riparian forest, Tigrana vereda

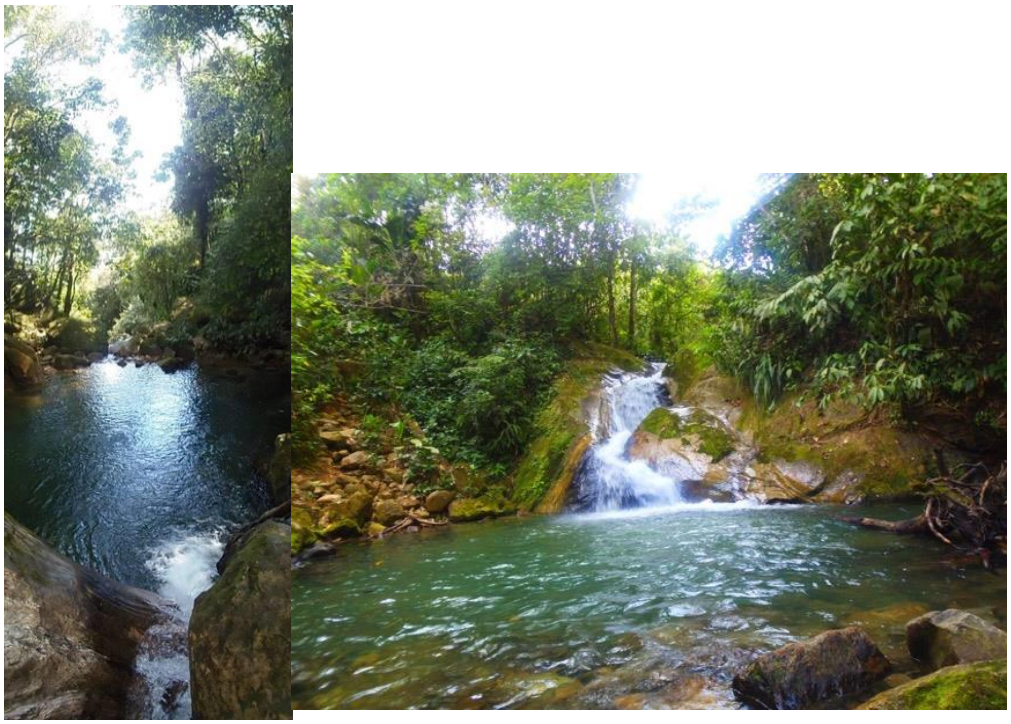

Figure 6. Algarroba and Tobogan Stream. Source: research group

These spots are constituted by exuberant vegetation and great slopes. Sometimes, Algarroba and Tobogan streams (*Figure 6*) are not accessible. They also have very dense forest and a lot of water sources that are located in private properties.

Túa River and its riparian forest.

Alongside the river, different activities are conducted by the locals (Regiomontunos); festivals are held in December and other water-related activities during the year.

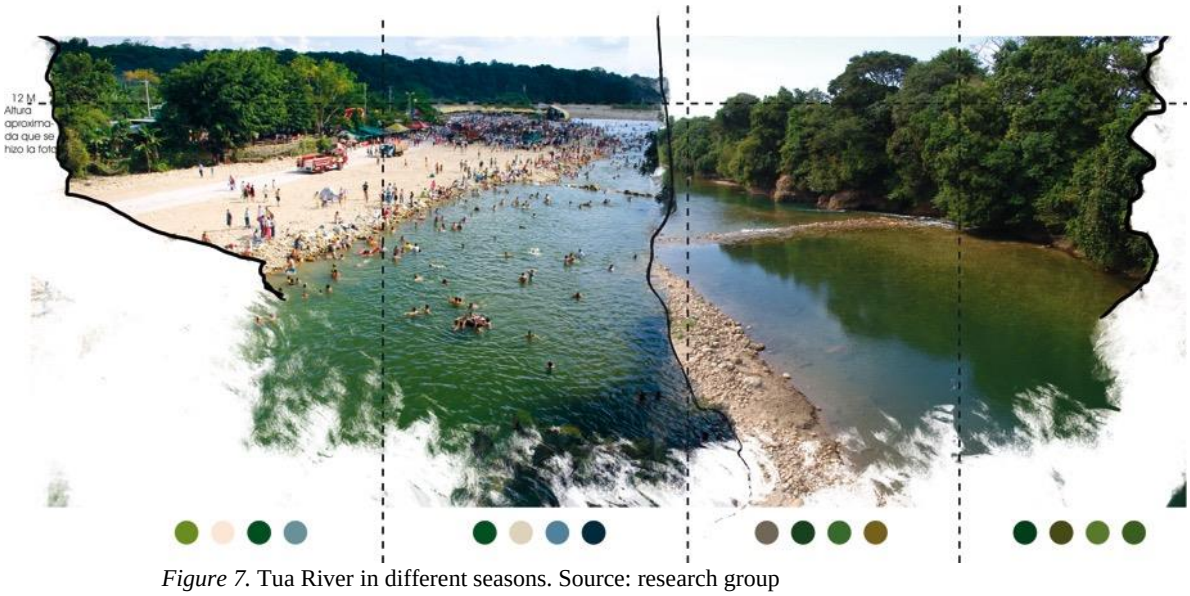

Figure 7. Tua River in different seasons. Source: research group

The water's distinctive color could give meaning and identity to the place. Even though this first case has a whole range of characteristics for being an important spot for ecotourism, the municipality has not done anything to plan and make policies according to this natural richness. In the making of policies,

the visibility and the use of natural patterns should be led by the water corridors and the links with other ecosystems. Those policies should be done prioritizing the biodiversity, noting the local population in particular know the value of this place.

4.2 Lejanias and Mesetas in the valley of Guejar, Meta

Weather: warm humid; Temperature: 27 degrees; Relative Humidity: 80 to 85%; MASL: 611m (an example is shown in *Figure 8*, marked with a rectangle where the peak of the mountain is the Natural National Park (NNP) Sumapaz). Pluviometry: 4000 to 5000mm (one of the rainiest places in Colombia); CorpoMacarena: the national entity that regulates this zone, it defined the environmental regulations regarding the NNP, La Macarena, an area of strong importance and relevance for being endemic in Colombia.

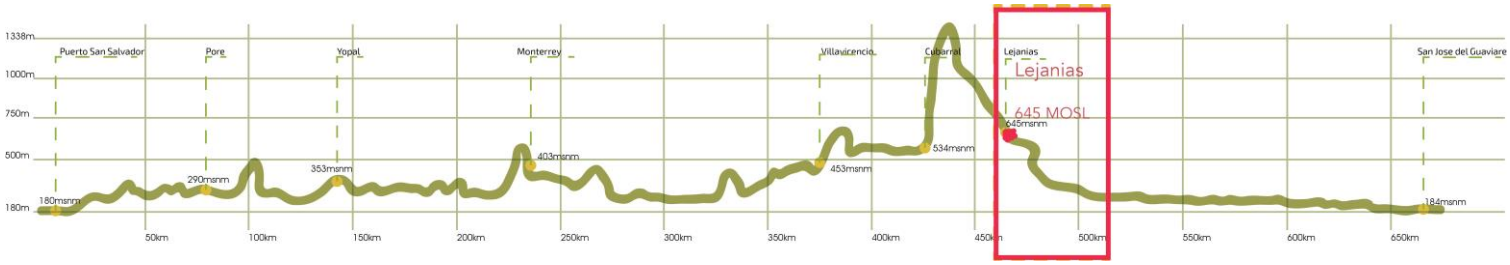

Figure 8. Altimetry of the route, Lejanias. Source: Research group.

4.2.1 Principal Ecological structure: Protected areas

The Lejanias municipality has been directly influenced by the NNP of Sumapaz. 20% of the Lejanias is part of the national park and 47%, an area named "Preservation of the east gradient", are protected from agriculture. The total area is 69% of the reserve, shown in *Table 2* (Alcaldia municipal Lejanias- Meta, 2012).

Additionally, complying with the master plan to protect the Ariari River that originates from the NNP of Sumapaz River, the Lejanias area has connections with this river, and the municipality sets aside a portion (31%) of its territory for agricultural production. See *Table 2*, below.

Table 2. Natural protected areas in Lejanias

Name		Category of protection	Regulation	Area/Hectares
Natural National Park Sumapaz		National Parks	Resolution No. 0153 from 06/03/1977	19,138.86
DMI Ariari – Guayabero- Preservation of the east gradient	DMI – AMEM (Area of Special Management of Macarena)	Decree No. 1989 from the 1st of September 1989	40,493.46	
DMI Ariari– Guayabero production Zone - Ariari Guayabero	DMI – AMEM (Area of Special Management of Macarena)	Decree No.1989 from the 1st of September 1989	22,211.31	

Source: environmental assessment CORMACARENA , taken from (Alcaldia municipal

Lejanias- Meta, 2012).

One of the most attractive rivers of the region is the Güejar River. This river has a unique color and a special rock formation. This zone is connected with the Guiana Shield and those special rocks could also be connected to this shield. This specific place, also known as Pools of the Guejar (Figure11) and the Quebrada Caño Lajon (Figures 12 and 13), is located 10 km from the human settlement in the vereda Miravalles.

On the other hand, the municipality of Mesetas is located along the side of the river Guejar. From the center of Mesetas, 10 km away, Canyon of the Guejar is found (Figure 14 and 15), a majestic place with a different landscape or areas for leisure activities that vary depending on the season. With rapids and different spots named by the local community, this part of the Guejar offers activities such as rafting. As mentioned before, this river has a singular colour, and along the side, it remains idyllic.

The Guejar River connects the mountain and paramos, plus la Serrania la Macarena. For this reason, it is an important location - a corridor where different places, NNP Sumapaz, Picachos, Macarena and Tinigua, are linked. The past government wanted to improve a path that could be put in place, focusing on ecotourism and following the historic stockbreeder's path.

4.2.2 Hydrological system

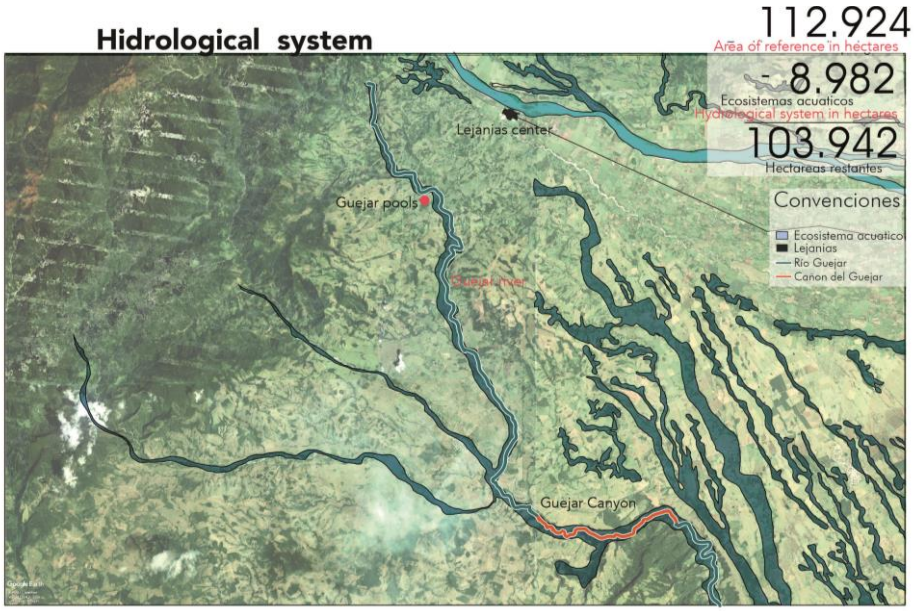

Figure 9. Hydrology of Lejanias. Image base from google maps, data SIAC. Source: research group

Besides Lejanias, both the Guape River, a braided river, and the Guejar River, a channel running at 611 m above sea level, are effluents of the Ariari River. It is important to note that any river in this place of the mountain being a braided river has the potential of flash floods. In the *Figure 9*, below, the red line shows the location of the Guejar Canyon and the hydrological system of this area, and a red spot which is the pools of the Guejar.

Rangel-Ch and Minorta-Cely (2014) defines this place as the *altillanura disectada*, based on the eco-geographic features of the Orinoco. In *Figure 10*, the different compositions of vegetation can be seen. Even if this area is more protected than the first presented (Monterrey), it is worth noting that more than 48% of the reserve is grassland for stockbreeding (olive green in *Figure 10*).

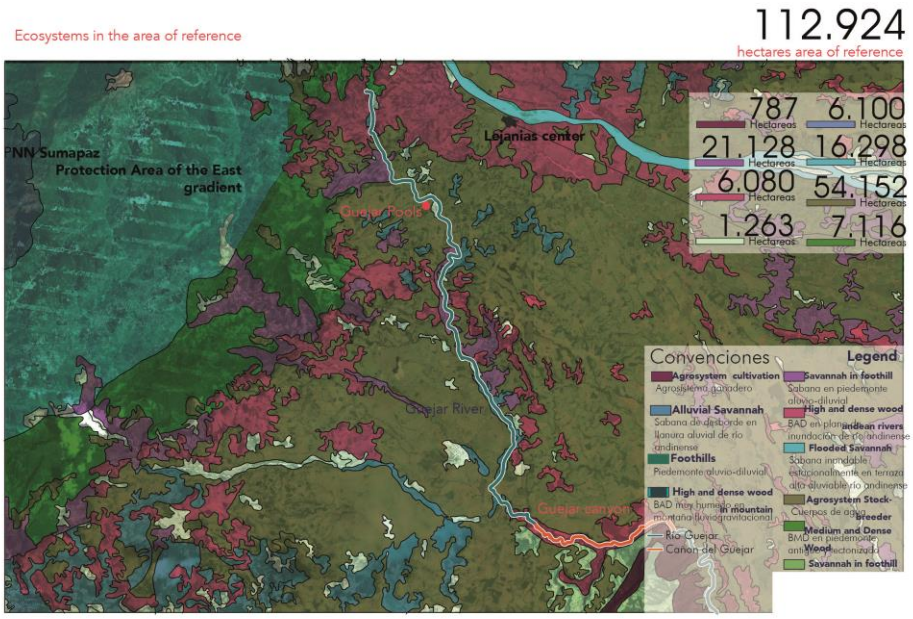

Figure 10. Ecosystem plan of Monterrey. Image base from google maps, data SIAC. Source: research group

4.2.3 Landscape features

In the vereda Miravalles, the Caño Lajon stream (*Figures 12 and 13*) and the Guejar River (*Figure 11*) with its riparian forest are situated. Its natural pools are pictured in *Figure 11* below. Nowadays the riparian forest has only 15 meters of protection from the river bank extending outwards. In the future, knowing the importance of this river, this protection could reach 50 meters to preserve the quality of the water. The communities that are living along the borders of the river have acknowledged its importance and are now developing a sort of ecotourism.

Figure 11. Natural pools of the Guejar. Source: research group

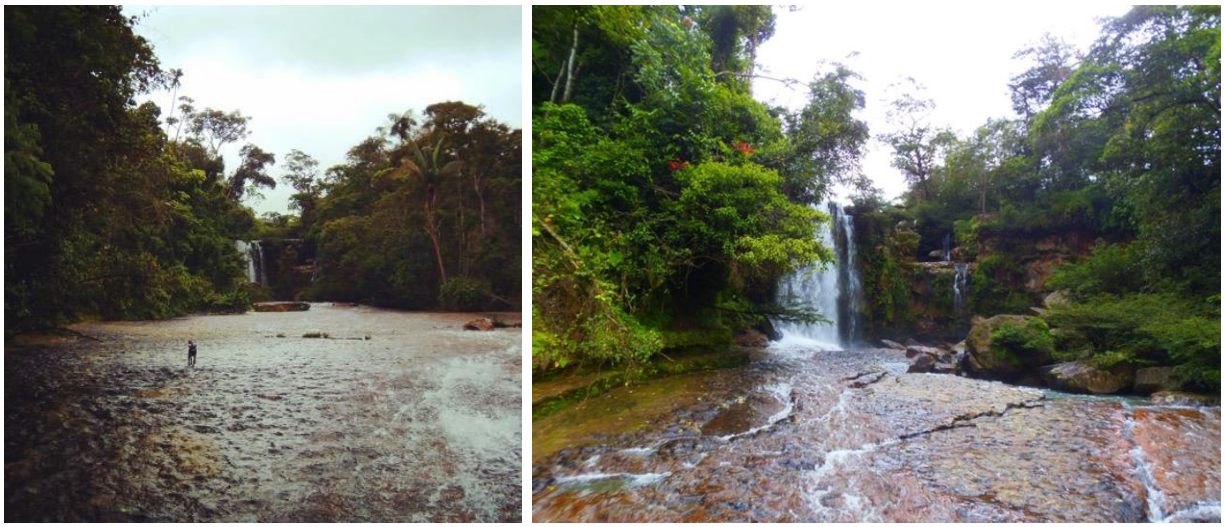

Figure 12 and 13. Caño Lajon Stream, Guejar. Source: research group

The second part of the Guejar River is near the human settlements of Mesetas, and the Guejar Canyon in the veredas Marina, las Rosas, Mesetas, and los Alpes, all along the river with just 10km of distance approximately from the banks. See Figure 14 and 15 below.

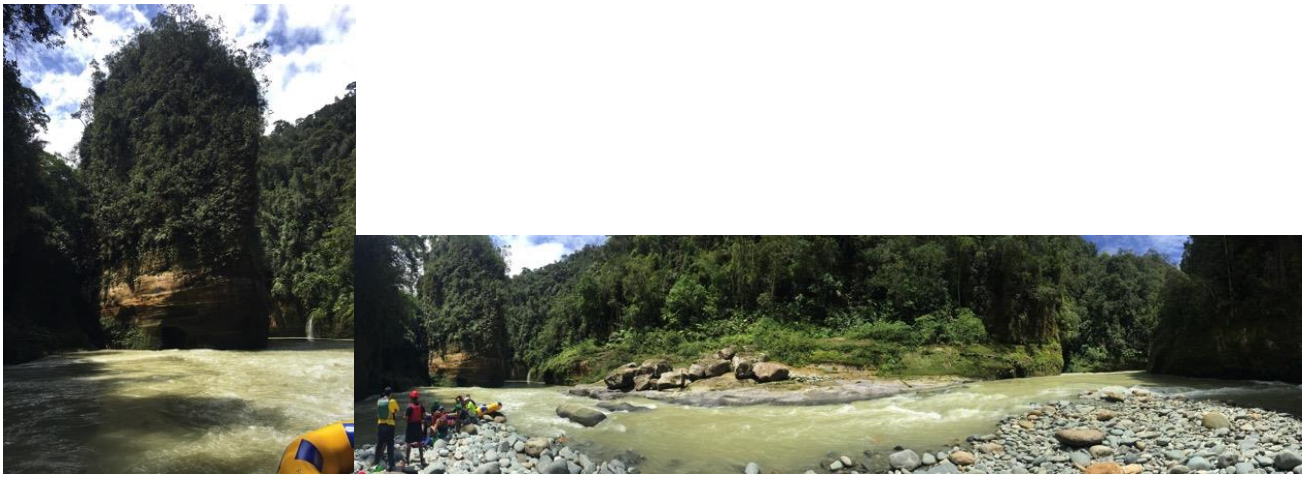

Figure 14 and 15. Guejar Canyon. Source: research group

In this second case, Guejar is privileged to be surrounded by the NNP, bringing very positive consequences in terms of planning and protection. Still, ecotourism could be put in place but has not been done. Some particular actions have been created, but again, the municipality does not have the strength to be more emphatic with policies of protection and with the diversity of the definition of ecotourism. People could become more in touch and conscious of the natural importance, and could use the landscape appropriately according to its patterns following the organization of ecotourism.

5. CONCLUSIONS

In both cases, Monterrey and Lejanias share the same characteristics because they belong to a piedmont region. Their ecosystems are similar, and their location in the mountain gives them a vantage point of panoramic views of the plains. These are privileged places to see the plains of the Orinoco and the jungle. Nevertheless, the state of protection and preservation of both cases

are opposing. For example, Monterrey is close to non-existent and Lejanias is privileged to have very important surroundings that make possible some protection to the area.

This research study underscored the importance of Monterrey and Lejanias in the overall geographical and environmental context of Colombia. The central government has not realized the immense impact of sound policies that could provide advantages: economic, environmental, and geographical among others, to these areas that it considers inaccessible and marginal. The planning of the municipalities and different zones of Colombia must take into consideration landscape features and their patterns, realizing the power behind those characteristics.

Only through understanding what those rivers represent in the framework of biodiversity, could those riparian corridors be taken seriously through the implementation of activities such as planning and regulations that could benefit everyone: the environment, communities, society, and the economy. Additionally, knowing the different elements that ecotourism has, the scientific communities could provide an accurate appraisal of this wealth.

There are some cultural issues that could impede the proper assessment of the ecosystem and the implementation of ecotourism. The challenges directly affect the conservation of the fauna, because the locals have had in their diet meats provided by animals, such as armadillos, deer, paca, chiguiro, urchins, and other animals indigenous to this region. Apart from this dietary obstacle, animals (bears, anthill, and iguana) are often struck by trucks used for oil transport that traverse the main road. This is testament to the little importance, or lack of knowledge, that people place on these animals for culture and for ecotourism itself. Following the principles of ecotourism, a balanced policy to maintain animals' wellbeing must be instituted.

In a vast country like Colombia, only a small number of people, usually the local inhabitants of the place in question, environmentalists, or tourists, really know these territories. Acknowledging the real value of these places from the patterns and structure could be a huge challenge, although, with the appropriate assessment of the context for opportunities related to the eco-touristic sightseeing or ecotourist attractions, an effective measure or tool for planning could be achieved. One thing to be added is the importance of the protection of the landscape itself, understanding the landscape patterns, and knowing how all are connected. Policies should be organised in different scales not only to protect the corridors and the hydrological structure, but also to protect what we see as a whole range of elements, so each one accomplishes its role; a protection for the landscape, sightseeing and also for the elements. For instance, rocks that give a special interest and of course, fauna and flora that contribute to an experience.

Raising awareness in terms of the Colombian piedmont environmental worth should be implemented on several levels. At the national level, it is crucial for policymakers and all people to understand the benefit of ecotourism through the protection of wildlife, and of the corridors, rivers, riparian forest, and links between the ecosystems. At the regional and municipal level, it should be taken into account the different landscape patterns for planning the zones accurately, the animal wellbeing for encouraging its protection, and the development of economic and recreational activities for creating a symbiotic connection between the humans and their environment.

The local communities should be aware through education of the actual great potential of their environment, so that all their activities, whether

economic, cultural, or recreational, would be geared towards the protection of their habitat.

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