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Tapia Chamba, Alex; Asadobay-Guashpa, Armando Patricio; Suarez Jaramillo, Alexandra; Larrea Silva, Jhohana; Sanchez Ruiz, Jefferson

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# Evaluation of the tourist attractions of Canton Puyango, Province of Loja- Ecuador

Evaluación de los atractivos turísticos del Cantón Puyango,  
Provincia de Loja-Ecuador

Alex Tapia Chamba turismo@yantza.gov.ec

*Autonomous Decentralized Government of Yantzaza, Ecuador*

Armando Patricio Asadobay-Guashpa

patricioasadobay@gmail.com

*Gobierno Parroquial Rural Augusto Nicolás Martínez, Ecuador*

Alexandra Suarez Jaramillo gladys.suarez@unl.edu.ec

*University of Seville, Ecuador*

Jhohana Larrea Silva jhohana.larrea@unl.edu.ec

*Universitat de les Illes Balears, Ecuador*

Jefferson Sanchez Ruiz j.sanchez@uib.cat

*Universitat de les Illes Balears, Ecuador*

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**Abstract:** Multi-criteria evaluation studies in the tourism field have gained importance in recent times due to the Covid19 pandemic that has presented challenges and new social, cultural and lifestyle changes in today's society. Therefore, in this context, the CME helps tourism planners and managers to have a clearer vision to make decisions in the prioritization and production of products that help to energize the local economy based on the tourist attractions with the greatest potential. The objective of the study is to inform planners, which tourist attractions have the greatest potential in the canton of Puyango. The research becomes strategic since the results determine that the petrified forest of Puyango, the 8-sphere clock of the San Jacinto church, the sphinx of the Lord of Giron and the Alma Lojana Gourmet coffee are in the top four positions that are strategic to develop efforts in tourism.

**Keywords:** Multicriteria evaluation, tourism potential, tourist attractions, Canton Puyango..

**Resumen:** Los estudios de evaluación multicriterio en el campo turístico han cobrado importancia en estos últimos tiempos debido a la pandemia Covid19 que ha presentado retos y nuevos cambios sociales, culturales y formas de vida en la sociedad actual. Por lo tanto, en este contexto la EMC ayuda a los planificadores y gestores turísticos a tener una visión más clara para tomar decisiones en la priorización y producción de productos que ayuden a dinamizar la economía local en base a los atractivos turísticos con mayor potencial. El objetivo del estudio es poner a conocimiento de los planificadores, que atractivos turísticos tienen mayor potencial en el cantón Puyango. La investigación se convierte estratégica puesto que los resultados determinan que el bosque petrificado de Puyango, el reloj de 8 esferas de la iglesia San Jacinto, la esfinge del señor de Girón y el café Gourmet Alma Lojana están en los cuatro primeros puestos que son estratégicos para desarrollar esfuerzos en el tema turístico.

**Palabras clave:** Evaluación multicriterio, potencial turístico, atractivos turísticos, Cantón Puyango.

## Introduction

According to Sanchez et al (2021), Ecuador, like other countries in recent years, has gone through various periods in relation to social, political, economic and environmental changes (p.83). Therefore, in the current context of the Covid-19 pandemic, the structural changes in society and ways of life have been transformed, especially in terms of tourism.

In this context we must take into account what Delgado (2020) and Rivera (2019) mention that tourism development should always be with a view to sustainable and sustainable development and even more so in times of pandemic Post-covid19. On the other hand, to this pandemic problem the World Tourism Organization (2020) decides to launch the "Tourism Recovery Plan, to Support Jobs and economies through tourism a call to action to mitigate the socio-economic impacts of Covid-19 and accelerate recovery" (Guerra, 2021, p. 143).

Continuing with the theme of the post covid-19 we must understand that territorial planning and tourism planning should be framed in the strategies and pillars of the UNWTO such as economic recovery and the development of strategic recovery of micro, small and medium enterprises in order to guide the tourism value chain, on the other hand the second pillar the development of marketing and promotion of territories with tourism potential and finally the strengthening of institutions and building resilience, strategic focused on business.

For the above mentioned, the EMC of the attractions of the Puyango canton is strategic because the territories need studies that help determine the tourism potential of each attraction within the territory, in order to join efforts in the planning and management of the attractions with potential.

The Multicriteria Evaluation (MCE) in the valuation and prioritization of tourist attractions has been used by several authors among them (Barredo, 1996; Barba & Charles, 1997 and Marín & Nogués, 2001; Proctor & Dreschsler, 2003; Franco et al., 2009; Joo & Alvarado, 2013; Zhingre 2020 and Sanchez et al 2021a, 2021b).

These authors used this methodology because it incorporates different evaluation alternatives of intrinsic and extrinsic criteria, through a logical thinking process that leads to a balanced analysis of all established attributes and all facets of the planning problems.

The MSC in the prioritization of tourist attractions in the canton of Puyango helped determine that the canton has enough attractions to develop a tourist flow among the attractions with the greatest potential is the petrified forest of Puyango, which "is a relic because it is the only one in Ecuador and is part of the few that exist in the world. It is preserved because it has a protected area of 2650 hectares, between the provinces of El Oro and Loja (Malacatus, 2020, p. 2).

On the other hand, the Puyango canton, besides having the petrified forest, has an important variety of natural and cultural resources with tourism potential, but it has been observed that tourism management is limited due to the lack of tourism project initiatives in the territory,

little research in prioritization and production of tourism products that energize the local economy, little support by the authorities in tourism initiatives. For this reason, the present study evaluates and assesses the tourism potential of natural and cultural resources, so that in the future the institutions have a basic tool to make decisions in the management and investment of promotion and adequacy with infrastructure accessible to all.

As the main result of the EMC, it was determined that, in terms of tourist attractions, the first places are occupied by the petrified forest of Puyango, the 8-sphere clock of the San Jacinto church, the sphinx of the Señor de Girón and the Alma Lojana Gourmet coffee. This will also offer possibilities for a post-Covid19 sustainable and community-based tourism model.

## Materials and methods

The multi-criteria evaluation methodology is based on a mixed analysis with quantitative and qualitative approaches. Following some references in EMC studies carried out in the province of Loja, the same methodological scheme of Zhingre et al. 2020 and Sanchez et al. 2021a 2021b) is followed.

These studies consider developing a diagnosis of the current situation in terms of infrastructure, accessibility of products and services. Following this process, a valuation and inventory of the attractions and resources of the canton will be carried out in order to develop the CME.

Diagnosis of the current situation: This first step begins with a bibliographic review of primary and secondary information on the infrastructure and services available for each resource and tourist attraction.

2. Inventory of tourist resources and attractions in Puyango canton: the methodology of the Ministry of Tourism of Ecuador (2004) was used to prepare the inventory. Ten cultural tourist attractions and three natural attractions were identified.

3. Multicriteria evaluation: considering the basic concepts of the evaluation matrix, a four-stage procedure was carried out:

- a) definition of the object and identification of alternatives
- b) definition of the set of attributes
- c) obtaining the decision matrix
- d) valuation of tourism resources through the application of the weighted linear summation method.

**Table 1** *Intrinsic and extrinsic criteria for the evaluation of tourism attractions*

**Table 1**  
Intrinsic and extrinsic criteria for the evaluation of tourism attractions

Intrinsic criteria			
Type of resource	Criteria	Attribute	Description
Terrestrial	a) Coverage	a <sub>1</sub> ) Vegetation	Abundant (A) Sufficient (S) Scarce (E)
	b) Soil conditions	b <sub>1</sub> ) Gradient	Steeply inclined (MI) Inclined (I) Somewhat Inclined (AI) Flat (P)
		b <sub>2</sub> ) Surface	Stony (Pe) Terracing (T) Wet (H) Compact (C) Pasture (Pa) Other (O)
		b <sub>3</sub> ) Difficulty	High (A) Medium (M) Low (B)
Aquatic (water currents)	c) Features	c <sub>1</sub> ) Width	Meters
		c <sub>2</sub> ) Transparency	Crystalline (C) Semiturbid (S) Turbid (T)
		c <sub>3</sub> ) Visible extension	1 to 3 mts. (A) 3 to 6 mts. (B) 6 to 10 mts. (C) More than 10 mts. (D)
	d) Additional attraction	d <sub>1</sub> ) Fauna	Yes (S) No (N)
Cultural manifestations	e) Features	e <sub>1</sub> ) Traditional State	Excellent (E) Good (B) Bad (M)
		e <sub>2</sub> ) Dissemination	Local (L) Regional (R) National (N) International (I)
		e <sub>3</sub> ) Community participation	Yes (S) No (N)
	f) Promotion	f <sub>1</sub> ) Means of promotion	Web (W) Television (T) Radius (R) Magazines (Re)
Extrinsic criteria			
Criteria	Attribute	Description	
g) Physical access	g <sub>1</sub> ) Distance	Kilometers	
	g <sub>2</sub> ) Time	Minutes	
h) Appreciation possibilities	h <sub>1</sub> ) State of conservation	Excellent (E) Good (B) Regular (R) Bad (M)	
	h <sub>2</sub> ) Quality of the environment	Optima (O) Good (B) Regular (R) Low (Ba)	
	h <sub>3</sub> ) Fragility	Very high (MA) High (A) Moderate (M) Low (B)	
	h <sub>4</sub> ) Contamination	Yes (S) No (N)	
i) Infrastructure and services	i <sub>1</sub> ) Signaling	Sufficient (S) Some (A) Insufficient (I) None (N)	
	i <sub>2</sub> ) Equipment	Sufficient (S) Some (A) Insufficient (I) None (N)	
	i <sub>3</sub> ) Recreational facilities	Recreational facilities (A) Elements subject to recreation (M) No recreational site (B)	
	i <sub>4</sub> ) Activities	Total number of activities	
j) Security	j <sub>1</sub> ) Surveillance	Very safe (M) Insurance (S) Moderate (Mo) Insecure (I)	

Source: Prepared by

## Results

In the tourism diagnosis of the current situation of the canton Puyango cantonal head of Alamor we can say that it has all the basic services such as tourist services such as lodging, food, recreation and transportation. In this context we also note that the access roads are in good condition, there is also road access to the coast and highlands. Taking the city of Loja as a starting point, there is a 200km distance to the city of Alamor, which can be reached by different means of transportation: bus, cab and private car.

On the other hand, in the inventory of the tourist attractions of the Puyango canton, 13 attractions of tourist interest were inventoried.

**Table 2.** *Tourist attractions of the canton Puyango*

**Table 2**  
Tourist attractions of the canton Puyango

Name of the attraction	Category	Type	Subtype	Hierarchy
Petrified forest of Puyango	Natural Sites	Forests	Petrified	III
Tagua or Ivory Forest	Natural Sites	Forests	Humid Tropical West	I
El Arenal Sulfurous Waters Spa	Natural Sites	Groundwater	Sulfur Waters	I
San Jacinto de Alamor church clock with 8 faces	Cultural Events	Technical and Scientific Achievements	Technical Works	II
Effigy of the Lord of Girón	Cultural Events	Contemporary Artistic Achievements	Sculpture	I
Alma Lojana gourmet coffee	Cultural Events	Technical and Scientific Achievements	Industrial Operations	I
Sunstone	Cultural Events	Historical	Archaeological Site	I
Sausage or sausage of the Mercadillo parish	Cultural Events	Ethnography	Typical food and beverages	I
Wine and orange confectionery	Cultural Events	Technical and Scientific Achievements	Industrial Operations	I
Tagua handicrafts	Cultural Events	Ethnography	Wooden handicrafts	I
Granulated panela factory	Cultural Events	Technical and Scientific Achievements	Industrial Operations	I
Guadua handicrafts	Cultural Events	Ethnography	Wooden handicrafts	I
Live museum of stingless bees "Meliponas".	Cultural Events	Technical and Scientific Achievements	Industrial Operations	I

**Source:** Field work

As explained in other investigations, the first step in the identification of alternatives is based on the search for resources or attractions that have limitations for the use of tourism, among them is the Piedra del Sol, which is located on private property, despite the fact that there is free access to observe this attraction, despite the fact that it does not have road and tourism infrastructure equipment. In this process, other attractions with a tourist current were also identified, such as the Petrified Forest of Puyango, which has infrastructure and equipment to develop tourism.

While it is true that the Autonomous Decentralized Governments (GAD) do not have the technical capacity of tourism professionals or there is little importance for the tourism sector, which has led to the insufficient implementation of strategies for tourism development in the canton of Puyango.

Once the field work has been carried out, the characterization matrix with a mixed approach is obtained. Table 2 below shows the characterization of the intrinsic criteria according to the type and name of the resources.

**Table 1** Construction of the intrinsic criteria for analysis



**Table 5**  
Decision matrix with normalized values

Resources	Intrinsic attributes				Total	Average	40%
Terrestrial (hills, ravines, parks, etc.)	va1	vb1	vb2	vb3			
Petrified forest of Puyango	9	9	9	9	36	9	3.6
Tagua or ivory forest	10	9	6	7	32	8	3,2
Aquatics (Water currents)	vc1	vc2	vc3	vd1	Total	Average	40%
El Arenal Sulfurous Waters Spa	8	8	9	9	34	8.5	3.4
Cultural Events	ve1	ve2	ve3	vf1	Total	Average	40%
San Jacinto de Alamor church clock with 8 faces	10	8	9	7	34	8.5	3.4
Effigy of the Lord of Girón	10	7	9	7	33	8.25	3.3
Alma Lojana Gourmet Coffee	8	7	9	7	31	7.75	3.1
Piedra del Sol	7	7	9	7	30	7.5	3
Sausage or sausage of the Mercadillo parish	7	7	7	7	28	7	2.8
Wine and orange confectionery	7	7	7	7	28	7	2.8
Tagua handicrafts	7	7	7	7	28	7	2.8
Granulated panela factory	7	7	7	7	28	7	2.8
Guadua handicrafts	7	7	7	7	28	7	2.8
Live museum of stingless bees "Melinonas"	8	7	7	7	29	7.25	2.9

Source: Own elaboration based on Franco (2009).

**Table 6.** Decision matrix with normalized values

**Table 6**  
Decision matrix with normalized values

Resources	Extrinsic attributes											Total	Average	60%
Terrestrial	vg1	vg2	vh1	vh2	vh3	vh4	vi1	vi2	vi3	vi4	vj1			
Petrified forest of Puyango	7	7	10	10	8	10	8	10	10	10	10	100	9,09	5,45
Tagua or ivory forest	8	8	8	8	6	8	6	2	9	8	8	79	7,18	4,31
Aquatics (Water currents)														
El Arenal Sulfurous Waters Spa	8	8	8	7	8	8	6	8	6	6	6	79	7,18	4,31
Cultural Events														
San Jacinto de Alamor church clock with 8 faces	9	9	10	10	8	10	10	10	10	2	10	98	8,91	5,35
Effigy of the Lord of Girón	8	8	10	8	6	10	8	10	10	2	10	90	8,18	4,91
Alma Lojana gourmet coffee	8	8	10	8	6	10	8	10	10	2	8	88	8,00	4,80
Piedra del Sol	7	8	8	7	6	8						44	4,00	2,40
Sausage or sausage of the Mercadillo parish	8	8	8	9	6	8	2	6	6	4	10	75	6,82	4,09
Wine and orange confectionery	7	8	8	8	6	10	2	10	6	2	10	77	7,00	4,20
Tagua handicrafts	7	8	8	8	6	8	6	8	8	2	8	77	7,00	4,20
Granulated panela factory	7	8	8	7	6	8	8	6	8	2	6	74	6,73	4,04
Guadua handicrafts	7	8	8	7	6	8	8	8	6	2	6	74	6,73	4,04
Live museum of stingless bees "Meliponas".	9	9	9	8	8	8	7	7	7	2	7	84	6,75	4,05

Source: Own elaboration based on Franco (2009).



Valuation of tourism resources through the application of the weighted linear summation method.

**Table 7:** Results obtained from the linear combination of attributes (normalized criteria)

**Table 7**  
Results obtained from the linear combination of attributes normalized criteria

Resources	Linear Sum of Intrinsic Resources	Linear Sum of Extrinsic Resources	Weighted Sum of Intrinsic Criteria	Weighted Sum of Extrinsic Criteria	Final value of weights	Order of Preference
Petrified forest of Puyango	36	100	3,6	5,45	9,05	1
Tagua or ivory forest	32	79	3,2	4,31	7,51	6
El Arenal Sulfurous Waters Spa	34	79	3,4	4,31	7,71	5
San Jacinto de Alamor church clock with 8 faces	34	98	3,4	5,35	8,75	2
Effigy of the Lord of Girón	33	90	3,3	4,91	8,21	3
Alma Lojana gourmet coffee	31	88	3,1	4,80	7,9	4
Sunshine	30	44	3	2,40	5,4	13
Sausage or sausage of the Mercadillo parish	28	75	2,8	4,09	6,89	9
Wine and orange confectionery	28	77	2,8	4,20	7	7
Tagua handicrafts	28	77	2,8	4,20	7	8
Granulated panela factory	28	74	2,8	4,04	6,84	10
Guadua handicrafts	28	74	2,8	4,04	6,84	12
Live museum of stingless bees "Meliponias"	29	84	2,9	4,05	6,95	11

## Conclusions

It is concluded that the multi-criteria evaluation research (MCE) of the tourist attractions of the canton of Puyango serves as a basis for developing efforts in the area of territorial planning, management and investment of economic resources in the adequacy of road and tourist infrastructure in each area where the resources and attractions with tourist potential are located.

On the other hand, the prioritization of attractions through the EMC will help to make better decisions in promotion and dissemination of the attractions that show greater importance within the research. As it has been observed and verified that EMC is a methodology that helps to have a better vision of the context of the territory in terms of both basic services and tourism infrastructure.

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