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# Analysis of Quality an Tourist Satisfaction in the Sierra of Durango

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## To cite this article:

Iván González Lazalde, Juana Hernández Chavarría, María Quetzalcihuatl Galván Ismael. Analysis of Quality an Tourist Satisfaction in the Sierra of Durango. *International Journal of Hospitality & Tourism Management*. Vol. 7, No. 12, 2023, pp. 78-89.

doi: 10.11648/j.ijhtm.20230702.14

**Received:** May 16, 2023; **Accepted:** August 24, 2023; **Published:** September 8, 2023

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**Abstract:** This assignment analyzes the characteristics of the tourists and the perception of the satisfaction at the offered service in the ecoturistic centers all around the municipality of Pueblo Nuevo, Dgo. The expectations are the beliefs about the characteristics, standards, or references of the service by which a judgment of the quality and performance of the service is made, 87 questionnaires were applied in 9 centers at the holiday period denominated as “Holly Week” (Semana Santa). The instrument got validated with a coefficient of reliability Cronbach’s Alpha of 0.8229, the results were submitted to hypothesis Kruskal, Wallis and Mann Whitney’s tests. The evaluation in the tourist perception is high, it presents an average level of schoolarity of 14.5 years and an age around 40 years old, their main trip purpose is being with the family, the centers face the challenge of increase the days of stay and the use of additional services, having the risk of expand the gap between the perceptions and expectations, by comparing the quality/price perception among the groups of schoolarity, three of five groups valuate it as regular, respecting the use of the services of recreation hired are decreasing in proportion to the increase of number of nights.

**Keywords:** Tourism, Rural Tourism, Rural Development

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## 1. Introduction

Tourism in Mexico is qualified as a strategic sector for national development, by providing economic resources, generating jobs, and contributing to regional development [1]. This activity represents one of the main sources of employment and economics in Mexico, granting employment to 6% of paid workers and contributing 9 out of every 100 pesos of the country's Gross Domestic Product (GDP) [2].

Tourism includes all those activities carried out by people for recreational or business purposes when traveling; rural communities, having natural attractions, exploit these activities by offering accommodation and various activities for that purpose.

Development is conceptualized as the process of positive change, thus being synonymous with progress or evolution; tourism development is therefore about providing lodging

services for various purposes that will result in the growth of the community [3].

Tourism development implies providing tourists with the necessary resources to have a satisfactory stay, these resources imply the facilities and services that will solve their needs considering the social and economic impact in the region where they are located.

Tourism can integrate various types, associated with the activity and purpose. Nature tourism encompasses ecotourism, adventure tourism, and rural tourism. According to the Ministry of Tourism (SECTUR, this includes trips whose recreational activity is carried out in nature considering the cultural expressions that allow to meet, respect, enjoy and participate in the conservation of both natural and cultural resources [4].

Ecotourism activities and rural tourism are considered as emerging; however, they represent an opportunity to increase the income of rural populations, communities and indigenous peoples, ecotourism revalues the territories allowing the appropriation and re-use of natural resources, having competitive advantages in other markets [5].

There are five geographical zones in the state of Durango: the ravines, the mountain range (sierra), the valleys, the plains and the semi-desert which present diverse orographic and climatic characteristics. There are localities of difficult access both in the ravines and in the sierra area that cause situations of marginalization and poverty. According to estimates by the National Council for the Evaluation of Social Development Policy (CONEVAL), 37.3% of the population in the entity is in a situation of poverty and another 37.4% is vulnerable due to social deprivation or income, a situation that is accentuated in the rural areas of the ravines and the sierra area, where the 12 municipalities that make it up, including Pueblo Nuevo, concentrate Very High and High degrees of marginalization [6].

In the municipality of Pueblo Nuevo, object of study in this research, the main economic activities are related to the primary sector such as agriculture, livestock, and forestry, however, in recent years rainfall has been irregular, despite having abundant rains (1041 mm) in 2019 [7], which has limited crop yields, cattle breeding and forest use. Consequently, tourism has become a global socioeconomic manifestation, which has created new forms and new tourist destinations considering their peculiarities, skills, and identities [8].

Ecotourism and rural tourism represent an opportunity for the towns of the municipality of Pueblo Nuevo by having mountainous areas that offer tourists an attraction, besides providing alternative opportunities in economic activities for the inhabitants. By managing the attractions of the municipality considering their sustainability, they will allow to maintain a long-term economy based on tourism [9]. The management of these attractions implies directing and administering the tourist activity considering the evolution of the needs and demands of the customers, therefore, to improve and achieve their objectives and for the customer to satisfy their wishes or needs, their characteristics and demands must be known [10].

The municipality of Pueblo Nuevo is located within the sierra area of the state of Durango, it has natural landscapes, flora, and fauna typical of the forest. In recent years, the municipality has benefited from tourist activity by exploiting its attractions, however, it has been carried out in a disorderly manner and without adequate planning when providing services in response to market behavior. Therefore, it is necessary to identify the characteristics of the tourists who visit them and the perception of the quality of the service provided.

The design of quality in the tourist service refers to considering the customers in the formulation of a culture, climate, methods and actions for the continuous improvement of the service that is provided, however, it is a difficult

concept to measure. There are a variety of definitions, although regardless of the concept that is adopted, the purpose must be to satisfy the customer [11].

## 2. Tourism and Services Marketing

### 2.1. Importance of the Tourism Sector in the State of Durango

From 2016 to date, tourism activity in the state of Durango maintained its development potential by generating an accumulated economic income of three thousand 899 million pesos. The exploited tourist aspects are culture, cinematography, meeting tourism and alternative tourism, which generated 307 million 392 thousand pesos in 2020 [12].

In recent years the number of visitors has increased, for 2017 a figure of 988,510 tourists was reached; There are various reasons why people decide to travel to Durango, the main motivation is due to vacations to rest or visits to relatives, the other important reasons are the National Fair of Durango, sporting events and business trips. Most of the visitors come from the neighboring state of Sinaloa, followed by tourists from the US, Coahuila, and Chihuahua. Due to the geographical characteristics of certain regions of the state, nature tourism has an important presence, in what is known as the Durango-Mazatlán corridor there are a total of 32 private and ejido (commons land) ecological tourist centers [13]. This corridor is part of the so-called Gulf-Pacific corridor located between Matamoros, Tamaulipas and Mazatlán, Sinaloa, connecting the states of Sinaloa, Durango, Coahuila, Nuevo León and Tamaulipas [14].

#### 2.1.1. Tourism in the Municipality of Pueblo Nuevo

The municipality of Pueblo Nuevo, belonging to the state of Durango figure 1, is made up of 315 localities. The municipal seat whose name is El Salto is located 98.3 kilometers southeast of the capital of the state of Durango, taking the Durango-Mazatlán highway [15]. The total population of the municipality is 51,269 inhabitants, representing 28% of the state population, the localities of this municipality with the largest population are: El Salto, La Ciudad and San Jerónimo [16].

This municipality is located in the Sierra Madre Occidental, so there is a variety of timber trees that generate one of the main economic activities in relation to the employed population according to the activity sector, for the manufacturing industry it represents 33.41%, for the service sector that includes transportation, government and other services 31.32%, followed by commerce with 20.03% and the agricultural sector with 13.29% [17].

The degrees of social marginalization are established from the Gini index, which represents the distribution of the inhabitants' income. Indices close to zero represent greater equity among its inhabitants, while values close to one represent greater inequity among the population. Social inequality is a characteristic of the municipality of Pueblo Nuevo, presenting a Gini index of 0.418 in 2020 [18]. Other vulnerabilities that the municipality present are the percentage

of the population aged 15 or over that is illiterate (5.09%), population that has not completed primary school (18.02%), population that lives with up to two minimum wages, and

population that lives in localities with less than 5,000 inhabitants (50.69%) [19].



Source: Taken from [17]

Figure 1. Location of the Municipality of Pueblo Nuevo Durango.

**2.1.2. Infrastructure in Ecotourism Centers of the Sierra El Salto- Durango Corridor**

The natural wealth of the municipality is characterized by its wooded and mountain areas that offer tourists leisure and recreation options, as well as adventure activities. According to the National Statistical Directory of Economic Units [20], 16 economic units dedicated to the temporary lodging service are registered, the majority of which are establishments dedicated to temporary lodging, not including those that meet the characteristics of an ecotourism center. When trying to

locate a directory that will show information related to the ecotourism centers located in the Sierra El Salto - Durango corridor, the Secretary of Tourism of the state of Durango through the "headquarters of adventure tourism" provided a list of 20 centers, of which ten belong to the municipality of Pueblo Nuevo. In table 1 the main tourist centers and their installed guest capacity are shown, where 44% are cabins for up to four people, and 22% and 17% are cabins for six people and for eight respectively.

Table 1. Main Ecotourism Centers El Salto - Durango Corridor.

Turistic center name	Location locality	Municipality of location	Guest capacity per touristic center
Carreta del Fuerte	Navíos	Durango	64
Centro turístico el Bayo	El Encinal	Durango	32
Torre del Carpio	Navíos	Durango	36
Molinillos Mountain Resort	Sierra del Nayar	Durango	24
El Salto del Agua Llovida	Sierra del Nayar	Durango	30
Rancho Santa Isabel	El Salto	Pueblo Nuevo	78
Arroyo del Agua	El Salto	Pueblo Nuevo	44
Puentecillas	Ejido el Brillante	Pueblo Nuevo	40
Coscomate	Ejido Chavarría Nuevo	Durango	108
Parque la Pirámide	Ejido Chavarría Viejo	Pueblo Nuevo	58
Brillo de Luna	El Salto	Pueblo Nuevo	28
Mil Diez	El Salto	Pueblo Nuevo	24
Parque Mexiquillo	La Ciudad	Pueblo Nuevo	128
Cabañas Rústicas Mi Ranchito	La Ciudad	Pueblo Nuevo	60
Villas de Coronado	La Ciudad	Pueblo Nuevo	48
Hostal Mexiquillo	La Ciudad	Pueblo Nuevo	120
Tecuan	Parque Natural Estatal	Durango	60
La Casita	Cruz de Piedra	Durango	44
Otinapa Sierra Camps	Otinapa	Durango	66
La Muralla	Ejido Presidente Salvador Allende	Durango	68

Source: Secretary of Tourism of the state of Durango, [13].

## 2.2. Marketing of Services

The Services have come to take on greater relevance and participation not only in the economies of developed countries but also in developing countries, there are various definitions of the concept of service. For Zeithaml, services are tasks, processes, whether provided directly by a person or co-generated by an organization for another person or organization [21]. Stanton defines services as activities that can be intangible and identifiable, whose purpose is to satisfy the needs and/or desires of consumers [22]. Meanwhile, Kotler has a definition in a broader sense by saying that it is any act or task, generally intangible, that is offered from one party to another without transfer of ownership and that may or may not be physical products, such as added value by having a good customer service [23].

The tourism industry within the scope of services considers five of the ten points listed by Stanton: housing and other structures related to the rental of offices, hotels, motels, etc.; home management including maintenance, repairs, security, gardening, and cleaning; recreation and entertainment considering meals, restaurants, and rest centers; transportation, which includes passenger transportation; and communications which includes telephone, computer and internet services [22].

Considering the characteristics and nature of the service, the authors agree on four main elements i. the intangibility, ii. inseparability, iii. variability and iv. the expiration. For Kotler, the intangibility of the service is that they cannot be observed, tasted, touched, or smelled before being acquiring [24]. While Zeithaml considers intangibility as the most basic characteristic since they are executions or actions instead of objects, so they cannot be felt, touched, visualized, or tasted in the same way as a tangible product [21]. Variability is the second characteristic and defines services as highly variable, since it depends on who, when and where the service is provided [23]. Zeithaml calls it heterogeneity considering execution services that are generally provided by people, so there are two provided services exactly the same, also considering the interaction of the customer and the evaluation that is made through the perception of the customer, and each customer may differ in service performance, considering that no two customers are the same and expectations and demands may vary between customers as each one has unique demands [21]. By not being able to be saved, stored, or inventoried for the future, services are extremely perishable, creating imbalances between supply and demand, generating high and low seasons, days of the week and even times when demand fluctuates a lot [22]. When the demand for services is stable, it does not present major problems, but when the demand varies, the service companies face difficulties, establishing the companies' peak hours, days, and seasons, causing service providers to consider strategies in demand and supply. The stable demand the most used strategies are differential price, promotion in low demand, complementary services, and reservation systems. For supply, the main strategy is that of

part-time employees [23]. Another characteristic of services is their simultaneous production and consumption, as opposed to products that are first produced and then sold. In this case, the services are first sold and then consumed or produced and consumed simultaneously [21].

### 2.2.1. Customer Gap

The customer gap is considered to be the difference between customer expectations and perception. Expectations are references that customers obtain from previous experiences or from similar services, while subjective evaluations of service experiences are considered perceptions. Expectations are customers' beliefs about what a service should be, and perceptions are the value of the service experience. Four gaps have been identified, the first one is the knowledge gap, which is the lack of knowledge that the service company or organization has of the customers' expectations, mainly due to the lack of communication between managers and employees who interact directly with customers, in addition to the lack of strategies of organizations to retain customers and strengthen relationships with them. Secondly is the gap in service design and standards, being intangible they can be difficult to describe and communicate, and because they have a high degree of variability is also a challenge for standardization and the desired goal is not always achieved. When service standards are absent, it is likely that customers' perception of quality will be lower. The third gap is that of service performance, this refers to the performance offered by the company and the established standards, given the factors that intervene in the service such as people, systems, and technology, it is necessary that there are elements that provide support to these standards such as training and reward systems for employees. The fourth gap is that of communication, it refers to the generation of high expectations through advertising media by making exaggerated claims of the service offered to customers, resulting in a poor perception of the service [21].

### 2.2.2. Customer Expectations

Expectations are the beliefs about the characteristics, standards, or references of the service by which a judgment of the quality and performance of the service is made. There are different levels of expectations that reflect the different hopes, desires, and beliefs of customers, ranging from the ideal expectations to the minimum tolerable. Since services can vary in performance between providers and employees, the variation that clients recognize and are willing to accept is known as the zone of tolerance. Since services can vary in performance between providers and employees, the variation that customers recognize and are willing to accept is known as the zone of tolerance. if the service is offered below this limit there will be frustration and dissatisfaction with the company. On the other hand, if the service exceeds the expectations the customer will be very pleased, the tolerance zone is the range in which the clients do not notice differences in the performance of the service. It is also important to consider the differences between customers, that is, the variability of the

tolerance zone is different for each customer, which is influenced by several factors such as price, time, quality, etc. When prices are high, the customer tends to have less tolerance for poor service because the threshold for adequate service rises [21].

### 3. Method

To carry out this study, the Ministry of Tourism identified the main ecotourism centers, considering their willingness to provide the necessary information. In a first stage, a prediagnosis was carried out in which information was obtained on the physical infrastructure of the tourist centers, their recreational activities and their presence in social networks and the Internet. Based on this information, the design of the questionnaire was elaborated. An adaptation was created of the instrument elaborated by the Center for Higher Studies in Tourism of the Anahuac University of the questionnaire of magical towns and heritage cities [25]. The adjustment consisted in eliminating the questions addressed to

aspects related to cultural heritage, replacing it with aspects intrinsic to the activities carried out in ecotourism centers.

The study was analyzed through three indicators: profile of the tourist, stay and evaluation of the tourist center with variables of scale, nominal and ordinal type. In the first indicator the demographic information was obtained; in the second indicator the *length of stay, contracted recreation services, purpose of the trip and means of transport used to reach the tourist center* were obtained; the variables of *quality in road infrastructure to reach the ecotourism center, perception in the variety and quality of the cultural and natural attractions found*, were also included, as well as rating on lodging services, *perception of the price/service relationship received, perceived security and perception of the satisfaction/recommendation* relationship as shown in table 2. The answers related to these variables were designed with a Likert scale to measure the level of satisfaction of the tourist considering a scale of five entries in the answers: satisfaction level 1 is considered as very bad and 5 as very good, going through bad level 2, regular level 3 and good level 4.

Table 2. Operationalization of the Variables.

Indicator	Variable	Type of variable
Tourist profile	Age	Scale
	Gender	Nominal
	Education	Ordinal
	Occupation	Ordinal
Stay	Place of residence	Nominal
	Length of stay	Scale
	Number of visits to the TC	Scale
	Contracted recreation services	Ordinal
	Purpose of the trip	Nominal
	Means of transport used to reach the tourist center	Nominal
TC Assessment	Quality in road infrastructure to reach the ecotourism center	Ordinal
	Perception of the variety and quality of the cultural and natural attractions found	Ordinal
	Qualification in hosting services	Ordinal
	Perception of the price/service ratio	Ordinal
	Perceived safety	Ordinal
	Satisfaction/recommendation ratio	Ordinal

Source: own elaboration with the operationalization of the variables

#### 3.1. Reliability Analysis

The instrument was subjected to the Cronbach's Alpha reliability analysis in the following variables: *perception of the image of the ecotourism center, perception of general satisfaction of the trip, satisfaction according to expectations and willingness to visit the ecotourism center again*, obtaining a coefficient of 0.8229 appreciated by various authors as a good level of reliability.

As a criterion for applying the questionnaire, a person of legal age staying at the ecotourism centers and willing to answer the instrument was considered. Nine ecotourism centers located throughout the municipality of Pueblo Nuevo were visited, achieving the application of 87 questionnaires. The survey was carried out in the first weeks of April corresponding to the holiday period called "Holy Week" due to the influx of tourists who visit the ecotourism centers.

#### 3.2. Information Processing Techniques

In the treatment of the information, a descriptive analysis of the demographic profile of the tourist was carried out, determining the main statistics in each variable; also, given that there was no information on the type of population distribution and the need to make the inference between k samples, non-parametric statistics were chosen through rank sum tests such as the Kruskal Wallis K use (1) and the Mann Whitney U test use (2). Through non-parametric statistics, inference was sought with Kruskal Wallis and Mann Whitney hypothesis tests [26].

$$K = \frac{12}{n(n+1)} \sum \frac{R_j^2}{n_j} - 3(n+1) \quad (1)$$

K=Kruskal-Wallis

nj=number of items in sample j

Rj=sum of ranks of all elements in sample j

K= number of samples

n= total number of observations from all samples

$$U = n_1n_2 + \frac{n_1(n_1+1)}{2} - R_1 \quad (2)$$

U=Mann Whitney

n<sub>1</sub>=number of items in sample 1

n<sub>2</sub>=number of items in sample 2

R<sub>1</sub>=sum of the ranks of the elements of sample

A measure of rank correlation association, known as Spearman's Rho rank correlation use (3), was also performed between the variables *contracted recreation services, number of nights of stay, satisfaction according to expectations and quality/price ratio.*

$$r_s = 1 - \frac{6 \sum d^2}{n(n^2-1)} \quad (3)$$

r<sub>s</sub>=rank correlation coefficient

n=number of paired observations

d=difference between the ranges for each pair of observations

## 4. Results

### 4.1. Results of the Descriptive Analysis

The study was carried out by analyzing the profile of the tourist considering: *age, occupation, length of stay, place of residence, recreation services contracted when making the visit, level of schooling, purpose of the trip, segment of tourism that visits the centers and means of transportation used to get to the ecotourism center, finding that the average age of the interviewees is almost 40 years with a standard deviation of 12 years.*

The ecotourism centers are visited by people who are employed in the private initiative (Empl IP), in the government (Empl gob), students (Est) or professionals or technicians (Prof o tec)). In figure 2 you can see the occupation in percentage of respondents.

The average length of stay is two nights, 24% of tourists stay one night, 44% stay two nights, 21% stay three nights and only 10% stay four nights or more. 55% of the visitors reside in the state of Durango, but visitors are received from other states of the Mexican Republic and other places such as Sinaloa, Baja California, Zacatecas, Nuevo León and Quintana Roo, one of the interviewees came from Belgium figure 3.

In the ecotourism centers, various contracted recreation services are offered: 49.43% of the visitors made a visit, excursion, or tour; 47.13% required food services; 35.63% hiking; 20.69% zip-lining, 16.09% rappelling, 5.75% and 4.60% renting horses and bicycles, respectively; and 3.45% engaged in kayak, boat, or raft activities as well as fishing and archery; 1.15% visited a shooting range. Figure 4 shows the percentage of services contracted by tourists who visit ecotourism centers.

Regarding the level of *formal schooling* that the interviewees have, 52.87% have undergraduate studies, however, 32.18% finished it and 20.69% did not complete their studies. 18.39% have postgraduate studies and high school level has the same percentage. Figure 5 shows the percentages in the level of *formal studies* achieved by the interviewees.

The purpose of the trip was mostly for vacations, leisure and recreation 85.06% of the time, in other cases it was for business reasons, education or training among others. The main segment of tourism that visits the centers are families 68.97%, couples 10.34%, friends 8.05%, groups 3.45% and 2.30% alone, see Figure 6.

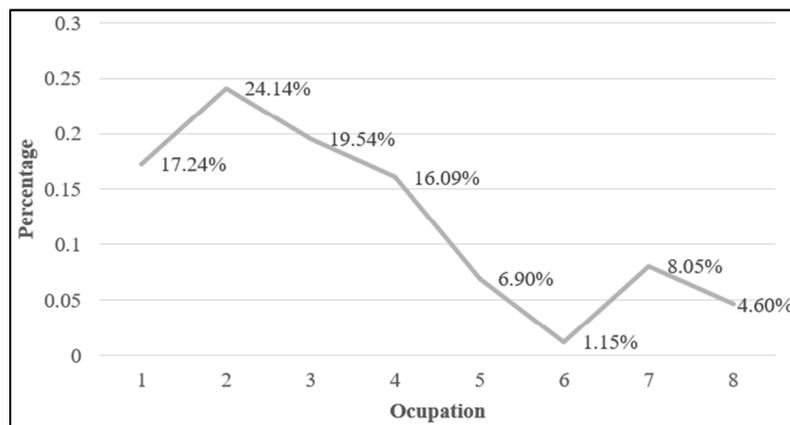


Figure 2. Occupation of Visitors in Ecotourism Centers.

Source: Own elaboration with data obtained in the collection of information

1. Est= Students

2. Empl IP=Private initiative employee

3. Empl gob=Government employeee

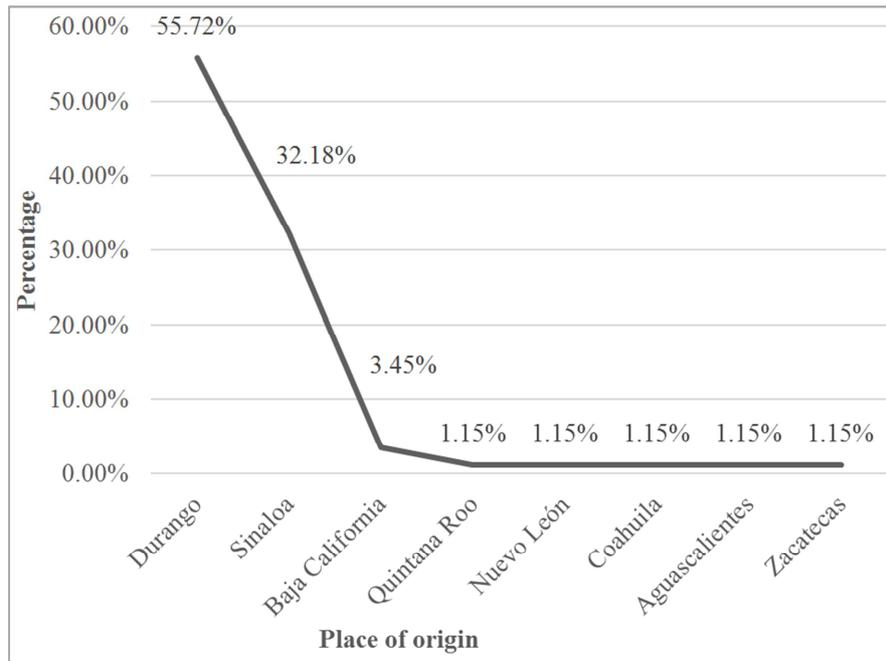
4. Prof o tec=Professional or technician

5. Ama de casa=Housewife

6. Dir/eje=Ejecutive

7. Dueno neg=Business owner

8. Retirado=Retired



Source: Own elaboration with data obtained in the collection of information.

**Figure 3.** Place of Origin of Visitors to Ecotourism Centers.



**Figure 4.** Services Contracted by Visitors in Ecotourism Centers.

Source: Own elaboration with data obtained in the collection of information

- 1. V/T/E/R =Visit/tour/excursion
- 2. Restaurante/Serv ali=Restaurant/ food service
- 3. Renta de bicicletas=Bicycle rental
- 4. Renta de caballos=Horse rental
- 5. Tirollesa=Zip line
- 6. Rapel=Rappelling
- 7. Senderismo=Hiking
- 8. Kayak/ Lancha/ Balsa=Kayak/ Boat/ Raft
- 9. Pesca=Fishing
- 10. Campo de tiro=Shooting range
- 11. Tiro con arco =Archery
- 12. Ninguno=None

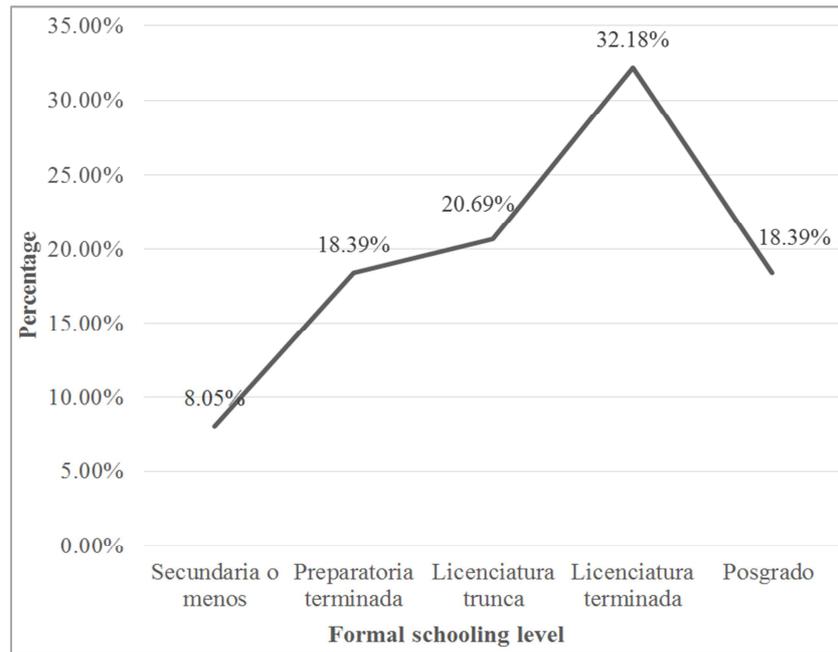


Figure 5. Level of Formal Schooling of Ecotourism Centers Visitors.

Source: Own elaboration with data obtained in the collection of information.

1. Secundaria o menos=Junior high school or less
2. Preparatoria terminada=Finished high school
3. Licenciatura trunca=Truncated degree
4. Licenciatura terminada=Completed bachelor's degree
5. Posgrado=Postgraduate

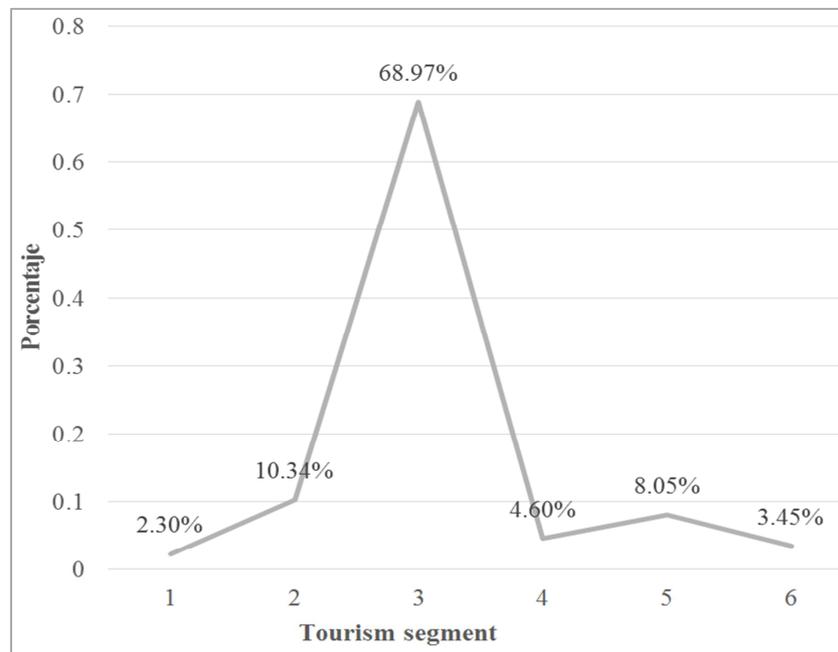


Figure 6. Tourism Segment that Visits Ecotourism Centers.

Source: Own elaboration with data obtained in the collection of information.

1. Solo=Alone
2. Pareja=Couple
3. Familia=Family
4. Compañeros de trabajo=Coworkers
5. Amigos=Friends
6. Grupos =Groups

The means of transport used to reach the ecotourism center were own car 90.8%, rented car in minimal cases (3.45%), and bus (1.15%), among others.

**4.2. Results of the Statistics in Perception in the Level of Satisfaction Achieved and Inferential Analysis**

Inferential analysis was carried out considering the following variables: perception of the quality of the access infrastructure to the tourist center, signs to reach the tourist center, attractions and services offered, conservation of tourist attractions, variety of attractions, quality of attractions, conservation status of natural attractions, general conservation status, rating of accommodation, cleanliness of the rooms, quality/price ratio, price/service ratio received and perception

of security during the visit, pointing out the results of those where statistically significant differences were found.

The analysis consisted of applying the non-parametric statistical hypothesis tests with the Kruskal-Wallis test for independent samples for the gender group, finding that there are no statistically significant differences except in the perception of the tourist in the state of conservation of natural attractions with an average level of satisfaction for men of 4.42 and a standard deviation of 0.7; while for women the satisfaction was 4.7 and the deviation was 0.6. The rating of lodging in the tourist center shows an average level of 4.6 satisfaction for men with a deviation of 0.49, and 4.8 for women with a deviation of 0.4. Table 3 shows the differences in the level of satisfaction achieved between men and women.

**Table 3.** Comparison of the Average level of Satisfaction Achieved Between Men and Women.

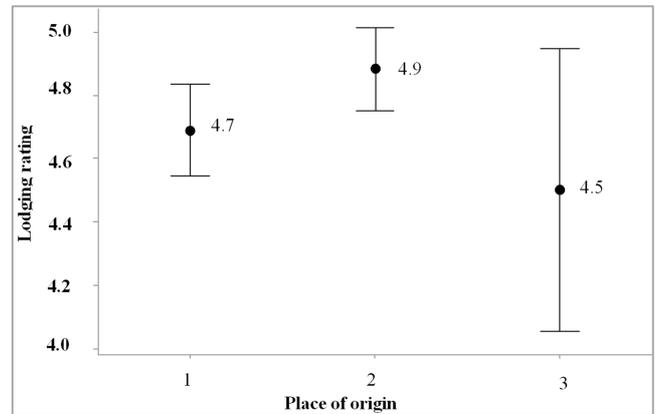
Variables/gender group	Average satisfaction level		Standard deviation	
	Men	Women	Men	Women
Tourist perception in the state of conservation of natural attractions	4.42	4.7	0.7	0.6
Touristic center lodging rating	4.6	4.8	0.49	0.4

Source: own elaboration with the data obtained in the collection of information.

The foregoing led to the application of the Mann-Whitney test, accepting the working hypotheses, resulting in the perception of *lodging rating* and the *conservation of natural attractions* being statistically lower in men than in women.

Likewise, the differences of the same variables between the categories of *place of origin of the visitors* were analyzed, grouping them by visitors from Durango (1), Sinaloa (2) and other states or places (3). It was found that, in the distribution in the *conservation of tourist attractions* and lodging qualification, the perception is different. In the case of the *perception in the conservation of tourist attractions*, the average level of satisfaction for Durango was 4.47 with a standard deviation of 0.68, in the case of Sinaloa 4.6 with a standard deviation of 0.75 and that of other states or places 4.12 and 0.35; applying the Mann-Whitney test, the *perception of the conservation of tourist attractions* among visitors from Sinaloa is greater than that of other states. Regarding the *lodging rating* for the visitors of Durango, the level of satisfaction reached is 4.7 with a standard deviation of 0.47, in the case of Sinaloa 4.9 with a deviation of 0.33 and other states or places 4.5 average level of satisfaction and deviation of 0.53 (see table 4). Statistically significant differences were found between visitors from Sinaloa and

from other states or places, applying the Mann Whitney test, it is found that the *lodging rating* is statistically higher in visitors from Sinaloa than those of other states or places. Figure 7 shows the interval diagram of the level of satisfaction achieved in *lodging rating* in place of origin categories.



Source: Own elaboration with data obtained in the collection of information.

**Figure 7.** Interval Diagram of the Level of Satisfaction Reached in the Qualification of Lodging in the Categories of Place of Origin.

**Table 4.** Comparison of the Average Level of Satisfaction Between the Categories of Place of Origin.

Variables/categories of place of origin	Average satisfaction level			Standard deviation		
	Durango (1)	Sinaloa (2)	Other states or places (3)	Durango	Sinaloa	Other states or places
Perception in the conservation of tourist attractions	4.47	4.6	4.12	0.684	0.75	0.35
Lodging rating	4.7	4.9	4.5	0.47	0.33	0.53

Source: own elaboration with the data obtained in the collection of information.

Another category analyzed was the formal schooling level considering the schooling level achieved by those interviewed:

junior high school or less (1), finished high school (2), truncated degree, completed bachelor's degree (4) and

postgraduate (5), the variables in which statistically significant differences were found were: in *signaling to reach the tourist center* the average level of satisfaction reached by the schooling group 1 is 4 with a standard deviation of 1.52; for group 2 the average is 3.4 and deviation 0.72; group 3 and average satisfaction of 3.38 with a deviation of 1.2; group 4 with an average of 3.6 with a deviation of 1; and group 5 on average a level of satisfaction reached of 4 with a variation of 1.07. When applying the Mann Whitney test in the opinion variable regarding signaling to the tourist center, it is higher in schooling group 2 than in 3 (truncated degree) and 4 (completed bachelor's degree). The lower the level of formal

studies completed high school, the better opinion they have of signaling. In the variable *quality/price* relationship of the tourist center, in group 1 the average level of satisfaction reached was 4.8 with a deviation of 0.4; in group 2 it showed an average of 3.5 and a deviation of 1.41; in group 3 an average of 3.9 with a deviation of 0.83; in group 4 an average of 4.32 and 0.9 deviation; and in group 5 an average level of satisfaction of 3.8 and a 1.3 standard deviation. Table 5 shows the comparison of the average level of satisfaction achieved and the standard deviation in the formal education level groups.

**Table 5.** Comparison of the Average Level of Satisfaction Achieved in the Formal Schooling Level Groups.

Variables/groups of level of formal schooling	Junior high school or less (1)		Finished high school (2)		Truncated degree (3)		Completed bachelor's degree (4)		Postgraduate (5)	
	*	**	*	**	*	**	*	**	*	**
<i>Signaling to reach the tourist center</i>	4	1.52	3.4	0.72	3.38	1.2	3.6	1	4	1.07
<i>Quality/price ratio</i>	4.8	0.41	3.5	1.41	3.9	0.83	4.32	0.9	3.8	1.3

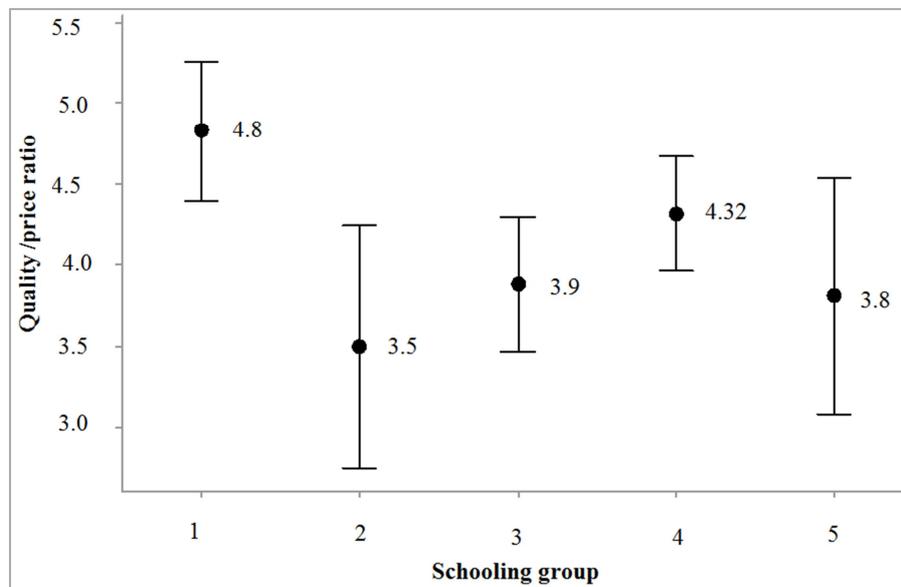
Source: own elaboration with the data obtained in the collection of information.

\*Average satisfaction level

\*\* Standard deviation

The *quality/price ratio* is higher in schooling group 1 than in 2 and 3, figure 8, that is, people with a formal junior high school level of education or less consider it to be better value

for money than those who have completed high school and have a truncated degree.



Source: Own elaboration with data obtained in the collection of information.

**Figure 8.** Interval Diagram of the Level of Satisfaction Achieved in the *Quality/Price Ratio* in the Schooling Groups.

The length of stay of visitors to touristic center was also analyzed by grouping them into one night, two to three nights, and four or more nights, resulting in the variable in which there are statistically significant differences is in *the perception in the general state of conservation of the tourist center*, establishing that the level of satisfaction decreases as the nights of stay increase. While in the guests who stayed one night the average satisfaction was 4.8 with a standard deviation of 0.42, within the guests who stayed 2 or 3 nights

the level of satisfaction was 4.7 with a standard deviation of 0.54. When applying the Mann Whitney test, the level of satisfaction is statistically the same. However, within the group of guests who stayed four nights or more, the level of satisfaction was 4.1 with a standard deviation of 0.64. Table 6 shows the comparison of the level of satisfaction achieved in the general state of conservation of the tourist center by the nights of stay of the visitors; when applying the Mann Whitney test, it was found that the level of satisfaction of this

group of guests is lower than both the group that stayed one night ( $p=0.004$ ) and the group that stayed from one to three nights ( $p=0.004$ ); this means the satisfaction in the perception

in the general state of conservation of the tourist center begins to decrease from the fourth night of lodging.

**Table 6.** Comparative in the Level of Satisfaction Reached by the Nights of Stay.

Variable/Length of visitor stay	One night		Two to three nights		Four or more nights	
	Average satisfaction level	Standard deviation	Average satisfaction level	Standard deviation	Average satisfaction level	Standard deviation
Perception in the general state of conservation of the tourist center	4.8	0.42	4.7	0.54	4.1	0.64

Source: own elaboration with the data obtained in the collection of information.

In the Spearman's Rho correlation results, only four variables were considered: *number of nights of stay*, *satisfaction according to expectations and quality/price ratio*. Table 7 shows that only the correlation *contracted recreation services-number of nights of stay* has a significance of 0.03,

finding a weak inverse correlation of -0.245, which suggests that tourists, by increasing the number of nights they stay, stop consuming the recreational services offered in the ecotourism center.

**Table 7.** Spearman's Rho Correlation Analysis.

	contracted recreation services	number of nights of stay	satisfaction according to expectations
<i>number of nights of stay</i>	-0.245 p=0.030		
<i>satisfaction according to expectations</i>	-0.043 p=0.690	0.039 p=0.733	
<i>quality/price ratio</i>	0.153 p=0.165	-0.030 p=0.793	0.009 p=0.936

Source: own elaboration with the data obtained in the collection of information.

## 5. Conclusion

The tourism industry in the Sierra of Durango area has been positioning itself as an alternative economic activity that is more relevant for the inhabitants of the localities where the tourist centers are located and for the ejido, municipal and state authorities. The characteristics of this type of tourism, unlike beach tourism or magical towns, have a lower density of tourists, that is, the tourist seeks an experience of relaxation with the family, therefore, the tourist centers have a capacity of 58 guests on average and only three of these centers exceed the capacity by more than 100. Cabins must have a considerable separation that allows families greater privacy. The evaluations in the perception of the quality of the services in these centers are generally high, given that they may be new experiences that cannot be compared with previous services, reducing the gap between the difference in expectations and perception. The tourist profile shows a level of schooling of 14.5 years on average, an age that ranges from 40 years and their main purpose of the trip is to be with family. However, ecotourism centers face the challenge of increasing the days of stay of their guests and the use of additional tourist services that are offered, which would allow a greater economic benefit for the benefit of rural localities, however, there is a risk that by increasing the frequency of visits by tourists, expectations may be increased and, by not having improvement plans or service standards, the gap between perception/expectations may increase, considering the schooling groups, three of the

five groups value the quality/price ratio as regular and the use of contracted recreation services decreases as the nights of stay increase, being necessary that the tourist centers establish packages of discounts in the services as the nights of stay increase. The rural tourist activity is an economic activity that allows the inhabitants to have income without deforesting the areas, if there are adequate programs and specialized advice, the ecological impact of this activity could be mitigated.

## Acknowledgements

The research was carried out with funding from the National Technological Institute of Mexico (TecNM).

## References

- [1] Palomino, Villavicencio. C. Bertha, & Lopez, Pardo. A. Gustavo (2011). *Tourism & Management Studies*. From Ecoturismo Indígena en Quintana Roo, México. Estudio de Caso Kantemo [Indigenous Ecotourism in Quintana Roo, Mexico. Kantemo Case Study]: <https://www.redalyc.org/pdf/3887/388743867090.pdf>
- [2] García, Ana Karen (2021, Septiembre 27). *El Economista*. From Día Mundial del Turismo: el sector aporta 9 de cada 100 pesos al PIB de México [World Tourism Day: the sector contributes 9 out of every 100 pesos to Mexico's GDP]: <https://www.economista.com.mx/economia/Dia-Mundial-de-Turismo-el-sector-aporta-9-de-cada-100-pesos-al-PIB-de-Mexico-20210927-0058.html>

- [3] Pearce, Douglas. (1991). Desarrollo Turístico. Su planificación y ubicación geográficas [Turistic development. Its geographical planning and location.]. México: Trillas.
- [4] SEMARNAT. (2014). *SEMARNAT, Secretaría de Medio Ambiente y Recursos Naturales [Secretary of Environment and Natural Resources]*. From Compendio de Estadísticas Ambientales: [https://apps1.semarnat.gob.mx:8443/dgeia/compendio\\_2014/dgeiawf.semarnat.gob.mx\\_8080/ibi\\_apps/WFServlet43c3.html#:~:text=La%20Secretar%C3%ADa%20de%20Turismo%20\(SECTUR, en%20la%20conservaci%C3%B3n%20de%20losYoshito](https://apps1.semarnat.gob.mx:8443/dgeia/compendio_2014/dgeiawf.semarnat.gob.mx_8080/ibi_apps/WFServlet43c3.html#:~:text=La%20Secretar%C3%ADa%20de%20Turismo%20(SECTUR, en%20la%20conservaci%C3%B3n%20de%20losYoshito)
- [5] Villavicencio, Palomino Bertha, Gasca, Zamora José, & López, Pardo Gustavo (2008). El Periplo Sustentable. *El turismo comunitario en México: perspectiva desde las instituciones y la gobernanza en territorios indígenas* [The Sustainable Journey. Community tourism in Mexico: perspective from institutions and governance in indigenous territories]. (México, Ed.) Puerto Vallarta, Jalisco. From Turismo, identidades y exclusión: <https://rperiplo.uaemex.mx/article/view/>
- [6] CONEVAL a, Consejo Nacional de Evaluación de la Política de Desarrollo Social (2020). Informe de Pobreza y Evaluación 2020, Durango [Poverty and Evaluation Report 2020, Durango], from: [https://www.coneval.org.mx/coordinacion/entidades/Documents/Informes\\_de\\_pobreza\\_y\\_evaluacion\\_2020\\_Documentos/Informe\\_Durango\\_2020.pdf](https://www.coneval.org.mx/coordinacion/entidades/Documents/Informes_de_pobreza_y_evaluacion_2020_Documentos/Informe_Durango_2020.pdf)
- [7] CONAGUA, Comisión Nacional del Agua (2020). Precipitación registrada en las estaciones representativas de los municipios del estado de Durango [Precipitation registered in the representative stations of the municipalities of the state of Durango] (p. 11).
- [8] Lorenzo, Linares Hermys, & Morales, Garrido Geily (2014). Del desarrollo turístico sostenible al desarrollo local. Su comportamiento complejo [From sustainable tourism development to local development. His complex behavior]. *Revista de Turismo y Patrimonio Cultural [Journal of tourism and cultural heritage]*, 12 (2), 453-466. From <https://www.redalyc.org/pdf/881/88130205003.pdf>
- [9] Secretaría de Turismo c. (2000). Planeación y Gestión del Desarrollo Turístico Municipal (un enfoque de cambio) [Planning and Management of Municipal Tourism Development (a change approach)].
- [10] Ojeda, García Delia, & Mármol, Sinclair Patricia (2016). *Marketing turístico [Turistic marketing]* (2da ed.). Madrid, España: Parainfo.
- [11] González, Menorca Carlos, González, Menorca Leonor., Juaneda, Ayensa Emma, & Pelegrín, Borondo Jorge (2014). *La calidad en las organizaciones turísticas [Quality in tourism organizations]*. Madrid: Ediciones Parainfo, S. A.
- [12] SETUED, Secretaría de Turismo del Estado de Durango (2021). *5to informe de gobierno [5th government report] SETUED*. Durango.
- [13] SECTUR, Secretaría de Turismo (2020). *Datatur*. From Proyecto estratégico Durango 2040 [Strategic project Durango 2040]: <http://planeacion.durango.gob.mx/PROYECTO%20DURANGO/Reportes%20de%20mesas/Turismo.pdf>
- [14] SCT. (2018). *Secretaría de Comunicaciones y Transportes [Secretary of Communications and Transportation]*. From El corredor Vial del Norte, en Durango [The Vial del Norte corridor, in Durango]: <https://www.gob.mx/sct/prensa/el-corredor-vial-del-norte-en-durango-mejora-la-conectividad-para-el-impulso-de-la-economia>.
- [15] SCT. (2022). Secretaría de Comunicaciones y Transportes [Secretary of Communications and Transportation]. From Traza tu ruta Mappir México [From Trace your route Mappir Mexico].
- [16] INEGI. (2021). *Instituto Nacional de Estadística y Geografía [National Institute of Statistic and Geography]*. From Panorama Sociodemográfico de Durango. Censo de Población y Vivienda 2020 [Sociodemographic panorama of Durango. Population and Housing Census 2020.]. 2021: [https://www.inegi.org.mx/contenidos/productos/prod\\_serv/contenidos/espanol/bvinegi/productos/nueva\\_estruc/702825197834.pdf](https://www.inegi.org.mx/contenidos/productos/prod_serv/contenidos/espanol/bvinegi/productos/nueva_estruc/702825197834.pdf).
- [17] INEGI. (2017) Instituto Nacional de Estadística y Geografía. *Anuario estadístico y geográfico de Durango 2017 [Statistical and geographic yearbook of Durango 2017]*. From <https://www.inegi.org.mx/app/biblioteca/ficha.html?upc=702825092115>.
- [18] CONEVAL b, Consejo Nacional de Evaluación de la Política de Desarrollo Social (2020). *Medición de la Pobreza. La cohesión social [Poverty Measurement. social cohesion]*. From [https://www.coneval.org.mx/Medicion/Paginas/Cohesion\\_Social.aspx](https://www.coneval.org.mx/Medicion/Paginas/Cohesion_Social.aspx)
- [19] Secretaría de Economía [Secretary of Economy]. (2020). *Data México Beta*. From <https://datamexico.org/es/profile/geo/pueblo-nuevo?yearTransportMean=Year20&workOrSchool=workMean>
- [20] DENUÉ, Directorio Estadístico Nacional de Unidades Económicas (2022). *INEGI, Instituto Nacional de Estadística y Geografía [National Institute of Statistic and Geography]*. From <https://www.inegi.org.mx/app/mapa/denué/default.aspx>
- [21] Zeithaml, Valerie., Bitner, Mary Jo Bitner, & Gremler, Dwayne. (2009). *Marketing de servicios [Service marketing]* (Quinta ed.). México: Mc Graw Hill. Retrieved 06, 2022.
- [22] Stanton, William., Etzel, Michael., & Walker, Bruce. (2007). *Fundamentos de Marketing [Fundamentals of Marketing]*. México: McGraw Hill. Retrieved 06, 2022.
- [23] Kotler, Philip, & Keller, Keller (2016). *Dirección de Marketing [Marketing direction]* (15 Ed ed.). México: Pearson Educación.
- [24] Kotler, Philip, & Armstong, Gary (2016). *Marketing* (16 ed.). Impreso en México [Printed in Mexico]: Pearson.
- [25] SECTUR, Secretaría de Turismo (2011). Evaluación de desempeño de los destinos turísticos en el marco de los Convenios de Coordinación en materia de Reasignación de Recursos. Análisis del desempeño turístico local. Modelo de satisfacción de los turistas [Evaluation of the performance of tourist destinations within the framework of the Coordination Agreements on the Reallocation of Resources. Analysis of local tourism performance. Tourist satisfaction model]. From <https://www.sectur.gob.mx/sub/conacyt/temas/documentos/pdf/re-spuestas/11/2-Evaluaci%C3%B3n-de-desempeno-de-los-destinos-turisticos-en-el-marco-de-los-Convenios-de-Coordinacion.pdf>
- [26] Lesik, Sally (2019). *Applied Statistical Inference with Minitab (2eda edición)*. Boca Raton: FL: CRC Press Tayloy u Francis Group.