Proposal to measure tourism development within a destination and segment its different territories

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A B S T R A C T

Tourism offers a means of promoting a local development strategy capable of harnessing the resources available within a territory. In order to do this, we must know the potential for tourism development in each territory, as well as the factors that would condition it. In this article, a methodology (based on the design of a system of indicators, the construction of composite indexes, and segmentation by means of cluster analysis) is proposed to measure tourism development within an emerging country and segment its different territories. The case study chosen to validate this methodology is Ecuador, a country with interesting tourist potential, where individual cities have very different levels of tourism development. The results highlight the factors that drive or constrain the degree of tourism development presented by the cities analysed, thereby facilitating decision-making for major stakeholders in each of them.

1. Introduction

Increasingly, governments, international development cooperation agencies, and/or non-governmental organisations are promoting tourism as an instrument for local development, social inclusion, and poverty alleviation [1,2].

However, the different strategies and models have not achieved the expected changes mainly in developing countries, where plans, programs and projects have been implemented, but totally external to the reality of the territory, which has not allowed true development. Fayos-Solà et al. [3], in response to this reality, they consider that there is a tendency to opt for a strategy that focuses on a "diagnosis of local constraints linked to development", allowing the shaping of policies and governance based on a "local socio-economic system" centered on "institutional social capital and the growth of human capital" with development as a key objective ([3]:319).

There is a vast body of literature that addresses the impact of tourism on economic growth [4,5]. However, very little has been written on the role of tourism as a tool for local development [6–8], and the existing literature largely focuses on the analysis of specific cases [9,10]. Therefore, this research aims to contribute to the debate on the role of tourism as an instrument of development in emerging territories.

These studies show that tourism activity is presented as a solid way of harnessing the development of a territory's endogenous resources. In some cases, in fact, it is the only economic driver available to a particular society or social group, either to lift them out of underdevelopment or to recover from the decline of activities that had flourished in other more prosperous times [11].

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This need to take advantage of resources for tourism development and improvement of the quality of life through economic development can affect its long-term sustainability, therefore, "the contribution should be measured in local terms, but not in the whole economy" ([12]:356) and the participation of communities in the processes of tourism development becomes an important aspect of sustainable tourism [13].

In principle, therefore, tourism would appear to be an interesting tool to promote a local development strategy capable of harnessing the resources of a territory, which are often left idle or have lost their traditional use. However, tourism also generates negative impacts, so we need to identify the potential, but also the deficits a territory possesses. To this end, sufficient information must be available to measure the degree of tourism development within a territory and, above all, the factors that affect this development, both positively and negatively.

In this context, the purpose of this paper is to design a system of indicators and, subsequently, different composite indexes, which, on the basis of the information available about four core aspects (management, infrastructure, tourism services, and tourism resources) of any territory, would be able to measure their degree of tourism development and, subsequently, to classify the different territories analysed according to this degree of development.

The case study chosen to verify the proposed methodology is Ecuador, an emerging country with an interesting tourism potential but evident deficits in many of its cities, which must be tackled in the future if the country is to improve its competitive position within the global tourism sector.

Three hypotheses are proposed for the development of this research:

1. The design and implementation of a system of indicators that collects information on four central aspects (management, infrastructure, tourism services and tourism resources) and a composite indicator that brings together all this information will allow measuring the degree of tourism development in provincial capitals from Ecuador.
2. From this system of indicators, the provincial capitals of Ecuador can be classified according to their degree of tourism development, and the factors that favour or limit this level of tourism development can be identified.
3. With respect to Ecuador, the twenty-four provincial capitals analysed in this work have very different levels of tourism development, which can be explained by their different endowments of each of the central aspects analysed (management, infrastructure, tourism services and tourism resources).

With regard to the structure of this article, following this first introductory section, the second section provides a review of the literature. The third section analyses the main characteristics of Ecuador and justifies its choice as a case study. The fourth section sets out the methodology used in this research. The fifth section presents the main results yielded by this research, and the sixth section discusses these results and sets out the main conclusions reached.

2. Literature review

To understand the nature of tourism, it must be analysed as a system that encompasses resources and infrastructure [14,15], which depends on the stakeholders involved [16,17] and how their interactions affect its dynamics [18,19]. Furthermore, its impact is conditioned by the place, time, and nature of the activity [20] and its competitiveness is determined by the harnessing of tourism resources that make up a tourist product [21].

Traditionally, tourism has been regarded as an instrument for local development [2], understanding the latter not as a mere synonym for economic growth [22,23], but as a phenomenon that encompasses other aspects, such as the dimensions of sustainability. We must talk, therefore, about sustainable local development, that is, socially equitable, economically viable, and environmentally friendly [22].

For Nel [23], local economic development facilitates empowerment, generating tangible benefits, applied through policies at different territorial levels: city, neighbourhood, or community, taking into account stakeholders. It is common for local governments to implement such a strategy, regardless of their ability to do so, and, therefore, they are a growing drive recently to understand, integrate, and implement the principles of sustainable tourism in their tourism policy and planning [24–26].

Tourism, as a tool for development at a local level, in conjunction with other activities, is considered one of the most dynamic economic sectors, involving major movements of people and travel worldwide, as well as an important factor in poverty reduction, provided there are clear and applicable policies in place that allow for sustainable management to develop, reducing the negative effects and remaining stable over time (Word Tourism Organization - UNWTO [27]).

Hence, tourism becomes a key activity [2], creating a value chain for products and services [28] that generates benefits [11,29,30] based on the articulation of socio-economic development processes in a given territory [31,32]. Based on sustainable development as a substantial element [33,34], it generates changes in consumer behaviour [20,35], contributes to long-term management [36], to the implementation of plans and projects, and the relationship between the public and private sectors [37,38], as well as other sectors that contribute to local development [39], as a commercial activity that attracts capital and investment [20].

When the local tourism model is not endogenous, participatory, and self-managed, residents do not perceive the benefits of tourism, which generates incompatibilities that affect sustainability, made evident through adverse environmental and socio-cultural impacts [40–42]. Therefore, in order for tourism to become an established instrument for local development, it must be planned through the application of comprehensive and non-linear approaches, based on the reality of the territories, the host community, and market trends ([43:11,45]).

Articulation between sectoral and local policy is also important for the sustainable development of tourism. Local administrations are key to securing competitiveness, investment, and ensuring the participation of all stakeholders [43,44], taking into account the different approaches and competences [45,46].

The consolidation of tourism in any territory as an instrument of local development involves identifying the deficits and potential it possesses. To determine these characteristics, indicators must be available to measure the degree of tourism development within a territory and, above all, the factors that affect this degree of development, both positively and negatively.

An indicator is based on "quantitative or qualitative parameters that evaluate and measure the achievement of objectives in terms of results, to assist decision-making and to correct or strengthen strategies and resource orientation" Secretariat of Tourism -Government of Mexico City - SECTUR, ([47]:5). Systems of indicators are built on the basis of a social, environmental, and economic evaluation of tourism [48], World Trade Organization – WTO [49], and they strengthen governance through strategies, action plans, and monitoring [50–52].

Indicators are proposed depending on objectives and interests (analysis, monitoring, management, and information) and levels [53], based on different methodologies [56,49, European Commission – EU 57]. They can guide the allocation of public and private resources, and protect fragile systems, taking into account aspects of sustainability [54], allowing for discussion to occur between tourism actors and society.

It is also important to mention that indicators do not always meet the objectives for which they have been developed. The absence of data [52], the lack of application processes, the failure to take into account the reality of the activity, place, or territory analysed, etc., are all issues that limit the role of indicators as a management tool for a territory. Ocampo et al. [30] state that indicators should be "specific" and include all the conditions they present; only then will they provide a more accurate picture of reality, thereby benefitting decision-making [55].

There is a long tradition in the use of indicators to measure different aspects of tourism, for example: sustainability [15,37,56,57], image [58,59], competitiveness [60,61], carrying capacity [62], or governance [50] of tourist destinations. There is also literature available on the specific subject of this research [63–65]. This work, therefore, adds to extant research carried out in this field and provides a vision linked to the analysis of tourism development in an emerging destination.

3. Case study

Ecuador is an emerging tourist destination with great potential for development. Tourism first developed in this country in the 1950s, as an initiative promoted by central government, with a view to raising the country's international profile, focusing on markets such as the US, and promoting indigenous peoples in the north of the country, considering international tourism an instrument for development [66].

Tourism is now considered an important activity for the country's economic development. According to the statistics compiled by Ecuador's Ministry for Tourism, tourism accounted for 2.2 % of the country's Gross Domestic Product - GDP in 2019, 1,471,968 foreign arrivals in 2018, and 2287.5 million in foreign currency revenues from inbound tourism in 2019 (Ministry of Tourism of Ecuador - MINTUR, [67]). As a result, tourism ranks fourth among non-oil exports, after cooking bananas, bananas, and shrimp (National Planning Secretariat – Senplades [68]).

Ecuador's government is currently focusing on "strengthening public-private coordination to diversify and improve the quality and competitiveness of tourism services" [68].

Ecuador is located in South America, traversed by the equator, which divides it into the northern hemisphere and the southern hemisphere, as well as by the Andes mountain range, which divides Ecuador into four regions: Coast, Mountains, East, with important cultural characteristics and natural ecosystems, and the fourth island region, corresponding to the Galapagos archipelago and the marine platform [68], which present unique geographical and natural characteristics in the world (Map 1).

A priori, tourism development in Ecuador seems very uneven. Undoubtedly, its main tourist attractions are the Galapagos Islands, but it also has other attractions, which are reflected in cities with colonial features, declared World Heritage Cities, cities surrounded by volcanoes, large cities that are the nucleus of the economy, cities and sites linked to nature, etc., which become emerging destinations with great tourism potential, but also with great shortcomings in terms of their optimal development.

This study seeks to analyse the degree of tourism development in the cities of Ecuador, selecting twenty-four significant cities on account of their status as provincial capitals, which means they are the main administrative centres of each province. They are also often information hubs about the tourist attractions in their respective areas of influence.

In this context, the development and application of a system of indicators allows us to ascertain the characteristics of each of the cities in Ecuador and, consequently, their degree of tourism development, which will facilitate the application of strategies for their management and participatory planning processes, resulting from the promotion and invigoration of tourism in each city, differentiation in their tourism offers and, therefore, their contribution to the growth of tourism in the country as a whole.

4. Methodology

The methodology applied in this research is summarized in the following diagram in Fig. 1.

The methodology constructed to achieve the objectives proposed in this article can be structured into three phases. In the first phase, a system of indicators will be constructed and scientifically validated to provide as much information as possible on the degree of tourism development in each of the cities studied. This system of indicators will be fed with information from different sources, as described later.
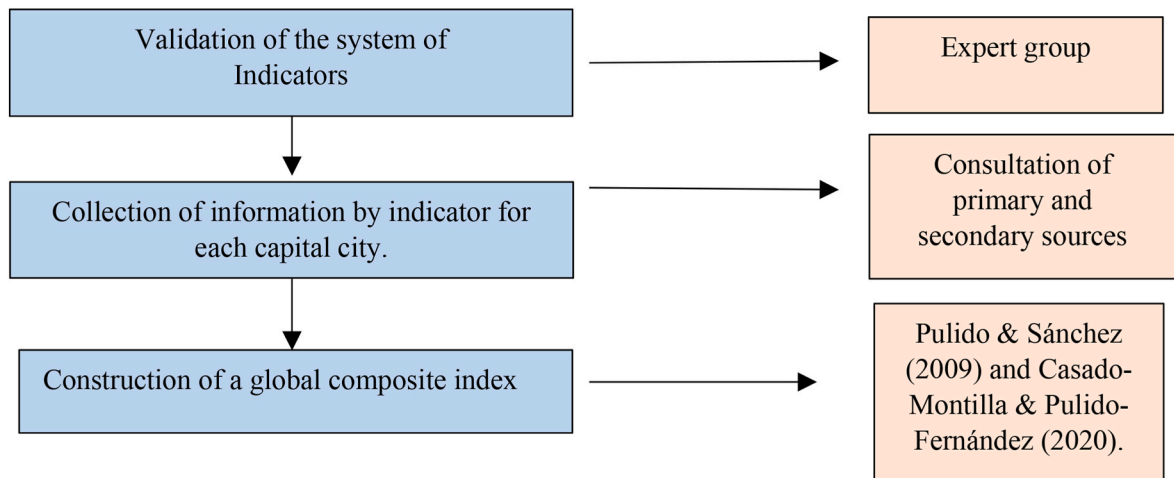
Stages of research

Methodology

Stage 1. Construction and validation of a system of indicators

Analysis of tourism indicators system
Construction of the system of indicators

→

Review of Indicator systems

Stage 2. Construction of a global composite index of tourism development in cities.

Validation of the system of Indicators

→

Expert group

↓

Collection of information by indicator for each capital city.

→

Consultation of primary and secondary sources

↓

Construction of a global composite index

→

Pulido & Sánchez (2009) and Casado-Montilla & Pulido-Fernández (2020).

Stage 3. Segmentation of the cities and characterization of the different groups.

City segmentation

→

Cluster analysis

↓

Analysis of the tourism index by selected city

→

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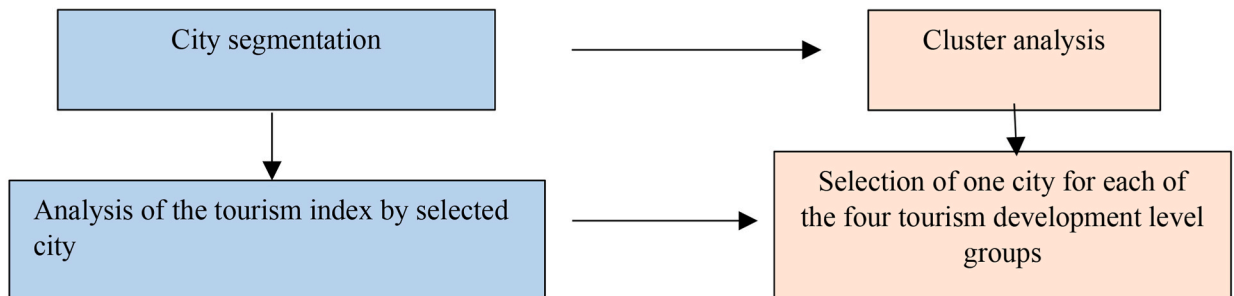| |
|---|
| Selection of one city for each of the four tourism development level groups |

Fig. 1. Methodological diagram.
Source: Authors' own

In the second stage, a composite index will be designed to aggregate all the information provided by the system of indicators and, consequently, to determine the degree of tourism development in each of the cities analysed. Similarly, it will then be possible to rank the cities according to their degree of tourism development.

The third stage will aim to cluster the analysed cities and to establish the characteristics of the different clusters obtained. This will make it possible, in subsequent studies, to select one or more representative cities from each group.

Step 1. Construction and validation of the indicator system

The objective of this stage is to develop a system of indicators that allows us to know the level of tourism development of Ecuador's cities, based on models of analysis carried out in other cities or destinations. This system of indicators has been constructed on the basis of a search and analysis of bibliographic information, as well as a review of texts, documents, and the various proposals for tourism indicators developed by international organisations, such as the WTO, The Organisation for Economic Co-operation and Development - OECD, the European System of Tourism Indicators and the Tourism Indicators developed by Mexico's Ministry for Tourism (SECTUR).

The search for information in each of the cities was developed based on official sources of information, both at the national level (Ministries of Tourism, Transportation, Health, Culture and Heritage, National Institute of Statistics and Census INEC, National Transit Agency, General Directorate of Aviation, Association of Hotels of Ecuador AHOTEC, Association of Municipalities of Ecuador AME, General Aviation Directory, National System of Protected Areas) as well as at the local level (Decentralised Autonomous Governments GAD and local governments) and the different departments, Land Management Plans). The analysis was developed taking into account the existence or not of information related to the objective and interpretation of the indicator, whether these are laws, regulations, resolutions, plans, ordinances, basic services. On the other hand, the number of tourism services (lodging, catering, operation and intermediation) and the number of tourism resources (cultural and natural) were taken into account. This information is available in greater detail in Annex 2.

The system of indicators proposed in this study is composed of indicators classified into four areas of analysis, each area encompassing a number of indicators to assess the destination and its components. Specifically, the four areas are:

- Management indicators, which aim to analyse the planning process put into effect by public administrations, as well as the level of interest shown by the latter in the tourist activity of cities.
- Destination infrastructure indicators, which are proposed on the basis of an analysis of basic characteristics and services, taken from different sources of analysis and indicator systems, as well as national regulations in relation to services, especially transport, highways, and environmental regulations.
- Tourism services indicators, which are composed of information and data obtained from various sources, as well as in the regulations emanating from Ecuador's Ministry for Tourism.
- Tourism resources indicators, classified as either cultural or natural, taken from different sources, which can evaluate the amount of resources available to cities.

To validate the indicator system, a panel of experts was proposed, consisting of a qualitative assessment [69] in which an opinion or "judgement" is requested in relation to content or an instrument [70] to estimate its validity [71] or relevance [69]. The panel is usually made up of people with recognised expertise in the field in which the research is being conducted [71]. There is no consensus with regard to the number of experts who should be included on the panel [69,70,72], giving greater importance to their level of knowledge and experience instead [71].

For this study, the panel was made up of 14 experts. The criteria for their selection were, mainly, their knowledge of the subject matter encompassed by the study as well as of the structure and development of tourism in Ecuador. The invitation for experts was carried out through e-mail, and once the invitation was accepted, the proposed indicator system was sent to them for validation. Consequently, the panel was composed of Ecuadorian researchers with experience in tourism development in this country, the environment, tourism planning, natural and cultural heritage management, sustainable management, public policies, local development and innovation, as well as being university lecturers and consultants. It should be noted that, although there is no consensus regarding the number of experts to be included on such a panel, authors such as [73] or [74] suggest a range of two to twenty experts, so the composition of the panel in our case would be adequate. The expert summary is set out in Table 1.

In order to validate the system of indicators, the experts were asked to give their opinion on two key aspects: the validity and importance of the indicators chosen [71,75]. To make this assessment, a Likert scale was used [76] in which 1 represented the total disagreement of the experts with the validity and/or importance of the indicator to measure tourism development in the cities studied, and 7 represented their total agreement. The results obtained during this indicator validation process are set out in Annex 1.

The validated indicators show a level of acceptance and agreement in the parameters of validity and importance. Based on the results obtained, all the indicators are applied within the assessment of tourism development in Ecuador's cities.

Step 2. Construction of a global composite index for tourism development

The construction of a global composite index has been mostly applied to the measurement of sustainability of territories. However, according to Saisana and Tarantola [77], Saisana et al. [78] and Nardo et al. [79], there is no specific methodology in the construction of composite indicators, so its application will be made according to the type of analysis, respecting the quality of the indicator and the relevance of the data. Therefore, in the literature there are studies in which the construction of a global index is developed by applying different analyses, as is the case of Blancas et al. [80], in whose work they combine principal component analysis and benchmark distance, applied to the evaluation of sustainable tourism in coastal destinations. Likewise, they replicate this same methodology in sustainability indicators in tourism planning, as is the case of rural tourism in Andalusia (Spain) [81]. On the other hand, García-Bernabeu et al. [82] construct a composite index of circular economy based on the technique for ordering preferences by similarity or

Table 1
Summary table panel of experts.

N°	Type of experts	Degree	Lines of research
8	Research professors	PhD; magister	Tourism planning, destination management, governance and tourism policy; heritage; digital technologies; cultural heritage; innovation and competitiveness; tourism administration; ecotourism; urban destination management; cultural tourism.
6	Consultants and public managers	PhD; mágister	Sustainable development; market research; international markets; social capital; tourism planning; destination management; community tourism; tourism products; management programs.

Source: Authors' own.

TOPSIS ideal solutions. Carrillo and Jorge [83] also analyse the tourism sustainability of Spanish regions using the multicriteria decision technique for the aggregation and weighting of the simple indicators considered. Finally, the methodology we propose in this research has already been successfully applied by Refs. [4,63].

The construction of this global composite index requires the prior design of four composite tourist indexes, one for each of the areas into which the different indicators were classified in the previous stage. A management index, a basic services index, a tourism services index, and a tourism resource index will, therefore, be calculated.

The methodology used in the construction of these indexes and the subsequent global composite index has been used by Refs. [4, 63], and follows the steps outlined below.

Before calculating the indexes, given the different nature of each indicator and its measurement scale, the first step will be to normalise these values. Based on the methodology proposed by the United Nations Development Programme (UNDP), we will calculate the normalised scores as follows.

For direct items or indicators (the higher the score, the better the situation), the normalised value of indicator j in municipality i will be calculated by the expression:

$$y_{ij} = \frac{x_{ij} - \min_i x_{ij}}{\max_i x_{ij} - \min_i x_{ij}} \tag{1}$$

where x_{ij} is the non-normalised value of indicator j in municipality i, and y_{ij} is the normalised value of indicator j in municipality i. Thus, the municipality with the highest value in that indicator will be assigned a score of 1, and the one with the lowest value will be assigned a score of 0. In this way, all the normalised indicators will take values between 0 and 1, where 1 indicates the greatest tourist vocation. Note that these normalised values are relative to the other cities in the sample.

For the specific case of indicator I.6, which operates in reverse (higher score, lower level of heritage protection), the normalised value in municipality i shall be calculated by the expression:

$$y_i = \frac{\max_i x_i - x_i}{\max_i x_i - \min_i x_i} \tag{2}$$

The normalisation process will be performed using Microsoft Excel 2016 software.

The composite index for each block of indicators will be calculated as a linear combination of the n_k indicators that make it up once normalised ($k = 1,2, …,4$ in our case, since there are 4 blocks), where each of them will have a determined loading based on factor analysis. In particular, these loadings will be given by the correlation between each normalised indicator and the first factor extracted through factor analysis.

$$I_k = \alpha_{11} Y_1 + \alpha_{21} Y_2 + … + \alpha_{n_k 1} Y_{n_k} \tag{3}$$

if it is necessary to extract more than one factor, the loadings will be obtained from the rotated factor loading matrix (coefficients β_{jr}, with $j = 1,2, …,n_k$ and $r = 1,2, …,m$, where m is the number of factors extracted):

$$G_1 = \beta_{11} Y_1 + \beta_{21} Y_2 + … + \beta_{n_k 1} Y_{n_k}$$

$$G_2 = \beta_{12} Y_1 + \beta_{22} Y_2 + … + \beta_{n_k 2} Y_{n_k} \tag{4}$$

$$G_m = \beta_{1m} Y_1 + \beta_{2m} Y_2 + … + \beta_{n_k m} Y_{n_k}$$

finally constructing the index as:

$$I_k = \omega_1 G_1 + \omega_2 G_2 + … + \omega_m G_m \tag{5}$$

where $\omega_i = \frac{\lambda_i^*}{\sum_{i=1}^m \lambda_i^*}$ $para\ i = 1, 2, …, m$; with λ_i^* being the eigenvalue associated with the common rotated factor G_i.

Finally, the aggregate index will be transformed using Casalmiglia's function [84]:

$$I_k' = \begin{cases} 1 + \dfrac{s-1}{2} \exp(I_k) & si\ I_k < 0 \\ s - \dfrac{s-1}{2} \exp(-I_k) & si\ I_k \geq 0 \end{cases} \tag{6}$$

taking $s = 100$, so that the final result ranges from 0 to 100.

Factor analyses will be performed using the principal components extraction method, which assumes that it is possible to explain 100 % of the observed variability. The number of factors to be extracted will be decided on the basis of the eigenvalues and the cumulative percentage of explained variability. Thus, factors with eigenvalues greater than 1 will be considered in principle, and it is desirable that, as a whole, they explain at least 70 % of the variance. If more than one factor is extracted, the varimax rotation method is used.

Factor analyses will be carried out using the software package IBM SPSS Statistics v.21, and the rest of the analysis will be conducted using Microsoft Excel 2016.

Finally, following the methodology proposed by Gooroochurn and Sugiyarto [61], confirmatory factor analysis will be carried out based on the composite indexes of the 4 blocks calculated previously. Thus, the global composite index for each municipality i will be given by:

$$I_i = \omega_1 I'_{1i} + \omega_2 I'_{2i} + \omega_3 I'_{3i} + \omega_4 I'_{4i} \tag{7}$$

where:

$$\omega_k = \frac{|\widehat{\beta}_k|}{\sum\limits_{k=1}^{4} |\widehat{\beta}_k|} \; para \; k = 1, 2, 3, 4.$$

This factor analysis will also be carried out using the software package IBM SPSS Statistics v.21, and the rest of the analysis will be conducted using Microsoft Excel 2016.

Step 3.   Segmentation of cities and characterisation of different groups

To obtain the different groups of cities based on their characteristics, a cluster analysis will be performed. This analysis will be hierarchical, allowing us to determine the optimal number of clusters, which is unknown a priori, and also recommended when the sample size is not very large.

The variables that will be included in the analysis to determine the groups will be the scores of the 4 previously calculated indexes. As these scores are calculated on the same scale, the squared Euclidean distance will be used in the analysis. The Ward method will be used for clustering purposes, which minimises variance in each group and avoids the formation of clusters with isolated cases.

Finally, the resulting clusters will be characterised by the scores of the four composite indexes and the global composite index, each offering the mean and standard deviation. In addition, the results will be compared between the groups using Student's t tests (if two groups are established and the criteria are met, or alternatively, Mann-Whitney's U), or ANOVA (if three or more groups are established and the criteria are met, or alternatively, Kruskal-Wallis's H).

All these analyses will be performed using the software package IBM SPSS Statistics v.21.

5. Analysis of results

As noted in the methodology section, data have been collected for the different indicators that make up the system for the 24 cities in Ecuador studied in this paper, divided into four different headings: management indicators, basic services indicators, tourism services indicators, and tourism resources indicators. Due to considerations of space, the four tables with these indicators have not been included in this text.

However, the normalised scores for each city obtained for each indicator are shown in Tables 2–5, following the methodology set out in the previous section. The scores range from 0 to 1, with 0 corresponding to cities with the lowest scores on each item and 1 to cities with the highest scores (by reversing item I.6).

Once the results have been normalised, the next step is to obtain a composite index for each group of indicators, applying factor analysis to the four dimensions separately, which gives them specific loadings. These loadings will be given by the correlation of each normalised indicator and the first factor extracted in the factor analysis. It may be necessary to extract more than one factor, in which case the loadings would be obtained using the rotated factor loadings matrix. Finally, the composite indicator is obtained when it is transformed by means of Casalmiglia's function [84].

Table 6 shows the calculation of the composite management index for each city. As you can see, the best-managed cities are Cuenca, Pto. Baq. Moreno, Guayaquil, Ibarra, Macas, Quito and Ambato, all with indexes above 90 points. In contrast, the lowest levels of management (scores below 60) are found in the cities of Pto. Fco. Orellana, Sto. Domingo and Zamora.

Table 7 shows the calculation of the composite basic services index for each of the cities analysed. The cities with the highest indexes for basic services (all above 70 points) are Cuenca, Pto. Baq. Moreno, Tena, Quito and also Pto. Fco. Orellana, which had poor scores for management, but performed well in basic services. The lowest indexes (below 55) are obtained by the cities of Guaranda, Riobamba, Portoviejo, Santa Elena and Nueva Loja.

Table 8 shows the calculation of the composite tourism services index for each city. The city of Quito stands out above the rest, with more than 99 points out of 100, although there are several cities that score over 90 points. In contrast, there are 6 cities that score lower than 75 points, particularly Guaranda, which scored around 60 points in this block.

Finally, Table 9 shows the results of the calculation of the composite tourism resources index for each city. The only city that scores more than 95 points in the tourism resources index is Pto. Baq. Moreno. The rest score below 90. Furthermore, there are four cities with scores below 70: Tulcán, Sto. Domingo, Nueva Loja and Zamora.

Finally, the overall composite index is calculated, following the methodology outlined in the previous section. Table 10 summarises the composite indexes for all blocks for each city, as well as the global composite index.

The two cities that, globally, are in a better position than the rest are Pto. Baq. Moreno, with a value for the global composite index equal to 90.16999749, and Cuenca, which obtains a value of 89.04952332. These are cities that have obtained high scores in all four blocks analysed. At the opposite end are Sto. Domingo (69.54736618) and Zamora (66.41560161). The country's capital city finally

Table 2
Normalised scores for each city in each management indicator.

Provinces	Cities	1. Existence of an updated tourism development plan	2. Existence of a plan for territorial planning	3. Existence of ordinances issued with regard to tourism	4. Existence of ordinances or resolutions to preserve heritage	5. Availability of funds for the restoration, conservation and maintenance of cultural heritage	6. Register of destroyed heritage buildings.	7. Existence of laws, ordinances or resolutions to conserve natural resources at the municipal level	8. Availability of funds for the restoration, conservation and maintenance of natural resources
Azuay	Cuenca	1	1	1	1	0.11111323	1	1	0.00288079
Bolívar	Guaranda	0	1	1	1	0.025864787	1	1	0.000464855
Cañar	Azogues	0	1	1	1	0.243478422	1	1	0.004807079
Carchi	Tulcán	0	1	1	1	0.041524664	1	1	0.015920521
Chimborazo	Riobamba	0	1	1	1	0.004529247	1	1	8.29163E-05
Cotopaxi	Latacunga	0	1	1	1	0.000220628	1	1	7.92286E-08
El Oro	Machala	0	1	1	1	0.000291471	0	0	0.000177242
Esmeraldas	Esmeraldas	0	1	1	1	0.008761089	1	1	0
Galápagos	Pto. Baq Moreno	1	1	1	1	0	1	1	0.002372265
Guayas	Guayaquil	1	1	1	1	0.643061336	0.5	1	0.001727597
Imbabura	Ibarra	1	1	1	1	0.033816899	0	1	0.000509754
Loja	Loja	0	1	0	1	0.274455796	1	1	0.004202146
Los Ríos	Babahoyo	0	1	1	0	0.000179372	0	1	6.53026E-05
Manabí	Portoviejo	0	1	1	1	0.011984565	0.5	1	4.478E-05
Morona Santiago	Macas	0	1	1	1	0.056053812	1	1	1
Napo	Tena	0	1	1	0	0	1	1	5.07856E-05
Orellana	Pto. Fco. Orellana	0	1	0	0	0.008071749	1	0	0.000261692
Pastaza	Puyo	0	1	1	1	0.000807875	1	1	1.0379E-05
Pichincha	Quito	1	1	1	1	0.140743651	1	1	0.01340008
Santa Elena	Santa Elena	1	1	0	1	0.008761089	1	1	0.000298914
Sto. Domingo	Sto. Domingo	0	1	0	0	0.000240231	1	0	0.001376428
Sucumbios	Nueva Loja	0	1	1	1	0.000313901	1	1	6.06099E-05
Tungurahua	Ambato	1	1	1	1	1	1	1	0.006176744
Zamora Chinchipe	Zamora	0	1	0	0	0.00044843	1	0	1.5925E-05

Source: Authors' own.

Table 3
Normalised scores for each city in each basic services indicator.

Provinces	Cities	1. Existence of major roads to access the destination	2. Existence of roads that connect the destination with other cantons and parishes.	3. Existence of cycle paths in the destination's urban area	4. Availability of public transport at a provincial level	5. Availability of buses and taxis within the destination	6. Availability of commercial transportation for the transfer of persons.	7. Availability of bicycle transport within the city centre	8. Existence of water (drinking or treated) and sewage service	9. Availability of electrical power (domestic grid, public lighting)	10. Availability of renewable energy (hydraulic, wind, solar panels)	11. Availability of hospitals, clinics, health centres and outpatient care	12. Availability of information and communications technology–ICT	13. Availability of judicial services	14. Availability of banking services
Azuay	Cuenca	0.814814815	1	1	0.261904762	0.253333333	0.03187251	1	0	1	0.5	0.180788196	1	0.005360202	0.498561934
Bolívar	Guaranda	0.185185185	0.12	0	0.142857143	0.12	0	0	0	1	0	0.194246994	1	0.05540843	0.056552075
Cañar	Azogues	0.481481481	0.448	0	0.178571429	0.213333333	0	0	0	0	0	0.104135532	1	0.063240946	0.447435899
Carchi	Tulcán	0.074074074	0.096	0	0.583333333	0.48	0	0	0	1	1	0.531709485	1	0.030581479	0.327403233
Chimborazo	Riobamba	0.074074074	0.112	0	0.238095238	0.08	0	0	0	1	0	0.074639983	1	0.006932287	0.227441917
Cotopaxi	Latacunga	0.222222222	0.056	0	0.047619048	1	0	0	0	1	0	0.05820364	1	0.021419288	0.231074861
El Oro	Machala	0.074074074	0.192	0	0	0.306666667	0	0	0	1	0	0.082925523	1	0.012465273	0.463510488
Esmeraldas	Esmeraldas	0.703703704	0.144	0	0.083333333	0.453333333	0	0	0.5	1	0	0.0512109	1	0.009741488	0.23610822
Galápagos	Pto. Baq Moreno	0	0	1	0.035714286	0.04	0.011952191	1	1	1	0	1	1	0.103155849	1
Guayas	Guayaquil	0.148148148	0.112	1	1	0.36	1	0	0	1	0	0	1	0	0.467134061
Imbabura	Ibarra	0	0.064	0	0.083333333	0.613333333	0.394422311	0	0	1	0.5	0.057074101	1	0.024274486	0.450893006
Loja	Loja	0.37037037	0.208	0	0.154761905	0	0	0	0	0	0.5	0.161952799	1	0.065558857	0.392520267
Los Ríos	Babahoyo	0.074074074	0.024	1	0.023809524	0.04	0	0	0	1	0.5	0.146553824	1	0.06772259	0.074727607
Manabí	Portoviejo	0.296296296	0.336	0	0	0	0	0	0	1	0	0.158229803	1	0.004084223	0.131804614
Morona Santiago	Macas	0.185185185	0.04	1	0.023809524	0.146666667	0	0	0	0	0	0.408437608	1	0.052677699	0.138329129
Napo	Tena	0.62962963	0.024	1	0.202380952	0.16	0.039840637	0	0	0	0	0.343350453	1	0	0.033785355
Orellana	Pto. Fco. Orellana	0.296296296	0.072	1	0.202380952	0.16	0.039840637	0	0	0	0.5	0.314946948	1	0.971723125	0.180504903
Pastaza	Puyo	0.074074074	0.104	1	0.023809524	0.133333333	0.071713147	0	0	0	0	0.127848526	1	0.085823673	0.31529458
Pichincha	Quito	1	0.152	1	0	0.64	0.067729084	0	0.5	1	0	0.101147637	1	0.006681557	0.361262126
Santa Elena	Santa Elena	0.074074074	0.144	0	0.035714286	0.306666667	0	0	0.5	1	0	0.06723121	1	0.009504876	0
Sto. Domingo	Sto. Domingo	0.333333333	0.04	1	0.202380952	0.226666667	0.067729084	0	0	1	0	0.051616574	1	0.118402133	0.164473661
Sucumbíos	Nueva Loja	0.037037037	0.032	0	0.142857143	0.106666667	0	0	0.5	1	0	0.265184593	1	0.001278315	0.105149311
Tungurahua	Ambato	0.111111111	0.12	0	0.05952381	0.053333333	0	1	0	1	0	0.032719935	1	0.014862668	0.339017402
Zamora Chinchipe	Zamora	0.037037037	0.08	0	0	0	0	0	0	0	0.5	0.47543704	1	0.154743474	0.509736661

Source: Authors' own.

Source: Authors' own.

Table 4

Normalised scores for each city in each tourism services indicator.

Provinces	Cities	1. Availability of tourist transport	2. Availability of air transport	3. Availability of tourist-heritage railway system	4. Availability of accessibility in hotel services	5. Number of places to stay in hotels and hostels	6. Number of places to stay in hosterías, Hacienda Turística	7. Number of places to stay in Lodges and Resorts	8. Number of places to stay in shelters, tourist camps and guest houses	9. Existence of unregistered places to stay	10. Number of restaurant places (restaurants and cafes)	11. Availability of accessibility in restaurant services	12. Existence of mass events and shows	13. Development of traditional events typical of the destination	14. Availability of recreational events	15. Availability of shopping centres	16. Availability of shops and craft centres	17. Existence of night clubs, bars and discos	18. Number of travel agencies (international, dual, operators)	19. Availability of tourist signage	20. Existence of Tourist Information Offices	21. Availability of tourist leaflets and brochures	22. Number of specialised guides in the destination
Azuay	Cuenca	1	1	0	1	0.309759	0.265021	0	0.477419	1	0.310265	1	1	1	1	1	1	1	0.173722628	1	0.25	1	0.093280
Bolívar	Guaranda	0	0	0	0	0.015229	0	0	0	1	0.010508	0	0	1	0	1	0	1	0.017518248	1	0	1	0.009027
Cañar	Azogues	1	0	0	1	0.003907	0.031276	0	0	1	0.021557	1	1	1	1	1	1	1	0.017518248	1	0	1	0.001003
Carchi	Tulcán	0	0	0	1	0.038630	0	0	0	1	0.006581	1	0	1	0	1	0	1	0.001459854	1	0	1	0.001003
Chimborazo	Riobamba	1	0	1	1	0.086310	0.165432	0	0.174194	1	0.073445	1	1	1	1	1	1	1	0.039416058	1	0.75	1	0.081244
Cotopaxi	Latacunga	1	1	1	0	0.046045	0.275720	0	0.225806	1	0.048564	0	1	1	1	1	1	1	0.026277372	1	0.75	1	0.114343
El Oro	Machala	1	0	0	1	0.083440	0	0	0	1	0.049748	1	0	1	1	1	0	1	0.042335766	1	0	1	0.001003
Esmeraldas	Esmeraldas	1	1	0	1	0.027667	0.259259	0	0	1	0.019092	1	1	1	0	1	0	1	0.005839416	1	0.75	1	0
Galápagos	Pto. Baq Moreno	1	1	0	1	0.054816	0	0.038071	0.941935	1	0.004171	1	1	1	1	0	1	1	0.045255474	1	0.25	1	0.001003
Guayas	Guayaquil	1	1	0	1	0.424653	0.060905	0	0.090323	1	0.820186	1	1	1	0	1	1	1	0.398540146	1	0.25	1	0.028084
Imbabura	Ibarra	1	0	1	1	0.081646	0.937449	0	0.090323	1	0.054569	1	0	1	0	1	1	1	0.040875912	1	0.5	1	0.034102
Loja	Loja	1	0	0	1	0.086031	0.355556	0	0.354839	1	0.057656	1	0	1	0	1	1	1	0.03649635	1	0	1	0.021063
Los Ríos	Babahoyo	0	0	0	1	0	0	0	0	1	0.010995	1	0	1	0	1	0	1	0.002919708	0	0.5	1	0.001003
Manabí	Portoviejo	0	0	0	1	0.066895	0.265844	0	0	1	0.051969	1	0	1	0	1	0	1	0.02919708	1	0	1	0.007021
Morona Santiago	Macas	1	1	0	1	0.016106	0.149794	0	0.058065	1	0.008504	1	1	1	1	0	0	1	0.010218978	1	0.25	1	0.009027
Napo	Tena	1	0	0	1	0.103731	0.761317	0	0.193548	1	0.016872	1	1	1	1	0	0	1	0.045255474	1	0.75	1	0.113340
Orellana	Pto. Fco. Orellana	1	1	0	1	0.065101	0.153909	0	0.232258	1	0.007935	1	1	1	1	0	0	1	0.008759124	1	0.25	1	0.050150
Pastaza	Puyo	1	0	0	1	0.069646	0.546502	0	0.219355	1	0.0220984	1	1	1	1	0	0	1	0.00729927	1	0.75	1	0.023069
Pichincha	Quito	1	1	1	1	1	0.568724	1	0.348387	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Santa Elena	Santa Elena	0	0	0	0	0.196619	1	0.342640	1	1	0.019119	0	0	1	0	0	0	1	0.027737226	1	0	1	0.001003
Sto. Domingo	Sto. Domingo	0	0	0	0	0.151730	0.328395	0	0.225806	1	0.04043	1	1	1	1	1	1	1	0.024817518	1	0	1	0.006018
Sucumbíos	Nueva Loja	1	0	0	1	0.078935	0	0	0.064516	1	0.00948	1	0	1	0	1	0	1	0.005839416	1	0.25	1	0.028084
Tungurahua	Ambato	1	0	1	1	0.086071	0.069959	0	0	1	0.156720	1	1	1	1	1	1	1	0.052554745	1	0	1	0.014042
Zamora Chinchipe	Zamora	0	0	0	1	0.000359	0.09218	0	0.038710	1	0	1	0	1	0	0	0	1	0.001459854	1	0.25	1	0

Source: Authors' own.

Table 5

Normalised scores for each city in each tourism resources indicator.

Provinces	Cities	1. Number of Museums	2. Number of Cultural Centres	3. Number of archaeological areas	4. Number of Art Galleries	5. Number of heritage assets	6. Number of Parks and Squares	7. Number of craft shops	8. Number of resources classified as cultural interest assets	9. Number of traditional festivities	10. Number of wildlife shelters	11. Number of national recreation areas	12. Number of National Parks	13. Number of Reserves	14. Number of Protected Forests	15. Number of protected areas at the municipal level	16. Existence of tourist packages (cultural and archaeological)	17. Existence of tourist packages (adventure and ecotourism)	18. Existence of flora and fauna spotting/watching	19. Existence of hiking activities	20. Existence of special activities
Azuay	Cuenca	0.295697064	0.488405	0.862896	0.118278826	1	0.093100233	1	1	0.011737	0	0	0.029570	0	0	0.044355	1	1	1	1	1
Bolívar	Guaranda	0.081358773	0.447936	0.002094	0	0.424560691	0.170772087	0.108609	0.128117	0.161411	0	0	0	0	0	0	1	1	1	1	1
Cañar	Azogues	0.213376342	0.587392	0	0.213376342	0.49859615	0.319912142	0.094948	0.148139	0.176517	0	0	0	0	0	0	1	1	0	1	0
Carchi	Tulcán	0.259254549	0.475791	0	0.043209092	0.470580962	0.155478677	0	0.045510	0.008194	0	0	0	0	0	0	1	0	0	0	0
Chimborazo	Riobamba	0.231792187	0.182311	0.025564	0.049669754	0.682617372	0.049646108	0.058939	0.308562	1	0	0	0.033113	0.033113	0	0.065767	1	1	1	1	1
Cotopaxi	Latacunga	0.131533413	0	0.007334	0.043844471	0.312824144	0.223500351	0.058530	0.000307	0.018085	0	0	0.043844	0.043844	0	0.065767	1	1	1	1	1
El Oro	Machala	0.030389638	0.167316	0.001564	0.13675337	0.086880153	0.027337653	0.013523	0.015416	0.005344	0	0	0	0	0	0	1	1	1	1	0
Esmeraldas	Esmeraldas	0.078890155	0	0.000508	0	0.051054067	0.059139449	0	0.050178	0.103842	0	1	0	0	0.039445	0.157780	1	1	1	0	1
Galápagos	Pto. Baq Moreno	1	0	0	1	0.729879577	0.599714363	0	0	0.332139	0	0	1	1	0	1	1	1	1	0	1
Guayas	Guayaquil	0.034975743	0	0.241458	0.063592261	0.187935263	0.022882315	0.708845	0.002580	0	0.080609	1	0	0.003180	0.033192	0.007949	1	1	1	1	1
Imbabura	Ibarra	0.165033807	0.227156	0.611553	0.041258452	0.778341634	0.074229858	0.018359	0.000614	0.026110	0	0	0.0347910	0.041258	0.061528	0.020629	1	1	1	0	1
Loja	Loja	0.243536338	0.383096	0.029545	0.069581811	0.399837867	0.062593817	0.030962	0.285776	0.010191	0	0	0.0347910	0	0.311297	0	1	1	1	1	1
Los Ríos	Babahoyo	0.097219332	0	0.200143	0.048609666	0.123454759	0.262367234	0	0.000369	0.014800	0	0	0	0	0.144981	0.048610	1	0	1	1	1
Manabí	Portoviejo	0.106774655	0	0	0.040404496	0.040904528	0.040021434	0.023756	0.122282	0.007490	0	0	0	0	0	0.013347	1	1	1	1	0
Morona Santiago	Macas	0.181630422	1	0.074784	0	0.126032406	0.326779118	0.080822	0.066761	0.160142	0	0	0.181630	0	0.541722	0.181630	1	1	1	0	0
Napo	Tena	0	0.676002	0.006319	0.061391261	0.058233308	0	0	0.005036	0.066843	0	0	0.245565	0.122783	0.183103	0.184174	1	1	1	1	1
Orellana	Pto. Fco. Orellana	0.102685624	0	0.013212	0	0.025045968	0.277119196	0.045693	0.000553	0.135590	0	0	0.205371	0.102686	0	0.872828	1	1	1	1	1
Pastaza	Puyo	0.241066821	0	0.549009	0	0.654792264	0.433713706	0.160904	6.1417E-05	0.213009	0	0	0.120533	0	0.539246	0.120533	1	1	1	1	1
Pichincha	Quito	0.196957294	0.110276	0.152310	0.081787351	0.393151482	1	0.303033	0.961983	0.005638	0	0	0	0.006677	0.124457	0.010015	1	1	1	1	0
Santa Elena	Santa Elena	0.363176379	0	1	0	0.860996981	0	0.184692	0.118474	0.021660	0	0	0	0.051882	0	0	0	1	0	0	1
Sto. Domingo	Sto. Domingo	0.020311782	0	0	0.060935347	0	0.060906338	0.072307	0.002272	0.007619	0	0	0	0	0	0.030468	1	0	1	1	
Sucumbios	Nueva Loja	0.162953436	0.448585	0	0	0.020556141	0.146588274	0.036255	0.014433	0.034822	0	0	0	0	0.121504	0	0	1	1	1	0
Tungurahua	Ambato	0.249275441	0.249533	0.006415	0.045322808	0.253564702	0.06795185	0.060503	0.209925	0.008664	0	0	0	0.022661	0	0	1	1	1	1	1
Zamora Chinchipe	Zamora	0.293022344	0	0.165891	0	0.455605118	0.61505398	0.130389	0.010195	0.161484	0	0	0.293022	0	0	0	0	0	0	0	0

Source: Authors' own.

Source: Authors' own.

gets a score of 87.55358339, which puts it in third position, only surpassed by Pto. Baq. Moreno and Cuenca.

The final stage of this work involves segmenting the cities and characterising the different groups. To obtain the different groups of cities based on their characteristics, a cluster analysis was performed.

The result of the hierarchical clustering based on the four indexes is shown in the dendrogram provided in Fig. 2.

In view of the dendrogram, a classification of the municipalities into four groups is proposed. The characteristics of these can be seen in Table 11.

Group 1 includes cities with the highest scores in the four indexes and the global index. These are the four best-positioned cities in the sample in terms of tourism. The next best-placed group of cities is in cluster 2, with medium-high values in almost all indexes, except for basic services. The next group, the third cluster, encompasses cities with values below the previous groups, mainly in basic services, although still well placed in management. Finally, cluster 4 groups together the cities with the worst scores overall, even though they have higher scores for tourist services. In contrast, they score particularly low in the management index.

6. Discussion and conclusions

The results obtained have validated the three proposed hypotheses. It is indeed possible to generate a system of indicators, and a composite indicator, which allow us to measure tourism development in a given territory. It has also been verified that it is possible to classify the territories analysed considering tourism, according to Bigné et al. [14] and Ghoochani [15], as a system, according to their degree of tourism development in accordance Hanley [53], levels [41] and its territorial reality, as considered by Saarinen [20], Gkoumas [41] and Vitálišová et al. [43].

In the case of Ecuador, it has been shown that the twenty-four cities analysed have very different levels of tourism development, so policy makers, destinations managers and, in general, all stakeholders interested in the tourism development of the country, and from each of these cities in particular, will have to design strategies to address the deficits presented by each city and to favour their respective potential for tourism development [51–53]. Which allows to determine their competitiveness according to the use of their tourism resources [21].

The development of strategies guided by knowledge of the deficits and potential of each territory allows for local economic development and, according to Nel [23], it can lead to the empowerment of stakeholders, which, in turn, leads to the application of the principles of sustainable tourism in tourism policy and planning [24–27].

Table 6
Calculation of the composite management index for each city.

Province	City	G1	G2	G3	Composite management index before it is transformed using Casalmiglia's function	Composite Management Index
Azuay	Cuenca	2.577076464	1.38873823	0.779083	1.830605265	92.06433303
Bolívar	Guaranda	2.364673338	0.510040322	0.86895225	1.510136333	89.0664468
Cañar	Azogues	2.395723437	0.678477294	0.89398632	1.576811066	89.77166711
Carchi	Tulcán	2.371980729	0.516104079	0.87761361	1.517429146	89.14589311
Chimborazo	Riobamba	2.361643755	0.493508704	0.86651766	1.503606542	88.99481938
Cotopaxi	Latacunga	2.361030032	0.490172499	0.86602342	1.502286939	88.98028732
El Oro	Machala	1.623099016	0.213157034	−0.1788888	0.815920068	78.1095033
Esmeraldas	Esmeraldas	2.362191508	0.496851171	0.86692868	1.504875566	89.00877636
Galápagos	Pto. Baq Moreno	2.561794709	1.302051094	0.76707464	1.796842722	91.79183043
Guayas	Guayaquil	2.694035087	1.769182926	0.3799471	1.896340056	92.56920677
Imbabura	Ibarra	2.655769866	1.257240913	−0.1401845	1.616165185	90.16637648
Loja	Loja	1.551733707	0.762943574	1.19299589	1.254018581	85.87488966
Los Ríos	Babahoyo	1.676046271	0.145114148	−0.1609514	0.827944118	78.37113962
Manabí	Portoviejo	2.407644902	0.463354018	0.41229065	1.410549637	87.92154808
Morona Santiago	Macas	2.703623318	0.133834081	1.3249417	1.683955918	90.81091146
Napo	Tena	1.586017013	0.216979686	0.74902301	1.018508062	82.12390031
Orellana	Pto. Fco. Orellana	−0.088814575	0.078207431	0.91097415	0.193110389	59.19264719
Pastaza	Puyo	2.361113348	0.490627607	0.86609034	1.502466632	88.98226731
Pichincha	Quito	2.584630163	1.407701503	0.78698906	1.841319347	92.14890256
Santa Elena	Santa Elena	1.714291644	1.369731606	1.06306408	1.467074496	88.58534366
Sto. Domingo	Sto. Domingo	−0.089506225	0.071637289	0.91064899	0.190920279	59.10317668
Sucumbios	Nueva Loja	2.361062995	0.490221227	0.86606073	1.502325183	88.98070875
Tungurahua	Ambato	2.699069209	2.082529302	0.87479807	2.100572606	93.94187671
Zamora Chinchipe	Zamora	−0.089933679	0.072344303	0.91005475	0.190759248	59.09659049

Eigenvalues: $\lambda_1^* = 2.426$; $\lambda_2^* = 1.326$; $\lambda_3^* = 1.165$.
ω1 = 0.493390279; ω2 = 0.269676632; ω3 = 0.236933089.
Source: Authors' own.

Table 7
Calculation of the composite basic services index for each city.

Province	City	G1	G2	G3	G4	G5	G6	Composite basic services index before it is transformed using Casalmiglia's function	Composite basic services index
Azuay	Cuenca	1.749364507	−0.016957708	0.763036576	2.147980337	0.071816612	0.634361593	0.941834688	80.6993653
Bolívar	Guaranda	0.343078028	−0.556069191	0.245346572	0.20981984	−0.139435807	0.512319441	0.07015099	53.85347412
Cañar	Azogues	0.404317366	0.098253106	0.203603757	0.77890314	0.133010817	0.341743593	0.322783752	64.15554375
Carchi	Tulcán	0.880973505	−0.51993951	0.751491367	0.09047454	1.03546006	0.808152125	0.455032408	68.59584335
Chimborazo	Riobamba	0.403865305	−0.687645944	0.395489401	0.185712992	−0.110919336	0.442745057	0.077482938	54.19058072
Cotopaxi	Latacunga	0.268724453	−0.803151291	0.348093028	0.259488651	−0.122352506	1.321188226	0.107205463	55.53211664
El Oro	Machala	0.578762467	−0.774293385	0.265449575	0.281683866	−0.091885714	0.612901267	0.1088822	55.60661511
Esmeraldas	Esmeraldas	0.647337418	−0.585460415	0.128045648	0.574074537	−0.44393623	1.202761172	0.193525626	59.20958844
Galápagos	Pto. Baq Moreno	3.393427138	0.049289174	0.263379347	0.190279224	−0.605361691	0.313272838	0.7984644	77.72403555
Guayas	Guayaquil	0.748226918	−0.124644636	2.434749725	0.403164585	−0.314476714	0.871534907	0.691687669	75.21385072
Imbabura	Ibarra	0.549283068	−0.813820947	0.797252197	0.113403659	0.354601802	0.932943276	0.25348516	61.58348253
Loja	Loja	0.473134502	0.201469647	0.172396237	0.467090894	0.562978691	0.145502292	0.342397916	64.85175269
Los Ríos	Babahoyo	0.661004707	0.137023824	0.515646394	0.237350547	0.011054904	0.443510144	0.3517611	65.1793163
Manabí	Portoviejo	0.405354895	−0.595303151	0.115653437	0.507310485	−0.164751107	0.430799797	0.089083475	54.7189241
Morona Santiago	Macas	0.666020604	0.866996494	0.298058829	0.220194585	−0.168479014	0.169257068	0.411484	67.1980269
Napo	Tena	0.407237198	1.840750888	0.393613152	0.446389262	−0.163303966	0.388364983	0.629350248	73.61957069
Orellana	Pto. Fco. Orellana	0.583024467	1.700048564	0.499911251	0.298549501	0.380567244	0.2593274	0.695476609	75.30758625
Pastaza	Puyo	0.602598005	0.7312895	0.465371441	0.299177799	−0.183160241	0.136435738	0.407524948	67.06790475
Pichincha	Quito	1.020917296	0.149560522	0.458388989	0.954687775	−0.756435936	1.508568349	0.537569783	71.08377412
Santa Elena	Santa Elena	0.529240369	−0.746861485	0.085162176	0.086425262	−0.380471379	0.793442531	0.017747014	51.37072791
Sto. Domingo	Sto. Domingo	0.561460048	0.155603052	0.736666584	0.457629876	−0.457978053	0.720689413	0.372785963	65.90377388
Sucumbios	Nueva Loja	0.782436478	−0.658802705	0.136853347	−0.095180086	−0.321550274	0.586577942	0.061418139	53.44871861
Tungurahua	Ambato	1.187610526	−0.83632869	0.233729874	0.668105673	−0.232427748	0.189706475	0.230559284	60.69257683
Zamora Chinchipe	Zamora	0.810264052	0.259821471	0.031993265	0.011508633	0.673373218	−0.047868374	0.327731461	64.33245368

Eigenvalues: $\lambda_1^* = 2.415$; $\lambda_2^* = 2.223$; $\lambda_3^* = 1.97$; $\lambda_4^* = 1.73$; $\lambda_5^* = 1.429$; $\lambda_6^* = 1.008$.
ω1 = 0.22412993; ω2 = 0.206310905; ω3 = 0.182830626; ω4 = 0.160556845; ω5 = 0.13262181; ω6 = 0.093549884.
Source: Authors' own.

Table 8
Calculation of the composite tourism services index for each city.

Province	City	G1	G2	G3	G4	G5	G6	Composite tourism services index before it is transformed using Casalmiglia's function	Composite tourism services index
Azuay	Cuenca	2.299915284	4.021553746	1.990778029	1.063633061	−0.257002623	1.443121405	2.133715669	94.13937062
Bolívar	Guaranda	0.222581792	0.068327908	−0.02251819	0.834192421	−0.115530788	0.657138391	0.228487146	60.61104197
Cañar	Azogues	0.862406178	3.155925574	2.203439558	1.464466191	−0.131922234	1.350110441	1.496606007	88.91750693
Carchi	Tulcán	0.336092965	0.29199566	1.851965626	0.809680473	−0.24806022	0.575952895	0.579474605	72.27046574
Chimborazo	Riobamba	1.697562178	3.979583712	2.039844816	1.971318129	0.773180695	0.903630995	2.053387502	93.6491722
Cotopaxi	Latacunga	1.979144021	4.314087726	0.062817684	1.724533554	0.511694681	0.966439906	1.875088139	92.40959818
El Oro	Machala	0.579904324	1.866128143	2.239286908	0.910838139	−0.131808536	0.854310441	1.059920596	82.84907559
Esmeraldas	Esmeraldas	1.302087218	2.892182084	2.173664227	0.59439693	−0.307063938	0.329982695	1.42861506	88.13779127
Galápagos	Pto. Baq Moreno	1.499821409	4.199536253	1.797122752	−0.074469233	−0.133534013	1.621090623	1.71630402	91.10340473
Guayas	Guayaquil	2.864382501	3.265856955	2.228347371	1.442576628	−0.65644795	1.178948687	2.244015507	94.75142211
Imbabura	Ibarra	1.535233242	2.145255076	1.881020786	1.882280106	1.314203648	0.896263227	1.67203876	90.70074853
Loja	Loja	1.001112544	1.557860362	1.976294832	1.277965525	0.229730043	1.339116843	1.238180115	85.6493885
Los Ríos	Babahoyo	0.446354217	0.286559199	1.907511995	0.829275556	−0.175865135	−0.427275047	0.566563054	71.91011309
Manabí	Portoviejo	0.498784541	0.303385774	1.816208975	0.766466948	−0.030854178	0.615159269	0.656988086	74.33868554
Morona Santiago	Macas	0.973796425	3.628719141	2.158623525	−0.279183259	−0.266586213	0.822680267	1.369720136	87.4181848
Napo	Tena	1.162603506	3.390143279	2.10200647	−0.256898404	0.981871362	0.711500181	1.497190334	88.92398083
Orellana	Pto. Fco. Orellana	1.098919689	3.669284642	2.093129928	−0.357796731	−0.217229379	0.89849306	1.416948265	87.99858685
Pastaza	Puyo	0.971374545	3.371248782	2.122979519	−0.235788806	0.789414293	0.703776686	1.406810955	87.87630606
Pichincha	Quito	6.706937428	5.190765255	1.954262275	1.930925734	1.065578194	0.901238809	4.244134085	99.28976645
Santa Elena	Santa Elena	1.05648541	0.442564752	−0.607773138	−0.745592846	1.236463774	1.282522538	0.517974255	70.51155727
Sto. Domingo	Sto. Domingo	0.994124627	2.327997591	0.774471472	1.255410754	0.173055198	1.475244629	1.192753281	84.98245193
Sucumbios	Nueva Loja	0.997511556	1.767417131	2.139510361	0.661767485	−0.59437666	0.542841373	1.098806527	83.50320461
Tungurahua	Ambato	1.389401318	3.557531072	2.089064909	2.112020896	0.355142938	1.265618072	1.86911818	92.36414826
Zamora Chinchipe	Zamora	0.261030186	0.625203134	1.831076532	−0.107666137	0.156114558	0.510008173	0.533246426	70.95848833

Eigenvalues: $\lambda_1^* = 5.872$; $\lambda_2^* = 2.699$; $\lambda_3^* = 2.289$; $\lambda_4^* = 1.709$; $\lambda_5^* = 1.326$; $\lambda_6^* = 1.079$.
ω1 = 0.392146387; ω2 = 0.180245759; ω3 = 0.152864966; ω4 = 0.114131161; ω5 = 0.088553493; ω6 = 0.072058234.
Source: Authors' own.

Table 9
Calculation of the composite tourist resources index for each city.

Province	City	G1	G2	G3	G4	G5	G6	G7	Composite tourism resources index before it is transformed using Casalmiglia's function.	Composite tourism resources index
Azuay	Cuenca	0.688109947	3.291049066	3.638868576	−0.185936903	0.194747006	−0.072092378	−0.158111757	1.343110733	87.0788961
Bolívar	Guaranda	0.626344139	0.872465979	3.325873355	0.00094644	−0.429564792	0.32112207	−0.17495793	0.824612947	78.29897005
Cañar	Azogues	0.710629123	0.614520836	2.263182582	−0.06064919	0.402955417	0.398497186	−0.483449181	0.702027344	75.46881108
Carchi	Tulcán	0.326766422	0.31233558	0.670417493	0.08695688	0.302266597	0.391257872	−0.12089485	0.320984664	64.09099838
Chimborazo	Riobamba	1.056574229	1.301637805	3.512084194	−0.089677107	−0.472167424	0.98100854	0.134895791	1.116221351	83.78800633
Cotopaxi	Latacunga	0.913804454	0.674406779	3.192059038	0.021014382	−0.472143234	0.181600929	0.173676187	0.861734172	79.08977031
El Oro	Machala	0.488044303	0.116688628	2.955163431	−0.111838748	−0.083277367	0.019916708	−0.495656797	0.564369873	71.84843927
Esmeraldas	Esmeraldas	0.436562922	0.293851343	1.553910714	2.415585763	−0.687131768	0.292849501	0.450132308	0.70328959	75.49975592
Galápagos	Pto. Baq Moreno	5.44864684	1.104765306	3.453300571	−0.214438413	0.032079077	0.925881735	0.441479092	2.414883911	95.57580315
Guayas	Guayaquil	0.459320287	1.257142998	3.529927995	0.072575907	−0.734447052	−1.018375215	0.502671887	0.790553705	77.54711836
Imbabura	Ibarra	0.753264915	1.688274923	2.275569473	0.316703751	−0.76111804	0.33801907	−0.09535151	0.863626079	79.12929312
Loja	Loja	0.755636046	0.931293375	3.307306852	0.279552649	−0.395803368	0.296487343	−0.203298139	0.90479641	79.97109942
Los Ríos	Babahoyo	0.462419138	0.327301295	1.656737596	0.141340869	−0.169550526	0.24418919	0.852183842	0.524237685	70.69567886
Manabí	Portoviejo	0.475345472	0.16752927	2.958556737	−0.102159347	−0.012534698	0.000414314	−0.376327466	0.584828002	72.4185163
Morona Santiago	Macas	0.708677371	0.346849652	2.30255906	0.700540442	0.103188128	0.310641948	−1.276724591	0.664880758	74.54042471
Napo	Tena	0.943310801	0.323035968	3.343161534	0.253359911	−0.669922226	0.240607779	−0.371630626	0.807915895	77.93358488
Orellana	Pto. Fco. Orellana	1.704075093	0.283857387	3.362873718	0.141091282	−0.495246728	0.209494284	0.269684274	1.069901009	83.01939754
Pastaza	Puyo	1.154837646	1.516345629	3.102243743	0.432292558	−0.355040111	0.347839925	0.143668125	1.147792314	84.29183948
Pichincha	Quito	0.800118969	1.295942511	3.232325908	−0.102933049	1.350083578	0.070951596	−0.471500439	1.065459667	82.94381315
Santa Elena	Santa Elena	0.710672826	2.503045882	0.770793069	0.177198067	−0.717942834	0.184033332	0.153611017	0.761163786	76.87743725
Sto. Domingo	Sto. Domingo	0.22204657	0.173780769	0.956551422	0.364128321	−0.401853976	0.203834067	0.791752368	0.315512968	63.89397671
Sucumbios	Nueva Loja	0.482022759	0.297658915	2.321522561	−0.193824599	−0.052690744	−0.057009011	−0.993398736	0.453801649	68.55716859
Tungurahua	Ambato	0.744925662	0.790450159	3.284925979	0.01746596	−0.441095916	0.206076563	−0.050371709	0.837792912	78.58311226
Zamora Chinchipe	Zamora	0.869308205	0.725081023	−0.052698536	−0.14664739	0.563522862	0.26055393	0.040664041	0.442989114	68.21534725

Eigenvalues: $\lambda_1^* = 4.789$; $\lambda_2^* = 2.984$; $\lambda_3^* = 2.485$; $\lambda_4^* = 2.017$; $\lambda_5^* = 1.630$; $\lambda_6^* = 1.315$; $\lambda_7^* = 1.041$.
ω1 = 0.294520698; ω2 = 0.183507093; ω3 = 0.152800401; ω4 = 0.12407746; ω5 = 0.100216709; ω6 = 0.080879666; ω7 = 0.063997973.
Source: Authors' own.

Table 10

Summary of the composite indexes for each block and calculation of the global composite index for each city.

Province	City	Management index	Basic services index	Tourism services index	Tourism resources index	Global index
Azuay	Cuenca	92.06433303	80.6993653	94.13937062	87.0788961	89.04952332
Bolívar	Guaranda	89.0664468	53.85347412	60.61104197	78.29897005	70.77923675
Cañar	Azogues	89.77166711	64.15554375	88.91750693	75.46881108	80.37968319
Carchi	Tulcán	89.14589311	68.59584335	72.27046574	64.09099838	72.58510795
Chimborazo	Riobamba	88.99481938	54.19058072	93.6491722	83.78800633	82.36868567
Cotopaxi	Latacunga	88.98028732	55.53211664	92.40959818	79.08977031	80.78929757
El Oro	Machala	78.1095033	55.60661511	82.84907559	71.84843927	73.4452167
Esmeraldas	Esmeraldas	89.00877636	59.20958844	88.13779127	75.49975592	79.08799592
Galápagos	Pto. Baq Moreno	91.79183043	77.72403555	91.10340473	95.57580315	90.16999749
Guayas	Guayaquil	92.56920677	75.21385072	94.75142211	77.54711836	85.37883782
Imbabura	Ibarra	90.16637648	61.58348253	90.70074853	79.12929312	81.65294358
Loja	Loja	85.87488966	64.85175269	85.6493885	79.97109942	80.1139604
Los Ríos	Babahoyo	78.37113962	65.1793163	71.91011309	70.69567886	71.64455624
Manabí	Portoviejo	87.92154808	54.7189241	74.33868554	72.4185163	72.97016002
Morona Santiago	Macas	90.81091146	67.1980269	87.4181848	74.54042471	80.42217152
Napo	Tena	82.12390031	73.61957069	88.92398083	77.93358488	81.28915796
Orellana	Pto. Fco. Orellana	59.19264719	75.30758625	87.99858685	83.01939754	78.11239805
Pastaza	Puyo	88.98226731	67.06790475	87.87630606	84.29183948	83.1705208
Pichincha	Quito	92.14890256	71.08377412	99.28976645	82.94381315	87.55358339
Santa Elena	Santa Elena	88.58534366	51.37072791	70.51155727	76.87743725	72.73222871
Sto. Domingo	Sto. Domingo	59.10317668	65.90377388	84.98245193	63.89397671	69.54736618
Sucumbíos	Nueva Loja	88.98070875	53.44871861	83.50320461	68.55716859	74.49335413
Tungurahua	Ambato	93.94187671	60.69257683	92.36414826	78.58311226	82.60354867
Zamora Chinchipe	Zamora	59.09659049	64.33245368	70.95848833	68.21534725	66.41560161

$\omega 1 = 0.208676945$; $\omega 2 = 0.183936895$; $\omega 3 = 0.297956257$; $\omega 4 = 0.309429903$.

Source: Authors' own.

The analysis of the degree of tourism development in Ecuador's cities through a system of indicators has made it possible to know the different aspects of the development of tourism activity based on the reality of its management, tourism resources, tourism services and basic infrastructure of each city analysed, taking into account the statement of Ocampo et al. [30], according to which the indicators should be "specific" and include all the conditions they present; which, in turn, allows an x-ray of the tourism reality of each city and of the country as a whole, thus benefiting decision-making [55].

Group 1 cities present important development factors. Quito and Guayaquil are administrative, political, and commercial centres in the country. They are also the gateway to international tourism, with an infrastructure of tourism and core services that are adequate to meet these needs. In the case of Puerto Baquerizo Moreno, in the Galapagos, tourism management is conditioned by special guidelines, because it is a fragile ecosystem. In general, the four cities that make up this group have important cultural and natural resources at national and international level, particularly the historic centres of Quito and Cuenca, declared Cultural Heritage of Humanity, and the National Park of the Galapagos Islands, Natural Heritage of Humanity.

Group 2 includes the largest number of cities, with mid-level development factors. Most of these cities are in the Ecuadorian mountains: Ibarra, Latacunga and Ambato to the north, Riobamba in the centre, and Azogues to the south. Due to their geographical position, they are close to major natural and cultural attractions such as the Avenue of the Volcanoes (which encompasses protected natural areas, indigenous communities, and cultural resources), the train station covering the Riobamba-Alausí route, and the archaeological site of Ingapirca. The cities of Puyo, Tena, and Macas belong to the eastern region and are the gateway to the east of Ecuador. Their population is characterised by the existence of ethnic groups and they have natural tourist attractions. Loja, on account of its geographical position, is a little isolated from the rest of the cities. It connects to the region's natural and cultural attractions and presents seasonal tourist activity, based mainly around religious tourism. Finally, Esmeraldas is the only city that belongs to the coastal region. Geographically, it is very close to the city of Quito and the border with Colombia. The city as such does not have major tourism resources, but is characterised by its status as an administrative and industrial centre, with basic and tourism services that meet these needs.

In the cities included in Group 3, there are marked differences in the indexes in relation to the cities in Groups one and two. The factors that might influence these results are related to cities that, although they have tourism services (accommodation and restaurants/cafes), are not geared towards tourism, but rather towards commercial and industrial activity, as is the case with Machala and Babahoyo. Nueva Loja and Tulcán, on the other hand, are border cities with Colombia, so their commercial activity is very important in the eastern region and the mountains, respectively. Guaranda concentrates an industrial development of products in which the communities participate. It is an activity that focuses on tourism, but is not tied in with other tourism resources and services. Portoviejo and Santa Elena, despite being administrative centres, show a weak level of tourism development, which is surpassed by other cities in their provinces with greater tourist activity.

Group 4 is characterised by the presence of cities populated by representative ethnic groups. Santo Domingo and Zamora are close to sites or cities with major tourist attractions, while Puerto Francisco de Orellana is a transit city to reach important protected areas in the Amazon. This group obtains a low management index, compared with the other groups, but it also obtains high values with respect to the other indexes, so they are cities that possess resources and services, although these are not articulated on the basis of
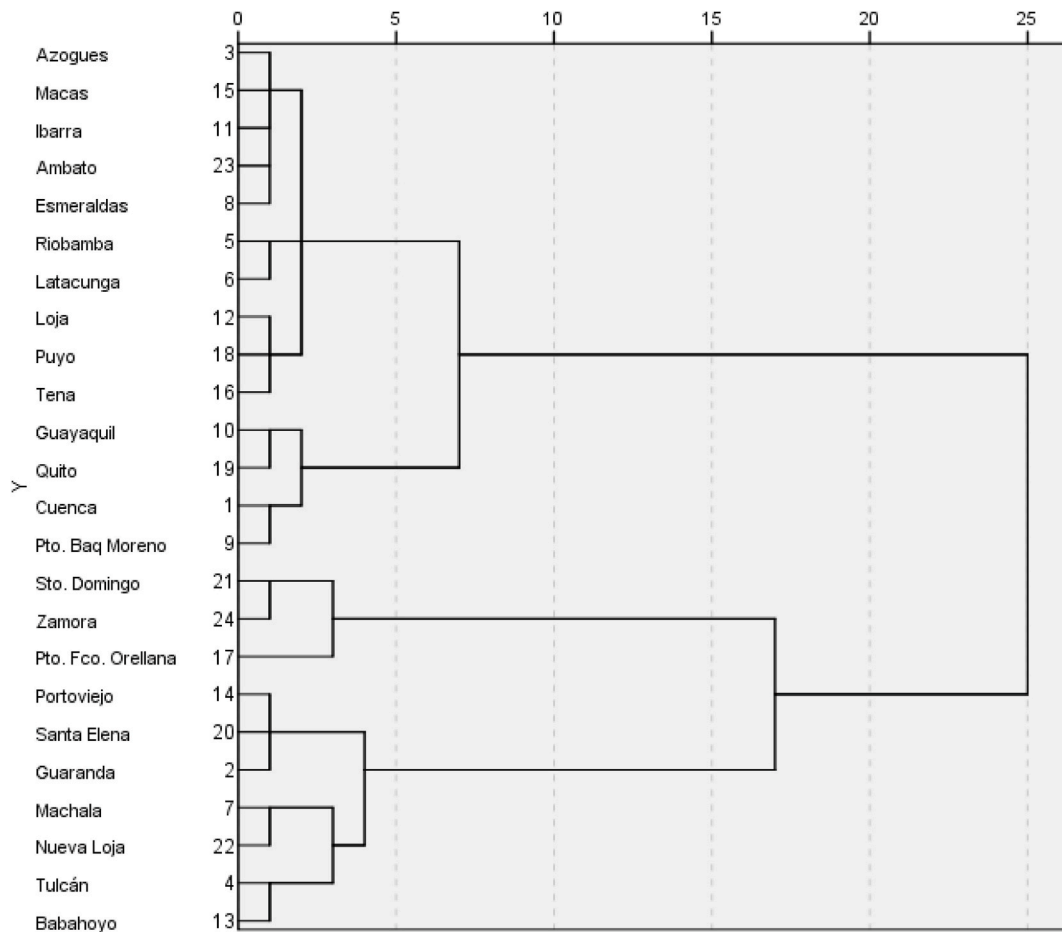
Fig. 2. Dendrogram that uses Ward's method. Combination of re-scaled distance clusters.
Source: Authors' own.

comprehensive tourism management.

An analysis broken down by each of the groups of indicators that make up the composite index shows a greater importance of tourism activity in Group 1, due to the presence of attractions that, on account of their conditions, facilitate the promotion of the country at an international level. The management of these cities is based on tourism development plans [37] and focuses on the protection and promotion of natural and cultural resources. In the case of the cities in groups 2, 3 and 4, tourism management by local governments is carried out on the basis of ordinances and regulations, without taking into account planning processes, without professional human resources.

With regard to the tourism services index, it should be noted that these services, for the most part, are developed by private companies, in accordance with regulatory rules imposed by the Ministry for Tourism and the municipalities, through ordinances and regulations. The development of these regulations and ordinances has not always involved the private sector, even though the latter manages the services. Public-private cooperation is a strategy that the current government has sought to implement as a main axis of tourism management, under the responsibility of the Ministry for Tourism [68], but it has not, in general, been consolidated so far in the different groups of cities. This may be due to on-going administrative changes and a failure to involve the private sector and communities in planning and decision-making. For its part, the private sector invests very little in the training of human resources and the application of quality standards, making it difficult for these cities to be competitive at a national level, much less at an international level.

Finally, in relation to the basic services index, it should be taken into account that cities are managed for the inhabitants of them; therefore, the improvement of tourism development in cities must be analysed and coordinated by local governments, with the participation and support of the private sector and communities these results coincide with the conclusions obtained for Nel [23] in relation to stakeholder participation. However, the results obtained for this index show that no group of cities has sufficient basic services to meet the needs of tourism development, possibly due to the unchecked growth of these needs and, in some cases, the presence of human groups with marked differences. Cities in Group 1 have important tourism resources at a national and international level, whereas the cities in the other groups have such resources at a national and local level. It is important to bear in mind that, for these resources to

Map 1. Location and administrative division of Ecuador.
Source: Authors' own.

Table 11
Characteristics of the clusters obtained.

	Cluster				p-value
	1	2	3	4	
Municipalities	Cuenca	Ambato	Babahoyo	Pto. Fco. Orellana	
	Guayaquil	Azogues	Guaranda	Sto. Domingo	
	Pto. Baq. Moreno	Esmeraldas	Machala	Zamora	
	Quito	Ibarra	Nueva Loja		
		Latacunga	Portoviejo		
		Loja	Santa Elena		
		Macas	Tulcán		
		Puyo			
		Riobamba			
		Tena			
Management index	92.144 (0.322)	88.866 (3.101)	85.740 (5.140)	59.131 (0.0537)	0.002[a]
Basic services index	76.180 (4.071)	62.810 (5.835)	57.539 (6.591)	68.515 (5.935)	<0.001[b]
Tourism services index	94.824 (3.379)	89.605 (2.572)	73.713 (7.820)	81.313 (9.093)	<0.001[b]
Tourism resources index	85.786 (7.604)	78.830 (3.292)	71.827 (4.823)	71.710 (10.030)	0.003[b]
Global index	88.038 (2.072)	81.188 (1.270)	72.664 (1.201)	71.358 (6.055)	<0.001[b]

The following are shown: Means (standard deviations).
[a] Kruskal-Wallis H.
[b] ANOVA.
Source: Authors' own.

become tourism products, they require an infrastructure based on basic and tourism services and coordinated participatory management.

It should also be noted that the information obtained in this study allows us to identify all the factors that favour or prevent tourism from becoming a development tool in each of the twenty-four cities studied. Owing to considerations of space in this paper, it is impossible to carry out a detailed analysis, which we have preferred to leave for a later article. In any case, the reader can easily recognise these factors through a detailed reading of Tables 1–4

It is important to point out that the methodology we have used is the one most recommended by the literature Pulido-Fernández, & Sánchez-Rivero [4], and Casado-Montilla & Pulido-Fernández [63], for dealing with a large amount of information through the calculation of composite indexes, which in turn include information from a set of indicators in different aspects, thus allowing us to obtain the level of tourism development of a territory or destination.

The objective is to specify the components of tourism in a specific territory, identifying them as the different elements that make up the tourism offer of a tourist destination. This approach shows that tourism, defined as a product, is made up of different supply elements that must necessarily interact with each other for overall production and that are acquired and consumed by the tourism demand [21].

This approach must be taken into account generically for any planning and development process, but it takes on special significance in the case of emerging tourism areas and which must find their niche in the market. Firstly, because these are generally tourism developments in which the attractiveness will only be sufficiently important when it integrates all the social, cultural, geographic and

economic variables of the host area [85].

Finally, the results of this study facilitate the decision-making of policy makers, destination managers and, in general, all stakeholders interested in the tourism development of each of the cities analysed, allowing them to guide their actions towards promoting factors that favour the development of tourism, or limiting those that constrict it.

6.1. Theoretical contribution

The proposed system of indicators is one of the main contributions of this article to determine the degree of tourism development. It should be remembered that Ecuador is a developing country and its tourism is at a very incipient stage. Both circumstances make the availability of information extremely difficult, so the system of indicators designed is in itself a great contribution to the analysis of the degree of tourism development in the country. Therefore, this work adds to the existing research in this field and provides a vision linked to the analysis of tourism development in an emerging destination.

This research also highlights the importance of tourism as a key instrument for local development [2]. Despite the scarce existing literature on these aspects, this research aims to be a contribution to the debate on the role of tourism as a development tool in emerging territories. We consider that knowing the degree of development of a territory can lead to a determined socioeconomic development [31,32] and the participation of all actors in the sector [37,38], as long as the implementation of plans and projects is comprehensive and based on the reality of the territory and its stakeholders without neglecting market trends [41,43].

6.2. Limitations

As Ecuador is a developing country, tourism activity is in an incipient stage of development. Consequently, there are no indicators to measure this situation, which justifies the need to create a system of indicators.

One of the limitations presented in this study is the lack of updated information, mainly in the institutions and public agencies in charge of managing tourism activity in each of Ecuador's capital cities and at the country level.

Data availability statement

Data included in article/supp. material/referenced in article.

Additional information

No additional information is available for this paper.

CRediT authorship contribution statement

Diana López-Molina: Data curation, Investigation, Validation, Writing – original draft. **Juan Ignacio Pulido-Fernández:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Annex 1.

Validation of indicators to measure tourism development in the cities of Ecuador

Management	Validity of the indicator			Importance of the indicator		
	MEAN	STANDARD DEV	PEARSON	MEAN	STANDARD DEV	PEARSON
1. Existence of an updated tourism development plan	6.429	0.938	0.146	6.643	0.842	0.127
2. Existence of a plan for territorial planning	5.929	1.492	0.252	5.857	1.512	0.258
3. Existence of ordinances issued with regard to tourism	6.429	0.938	0.146	6.286	1.069	0.170
4. Existence of ordinances or resolutions to preserve heritage	5.857	1.231	0.210	5.643	1.336	0.237
5. Availability of funds for the restoration, conservation and maintenance of cultural heritage	5.429	1.284	0.237	5.429	1.399	0.258
6. Register of destroyed heritage buildings	4.929	1.385	0.281	5.000	1.359	0.272

(*continued*)

Management	Validity of the indicator			Importance of the indicator		
	MEAN	STANDARD DEV	PEARSON	MEAN	STANDARD DEV	PEARSON
7. Availability of laws, ordinances or resolutions to conserve natural resources at the municipal level	5.714	1.590	0.278	5.786	1.528	0.264
8. Availability of funds for the restoration, conservation and maintenance of natural resources	5.429	1.284	0.237	5.429	1.555	0.286

Infrastructure of the Destination	**Validity of the indicator**			**Importance of the indicator**		
	MEAN	**STANDARD DEV**	**PEARSON**	**MEAN**	**STANDARD DEV**	**PEARSON**
1. Existence of major roads to access the destination	6.500	0.760	0.117	6.571	0.852	0.130
2. Existence of roads that connect the destination with other cantons and parishes	6.286	0.994	0.158	6.286	1.069	0.170
3. Existence of cycle paths in the destination's urban area	5.000	1.414	0.283	5.000	1.414	0.283
4. Availability of public transport within the canton and to parishes	5.857	1.351	0.231	5.929	1.542	0.260
5. Availability of public transport at a provincial level	6.000	1.359	0.226	6.000	1.414	0.236
6. Availability of buses and taxis within the destination	5.714	1.590	0.278	5.643	1.598	0.283
7. Availability of commercial transportation for the transfer of persons	5.714	1.637	0.287	5.571	1.651	0.296
8. Availability of bicycle transport within the city centre	5.071	1.385	0.273	4.929	1.269	0.257
9. Existence of water (drinking or treated) and sewage service	6.857	0.363	0.053	6.714	0.825	0.123
10. Availability of electrical power (domestic grid, public lighting)	6.857	0.363	0.053	6.571	0.938	0.143
11. Availability of renewable energy (hydraulic, wind, solar panels)	6.429	0.852	0.132	6.143	1.027	0.167
12. Availability of hospitals, clinics, health centres and outpatient care	6.857	0.363	0.053	6.500	0.760	0.117
13. Availability of information and communications technology– ICT	6.786	0.579	0.085	6.571	0.938	0.143
14. Availability of judicial services	4.714	1.383	0.293	4.571	1.222	0.267
15. Availability of banking services	6.143	1.292	0.210	6.143	1.231	0.200

Tourism Services	**Validity of the indicator**			**Importance of the indicator**		
	MEAN	**STANDARD DEV**	**PEARSON**	**MEAN**	**STANDARD DEV**	**PEARSON**
1. Availability of tourist transport	6.357	0.929	0.146	6.071	1.207	0.199
2. Availability of air transport	6.143	1.027	0.167	6.143	0.864	0.141
3. Availability of tourist-heritage railway system	4.929	1.385	0.281	4.786	1.251	0.261
4. Number of hotel services	5.857	1.292	0.221	5.786	1.424	0.246
5. Number of places to stay in hotels and hostels	6.000	1.359	0.226	6.000	1.359	0.226
6. Number of places to stay in *hosterias* and holiday apartments	5.786	1.424	0.246	5.786	1.424	0.246
7. Number of places to stay in boarding houses	5.571	1.342	0.241	5.286	1.437	0.272
8. Number of hotels in heritage buildings	5.429	1.604	0.295	5.429	1.555	0.286
9. Existence of camping areas and accommodation in communities	5.143	1.512	0.294	5.143	1.231	0.239
10. Existence of unregistered places to stay	5.857	1.460	0.249	5.857	1.460	0.249
11. Number of restaurant places (restaurants and cafes)	5.786	1.626	0.281	5.857	1.512	0.258
12. Number of typical food restaurants	5.429	1.453	0.268	5.357	1.550	0.289
13. Existence of mass events and shows	5.357	1.499	0.280	5.214	1.424	0.273
14. Development of traditional events typical of the destination	6.214	1.122	0.181	6.286	1.139	0.181
15. Availability of recreational events	5.857	1.406	0.240	5.571	1.604	0.288
16. Availability of shopping centres	5.000	1.301	0.260	4.643	1.151	0.248
17. Availability of shops and craft centres	5.929	1.269	0.214	5.786	1.311	0.227
18. Existence of night clubs, bars and discos	5.286	1.326	0.251	5.143	1.406	0.273
19. Number of travel agencies (international, dual, operators)	5.929	1.072	0.181	5.786	1.122	0.194
20. Availability of tourist signage	6.714	0.611	0.091	6.714	0.611	0.091
21. Existence of Tourist Information Offices	6.714	0.611	0.091	6.500	0.855	0.132
22. Availability of tourist information	6.857	0.363	0.053	6.929	0.267	0.039
23. Number of specialised guides in the destination	6.286	0.914	0.145	6.357	0.929	0.146

Tourism Resources	**Validity of the indicator**			**Importance of the indicator**		
	MEAN	**STANDARD DEV**	**PEARSON**	**MEAN**	**STANDARD DEV**	**PEARSON**
1. Number of Museums	5.786	1.578	0.273	5.643	1.550	0.275
2. Number of Cultural Centres	5.714	1.490	0.261	5.571	1.604	0.288
3. Number of Archaeological Areas	5.643	1.598	0.283	5.643	1.336	0.237
4. Number of Art Galleries	5.571	1.399	0.251	5.429	1.453	0.268
5. Number of Heritage Buildings	5.500	1.557	0.283	5.286	1.383	0.262
6. Number of Parks and Squares	5.429	1.453	0.268	5.143	1.351	0.263
7. Number of Craft Shops	5.643	1.393	0.247	5.429	1.342	0.247
8. Number of resources classified as cultural interest assets	6.357	0.929	0.146	6.214	1.051	0.169
9. Number of traditional festivities	5.857	1.610	0.275	5.857	1.657	0.283
10. Number of Natural Protected Areas	6.000	1.468	0.245	5.929	1.730	0.292
11. Number of National Parks	5.571	1.651	0.296	5.429	1.604	0.295
12. Number of Reserves	5.643	1.393	0.247	5.500	1.345	0.244
13. Number of Protected Forests	5.571	1.342	0.241	5.429	1.284	0.237
14. Number of protected areas at the municipal level	5.500	1.345	0.244	5.429	1.284	0.237

(*continued*)

Management	Validity of the indicator			Importance of the indicator		
	MEAN	STANDARD DEV	PEARSON	MEAN	STANDARD DEV	PEARSON
15. Existence of tourist packages (cultural and archaeological)	6.500	0.760	0.117	6.500	0.941	0.145
16. Existence of tourist packages (adventure and ecotourism)	6.000	1.414	0.236	6.143	1.460	0.238
17. Existence of flora and fauna watching/spotting	5.714	1.490	0.261	5.643	1.499	0.266
18. Existence of hiking activities	5.786	1.477	0.255	5.786	1.369	0.237
19. Existence of special activities	5.786	1.578	0.273	5.571	1.604	0.288

Source: Authors' own.

Annex 2.

Description of indicators for the evaluation of Tourism Destinations Ecuador.

I. Management indicator

Management within a tourist destination has taken on great importance in recent years, as it allows us to know the level of development and participation of both public and private actors in formulating policies, plans, and projects to develop the activity.

INDICATOR	OBJECTIVE	HOW TO CALCULATE	SOURCE	INTERPRETATION	SOURCE OF INFORMATION
1. Existence of an updated tourism development plan	Analyse the tourism management of the destination	An updated tourism development plan exists or not.	Own interpretation based on: UNWTO [86] COOTAD [87]	The existence of tourism development plans shows that the Municipal Government develops the activity based on planning.	Decentralised Autonomous Governments Association of Municipalities of Ecuador (AME)
2. Existence of a plan for territorial planning	Analyse destination planning processes	Existence or non-existence of a land-use plan.	Own interpretation based on: [75]. COOTAD [87]	The existence of land-use plans shows that the municipality develops its management through planning guidelines set by the public administration and state planning bodies.	Decentralised Autonomous Governments Association of Municipalities of Ecuador (AME)
3. Existence of ordinances issued with regard to tourism	Analyzing the interest of the public administration in tourism activity	Number of regulations issued in the field of tourism.	Own interpretation based on: COOTAD [87]	The creation of regulations for the tourism sector in the destination shows the importance that the public sector attaches to this activity.	Decentralised Autonomous Governments
4. Existence of ordinances or resolutions to preserve heritage	To find out the level of concern of the public administration in relation to the conservation of heritage buildings.	No. of ordinances or resolutions to conserve heritage properties	UNWTO [86]	The creation of by-laws to protect the natural and cultural resources of the destination demonstrates the interest of the local administration in preserving the natural and cultural heritage.	Decentralised Autonomous Governments
5. Availability of funds for the restoration, conservation and maintenance of cultural heritage	To know the percentage of funds earmarked for the restoration, conservation, and maintenance of cultural property.	The existence of funds earmarked for the restoration, conservation and maintenance of cultural heritage.	UNWTO [86]	The existence of funds for the restoration, conservation, and maintenance of cultural property shows the interest of the local administration in the protection of cultural heritage.	Decentralised Autonomous Governments Plan for territorial planning
6. Register of destroyed heritage buildings.	Knowing the rate of loss of built heritage	Whether or not records of destroyed heritage buildings exist	UNWTO [86]	The existence of registers of destroyed heritage buildings shows the interest of the local administration in protecting cultural heritage.	Decentralised Autonomous Governments Plan for territorial planning
7. Existence of laws, ordinances or resolutions to conserve natural resources at the municipal level	To understand the importance of the public administration of the destination about the conservation of natural resources.	Whether or not there are laws, regulations, or resolutions on the conservation of natural resources at the local level.	UNWTO [88]	The existence of laws, ordinances, or resolutions on natural resource conservation at the municipal level indicates the importance attached to natural resource conservation by the public administration.	Decentralised Autonomous Governments Plan for territorial planning
8. Availability of funds for the	Analyse the percentage of funds allocated to	Funds exist for the restoration,	UNWTO [88]	The existence of funds for restoration, conservation, and	Decentralised Autonomous

(*continued*)

INDICATOR	OBJECTIVE	HOW TO CALCULATE	SOURCE	INTERPRETATION	SOURCE OF INFORMATION
restoration, conservation and maintenance of natural resources	restoring, conserving, and maintaining natural resources.	conservation, and maintenance of natural resources.		maintenance shows the interest of the local administration in protecting natural resources.	Governments Plan for territorial planning

II. Basic services indicators

Accessibility, connectivity with other destinations, areas, and complementary attractions of the tourist destination are analysed; the responsibility falls on the Autonomous Decentralised Governments, according to their competence and hierarchy; basic services such as water, electricity, public health, and connectivity are also analysed.

INDICATOR	OBJECTIVE	HOW TO CALCULATE	SOURCE	INTERPRETATION	SOURCE OF INFORMATION
1. Existence of major roads to access the destination	Know the existence of access routes, both external and internal, to the destination, areas and complementary attractions.	Whether or not there are main access routes to the destination	UNWTO [86] Ley del sistema nacional de infraestructura vial transporte terrestre [89]	Identification of internal and external access routes to the destination, complementary areas, and attractions indicate greater accessibility to the destination.	Decentralised Autonomous Governments Plan for territorial planning Ministry of Transport
2. Existence of roads that connect the destination with other cantons and parishes.	Know the existence of roads connecting cantonal centres and parishes within the province	Whether or not there are roads connecting cantonal centres y parishes inside the destination.	UNWTO [86] Ley del sistema nacional de infraestructura vial transporte terrestre [89]	Greater accessibility to the destination is indicated by the identification of roads connecting cantonal centres and municipalities within the destination.	Decentralised Autonomous Governments Plan for territorial planning Ministry of Transport
3. Existence of cycle paths in the destination's urban area	Know the existence of cycle routes in the urban area of the destination.	Whether cycle routes exist at the destination	Own iterpretation based on: Plan estratégico nacional de ciclo vías [90]	The existence of cycle lanes in the city demonstrates the local government's interest in alternative modes of transport.	Decentralised Autonomous Governments Plan for territorial planning Ministry of Transport
4. Availability of public transport at a provincial level	To know the availability of transport within the canton and to urban and rural parishes.	Whether or not transport is available within the canton and to urban and rural parishes.	Own interpretation based on: Ley del sistema nacional de infraestructura vial transporte terrestre [89]	The availability of transport within the canton and to urban and rural parishes allows easy access to tourist resources.	Decentralised Autonomous Governments Plan for territorial planning Ministry of Transport
5. Availability of buses and taxis within the destination.	To know the availability of buses and taxis within the destination you want to visit.	Existe o no disponibilidad de transporte de buses y taxis dentro del destino	Own interpretation based on: UNWTO [86] Ley del sistema nacional de infraestructura vial transporte terrestre [89]	El análisis de la disponibilidad del servicio de transporte de buses y taxis permite conocer la facilidad de movilización dentro del destino	Decentralised Autonomous Governments Plan for territorial planning Ministry of Transport
6. Availability of commercial transportation for the transfer of persons.	To know the availability of bus and taxi services within the destination.	Commercial transport is or is not available for the transfer of persons.	Own interpretation based on: Ley del sistema nacional de infraestructura vial transporte terrestre [89]	The analysis of the availability of the commercial transport service for the transfer of people allows us to know the ease of mobilization within the destination.	Decentralised Autonomous Governments Plan for territorial planning
7. Availability of bicycle transport within the city centre	To know the availability of bicycle transport for pedestrians within the urban area.	Whether or not bicycle transport is available for pedestrians within the city centre.	Own interpretation based on: Plan estratégico nacional de ciclo vías [90]	The analysis of the availability of bicycles for pedestrians provides insight into the public administration's interest in	Decentralised Autonomous Governments Plan for

(*continued on next page*)

(*continued*)

INDICATOR	OBJECTIVE	HOW TO CALCULATE	SOURCE	INTERPRETATION	SOURCE OF INFORMATION
				using alternative transport within the destination.	territorial planning
8. Existence of water (drinking or treated) and sewage service	Analyse water as a basic service within the tourist infrastructure of the destination.	Is there potable or treated water at the destination?	Own interpretation based on: Soto de la Rosa & Schuschny [74] Ley orgánica de recursos hídricos, usos y aprovechamiento del agua [91]	Water analysis as a basic service provides insight destination's infrastructure.	Decentralised Autonomous Governments Plan for territorial planning
9. Availability of electrical power (domestic grid, public lighting)	Analyse electricity as a basic service within the tourist infrastructure of the destination.	Is electricity (domestic, public lighting) provided or not provided at your destination?	Own interpretation based on: Ley orgánica del servicio público de energía eléctrica [92]	Analyzing electricity as a basic service allows us to understand the destination's infrastructure related to complementary services.	Decentralised Autonomous Governments Plan for territorial planning
10. Availability of renewable energy (hydraulic, wind, solar panels)	Knowledge of the use and application of renewable energy in the destination.	Whether or not renewable energy (water, wind, solar panels) is available.	Own interpretation based on: Ley orgánica del servicio público de energía Eléctrica [92]	The presence of renewable energy as a service provides an insight into the destination's infrastructure in relation to complementary services.	Decentralised Autonomous Governments Plan for territorial planning
11. Availability of hospitals, clinics, health centres and outpatient care	Analyse basic health services and their accessibility within the destination.	Does the destination have a health service or not?	UNWTO [88]	The accessibility to health services shows the destination's infrastructure in terms of complementary services.	Decentralised Autonomous Governments Ministry of Public Health. National Institute of Statistics and Census
12. Availability of information and communications technology– ICT	Analyse the destination's connectivity and communication levels.	The destination does or does not have information and communication technologies - ICT.	Own interpretation based on: Reglamento general a la ley orgánica de telecomunicaciones [93]	Information and Communication Technologies (ICT) allow us to know the implementation of the destination in complementary services.	Decentralised Autonomous Governments Plan for territorial planning
13. Availability of judicial services	Existence of judicial services in the destination	Does the destination have a judicial service or not?	Merinero-Rodríguez y Pulido-Fernández [94]	The existence of judicial services is part of the complementary services infrastructure of the destination.	Decentralised Autonomous Governments Plan for territorial planning Council of the Judiciary
14. Availability of banking services	Knowing the banking services at the destination	Whether or not banking services are provided at the destination	Own interpretation based on: Merinero-Rodríguez & Pulido-Fernández [94]	The presence of banking services is part of the complementary services infrastructure of the destination.	Decentralised Autonomous Governments Plan for territorial planning Ecuador banks

III Tourism services indicator

The analysis of tourism services comprises fourteen indicators obtained from various sources and the Ecuadorian Ministry of Tourism regulations.

INDICATOR	OBJECTIVE	HOW TO CALCULATE	SOURCE	INTERPRETATION	SOURCE OF INFORMATION
1. Availability of tourist transport	Analyse the tourist transport services at the destination.	Does the destination have tourist transport or not?	Ley del sistema nacional de infraestructura vial transporte terrestre [89]	The tourist transport service makes it possible to measure the level of tourist infrastructure in the destination.	National Transport Agency Zonal Directorates of the Ministry of Tourism

(*continued*)

INDICATOR	OBJECTIVE	HOW TO CALCULATE	SOURCE	INTERPRETATION	SOURCE OF INFORMATION
2. Availability of air transport	Analyse the destination's air service.	Does the destination have an air transport service or not?	Reglamento de permisos de operación para prestación de transporte aéreo [95]	The air transport service makes it possible to measure the level of tourism infrastructure established in the destination.	Directorate General Aviation
3. Availability of tourist-heritage railway system	Analyse the existence of rail services within the destination infrastructure.	Does the destination have rail services or not?	Own interpretation based on: servicio turístico en tren que prestan algunas ciudades de Ecuador.	The presence of rail transport makes it possible to measure the level of tourism infrastructure established in the destination.	The Ecuadorian Railway Company Decentralised Autonomous Governments Plan for territorial planning
4. Availability of accessibility in hotel services	The hotel services are accessible to people with disabilities.	Number of hotels and hostels in the destination with access for people with disabilities	UNWTO [96]	The growing interest in accessible tourism is reflected in the number of accommodation facilities accessible to people with disabilities.	Ministry for Tourism Ecuadorian Hotel Association
5. Number of places to stay in hotels and hostels	To know the number of places in hotels and hostels.	Number of hotels and hostels at the destination	Own interpretation based on: Reglamento de Alojamiento Turístico de Ecuador [97] UNWTO [88]	The analysis of the number of places in hotels and hostels shows the supply of accommodation services in the destination.	Ministry for Tourism. National Institute for Statistics and the Census
6. Number of places to stay in *hosterias, Hacienda Turística*	Know the number of lodgings in the hostel/flat category	Number of hotels and tourist apartments at the destination	Own interpretation based on: Reglamento de Alojamiento Turístico de Ecuador [97] UNWTO [88]	The analysis of the number of places in hostels and tourist apartments shows the destination's offer.	Ministry for Tourism. National Institute for Statistics and the Census
7. Number of places to stay in Lodges and Resorts	Know the number of beds in lodges and resorts.	Number of lodge and resort at the destination.	Own interpretation based on: Reglamento de Alojamiento Turístico de Ecuador [97] UNWTO [88]	The analysis of the number of places in lodge and resort shows the destination's offer.	Ministry for Tourism. National Institute for Statistics and the Census
8. Number of places to stay in shelters, tourist camps and guest houses	To know the number of accommodation places in hostels, tourist camps, and guest houses.	Number of accommodations in hostels, tourist camps, and guesthouses	Own interpretation based on: Reglamento de Alojamiento Turístico de Ecuador [97] UNWTO [88]	The analysis of the number of places in hostels, tourist camps, and guest houses shows the development of the supply of accommodation services in the destination.	Ministry for Tourism. National Institute for Statistics and the Census
9. Existence of unregistered places to stay	To know the number of accommodation places that are not registered.	Whether or not there are unregistered accommodation places at the destination	Own interpretation based on: Reglamento de Alojamiento Turístico de Ecuador [97] UNWTO [88]	The analysis of unregistered accommodation places shows the development of the supply of accommodation services in the destination.	Ministry for Tourism. National Institute for Statistics and the Census
10. Number of restaurant places (restaurants and cafes	Knowledge of the number of restaurants in the destination	The number of restaurants and coffee shops in the destination	Own interpretation based on: Reglamento turístico de alimentos y bebidas [98]	The analysis of restaurants shows the supply of food services.	Ministry for Tourism. National Institute for Statistics and the Census
11. Availability of accessibility in restaurant services	Analyse the accessibility of food services at the destination.	The destination has accessible restaurants.	UNWTO [96]	The growing interest in accessible tourism is reflected in the number of restaurants accessible to people with disabilities.	Ministry for Tourism.
12. Existence of mass events and shows	Analyse the destination's capacity to offer mass events and shows.	Are there mass events in the destination?	Own interpretation based on: UNWTO [86]	The development of mass events shows the level of the destination's offer.	Decentralised Autonomous Governments
13. Development of traditional events typical of the destination	Analyse the destination's traditional events.	Number of traditional festivals at destination	European Commission-U. E [99]. Rodríguez-Herrera [100]	Knowing the number of traditional festivals in the destination allows for a better offer and, therefore, better tourism development.	Decentralised Autonomous Governments Plan for territorial planning
14. Availability of recreational events	Analyse the destination's capacity to offer recreational events.	The destination offers recreational events.	Rodríguez-Herrera [100].	The availability of recreational events makes it possible to evaluate the destination's offer regarding alternative activities for tourists.	Decentralised Autonomous Governments Plan for territorial planning

(*continued*)

INDICATOR	OBJECTIVE	HOW TO CALCULATE	SOURCE	INTERPRETATION	SOURCE OF INFORMATION
15. Availability of shopping centres	Analyse alternative places for tourists in the destination.	Whether the destination has shopping centres or not	Rodríguez-Herrera [100].	The availability of shopping centres shows that alternative activities exist.	Decentralised Autonomous Governments Plan for territorial planning
16. Availability of shops and craft centres	Analyse the local crafts offered in the destination.	Are there any shops and centres for handicrafts in the destination?	Own interpretation based on: UNWTO [86]	The analysis of the existence of shops and craft centres provides information on the destination's supply level.	Decentralised Autonomous Governments Plan for territorial planning
17. Existence of night clubs, bars and discos	Analysing the capacity of the destination to entertain	Whether or not there are nightclubs, bars, and discotheques	Own interpretation based on: UNWTO [86]	The presence of nightclubs, bars, and discos makes it possible to assess the level of alternative activities offered by the destination to tourists.	Ministry for Tourism. Internal Revenue Service
18. Number of travel agencies (international, dual, operators)	Analysing the services offered by travel agencies and their categories	Number of travel agencies (international, dual, or operator)	Own interpretation based on: UNWTO [86] Reglamento de operación e intermediación Turística [101]	The presence of travel agencies allows for a more significant development of the tourist industry in the destination.	Ministry for Tourism.
19. Availability of tourist signage	Analyse the tourist signage of the destination.	There are tourist signs at the destination.	Rodríguez-Herrera [100].	Tourist signs measure the level of tourist infrastructure at the destination.	Decentralised Autonomous Governments Plan for territorial planning
20. Existence of Tourist Information Offices	Analyse the destination's tourist information service.	There are tourist information offices at the destination	Rodríguez-Herrera [100].	The presence of tourist information offices is an important factor in the analysis of the tourist infrastructure of a destination.	Decentralised Autonomous Governments Plan for territorial planning
21. Availability of tourist leaflets and brochures	Analyse the availability of tourist information about the destination.	Number of brochures and staff providing tourist information	Rodríguez-Herrera [100].	More promotional material, more development of the tourism industry	Decentralised Autonomous Governments Plan for territorial planning
22. Number of specialised guides in the destination	Whether the destination has a specialist tour guide service.	The number of guides specialised in tourism.	Own interpretation based on: UNWTO [86]	The more specialist guides, the greater the tourism development in the destination.	Ministry for Tourism.

IV. Tourism resources indicator

The destinations have different cultural and natural tourist resources, which, together with the tourist facilities, allow the development of the tourist offer.

INDICATOR	OBJECTIVE	HOW TO CALCULATE	SOURCE	INTERPRETATION	SOURCE OF INFORMATION
1. Number of Museums	To know the number of museums in the destination.	Number of museums in the destination	Own interpretation based on: SECTUR [47]	The more museums, the more tourist resources the destination offers.	Ministry of Culture & Heritage
2. Number of Cultural Centres	To know the number of cultural centres	Number of cultural centres	Own interpretation based on: SECTUR [47]	The more cultural centres, the more tourist resources the destination has.	Ministry of Culture & Heritage
3. Number of archaeological areas	To know the number of archaeological areas.	Number of archaeological áreas	Own interpretation based on: Villa et al. [102]	The more archaeological areas there are, the greater the tourist resources available to the destination.	Ministry of Culture & Heritage
4. Number of Art Galleries	To know the number of art galleries.	Number of art galleries in the destination	Own interpretation based on: Villa et al. [102]	The more art galleries, the more tourist resources the destination has	Ministry of Culture & Heritage
5. Number of heritage assets	To know the number of heritage assets.	Number of heritage assets.	Own interpretation based on: Villa et al. [102]	The more heritage assets, the more resources the destination has.	Ministry of Culture & Heritage

(*continued*)

INDICATOR	OBJECTIVE	HOW TO CALCULATE	SOURCE	INTERPRETATION	SOURCE OF INFORMATION
6. Number of Parks and Squares	To know the number of parks and squares.	Number of parks and squares.	Own interpretation based on: PDOT de cada ciudad	The more parks and squares, the more resources the destination has.	Decentralised Autonomous Governments Plan for territorial planning
7. Number of craft shops	To know the number of craft shops.	Number of craft shops.	Own interpretation based on: UNWTO [86]	The more craft shops, the more resources the destination has.	Ministry of Culture & Heritage
8. Number of resources classified as cultural interest assets	To know the number of cultural assets	Number of cultural assets.	Merinero-Rodríguez & Pulido-Fernández [94]	The more cultural assets, the more resources.	Ministry of Culture & Heritage
9. Number of traditional festivities	To know the number of traditional festivals.	Number of traditional festivals.	Own interpretation based on: UNWTO [86]	The more traditional festivals, the more resources the destination has.	Ministry of Culture & Heritage
10. Number of wildlife shelters	To know the number of wildlife refuges.	Wildlife refuges number	Own interpretation based on: OECD [103] Sistema Nacional de Áreas Protegidas de Ecuador [104]	The more wildlife refuges there are, the greater the importance of protecting endemic fauna.	Ecuador's national protected areas system
11. Number of national recreation areas	To know the number of National Recreation Areas.	Number of national recreation areas	Own interpretation based on: OECD [103] Soto de la Rosa & Schuschny [75] Sistema Nacional de Áreas Protegidas de Ecuador [104]	The more national recreation areas, the more tourism resources.	Ecuador's national protected areas system
12. Number of National Parks	To know the number of national parks.	Number of national parks	Own interpretation based on: Soto de la Rosa & Schuschny [75] Sistema Nacional de Áreas Protegidas de Ecuador [104]	The more protected areas, the more tourism resources.	Ecuador's national protected areas system
13. Number of Reserves	To know the number of nature reserves.	Number of nature reserves.	Own interpretation based on: Sistema Nacional de Áreas Protegidas de Ecuador [104]	The more reserves there are, the more tourism resources there are in the destination.	Ecuador's national protected areas system
14. Number of Protected Forests	To know the number of protective forests.	Number of protective forests	Own interpretation based on: Sistema Nacional de Áreas Protegidas de Ecuador [104]	The more protected forest, the more tourism resources in the area.	Ecuador's national protected areas system
15. Number of protected areas at the municipal level	To know the natural resources of local interest	Number natural resources of local interest.	Own interpretation based on: Sistema Nacional de Áreas Protegidas de Ecuador [104]	The more protected areas, the more tourism resources in the destination.	Decentralised Autonomous Governments Plan for territorial planning Ecuador's national protected areas system
16. Existence of tourist packages (cultural and archaeological)	To know the cultural tourism packages offered in the destination.	The destination offers cultural tourism packages.	Own interpretation based on: SECTUR [47]	The existence of cultural tourism packages allows the development of cultural activities in the destination.	Tour Operators and Travel Agencies
17. Existence of tourist packages (adventure and ecotourism)	Analyse the supply of adventure tourism packages.	Adventure tourism packages offered by the destination	Own interpretation based on: SECTUR [47]	Adventure tourism packages allow for more significant development of adventure activities in the destination.	Tour Operators and Travel Agencies
18. Existence of flora and fauna spotting/watching	Analyse the destination's flora and fauna observations.	The destination offers flora and fauna observation activities.	Own interpretation based on: Soto de la Rosa & Schuschny [75]	Observing the flora and fauna allows for the development of complementary tourist activities.	Tour Operators and Travel Agencies
19. Existence of hiking activities	Analysis of walking activities at the destination	The destination offers trekking activities	Own interpretation based on: UNWTO [86]	The existence of walking activities makes it possible to offer complementary activities.	Tour Operators and Travel Agencies

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INDICATOR	OBJECTIVE	HOW TO CALCULATE	SOURCE	INTERPRETATION	SOURCE OF INFORMATION
20. Existence of special activities	Analyse tourism activities in communities or rural areas.	The destination offers activities in the community or the rural area.	Own interpretation based on: SECTUR [47]	The offer of special activities allows the development of the tourist offer of the destination.	Tour Operators and Travel Agencies

Source: Authors' own.

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