

## System of Sustainability Indicators for Tourism Development: a case study of the municipality of Areia – PB

Sistema de indicadores de sustentabilidade do desenvolvimento do turismo: um estudo de caso do município de Areia – PB

Sistema de indicadores de sostenibilidad del desarrollo del turismo: un estudio de caso del municipio de Areia – PB

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**Abstract:** *This article aims to identify and analyze the level of sustainability of tourism in the city of Areia - PB, by applying the methodology of the System of Sustainability Indicators for Tourism Development (SISDTur) proposed by Hanai (2009). This work is descriptive and it presents an exploratory and quantitative research. To carry out this study, three stages of data analysis criteria were established: analysis of indicators, in which the collected data were analyzed by statistical techniques (mean, standard deviation and coefficient of variation); analysis of dimensions; and analysis of global sustainability. The results indicate that the municipality presents partially unsustainable tourism, since from the six sustainability dimensions for tourism destinations two dimensions demonstrate intermediary sustainability, two dimensions are partially unsustainable, and the other two dimensions are unsustainable. This situation demands from public administrators the design of new action plans for the implementation of investments and projects that may facilitate the sustainable development of tourism in the municipality.*

**Keywords:** *Tourism. Indicators of sustainability. Sustainable Development. Areia – PB.*

**Resumo:** O objetivo deste artigo é identificar e analisar o nível de sustentabilidade da atividade turística no município de Areia - PB, através de aplicação da metodologia do Sistema de Indicadores de Sustentabilidade do Desenvolvimento do Turismo (SISDTur), proposto por Hanai (2009). A pesquisa caracteriza-se como descritiva e exploratória, de natureza quantitativa, complementada por análise

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de dados secundários e observação não participante. Foram estabelecidos três estágios de critérios de análises dos dados: análise dos indicadores, onde os dados coletados foram tratados por meio de técnicas estatísticas: média, desvio-padrão e coeficiente de variação; análise das dimensões e análise global da sustentabilidade. Os resultados obtidos apontam que o município pesquisado apresenta-se parcialmente insustentável, comprovada pela faixa do padrão de sustentabilidade e insustentabilidade, pois das seis dimensões da sustentabilidade duas apresentaram-se em sustentabilidade intermediária, duas parcialmente insustentáveis e duas insustentáveis. Tal situação demanda novas e melhores formas de atuação dos gestores públicos na implementação de investimentos, planos e projetos que possam viabilizar a sua melhoria e contribuir com o desenvolvimento sustentável do turismo no município.

**Palavras-chave:** Turismo. Indicadores de sustentabilidade. Desenvolvimento sustentável. Areia – PB.

**Resumén:** *El propósito de este artículo es identificar y analizar el nivel de sostenibilidad del turismo en el municipio de Areia - PB, aplicando la metodología del Sistema de Indicadores de Sostenibilidad del Desarrollo del Turismo (SISDTur), propuesto por Hanai (2009). La investigación se caracteriza por ser descriptivo y exploratorio, cuantitativo, el análisis completo de los datos secundarios y observación no participante. Se establecieron tres etapas de criterios de análisis de datos: El análisis de los indicadores de que los datos recogidos se analizaron por medio de técnicas estadísticas: media, desviación estándar y coeficiente de variación; Análisis de las dimensiones; Información general y de la sostenibilidad. Los resultados indican que el municipio ha investigado en parte insostenible, lo demuestra la gama estándar de sostenibilidad y la insostenibilidad a causa de las seis dimensiones de la sostenibilidad de dos presentados en la sostenibilidad intermedia, dos parcialmente insostenibles, y dos insostenible. Esta situación exige nuevas y mejores formas de trabajar de los gestores públicos en la ejecución de los planes de inversión y proyectos que pueden facilitar su mejora y contribuir al desarrollo sostenible del turismo en el municipio.*

**Palabras clave:** Turismo. Indicadores de sostenibilidad. Desarrollo sostenible. Areia – PB.

## 1 INTRODUCTION

Tourism has been the most significant economic event in the last few decades, and currently is one of the economic sectors with the greatest potential to generate wealth, development, competitiveness, and is of strategic importance. In some cases tourism is the main source of income for a region, it can be a factor of development and an ally in fighting and minimizing poverty of a given place (Rodrigues, 1999; Beni, 2002; Braga, 2007).

According to the data of the Ministry of Tourism and the World Travel & Tourism Council - WTTC (2014) on the impact of tourism, Brazil is ranked sixth in the world tourism economies. The substantial contribution of tourism development to a certain local economy and the environmental impacts of it, call for in-depth research on natural resources management and the development of tools for environmental and managerial education in the tourism

industry; the objective is meeting the tourism demand whilst minimizing the negative environmental impacts.

In this sense, Santos and Cândido (2015), point out that the activities carried out in a certain place should meet the principles of sustainability in order to keep the balance and equity between the environmental, social, and economic dimensions. The planning and development of actions should include the various social actors, and be managed in view of the balance and equity between the above-mentioned dimensions, given that tourism affects both negatively and positively the place.

The State of Paraíba (PB) presents a rich natural, historical and cultural heritage which composes a diversified tourism product which has contributed to the socioeconomic development of the region and the state. However, tourism has been precariously developed in the regions mapped by the Tourism Regionalization Program, carried out by the Federal Government, since, in many cases, there is no integrated action plan between institutions and tourism businesses.

This research was carried out in the tourism destination of Areia, PB, a municipality located in the microregion of Brejo Paraibano, nationally and internationally known for its production of 'cachaça' (a distilled spirit), sugar and 'rapadura' (brown sugar). Furthermore, after the Brejo Paraibano became registered and included in the tourism guides, the tourism activity has become more intense, e.g. ecological, rural, cultural, adventure, events, and food tourism based on the rich natural, historical and cultural heritage of the city and the region, composed of churches, manor houses, theatres, restaurants, mills, colonial houses, museums, and flour houses. The mills open for visit, the ecological trails and the beach resorts, besides a diversified handicraft and regional cuisine are the highlights of Ecotourism, rural and adventure tourism (Areia, 2015).

The municipality was chosen because according to the Tourism Regionalization Program of Federal Government it has potential for tourism after it had been listed as protected heritage. Also, it is a rural and agrarian place featuring great tourism assets, however, few projects and methodological studies have been developed and implemented in the region regarding sustainable tourism. These reasons justify the present research.

For this study the methodology adopted is the System of Sustainability Indicators for Tourism Development (SISDTur), proposed by Hanai (2009). It comprises a set of indicators of sustainability divided in six dimensions and their respective indicators of sustainability, selected, hierarchized and weighted indicators from the participation of local community. This model was chosen also because of its consistency and for presenting the criteria for selecting indicators, parameters and specific criteria for data analysis and work development.

After these initial considerations, the objective of this paper is to identify the level of sustainability of tourism in Areia, PB, after the characterization of the municipality and its tourism activities.

In terms of methodology this study carries out a quantitative, exploratory and descriptive approach, conducted in the form of a case-study of Areia, PB. Data collection was made by surveys to tourism stakeholders, trade, public and private entities, and civil society, besides non-participant observation during data collection.

This article is structured in five sections: the introduction; a theoretical survey upon which the research is based; section three presents the methodology; section four is the presentation and analysis of results; and, the section five concludes with some final considerations.

## 2 THEORETICAL FRAMEWORK

### 2.1 Sustainable Development of Tourism

The first definition of Sustainable Development resulted from the *Brundtland* Report, in 1987, which defined it as being the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. In this perspective, the United Nations World Tourism Organization (2003) posits that sustainable tourism relates the needs of visitors and host communities, protecting and strengthening future opportunities.

The Ministry of Tourism (2007) stresses that sustainability in tourism is a continuous process which requires a constant trend forecast and monitoring of impacts introducing the preventive or corrective measures whenever is necessary, in order to respect the potential and natural limits of the area to be developed for tourism. Thus, sustainable tourism comprises the planning and the management of natural, economic, social and aesthetic resources, respecting the cultural integrity, the essential ecological processes, the biodiversity and the life support systems (OMT, 2003).

Following Lage and Milone (2009) *apud* Silva et al. (2013), the practice of tourism entails the existence of a tourism product, composed of a set of goods and services: transportation, food services, accommodation, and entertainment, being the public and private managers responsible for the planning and development in accordance to sustainability principles.

According to Gomes (2009), the structure of tourism is made of accommodation, restaurants, entertainment, tourism agencies, tourism guides, and travel agencies, among others. This set of enterprises, according to Souza and Ferreira (2011), aims to increase the number of people going to a certain receiving area, their level of participation in entertainment activities, the supply of accommodation facilities, occupancy rate, visit and use rates, among others, in order to make a profit.

The organizations which supply tourism products and services in an ethical way contribute to the formation of a positive image regarding their competitors, and this may be turned

into a competitive advantage, given that tourists are interested in a social and environmentally responsible tourism (Virginio & Fernandes, 2011).

Molina (2011) points out that tourists are currently selecting the tourism destinations according to environmental quality criteria, level of noise, and density of the places they are going to visit. In this sense, the tourism industry needs to work together to offer to the tourists a tourism product or service within the principles of sustainability and, at the same time, meeting their expectations.

Santos and Cândido (2013), state that planning and executing tourism activities taking into account the principles of sustainability is an opportunity to several actors involved, insofar that companies are compromised with stakeholders (shareholders, employees, service providers, suppliers, community, government, clients, among others). The authors also reaffirm that the compromise of the companies with the environment and sustainable tourism happened fundamentally due to two main factors: consumers' demand for a more sustainable and environmentally responsible tourism, engaged with conservation of heritage; and the pressure of governmental regulations, which led the companies to adopt a more responsible and ethical behavior.

From this considerations it can be said that tourism is an economic activity with the potential to develop regions in a more sustainable way, however, it is necessary to reflect upon the environmental, social, economic, and cultural impacts of that activity, in order to meet the principles of sustainability.

## 2.2 System of Sustainability Indicators for Tourism Development

The systems of sustainability indicators correspond to the mechanisms that are adopted to assess the level of sustainable development of a given territory or a given economic activity. According to Van Bellen (2006), the chief goal of the indicators is to group and qualify information in a way that its significance is more evident. To the author, the indicators simplify information about complex phenomena, enhancing the process of communication and management.

On its part, the definition of a system of indicators, as well as the construction of measurement instruments and techniques, has become priority and key to the processes of planning and management of tourism destinations, demanding bases and practical application of proposed models (Hanai, 2009). Given this, concerned about environmental issues, the fast growing population, and the multiplicity of human activities that consume and exploit natural resources, Hanai (2009) put forward a System of Sustainability Indicators called: System of Sustainability Indicators for Tourism Development (SISDTur).

The main drive for the creation of this system was the concern about the socioeconomic and environmental problems and challenges, related to the use of water resources and heavy economic dependence on livestock farming in this region. This situation have led the

researcher to disclose local development opportunities, aiming to provide better conditions of live to the inhabitants through the creation and implementation of a set of indicators of development sustainability which verify and assess the establishment of sustainability conditions (environmental, social, economic, cultural, tourism, and institutional) for tourism development.

The development of this research required: the contextualization of sustainable development and sustainability applied to tourism; the analysis of current conditions of tourism development in the region; construction and application of the program of tourism awareness; conceptual and typological approach to indicators, as well as the initiatives, the systems, and the models of indicators of sustainable tourism, searched and obtained from case-studies; the process of selection and definition of sustainability, through a participative approach of local society of Bueno Brandão, taking into account the view of other groups engaged in the research (tourism experts and undergraduates of Environmental Engineering); and the elaboration and proposition of the SISDTur, making it a practical methodological tool, useful and feasible to apply to the process of development, management, and monitoring of tourism in the region, according to the principles of sustainability (Hanai, 2009).

In this sense, the SISDTur is composed by two sets of indicators: sustainability indicators for tourism establishments and visit places; and sustainability indicators for municipal tourism management, with descriptors, indicators, parameters, technical procedures, general guidelines and directions to the identification and attainment of information and tourism data, distributed in six dimensions of sustainability: environmental, social, cultural, economic, tourism, and institutional.

The system considers a priority the scientific research on the procedures and indicators for the analysis of the process of development of tourism, in order to enable the elaboration of technical and scientific tools to its measurement, assisting the decision-making process and the sustainable management of the tourism activity. As well as, the definition and the establishment of indicators which, not only assess the impacts of the economic activity but also identify the actions and initiatives to hinder possible negative impacts related to the tourism development in a given place.

At last, complementing this scenario, Hanai (2009) points out the importance of further research on the indicators of sustainability for the tourism activity and the need to come up with tools and analysis procedures of the sustainability and monitoring of tourism to assist the planning process and management of tourism activities in the rural spaces, which was sought in this research proposal.

### 3 METHODOLOGY

This study is exploratory and descriptive, conducted as a case study. The data survey was made from the selection of 41 indicators, taken into account the specific characteristics

of the researched municipality and the type of tourism activities carried out there. Furthermore, the specific parameters, form of measurement and units of measurement were modified, so as to adapt them to the reality of the municipality and to the available database.

From the indicators a research tool was prepared to collect the primary data. Additionally, fact-finding visits to the municipality were carried out to collect primary and secondary data and other useful information to outline the research. At last, to meet the research problem and the proposed objectives at the beginning of this study, triangulation was made: secondary data analysis, primary data analysis, and researcher’s inferences from non-participant observation.

Primary data was collected through questionnaire by using non-probability convenience sampling method, given the large amount and heterogeneity of social actors directly or indirectly involved in the tourism activity in the region, and due to the difficulty of access to this population. The sample was composed of 48 social actors, representatives of civil society, private sector, and public authorities.

Following the literature survey on the different models of indicators for tourism, and the knowledge of the SISDTur, the research tool was applied using a Likert scale to assess the level of agreement or disagreement regarding the statements made about sustainability indicators. In this stage, the respondents should indicate their level of agreement or disagreement regarding the statements by choosing one of the five options. After the definition of the questionnaire and the understanding of the items, a reconnaissance visit was made to the area of the study, followed by the application of the survey and non-participant observation, identifying the tourism social actors.

Therefore, taken into account the secondary data, three stages of data analysis were established: analysis of indicators; analysis of dimension; and global analysis of the level of sustainability of tourism in the municipality.

The analysis of the indicators of the dimensions was made with the scale used by Barreto, Alves and Morais (2012), which suggests the following:

Mean (Likert scale)	Classification
1.00 – 1.80	Strongly Disagree
1.90 – 2.60	Disagree
2.70 – 3.40	Neutral
3.50 – 4.20	Agree
4.30 – 5.00	Strongly Agree

Furthermore, the Standard Deviation (SD) was used as a measure of dispersion. The variables with a SD up to 2 indicate low dispersion, between 2 and 3 moderate dispersion, and a SD above 3 indicates high dispersion of data (answers) in relation to the mean.

On its part, the Coefficient of Variation (CV) organized the answers from primary data regarding the representativeness of the mean values and regarding the level of dispersion, indicating if the answers were homogenous or heterogeneous. In order to do so, the criterion of the analysis of distribution followed that of Oliveira (2010):

- CV less than 0.15% signifies low variability of answers around the mean;
- CV greater or equal to 0.15% or less or equal to 0.30% signifies a moderate variability around the mean;
- CV greater than 0.30% signifies high variability of answers around the mean.

This criterion was satisfactory to the analysis of indicators, inasmuch as after the calculation, the results were compared with secondary data and non-participant observation which verified the results obtained through this criterion.

The second stage was to know if the dimension is unsustainable, partially unsustainable, intermediate sustainability, potentially sustainable or sustainable, for each dimension. In order to do so, the proportion of the sustainability indicators of the dimension was calculated, the quantity of sustainable indicators of the dimension were add up, to achieve the percentage of the level of sustainability of it. In this way, the following criterion of classification is obtained:

Percentual Variation	Classification
0 – 20%	Unsustainable
21 – 40%	Parcially unsustainable
41 – 60%	Intermediate sustainability
61 – 80%	Potentially sustainable
81 – 100%	Sustainable

Finally, the global analysis of sustainability sought to measure the level of sustainability of the tourism activity of the municipality of Areia, PB, taking into account the total amount of the sustainable indicators of the set of dimensions. Thus, five categories were established

regarding the level of sustainable development found in the tourism activity in the municipality, as depicted in the table above:

Quantity of sustainable indicators	Classification
0 - 10	Insustainable
11 - 20	Parcially unsustainable
21 - 30	Intermediate sustainability
31 - 40	Partially sustainable
Above 40	Sustainable

Data was collected from October 2014 to April 2015, with several field visits. The participants of survey, from civil society, private initiative, and public authorities, were informed that they were part of a research, in which they agreed to participate voluntarily. To protect the anonymity of the respondents their identities are not disclosed.

#### 4 PRESENTATION AND DATA ANALYSIS

##### 4.1 Characterization of the research locus: Areia, PB

The municipality of Areia is located in the microregion of Brejo Paraibano. It has an estimated population of 23,829, in 2005, according to data of the Brazilian Institute of Geography and Statistics (IBGE, 2010). The territorial area of the municipality corresponds to 266.596 km<sup>2</sup> and to a population density of 88.42 people per Km<sup>2</sup>. The average annual temperature is around 23.5 °C (FAMUP, 2013).

With investment on local development, farming businesses, industry, services, and tourism activity, the municipality presents an average Municipal Human Development Index (MHDI) of 0.594, with a GDP per capita (current prices) of R\$ 7,047.08 BRL (IBGE, 2016). The municipality of Areia, also called “Sugar Civilization”, is located in the region of Brejo Paraibano, known nationally and internationally for its production of ‘cachaça’ (sugar cane distilled spirit), sugar, and ‘rapadura’ (brown sugar) (Areia, 2015).

Regarding tourism, the activity have increased since ecological, rural, and cultural tourism niches were included in the tourism guides of the Brejo Paraibano. The regions is characterized by a rich historical and cultural heritage, comprising churches, manor houses, theatres, mills, colonial houses, museums, mansions, and flour houses. Sugarcane plantation lead to the implementation of numerous mills, where the raw material was transformed in

products such as regular sugar, muscovado, ‘rapadura’ and other types of brown sugars, and ‘cachaça’. These products are marketed depending on the demand on the coast and on the interior of the state, and currently, the export of handicrafts and food products are highlighted (Areia, 2015).

Built on the twentieth century, the houses and mills open for visit have some characteristics of the buildings from the previous century, with decorated furniture, rooms carefully arranged, which give them a rustic and historical atmosphere. Among the cultural beauty of Areia, PB, there are a diversified handicraft, folk traditions, and regional typical cuisine. Areia, PB, has also tourism guides, handicraft workshops, organic street markets, hotels, inns, farmhouses, regional restaurants, bars, snack bars, cafés, ice-cream parlors, pizzerias, and ‘cachaçarias’ (distilleries). Furthermore, there are other occasional events carried out as an attraction to foster tourism.

## 4.2 Analysis of the Dimensions of the SISDTur

### 4.2.1 Environmental Dimension

Table 1 below presents the analysis of the fourteen indicators which comprise this dimension, taking into account the primary and secondary data, and researcher’s inferences by means of non-participant observation.

**Table 1** - Environmental Dimension Data (continua)

Indicators	Mean	Standard deviation	CV (%)
1) The amount of water consumed by the tourist does not affect the local consume.	2.69	1.54	57.25
2) There are programs to reduce the consumption, waste, or reuse of water.	2.52	1.61	63.89
3) The water quality is monitored.	2.48	1.59	64.11
4) The amount of solid waste generated by tourism is substantial.	2.90	1.34	46.21
5) There are programs to reduce the amount of solid waste.	2.69	1.40	52.04
6) There is solid waste sorting and recycling.	2.65	1.53	57.74
7) The amount of energy consumed by a tourist in a given period does not affect the consumption of local production, and it is a small proportion.	3.17	1.60	50.47

**Table 1** - Environmental Dimension Data (conclusão)

Indicators	Mean	Standard deviation	CV (%)
8) There programs to reduce energy consumption.	2.60	1.62	62.31
9) Wastewater is treated.	3.02	1.64	54.30
10) There are preservation areas, restored or in process of restoration.	3.63	1.41	38.84
11) There are programs or devices to improve air quality.	1.83	1.11	60.66
12) There is an interpetive guided program for environmental or cultural education.	3.42	1.32	38.60
13) There are associations of environmental groups in the locality.	3.35	1.31	39.10
14) There is a process of environmental or tourism certification.	3.33	1.31	39.34

**Source:** Research data (2015)

The data from the table above show that the environmental dimension of the sustainable tourism development of the municipality of Areia, PB, presented a total of fourteen indicators: five sustainable indicators; one partially sustainable; two indicators in intermediate sustainability; and, four indicators partially unsustainable.

In this sense, it can be observed that the environmental dimension of the municipality of Areia, PB, is partially unsustainable, given that the total mean of the indicators show that approximately 60% of the answers correspond to total or partial disagreement, whereas 40% correspond to neutrality (neither agree nor disagree) and partial agreement in relation to the affirmative, with low standard deviation and high variability of answers around the mean value for all indicators. This indicates that further and better investment, on the part of public municipal managers, both in the structure and infrastructure are needed; such as sanitation in the city, implementation of water supply facilities and wastewater treatment; and, management, treatment and disposal of sewage and solid waste produced by the inhabitants of the municipality and tourists, in order to preserve waterbodies and surrounding woods, so that the health and quality of life of residents, wildlife, and visitors as a whole are not compromised.

In turn, according to the municipal management of sanitation, the municipality of Areia, PB, is one of the municipalities of Paraíba without a program of reduction and safe handling of the amount of waste solid produced, thus, this indicator is unsustainable. Mucelin and Bellini (2008) emphasize that never in any other stage of human development, as the current, was so much waste (garbage) generated and the health of human populations and

the environment put in danger. Thus, the indicator: existence of programs to reduce the amount of solid waste, as well as the management (collection, storage, disposal), call for a particular attention on the part of those responsible for developing programs of awareness to minimize solid waste, in order to promote public policies regarding sanitation and safe solid waste disposal in sanitary landfills and incinerators, in a way that does not compromise environmental quality.

Finally, non-participant observation has shown that the municipal public authority must intervene and implement actions to promote investments, public policies, and programs which can mitigate the negative impacts of tourism on the environment. For that, the systems of sustainability indicators for tourism development can guide the preparation of plans, projects, and public policies aimed at the preservation, conservation, and restoration of the historic, tourism, cultural, and natural resources of the municipality and the region.

#### 4.2.2 Cultural Dimension

Table 2 below presents the analysis of the seven indicators which comprise this dimension, taking into account the primary and secondary data, and researcher’s inferences by means of non-participant observation.

**Table 2** – Cultural Dimension Data

Indicators	Mean	Standard deviation	CV (%)
1) There is a good amount of local typical products supply (handicrafts, <i>souvenirs</i> , etc.).	4.48	1.06	23.66
2) There is a good amount of architectonic, archeological, and historical heritage assets	4.38	0.97	22.15
3) There is a good amount of events and traditional popular festivities of cultural expressions.	3.60	1.35	37.50
4) There are acts of vandalism committed by tourists against cultural artifacts.	2.23	1.37	61.43
5) There are acts of vandalism committed by residents against cultural artifacts.	3.08	1.46	47.40
6) There were changes in the way people dress and interest in learning new languages.	3.21	1.26	39.25
7) There were changes in the perception about parking difficulties in the main streets.	3.46	1.63	47.11

**Source:** Research data (2015)

According to the research results, the cultural dimension of the municipality of Areia, PB presented, from a total of seven indicators, three sustainable indicators; one indicator partially sustainable; two indicators partially unsustainable.

Thus, as it was presented, the cultural dimension of the sustainable tourism of the municipality of Areia, PB is in intermediate sustainability, given that the total mean of the indicators show that approximately 60% of the answers correspond to neutrality (neither agree nor disagree) and 40% correspond to partial agreement and strong agreement in relation to the affirmative, with a low standard deviation and moderate to high variability of answers regarding a mean value for all indicators.

In this sense, it is important to consider that the dimension is heading towards a more sustainable tourism development, however, more investments in infrastructure are needed, and also the establishment of plans, projects, policies, and strategies aiming a more sustainable and responsible tourism development in terms of environment and culture.

To achieve that, public authorities, private sector, and civil society, working together, may implement an analysis tool to measure the development of a more sustainable tourism, using a system of sustainability indicators which guide and help the manager in the process of developing a sustainable tourism. The indicators are not only easy to understand, but they can promote the communication within society, besides providing a sound basis for decision-making.

#### 4.2.3 Social Dimension

Table 3 presents the analysis of the five indicators which comprise this dimension, taking into account the primary and secondary data, and researcher’s inferences by means of non-participant observation.

**Table 3 – Social Dimension Data**

Indicators	Mean	Standard Deviation	CV (%)
1) A good number of local residents work in the hospitality industry.	3.02	1.57	51.99
2) There are initiatives of professional training for employees who are local residents.	3.27	1.44	44.04
3) There are employees, local residents, with professional training in tourism.	3.63	1.20	33.06
4) The permanent jobs in the tourism industry are more than temporary jobs.	2.75	1.46	53.09
5) Local population is satisfied with the tourism activity.	3.65	1.35	36.99

**Source:** Research data (2015)

The analysis of the indicators which comprise the social dimension shows that the municipality of Areia, PB presented, from a total of five indicators, two sustainable indicators; two indicators partially unsustainable; and, one indicator partially sustainable. The mean value of the indicators shows that approximately 80% of the answers correspond to neutrality (neither agree nor disagree) and 20% correspond to partial disagreement in relation to the affirmative, with a low standard deviation and high variability of answers around the mean for all indicators.

Given these results, the social dimension of the sustainable tourism development of the municipality of Areia, PB is partially unsustainable. In the visits to the vocational-technical schools it was observed that the municipal management carries out initiatives, such as professional qualification training courses, which help local people to access the job market, and contributes to the development of quality tourism activities. However, this dimension lacks a better attention from the municipal managers regarding public policies aimed at the tourism activity. Social sustainability should try to offer and ensure the basic prerogatives guaranteed by the Brazilian Federal Constitution such as education, healthcare, security, transportation and employment, inasmuch as to achieve a sustainable development of tourism and an equitable access.

#### 4.2.4 Economic Dimension

Table 4 presents the analysis of the five indicators which comprise this dimension, taking into account the primary and secondary data, and researcher's inferences by means of non-participant observation.

**Table 4** – Economic Dimension Data

Indicators	Mean	Standard Deviation	CV (%)
1) Tourism activity generates income and employment for the local population.	4.15	1.27	30.60
2) Tourism companies stay for long in the tourism destination.	3.58	1.20	33.52
3) Tourism establishments work weekend and holidays.	3.67	1.39	37.87
4) Tourists spend a good amount of financial resources per day in tourism establishments.	3.90	1.12	28.72
5) Annual investments in tourism are balanced and meet the increased demand	3.06	1.30	42.48

Source: Research data (2015)

The economic dimension of the sustainable tourism indicators examines the macro and micro economic-financial performance, and the impacts of the infrastructure investment in the tourism activity.

In this sense, the economic dimension of the sustainable development of tourism of the municipality of Areia, PB presented, from the total of five indicators, one sustainable indicator; one indicator partially sustainable; one indicator with intermediate sustainability; and, two indicators partially unsustainable. The results allows us to consider that the economic dimension of the municipality of Areia, PB is unsustainable, even if the mean of the indicators shows that approximately 80% of the answers correspond to neutrality (neither agree nor disagree) and 20% correspond to partial agreement in relation to the affirmative, with a low standard deviation and moderate to high variability of answers around a mean value for all indicators.

Triangulation of data, and non-participant observation indicate an incipient tourism planning regarding tourism demand in the municipality. The municipal management falls short of investment in the urban structure and infrastructure as a whole, whilst the access to the city streets and the routes to the mills need better infrastructures conditions, public lighting, signage, sanitation, safety, among others.

#### 4.2.5 Tourism Dimension

Table 5 presents the analysis of the eleven indicators which comprise this dimension, taking into account the primary and secondary data, and researcher’s inferences by means of non-participant observation.

**Table 5 – Tourism Dimension Data** (continue)

Indicators	Mean	Standard Deviation	CV (%)
1) The accommodation supply is sufficient to meet tourism demand.	3.08	1.51	49.03
2) There is accessibility access for people with mobility impairments or other special needs.	2.13	1.35	63.38
3) There is monitoring and control of visits.	3.67	1.31	35.69
4) There is programming of educational activities and guided tours to environmental or cultural attractions.	3.46	1.24	35.84

**Table 5 – Tourism Dimension Data** (conclusion)

Indicators	Mean	Standard Devia- tion	CV (%)
5) Tourists spend time visiting cultural or environmental attractions.	3.04	1.04	34.21
6) Tourism companies and tourists respect the carrying capacity of the attractions.	3.35	1.18	35.22
7) There is balance between the number of guides and tourists.	3.02	1.44	47.68
8) There are many incidents involving tourists or visitors.	1.71	1.08	63.16
9) Tourists were pleased with the provided services and repeat the visit to the municipality.	4.02	1.11	27.61
10) There are admission fees to contribute to protection, conservation, or use of the tourism attractions.	2.42	1.35	55.79
11) There are facilities and structures to minimize the environmental impacts from tourism.	2.40	1.27	52.92

**Source:** Research data (2015)

In order to keep up with increasing tourism demand - international, state, and municipal-, as is the example of the municipality of Areia, PB, public policies, projects, and programs should be developed within the principles of the sustainable development, so that future generations may also enjoy these historical, leisure, cultural and information places.

Within this line of thought, the tourism dimension of the sustainable development of tourism of the municipality of Areia, PB, located in the microregion of Brejo Paraibano presented, from a total of eleven indicators, two sustainable indicators; one partially sustainable indicator; one indicator with intermediate sustainability; four indicators partially unsustainable; and, three unsustainable indicators. The mean of the indicators shows that approximately 65% of the answers correspond to neutrality (neither agree nor disagree) and 35% correspond to partial disagreement, strong disagreement and partially agreement in relation to the affirmative, with a low standard deviation and moderate to high variability of answers around the mean value for all indicators.

Non-participant observation has shown that in what refers to the mechanisms of monitoring and control of entrance, the visits to museums, churches, colonial houses, theatres, and mills, lack those mechanisms and need security, monitoring, and control of carrying capacity of the attractions aiming the preservation, integrity, and valuation of the assets com-

prising the tourism product. Therefore, monitoring and control must be more effectively applied, aiming the safeguard of natural and cultural heritage for the future generations within the principles of sustainability.

In this sense, the results show that the tourism dimension of the municipality of Areia, PB is unsustainable, falling short of infrastructure and structure investments in the tourism activity as a whole. This dimension also requires a careful attention of local managers in the development of actions, public policies, programs, projects, and investments which give rise to a sustainable development of tourism, since the urban and rural areas of the municipality of Areia, PB have great tourism potential in terms of adventure, rural, ecological, cultural, events, and food tourism; and it is the social actors duty, civil society, private sector, and public authorities, to enhance the valuable natural and cultural heritage which comprise the tourism product of the municipality.

#### 4.2.6 Institutional Dimension

Table 6 presents the analysis of the five indicators which comprise this dimension, taking into account the primary and secondary data, and researcher’s inferences by means of non-participant observation.

**Table 6** – Institutional Dimension Data

Indicators	Mean	Standard Deviation	CV (%)
1) Training and technical support in tourism is sufficient to meet tourism demand.	2.88	1.38	47.92
2) Local community participates in the development and management of local tourism planning.	3.21	1.38	42.99
3) There are promotional and marketing strategies for the tourism products.	3.54	1.32	37.29
4) There is legislation to protect historical heritage in the locality.	4.33	1.12	25.87
5) There is legislation to protect natural heritage in the locality.	4.08	1.11	27.21

**Source:** Research data (2015)

The results show that the institutional dimension of the sustainable development of tourism of the municipality of Areia, PB presented, from a total of five indicators, three sustainable indicators; one partially unsustainable indicator; and, one unsustainable indicator

In this sense, it can be asserted that the institutional dimension of Areia, PB is in intermediate sustainability, because the mean total of the indicators shows that approximately 60% of the answers correspond to partial disagreement and neutrality (neither agree nor disagree) and 40% correspond to partial agreement of answers in relation to the affirmative, with a low standard deviation and moderate to high variability of answers around a mean value for all indicators.

The institutional dimension is heading towards a more sustainable development of tourism, given that, through the National Historic and Artistic Heritage Institute (IPHAN), the national body linked to the Ministry of Culture (MinC), responsible for promoting and coordinating the process of preservation and enhancement of the Brazilian Cultural Heritage in its tangible and intangible dimensions, has a dependency in the State of Paraíba, the National Historic and Artistic Heritage Institute of the State of the Paraíba (IPHANEP), the body responsible for improving tourism services with the objective of heritage enlisting, control, conservation, increase visits and revenues of museums, promote purchasing and policies and the preservation of the collections. This shows that the municipality has physical facilities and legal tools to ensure the preservation conservation, restoration, monitoring, and control of its historical, cultural, natural, and tourism artifacts.

In order to minimize the problems above-mentioned, the municipality management should promote public policies of training and technical support in tourism, and in this way raise awareness to the importance of preserving and publicizing its history, its heritage, its culture, its tourism, for the reason that, more than a revenue, leisure and culture source, it is above all, its heritage. The municipality should also consider the organization of meetings wherein the residents' opinions and/or suggestions are heard, towards a more participatory and integrated management.

## 5 CONCLUSIONS

The application of the SISDTur enabled the identification of the level of sustainability of the municipality of Areia, PB, and at the same time it provided a set of critical information to the planning and development of actions, investments, projects, and public policies aimed at the sustainable development of tourism.

The analysis of the sustainable development of the tourism activity of Areia, PB, has shown through triangulation of data and in loco non-participant observation that tourism activities of the municipality are in a level of intermediate sustainability, confirmed through the global analysis of sustainability; from a total of forty-seven (47) indicators of sustainability, the municipality presented sixteen (16) sustainable indicators, five (5) partially sustainable, four (4) in intermediate sustainability, fifteen (15) partially unsustainable, and seven (7) unsustainable indicators, totalling twenty-five indicators with medium or high sustainability, and the remain twenty-two considered of low sustainability.

Therefore, considering the dimensions of analysis and the parameters established by the methodology applied, an overview of the analysis of the sustainable development of the tourism activity in Areia, PB, led us to conclude that from the six dimensions under analysis, and presented in the SISDTur methodology, two (2) presented intermediate sustainability: Cultural and Institutional; two (2) are partially unsustainable: Environmental and Social; and two (2) are unsustainable: Economic and Tourism. In this case, we have four dimensions presenting unfavorable results regarding the sustainability of the tourism activity in the given municipality.

Consequently, these dimensions call for a better attention from the public municipal managers in the implementation of actions, investments, plans, and projects of sustainable development of tourism in the municipality. Tourism is a growing activity, especially in Brazil, therefore, it should be developed within the principles of sustainability.

The results obtained with this study concurs with Leff's (2002) argument when he posits that it is necessary to study the effects of environmental issues on the methodological changes, conceptual transfers, and the terminology circulation between the different disciplines which take part in the explanation and diagnosis of social and environmental transformations. Other studies by Reyna (2002), Arranda, (2003), Cintra (2004), Lacerda (2011), Santos (2013), and Silva (2015) verify the results of this study and likewise have found low levels of sustainability in various tourism destinations, due, particularly, to the absence, or inadequacy, of management practices and planning of tourism activities and environmental and natural resources.

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