The Relationship Between the Perception of Environmental Pollution With the Tourist Experience of Visitors to Chimbote Bay

Marcia Cabala Hernandez[1], Cecilia Rivas Medina[1], Rocio Salas Laines[1] and Sandra Cherro Osorio[2]

[1]School of Hospitality and Tourism Management, Universidad Peruana de Ciencias Aplicadas, Lima, Peru

[2]Business and Construction Department, Melbourne Polytechnic, Melbourne, Victoria, Australia

marcia_cabala@outlook.com
ana.rivas@upc.pe
rocioslai@gmail.com
sandraosorio@melbournepolytechnic.edu.au

Abstract: Several studies have addressed the impact of tourism on the environment, but few have focused on how the environment can influence the tourism activity and visitor's experience. Visitors' perceptions of environmental contamination could pose a significant barrier to the optimal development and success of tourism destinations. This is the case of the Chimbote Bay, that has - high levels of contamination due to industrial activity and untreated waste. The main objective of this research was to determine the relationship between the perception of environmental pollution and the tourist experience and in intention to revisit Chimbote Bay. A mixed methodology was employed with the qualitative phase following an interpretative design and the quantitative phase used a non-experimental correlational design. The results showed that visitors to the destination perceived three types of environmental pollution in the bay namely air, water and soil, which highlighted the evidence of an environmental problem in the area. The study also determined an inverse relationship existed between the perception of environmental pollution with the tourist experience. As the perception of pollution increased, the tourist experience decreased. Similarly, an increased perception of environmental pollution reduced the intention to revisit the bay.

Keywords: Chimbote Bay, Coastal destination, Environmental pollution, Intention to revisit, Peru, Tourist experience

1. Introduction

In recent years, environmental pollution has become a global issue as it affects ecosystems, air, water and soil causing mortality among human populations. This phenomenon is defined as the presence of substances that degrade water, soil or air harming senses such as sight, taste or smell, and posing a health hazard (United States Environmental Protection Agency [EPA], n.d).

The tourism sector is heavily reliant on the environment so any negative impact on it will likely lead to a decline of visitation (Eusébio *et al*, 2020) and disruption on tourism development). Environmental pollution, for instance, impacts directly the image of a destination affecting the experience and satisfaction of tourists in a negative way (Huiming *et al*, 2020).

Coastal destinations are globally regarded as attractive to tourists because their natural surroundings and favourable climate. Previous studies, however, have identified that environmental pollution undermines the enjoyment of tourists due to perceptions of poor cleanliness (Castillo *et al*, 2022; Huiming *et al*, 2020). Considering that experiences related to the environment determine the tourist's attitude towards a destination, polluted coastal destinations cause tourist dissatisfaction making their stays shorter and the likelihood of revisiting lower (Huiming *et al*, 2020).

Previous studies have examined the impact of environmental pollution on tourism activities and its effects on ecosystems, however, few studies have explored the relationship between the perception of environmental pollution and the tourist experiences, particularly in coastal destinations (Eusébio *et al*, 2020; Huiming *et al*, 2020; Nabirye, 2018). Hence, this study aimed to explore the relationship between perceived environmental pollution and the tourist experience, and the intention to revisit a coastal destination.

This study is situated in Peru, a country with 2,250 km Pacific coastline, offering a wide array of coastal destinations. In the 1950s, Chimbote Bay was a popular sun-and-beach destination (Loayza, 1998). However, by the 1970s, overexploitation of marine resources and pollution from fish meal and oil factories, fish canning plants, and steel production had severely degraded its environment. As a result, it is now considered one of the most polluted coastal areas in the country (Grandez, 2017). This high level of pollution has caused loss of biological diversity and disappearance of scenic qualities (Loayza, 2022). Chimbote, often called "the city that

smells like fish," has long been avoided by both locals and tourists due to its reputation (Cajusol, 2023). However, its thriving fishing, industrial, commercial, and service sectors have gradually attracted people back over time. In 2022, Chimbote welcomed 437,097 domestic visitors (Dirección Sub Regional de Comercio Exterior y Turismo-Chimbote, 2023).

The main objective of this research was to determine the relationship between the perception of environmental pollution and the tourist experience and intention to revisit Chimbote Bay. For this purpose, three specific objectives were outlined as (i) establish the levels of visitor´s perception of the types of environmental pollution(ii) determine the relationship between the types of pollution perceived and the visitor´s tourist experience on the bay, and (iii) determine the relationship between the visitor´s perception of environmental pollution and the intention to revisit. The results of this research expect to offer valuable insights into the relationship between the perception of environmental pollution, the tourist experience and the intention to revisit a coastal destination.

2. Literature Review

2.1 The Perception of Environmental Pollution and its Relationship With Tourism in Coastal Destinations

Environmental pollution impacts natural resources by diminishing their quality particularly, ecosystems and their elements such as fauna, flora, water, soil and air. Considering that the tourism industry relies on the environment as a source of activities and recreation for tourists, any issues such as destruction of biological diversity or pollution would hinder its development (Amobonye *et al*, 2023). Depletion of natural resources in tourism destinations, for instance, has an impact on the sustainable growth of the place (Chien *et al*, 2022).

In the tourism sector, pollution levels serve as key sustainability indicators for governments, companies and communities. As a result, effective ecosystems management is crucial for the long-term sustainability of the sector (Kusumawati *et al*, 2020). In coastal environments, solid waste in the sea specially plastics significantly reduces the destination's appeal (Aparicio-Serrano and Mate-Sanchez-Val, 2022); soil contamination impairs cleanliness and aesthetics on coastal areas (Huiming *et al*, 2020); and air pollution impacts tourism activities because is perceived as a health risk (Kang *et al*, 2020).

2.2 Visitor Reactions to Pollution in Tourist Destinations

Nowadays, a growing number of tourists prefer destinations that offer activities designed to protect and preserve ecosystems. Consequently, tourists tend to avoid severely polluted coastal destinations because the environmental damage diminishes their value and overall appeal (Eusébio *et al*, 2020; Kusumawati *et al*, 2020; Nabirye, 2018). Furthermore, tourists often made subjective assessments when avoiding high polluted destinations considering the potential negative impacts on their health (Aparicio-Serrano and Mate-Sanchez-Val, 2022; Landowski *et al*, 2020).

Perceptions of the environmental condition of coastal zones are not well understood; however, they are likely influenced by personal experience, word of mouth, media coverage, and reports from travel agencies (Cox *et al*, 2003). Few empirical studies have examined visitors' perceptions of various types of environmental pollution in coastal destinations. Most research have focused on a single aspect such as air pollution (Bogalecka and Grobelna, 2023), debris or litter (Krelling *et al*, 2017) and water pollution (Lee and Lee, 2015). In contrast, this study will consider three types of environmental pollution in tourists' perceptions. Hence, the first research question is:

RQ1: What are the types and levels of pollution perceived by tourists visiting Chimbote bay?

2.3 The Tourist Experience and its Elements

Tourist experiences are influenced by the perceived quality of factors including infrastructure, facilities, cleanliness, safety, hospitality and authenticity (Maunier and Camelis, 2013). The tourist experience cycle begins with information gathering, followed by selecting a suitable destination, planning the trip, experiencing the location and reflecting on the possibility of revisit (Godovykh and Tasci, 2020). The decision-making process is influenced by tourist's image of the destination that is shaped by their expectations and prior experiences (Landowski *et al*, 2020). Additionally, the quality of the experience can impact satisfaction levels leading to either positive or negative feelings about the destination (Huang *et al*, 2019; Nabirye, 2018).

Klaus *et al* (2022) identify five key elements of the tourist experience: reverie, tourist landscape, reflection, transformation, and enjoyment. Reverie, or daydreaming, refers to the feeling of escaping to another reality, influenced by sensory stimuli such as the natural environment, climate, sounds, aromas, and colors of the

destination. Tourist landscape encompasses the physical characteristics of the place, including its natural surroundings and environmental conditions, which shape tourists' perceptions. Reflection involves travelers assessing their personal growth during the trip while also considering the destination's sustainability. Transformation relates to the knowledge and learning acquired during the journey, fostering curiosity and a deeper understanding of the place visited. Finally, enjoyment depends on individual preferences and the level of satisfaction with activities, influencing how entertaining and fulfilling the experience is.

2.4 The Relationship of Environmental Pollution to the Five Elements of the Tourism Experience

Tourists are attracted to destinations with higher environmental quality but when environmental damage occurs, it affects each of the five elements of the tourist experience. The first element, reverie, is influenced by perceptions of pollution which diminishes the destination's value and reduce its appeal when tourists consider places to visit (Kusumawati *et al*, 2020). Pollution damages the environmental conditions of the tourism landscape, a deterioration that is perceived through the senses: sight, taste, smell, hearing and touch (Godovykh and Tasci, 2020). Signs of pollution could be perceived as lack of sustainable actions to preserve the environment which have a direct impact on the element of reflection (Castillo *et al*, 2022). Transformation occurs when tourists perceive that protective actions to mitigate pollution have been effective or not potentially leading to a caring attitude towards a destination (Kusumawati *et al*, 2020) or raising awareness in third parties (Chih *et al*, 2023). The enjoyment element may be diminished by environmental pollution which can adversely impact on tourist activities. High air pollution can negatively affect tourists' mood by impairing sight and breathing (Kang *et al*, 2020).

2.5 Pollution in Coastal Destinations and its Relation to the Tourist Experience

Pollution in coastal destinations significantly impacts the tourist experience. Key factors like climate, beaches, and the natural environment shape satisfaction, but environmental quality—air, water, and soil—is crucial due to tourists' direct interaction with their surroundings. Pollution, including debris and water contamination, disrupts recreational activities and diminishes overall enjoyment, affecting the quality of the visitor experience (Dzitse *et al,* 2023).

The second research question is:

RQ2: What is the relationship between visitors' perception of environmental pollution and each one of the elements of the tourist experience?

2.6 Effects of the Perception of Environmental Pollution in Tourist Destinations: Reduction of Stay and Revisit

Recollection of previous experiences, particularly negative ones, can significantly influence tourists' decisions (Huang *et al*, 2019) including whether to revisit a destination (Nabirye, 2018). Pollution, for instance, had adverse effects on visitors' experiences and their intention to revisit (Cajusol, 2023; Chien *et al*, 2022). Therefore, perceptions contribute to the tourist's decision-making process (Santos *et al*, 2020). For this reason, the third research question is:

RQ3: Which is the relationship between the visitor´s perception of environmental pollution of Chimbote Bay and the intention to visit or revisit?

3. Methodology

The main objective of this research was to determine the relationship between the perception of environmental pollution and the tourist experience and intention to revisit Chimbote Bay. The specific objectives were (i) to establish the levels of visitor´s perception of the types of environmental pollution (ii) to determine the relationship between the types of pollution perceived and the visitor´s tourist experience on the bay, and (iii) to determine the relationship between the visitor´s perception of environmental pollution and the intention to revisit.

The limited number of previous studies exploring the relationship between environmental pollution and the tourist experience has created a gap in the literature. This exploratory study aimed to better understand the issue of environmental pollution at a coastal destination in Peru. To achieve this, a qualitative methodology was initially employed to explore the problem in depth. Following this, quantitative research was conducted to measure relationships between variables identified in the first phase (Truong *et al*, 2020). This mixed method approach provided a more effective way to address the research objectives and offer a clear understanding of the topic (Dawadi *et al*, 2021). As such, the qualitative phase used an interpretative design that focused on

understanding the underlying perspectives and experiences of participants, in this case the environmental issues in the bay. The quantitative phase employed a non-experimental correlational design to identify connections between variables without manipulating them.

3.1 Sample and Techniques

The population was national citizens non-residents of Chimbote, over 18 years of age that visited the area during March 2024. During the qualitative phase, 12 visitors to the bay (six women and six men) were selected by opportunity sampling to facilitate the rapid collection of data from individuals readily accessible (Hernández *et al*, 2014). In-depth interviews were conducted with these individuals that voluntarily agreed to participate in the study.

For the quantitative phase, a sample size of 385 visitors was determined with a margin error of 5% and a level of confidence of 95%. Convenience sampling was used due to specific characteristics identified by the researcher namely availability and willingness to respond (Hernández-Sampieri and Mendoza, 2018). This approach allowed the study to focus on individuals who were easily accessible and open to providing responses. A virtual survey was distributed via social media outlining the eligibility criteria and using filter questions to identify the target population.

3.2 Instruments

In the qualitative phase an inquiry guide was used to ensure key topics were covered while allowing researchers to explore responses in depth. The survey consisted of 21 open questions about environmental pollution, perceptions of visitors to the bay and the influence of environmental pollution on the tourist experience and intention to revisit.

Variables that emerged from the qualitative phase, such as the types of environmental pollution (air, water and soil) were included in the quantitative instrument so these perceptions could be measured. Similarly, variables defined by participants regarding the tourist experience and revisit intention were used to develop clear and precise items in the next part.

For the quantitative phase, a questionnaire that measured three variables through 23 items was used (Refer to figure 1 below) This instrument included Likert scale (ranging from 0 to 6) and socio-demographic questions as detailed below:

- Variable 1. Perception of Environmental pollution: 8 items
- Variable 2. Tourist Experience: 10 items
- Variable 3. Revisit Intention: 5 items

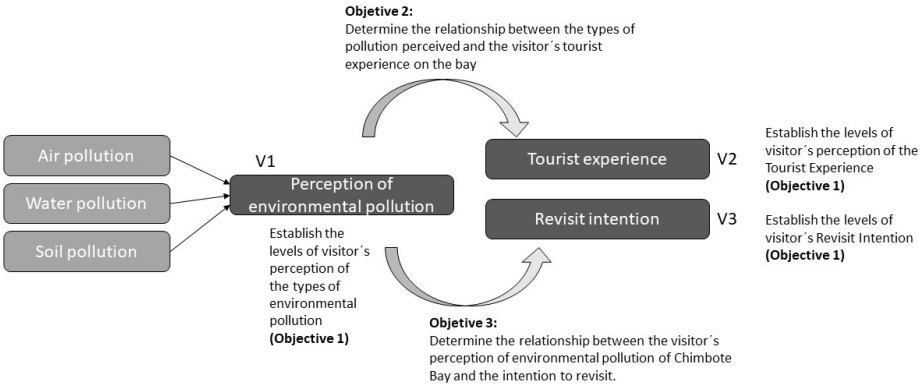

Figure 1: Variables and specific objectives of the study. Source: Own elaboration

3.3 Content Analysis

The content of the interviews was transcribed, and open code was used to identify categories through common themes. Axial coding was used to select relevant categories based on frequency and to group them into specific themes. Selective coding was also used to determine central themes related to the perception of environmental pollution and the tourist experience. Once no new themes or categories emerged, it was concluded that theoretical saturation had been reached (Hernández-Sampieri and Mendoza, 2018).

3.4 Data Analysis

SPSS was used to carry out the analysis of the three variables. The first objective was analyzed descriptively using frequencies and percentages; while to respond to objectives 2 and 3, non-parametric correlation tests were used. The Spearman coefficient was employed because normality tests have previously determined that some of the variables did not follow a normal distribution.

4. Results

4.1 Perceptions of Environmental Pollution

Participants' testimonies indicated that they perceived - three types of environmental pollution: air, water and soil through their senses. They also agreed on three main sources of environmental pollution from "fishing boats (E03)", "fishing factories (E08)" and "local residents: *Chimbotanos* (E09)". In the survey, the perception of environmental pollution was considered at very high level (96,92%) levels. Similarly, the types of pollution in the air, soil and water pollution were also identified the highest levels of perception with averages of 5,653, 5,672, 5,658 respectively. While differences in the perception means between the dimensions were noted, these were not significant.

4.2 Visitors' Perceptions of Environmental Pollution and the Tourist Experience

Using the five elements of the tourist experience, interviews revealed that regarding *reverie,* first-time visitors to the area had the illusion of finding a place where they could enjoy family outings and beautiful beaches, since "when you think of a bay, you expect blue sea, blue sky, sand (E10)". But once at the place, they had negative visual and olfactory effects due to pollution in the air, water and soil. This affected their perception of the *tourist landscape*, with some participants further pointing that the lack of fauna, such as birds and fish, was probably due to the high levels of pollution. While assessing their concerns during *reflectio*n, participants emphasised the need for stricter sanctions for polluters including those that throw garbage on the streets. They further noted the need for environmental education among local population to assist in improving conditions at the bay. In the *transformation element*, participants expressed concerns about the bay's environmental state with some feeling responsible for preventing littering and helping dispose of trash properly. For *recreation*, participants agreed that the environmental pollution limited tourist activities including "seeing fish (E01)", "swimming (E10, E12)", "photographing the landscape (E01)" and/or "walking or running (E05, E07)" or even enjoying the bay (E07 and E08).

Survey results showed that visitors had a very low-quality experience at 38.05%, and low quality at 61,18%. They also stated that while the destination evoked thoughts of beach days with the family (Mean=4,16), the current environmental conditions did not allow them to engage in planned tourist activities (Mean=1,21) and even they considered their health was affected (Mean=1,92).

The Spearman coefficient was used for the evaluation analysis between the perception of environmental pollution and the tourist experience, finding a significant inverse relationship (pvalue=0.000) but weak (rho=-0.231) since it was less than 0.25 (Hernández-Sampieri and Mendoza, 2018).

Correlation tests were also carried out between the tourist experience and each of the dimensions of environmental pollution: air, soil and water; finding significant relationships in the three cases: tourist experience*air pollution (Pvalue=0.000), tourist experience*water pollution (Pvalue=0,000), tourist experience*soil pollution (Pvalue=0,000). However, the relationships were also weak (-0,284, -0,196, -0,199 respectively).

4.3 Visitors' Perceptions of Environmental Pollution and Intention to Revisit

The presence of garbage, bad odors and lack of cleanliness negatively impacted the overall visitor experience reducing the likelihood of returning. However, anticipation of future improvements and potential actions to mitigate pollution were factors that could influence their intention to return. In effect, the strongest reasons for

returning were improvements (4,54) and likeness to the bay (4,05). Additionally, personal and emotional connections to the place may further shape the decision to revisit as 73,43% of visitors had a medium or moderate intention to revisit, while 14,91% had low intention, and 0,77% very low intention. The evaluation test carried out between perceived environmental pollution and the intention to revisit resulted in a significant and moderate relationship (Pvalue=0.000, rho=-0,365).

5. Discussion

This study determined that the relationship between the perception of environmental pollution with the tourist experience and the revisit intention of visitors to Chimbote Bay were inverse. Visitors' perceptions of high pollution at the destination decreased their experience and intention to revisit. This finding coincided with Nabirye (2018) that identified the importance of aesthetic value in the creation of positive tourist experiences. Similarly, the study provided evidence to the dependence of coastal tourism on the environmental quality of the destination as noted by Aparicio-Serrano and Mate-Sanchez-Val (2022).

Visitors to the bay, without exception, were able to identify each type of environmental pollution (air, water and soil) which highlights the notoriety of the environmental problem in the area. As noted by Godovykh and Tasci (2020) humans perceive the environment through their senses, which in turn shapes their own perceptions. The fact that the three types of environmental pollution were perceived in practically the same magnitude showed that visitors to Chimbote Bay were also aware of the different sources of pollution namely fishing boats, fishing factories and even the local community. As previously mentioned, uncontrolled exploitation of fishery resources, industrial pollution, and urban sprawl contributed to the perception that Chimbote was solely a transit point (Loayza, 2022).

This study confirmed that environmental pollution affects the reputation of a tourist destination including the experience and satisfaction of tourists (Huiming *et al*, 2020). In addition, environmental issues also influenced the five elements of the tourism experience proposed by Klaus *et al* (2022).

Regarding reverie, when comparing perceptions of a coastal environment, visitors were faced with a place with high level of pollution. This caused disillusionment that adversely impacted the image of the place. Previous research showed the importance of how tourists process and evoke perceptions of a destination, as this directly influences their travel decision (Santos *et al*, 2020).

For the tourist landscape, the presence of pollutants and absence of fauna altered both the olfactory and visual perception diminishing the natural attractiveness of the place and experience of observing the ecosystem, essential for tourist enjoyment. As demonstrated by Godovykh and Tasci (2020) that indicated the natural landscape influences the tourist experience through the human senses.

Reflection was linked to the environmental situation of Chimbote Bay. Visitors reflected that the destination required intervention from the local government, companies and community to improve the conditions of the place. This showed that the absence of competent authorities and engaged stakeholders could lead to increased pollution in coastal destinations.

In the transformation element, this study revealed that visitors were willing to contribute to environmental protection. This demonstrated a genuine concern for the bay's condition and a proactive desire to preserve and improve the natural environment. It can thus be affirmed that the tourist experience was educational, sparking visitors' curiosity (Klaus *et al*, 2022) and encouraging to adopt a proactive stance toward environmental protection.

Regarding the recreational element, visitors perceived that the possibility of recreational activities was limited due to the presence of pollutants. This further contributed to an unwelcoming environment that generated negative emotions in visitors. This contrasts with Chien *et al* (2022) that stated that the natural environment is the source of recreation for tourists.

6. Conclusion

This study confirmed that visitors perceived high levels of all types of environmental pollution in Chimbote Bay, with clear evidence of deterioration caused by fishing activity. This resulted in noticeable pollution, as visitors could distinctively sense unpleasant odors and observe solid waste in the area. Furthermore, perceptions of air, water and soil pollution had an inverse relationship to tourists' engagement and participation in activities.

An inverse relationship also existed between the perception of environmental pollution in Chimbote Bay and the intention to revisit the destination. Visitors felt demotivated with the poor environmental quality of the area.

The study contributed to the literature on the relationship between the perception of environmental pollution and the tourist experience and the intention to revisit by examining factors within the specific geographic context of the Chimbote Bay, highlighting the issue of environmental pollution in the area. The inverse relationship between perceived environmental pollution with the tourist experience and revisit intention underscores the need for local government intervention to improve the bay's conditions to promote tourism. Active participation from other stakeholders including businesses and local community is essential to reduce environmental problems and enable tourism as contributor to the local economy.

While this study contributed to the literature and tourism sector by presenting the tourists' perspective on the impact of the environment, it also acknowledges some limitations related to the constrained timeframe for quantitative data collection. The research needed to be conducted in the field to accurately assess the tourism experience while it was occurring. However, due to time constraints, researchers were unable to travel to Chimbote for in-person data collection and had to rely on virtual methods instead. In addition, during the period of this research, Chimbote was not in high season, therefore, visitors that could have been encountered were scarce.

Recommendations for future research include quantitative research to evaluate the tourist experience of visitors during the city's peak tourism season, a comparative or longitudinal study, interviews with local authorities and surveys to the local population. In addition, participant observations at tourist sites could assist in capturing visitor behavior and interactions with local services offering a more comprehensive understanding of their experiences.

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