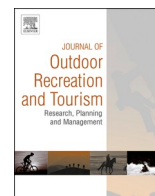


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Nature-based tourism development in coastal wetlands of Sri Lanka: An Importance–Performance analysis at Maduganga Mangrove Estuary

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ABSTRACT

Understanding visitor satisfaction is vital for ensuring the long-term sustainability of nature-based tourism experiences at high demand coastal destinations. The Ramsar listed Maduganga Mangrove Estuary (MME) on the west coast of Sri Lanka is such a destination. With the aim of enhancing the sustainability of tourism at MME, a self-reporting structured questionnaire and Importance Performance Analysis (IPA) were employed to explore visitor satisfaction with 16 attributes of the popular nature-focused boat tours. Respondents rated 'to be in a natural setting' as their main motivation for visiting this destination (73%), followed by 'to use free time' (60%), and 'to be with family or friends' (60%). Relaxing/fun/enjoyment (90%), enjoying boat rides (85%), and photography (73%) were the most popular activities reported by visitors. Respondents were generally satisfied with their boat tours, however, there was opportunity to enhance visitor satisfaction. Gap Analysis IPA identified nine instances where respondents ranked the performance of attributes as being significantly below their expectations (i.e. Performance < Importance). Respondents rated 'cleanliness of the river' as the worst performing attribute of their tour. 'Feeling safe' on the boat tours, 'information about visitor safety', interpretive aspects of the experience and the amount of wildlife seen also performed below visitor expectations. The novel application of IPA to quantitatively assess visitor expectations and attribute performance at the internationally significant MME coastal wetland reported in this case study demonstrates the contribution this technique can make to enhancing visitor satisfaction and management actions to ensure the sustainability of nature-based tourism in Sri Lanka.

Management implications: IPA can help to inform the operation and management of nature-based tourism in coastal wetlands. Government agencies need to establish standards and monitor compliance regarding the quality of boat tour operations. Operators need to ensure delivery of interpretive information and conduct tours that minimise negative impacts on wildlife. This case study provides insights regarding delivery of tours and wildlife conservation at coastal wetlands in Tropical Asia.

1. Introduction

In recent years, the tourism industry has been Sri Lanka's the third largest source of foreign exchange and generating over 13% of the country's GDP (Ranasinghe & Sugandhika, 2018; Sri Lanka Tourism Development Authority (SLTDA) (2019). The total tourist arrivals in Sri Lanka exceeded 2.3 million in 2018 with tourists spending over 4,380 million USD (SLTDA, 2019). The growing preference of people to observe natural areas has triggered a marked increase in visitation to nature-based destinations around the world (Perera et al., 2012;

Newsome et al., 2013). In the Sri Lankan context, over 2.7 million international tourists visited wildlife tourism destinations and approximately 173,000 of those tourists visited coastal wetlands and marine parks (SLTDA, 2019). Spatial concentration of visitors at few popular destinations is, however, a common, but problematic, phenomenon in Sri Lanka's nature-based tourism sector (Newsome, 2013; Perera et al., 2015; Prakash et al., 2019; Senevirathna & Perera, 2013). For instance, nearly 65% of visitation to National Parks by tourists in 2018 were to four popular National Parks (SLTDA, 2019). High levels of tourism visitation in protected areas can be unsustainable, leading to

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degradation of nature-based attractions and consequent visitor dissatisfaction (Newsome et al., 2013, 2019; Prakash et al., 2019; Rathnayake, 2015a).

Visitor satisfaction surveys are commonly used to obtain detailed information about the characteristics, preferences, expectations and experience of visitors to a destination (Simpson et al., 2019; Taplin, 2012). Importance-performance analysis (IPA), a technique originally developed by Martilla and James (1977), has become an extensively used approach in hospitality and tourism research to understand visitor satisfaction and expectations (e.g. Azzopardi & Nash, 2013; Birendra et al., 2018; Deng, 2007; Eskidsen & Kristensen, 2006; Lai & Hitchcock, 2015; Rose & Basri, 2019; Smolčić Jurdana et al., 2017; Soldić Frleta, 2018; Taplin, 2012; Wade & Eagles, 2003; Zhang & Chan, 2016). While a relatively unsophisticated quantitative diagnostic tool, IPA can facilitate identification of destination attributes that need improvement prioritization, thus allowing destination managers to mobilize and allocate scarce resources to areas where they need most attention (Azzopardi & Nash, 2013; Simpson et al., 2019). IPA has gained popularity because of its ease of application and the ability to present strategic recommendations together with data (Oh, 2001). The literature highlights the utility of IPA in understanding different stakeholder perspectives on nature-based tourism destination development and management (Birendra et al., 2018; McGuinness et al., 2017; Parker & Simpson, 2018; Taplin, 2012; Zhang & Chan, 2016).

As a response to the demand for nature-based tourism experiences and in line with the context provided below, there is growing need to diversify the nature-based tourism market in Sri Lanka. To that end, this case study examines visitor satisfaction with nature-focused boat tours at the Maduganga mangrove estuary, an emerging nature-based coastal wetland destination in the south-west of Sri Lanka using IPA techniques. For the reasons stated below, this case study thus makes a significant contribution towards expanding the limited literature on visitor perceptions of nature-based tourism in the Sri Lankan context generally, and in relation to the utilization of coastal wetland destinations more specifically. Important recommendations for destination development are further discussed.

2. Theoretical context

2.1. Context for case study

As a response to the high demand for nature-based tourism destinations reported above, it is essential to diversify the nature-based tourism market in Sri Lanka to reflect alternative natural destinations and auxiliary biodiversity features (Senevirathna & Perera, 2013; Sumanapala et al., 2015)). Being an island with a wide variety of natural ecosystems, coastal wetlands can provide opportunities for diversifying nature-based tourist attractions in Sri Lanka. Growing global demand for wildlife tourism at coastal destinations allows for the development of a significant market segment of nature-based tourism that can provide authentic ecotourism experiences based on the rich coastal biological resources, especially in tropical countries (Rathnayake, 2015b; UNWTO, 2019). However, nature-based tourism in sensitive coastal ecosystems should be developed with caution as such recreational activities are increasingly considered to be major sources of anthropogenic disturbance to wildlife inhabiting coastal waters and wetlands (Marasinghe et al., 2020; McFadden et al., 2017). Recent studies have further stressed the importance of understanding visitor perceptions on desired destination attributes and visitor satisfaction with the tourism experience to gain important insights for destination development (e.g. McGuinness et al., 2017; Newsome et al., 2019; Soldić Frleta & Smolčić Jurdana, 2018a; Soldić Frleta & Smolčić Jurdana, 2018b; Zhang & Chan, 2016). Further, information on visitors' needs, expectations, attitudes and motivations is highly important to enhance the quality of the leisure experience to remain competitive in the market (McCool, 2002; Wardell & Moore, 2005). Views and preferences of

visitors regarding their experiences play a vital role in recreational destination management, as understanding of visitor satisfaction levels allows managers to provide facilities and services that meet visitor expectations (Newsome et al., 2019; Simpson et al., 2019). However, there has hitherto been little attempt to explore visitor perceptions especially for nature-based coastal wetland tourism attractions in Sri Lanka (Jayasankha, 2016).

One theoretical context for this case study relates to the fact that despite a wealth of research that reports on the application of IPA in tourism, and more specifically nature-based tourism research, there are gaps in that literature regarding the application of IPA techniques in Sri Lanka. As reported by several authors (e.g. Bandara, 2009; Fernando & Kaluarachchi, 2016; Simpson et al., In Review), publication of studies such as this one is important to address those gaps in the literature to reassure Sri Lankan ecotourism operators and government officials that the techniques have relevance and are applicable in the local context. Establishing that local context is important in demonstrating to ecotourism operators and government officials that recommendations from the global literature relating to the delivery of sustainable nature-based tourism experiences at coastal wetlands have relevance and can work in Sri Lanka. Further, the research reported in this article can inform and enhance ecologically sustainable management practices and the delivery of nature-based tourism experiences at other coastal wetlands across the mega region described as Tropical Asia (Marasinghe et al., 2020).

2.2. Importance Performance Analysis (IPA)

At its simplest, IPA plots the mean importance and mean performance/satisfaction rankings of surveyed respondents for a set of attributes or characteristics of a service or product (measured using matched Likert scales). Those mean values provide the coordinates for placement of an individual attribute within a two-dimensional matrix that has Performance on the horizontal axis and Importance on the vertical axis (Martilla & James, 1977). Accordingly, the final output is visualized as an IPA matrix showing the attributes located within four quadrants that have the crosshairs either centred on the scale means, as shown in Fig. 4, or on the grand means for the importance and the performance data, as shown in Fig. 5 (Azzopardi & Nash, 2013; Lai & Hitchcock, 2015; Martilla & James, 1977; Oh, 2001).

Martilla and James (1977) further proposed optimization interpretations for the four quadrants (see Figs. 4 and 5) as follows: Quadrant (I) – high importance and high performance (Keep Up Good Work); Quadrant (II) – low importance and high performance (Possible Overkill); Quadrant (III) – low importance and low performance (Low priority); and Quadrant (IV) – high importance and low performance (Concentrate Here). This enables decisionmakers to easily choose the relevant strategic outcome and to effectively allocate resources and address the gap between importance and performance (Azzopardi & Nash, 2013; Eskidsen & Kristensen, 2006; Simpson, Patroni, Teo, Chan, & Newsome, 2019; Taplin, 2012; Zhang & Chan, 2016). A further development of the matrix-based IPA is the Gap Analysis IPA that quantitatively assesses the significance of the differences between visitor expectations (Importance) and the Performance of an attribute via a one-sample *t*-Test (Simpson et al., 2020; Taplin, 2012). The enhanced Data-centred and Gap Analysis techniques of IPA provide a greater focus on attributes of an experience that may warrant management action to enhance visitor satisfaction and increase the market competitiveness of the tourism product.

This case study utilizes the scale-centred, data-centred, and gap analysis approaches to quantify and visualize the IPA to elucidate visitor satisfaction with their boat tour experience (McGuinness et al., 2017; Parker & Simpson, 2018; Simpson et al., 2019). Results from the gap analysis are graphed on a hybrid Data-centred and Gap Analysis IPA matrix to provide a fine-scale visual representation of what optimization quadrant an attribute is located in and its negative (above and to the

left) or positive (below an to the right) and distance that from the line of parity where the Performance equals Importance and (Parker & Simpson, 2018; Simpson et al., 2019; Taplin, 2012).

2.3. Attribute performance and visitor satisfaction

Satisfaction of a visitor is defined as the outcome of the comparison between the expectations about the destination (Importance) and the experience at the destination visited (Performance) and is one of the commonly used indicators of measuring visitor experience/perceived quality of service (Pizam et al., 1978; Vaske et al., 2002). Martilla and

James (1977) proffered much the same definition in the introduction to their seminal IPA article. They defined satisfaction to be function of both expectations related to - certain attributes (i.e. importance of attributes to visitors) and judgments of visitors regarding attribute performance. As such, satisfaction or quality of experience is a psychological outcome which is generated by visiting a setting/destination that largely depends on the benefits acquired and activities visitors have taken part in during their experience as well as service quality (Baker & Crompton, 2000; Lee et al., 2011; Zabkar et al., 2010). Accordingly, evaluation of visitor satisfaction at a tourist destination is based on the comparison between the visitors' expectations before arriving and the experiences gained

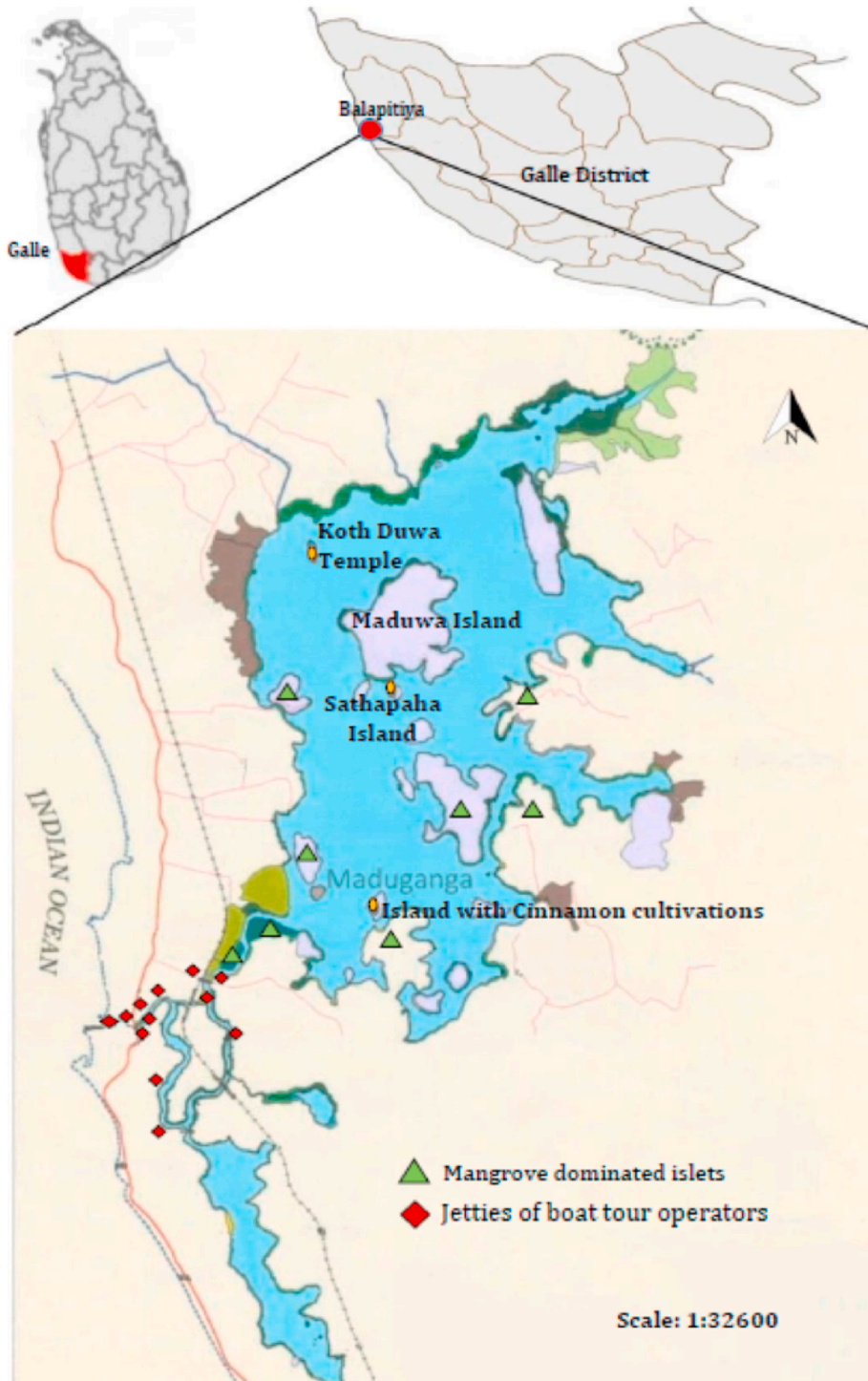


Fig. 1. Location map of Maduganga mangrove estuary.

after visiting the destination.

While tourism-based IPA studies often measure the output of the service provider(s) (e.g. Baker & Crompton, 2000; Chen & Lee, 2017; Babić-Hodović et al., 2019), the satisfaction of nature-based tourists and other visitors to natural areas also depends on natural features such as the quality and quantity of wildlife, natural landscape, and biodiversity (e.g. Tonge & Moore, 2007; Moore et al., 2009; Parker & Simpson, 2018; Newsome et al., 2019). Therefore, an analysis based on satisfaction provides more insight to response of visitors to those features in addition to service provision (Tonge & Moore, 2007).

3. Methodology

3.1. Study site

The Maduganga protected area is an estuary with an extent of 915 ha (145 ha of total land area comprising of 15 islands and 770 ha of the total surface water area) with a dense growth of mangrove vegetation (Fig. 1). The Maduganga mangrove estuary and islets of mangroves constitute a complex coastal wetland ecosystem with high biological, ecological and aesthetic significance. Declared a Ramsar wetland in 2003, this internationally significant coastal wetland supports over 111 bird species, including 13 migratory species, and at least 303 plant species belonging to 95 families (Bambaradeniya et al., 2002). Recognizing its high biodiversity and ecological values, the Department of Wildlife Conservation, Sri Lanka (2015) declared the Maduganga mangrove estuarine system as a Sanctuary in 2006, which is a protected area that allows human activities while protecting habitats and wildlife.

Over the past few years, the Maduganga mangrove estuarine system has been identified as a destination with a high potential for nature-based tourism development based on its scenic and biodiversity values. The estuary attracts over 10,000 local and foreign visitors per month during the peak tourism season in Sri Lanka (December to March), making it one of the most highly visited coastal wetlands in the country (Jayasankha, 2016). A network of over 25 local businesses have evolved in and around the sanctuary to provide boat tour services and other supporting services for those visitors. A typical nature-focused boat tour at the sanctuary takes between one to 2 h and consists of several stopovers at significant natural attractions such as mangrove islands.

3.2. Development of research instrument

A self-report structured questionnaire was used as the research instrument for this case study. The questionnaire was designed to gather information on visitor motivations, intended behaviours, trip characteristics, visitor demographics, and visitors' level of satisfaction and importance of specific attributes pertaining to a wetland tourism experience. The survey design and attribute sourcing for the IPA largely followed the guidelines in Simpson et al. (2019). The 16 attributes were selected after a thorough review of the literature based on similar studies done on nature-based attractions (Deng, 2007; McGuinness et al., 2017; Newsome et al., 2019; Vaske et al., 2009). Initially, the key underlying dimensions of attributes used in such studies were identified. A set of 24 attributes that are applicable to the tourism phenomena at the studied destination and local context were initially selected. The content validity of the selected set of attributes was established following review by a seven-member panel of experts consisting of academics in similar research fields, Department of Wildlife Conservation officials, boat tour operators, and tourism practitioners. The focus of included attributes needed to reflect that the local setting was unique and some items from the published studies were not be directly applicable to the local scenario. With the advice of local experts and operators, those attributes were modified to suit the estuarine wetland setting, surrounding natural environment, local attractions, and tour operations. Informed by the opinions of the expert panel and responses of the pilot study

participants, the list of attributes were modified and narrowed down to 16 locally relevant key attributes. Accordingly, the sixteen attributes were targeted to explore visitor satisfaction with the boat tour operation, nature-based tourism aspect, information/interpretation component, and the operating/destination environment. The questionnaire was pre-tested using a sample of 25 randomly selected visitors to Maduganga, and further revised before it was administered to the sample.

Both open-ended and close-ended questions were employed in the questionnaire. Open-ended questions were included to gain visitor perceptions and views on the tourism activities at Maduganga mangrove estuary. The respondents were asked to rate the Importance and Performance of 16 attributes pertaining to their nature-focused boat tour on matched 5-point Likert scale where 1 = "Not at all important" and 5 = "Extremely important" for the importance of an attribute and 1 = "Highly dissatisfied" to 5 = "Highly satisfied" for the performance of that attribute.

3.3. Sampling and data collection

As there were no reliable statistics on the visitor numbers and number of boat tours conducted at Maduganga mangrove estuary (population is unknown), an appropriate minimum sample size was determined using Cochran's (1963:75) formula for calculating a sample for proportions, desiring a 95% confidence level and $\pm 5\%$ precision with maximum variability of 0.5. Accordingly, the appropriate sample size was found to be 384 visitors to ensure the preceding statistical analysis have acceptable level of statistical power. Based on the response rate for the pilot survey, a total of 700 questionnaires were administered to obtain the desired number of responses.

Data collection was conducted from March 2018 to July 2019, predominantly on weekends where higher visitor numbers were anticipated. Boat tour providers who were willing to offer their assistance to the study were selected as sampling locations. Accordingly, the self-report questionnaire was administered to visitors arriving at private jetties of 12 boat tour operators. A group of five fieldworkers were employed to distribute the questionnaires and visitors were provided with the questionnaire prior to starting their boat excursions, while at the waiting area of their departure jetty. To minimize selection bias by fieldworkers, all members of each visitor group entering a sampling location were informed about the survey and asked about their willingness to participate. Only one member from each visitor group, who was over 18 years of age, and who volunteered themselves to participate were provided with a questionnaire. Those who declined to participate in the survey and unreturned questionnaires were considered as non-respondents.

3.4. Data analysis

Data were cleaned by performing a consistency check before proceeding to detailed analysis. Incomplete questionnaires with many missing responses were discarded. Data were analysed using IBM® SPSS® Statistics 20 software and Microsoft Excel.

4. Results

4.1. Visitor profile and trip characteristics

Out of the 700 visitors approached at 12 sampling locations, a total of 371 individuals participated in the survey, which accounted for a response rate of 53%. There were 353 useable questionnaires with eighteen questionnaires discarded as they were incomplete, illegible or responses were inconsistent, hence the adjusted response rate was 50.4%.

General respondent socio-demographic characteristics are summarized in Table 1. The respondents were dominated by young to middle-

Table 1
General respondent socio-demographic profile and trip characteristics (N = 353).

Visitor characteristics	Percentage (%)	Visit characteristics	Percentage (%)
Age group		Trip planning	
18–25 years	21.0	Main destination of trip	15.9
26–35 years	38.5	One of several on trip	63.2
36–45 years	24.9	Not a planned destination	20.9
46 or older	16.0		
Gender		First visit to Maduganga	
Male	66.3	Yes	82.2
Female	33.7	No	17.8
Highest education level attained		Trip specifically for wildlife tourism	
Primary	–	Yes	38.0
High school	35.3	No	62.0
University/college	57.9	Previously undertaken wildlife tour	
Postgraduate	6.8	Yes	77.9
Number of adults in a group		No	22.1
Less than 5	48.9	Income levels	
5 - 10 members	28.1	Less than 200 USD	10.0
More than 10 members	23.0	200- 500 USD	23.3
		500- 1000 USD	25.0
		1000- 2000 USD	26.3
		More than 2000 USD	15.4

age, well-educated, male visitors. Most respondents were between ages 26 and 45 (63%). Approximately 65% of the respondents had attained an education level of university/college degree or above.

Most respondents (82%) were first time visitors to Maduganga mangrove estuary. The majority (62%) of the visitor groups represented in the sample were not specifically visiting the destination for a wildlife tourism experience. However, 78% of the respondents had undertaken wildlife tourism experience elsewhere. For 63% of respondents, Maduganga the sanctuary was one of several destinations of their trip and for 16% respondents it was the main destination of their trip. About 21% of the respondents reported that Maduganga mangrove estuary was not a planned destination of their original schedule (Table 1).

4.2. Visitor motives and desired activities

Visitors were asked to indicate their main motivations for visiting Maduganga mangrove estuary. Almost three quarters (73%) of respondents cited their motivation for visiting as “To be in a natural setting” and a similar proportion (71%) nominated “To observe ecological landscapes” or “To learn more about new things and nature” (Fig. 2). The motivations “To be with family or friends” and “To use free time” were equally popular motives to visit (60%). Relaxing/fun/enjoyment (90%) was the top-ranked activity (Fig. 3), followed by enjoying boat rides (85%), photography (74%). Considered together, the nature-based tourism focused activities of “Viewing natural landscapes”, “Bird watching”, “Learn about nature”, and “Wildlife viewing” represented slightly more one third (36%) of the reported activities.

4.3. Overall visitor satisfaction

The results of the scale-centred IPA generally suggest that the destination is performing well with all 16 attributes placed in “Keep Up Good Work” quadrant (Fig. 4). This shows that visitors placed high importance on all 16 attributes and of the performance of those attributes was meeting or exceeding visitor expectations. This is further reflected in nearly 80% of visitors rating their overall satisfaction on the positive side of Likert scale (mean score = 3.91) and strong levels of support for personal recommendation and revisit intention for Maduganga mangrove estuary (Table 2). The results of the enhanced IPA and gap analysis for all 16 attributes are reported in Table 3 and the hybrid Data-centred and Gap Analysis IPA matrix is presented in Fig. 5

4.4. Visitor satisfaction with boat tour operation

A cursory examination of the hybrid IPA matrix (Fig. 5) suggest that attributes associated with the operation of the boat tours were performing relatively well. “Feeling safe on the boat tour” (2), “Clear information about visitor safety” (3), and “Duration of the boat tour” (9) are all located in Quadrant I (Keep Up Good Work). The “Number of animals seen” (6) and “Cost of the boat tour” (8) are in Quadrant IV (Concentrate Here) and could, therefore, warrant some corrective management action. However, both are located on or close to the boundaries of Quadrant III (Low Priority) and Quadrant I (Keep Up Good Work) and as such, should not have a major impact on visitor satisfaction. These findings appear to be supported by visitor responses to a question that specifically asked about the way their tour boat was operated. Most respondents (95%) rated the boat driver’s behaviour and

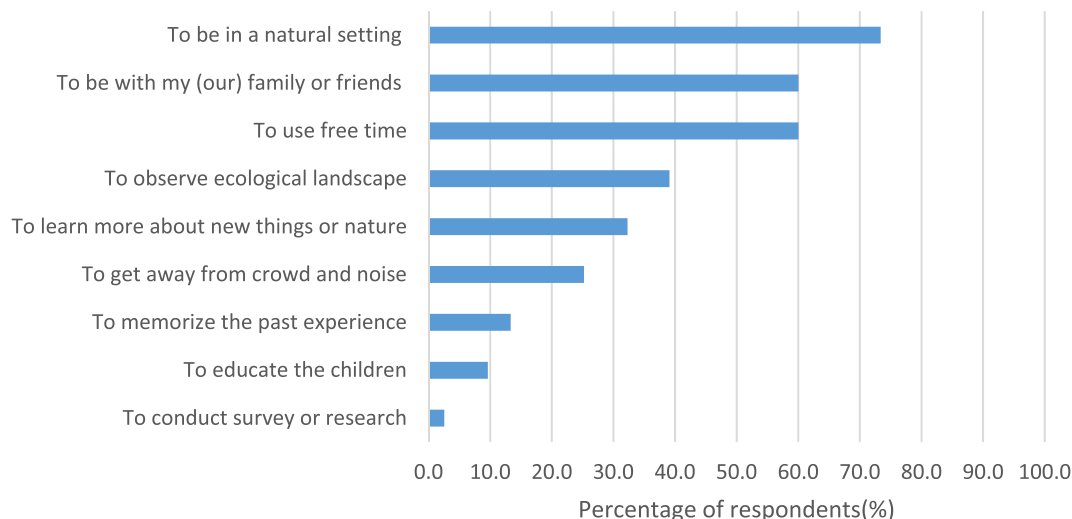


Fig. 2. Motivations of respondents for visiting Maduganga mangrove estuary (N = 353 with multiple responses possible).

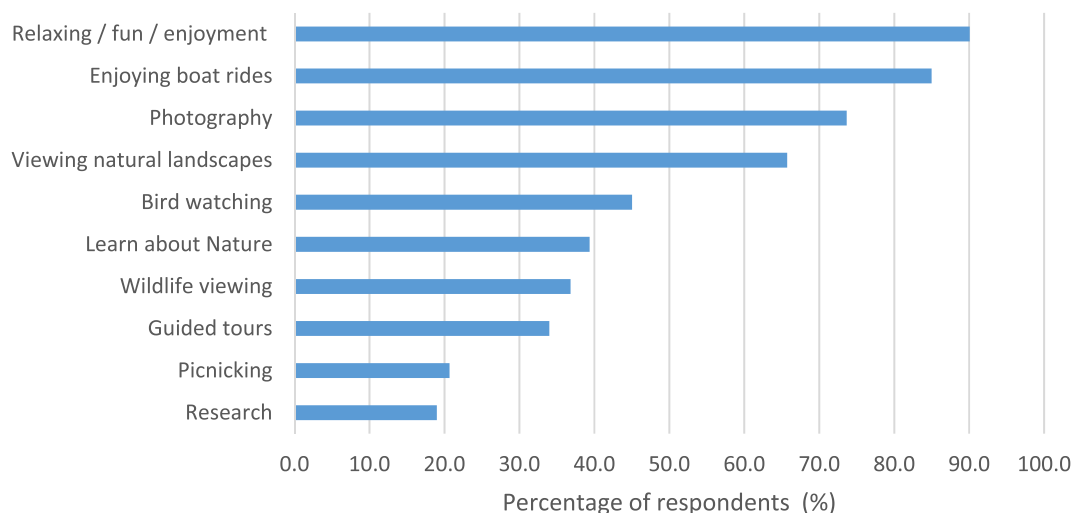


Fig. 3. Activities undertaken by the respondents at Maduganga mangrove estuary (N = 353 with multiple responses possible).

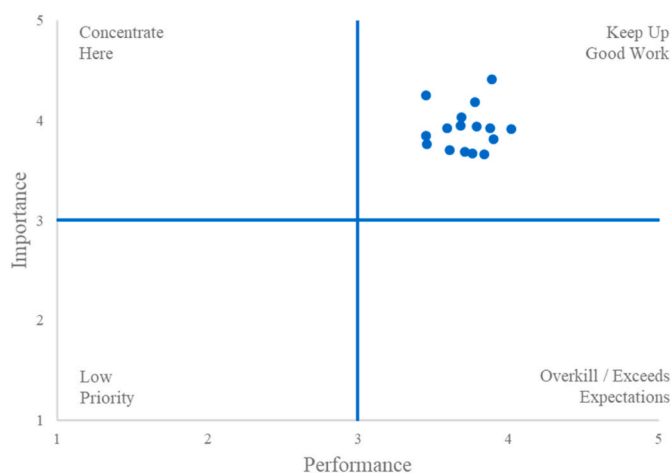


Fig. 4. Scale-centred IPA (Martilla & James, 1977) for nature-based tourism-focused boat tours at Maduganga mangrove estuary.

compliance with safety and operation rules as being acceptable or excellent and approximately 92% (n = 323) stated that the speed of the boat was acceptable or “about right”. Only 5% of respondents were unhappy about the boat driver’s behaviour and compliance with safety and operational rules, while a similarly small proportion (6%) reported that the speed of the boat was “too fast”.

However, the hybrid Data-centred and Gap Analysis IPA matrix revealed all five attributes of the boat tour operation have significant negative performance gaps (i.e. Importance > Performance) and, despite being located in the “Keep Up Good Work” quadrant, “Feeling safe on the boat tour” (2) and “Clear information about visitor safety” (3) are two of the worst performed attributes of the entire boat tour experience at Maduganga mangrove estuary. The apparently contradictory results for Attribute 2 and Attribute 3 can be interpreted as personal safety being important for most visitors (mean scores 4.41 and 4.18 respectively), but those expectations were only somewhat met for many visitors (mean scores 3.91 and 3.78), hence the negative gap between the expectations of most visitors and how safe they felt during their boats tour made these the two worst performing attribute for the operation of boat tours. Further insight into visitor perceptions of the underperformance of the boat tour operation was provided by the responses to a question that asked visitors to list one aspect of their experience that they would like to change. Almost half of those

recommendation (48%) related to the operation of the boat tours. Three of the top five most desired changes were that quality of the boat tours be enhanced and maintained (20%), boat tours should be operated in a manner that minimised disturbance to wildlife (18%), and better tour boats in good physical condition (10%).

4.5. Visitor satisfaction with the nature-based attributes

Perhaps the most striking feature of the finer scale analysis provided by the hybrid IPA matrix (Fig. 5) is that none of the nature-based attributes associated with the boat tours appear in the optimal Quadrant I (Keep Up Good Work). However, the Maduganga mangrove estuary meets visitor expectations (i.e. Performance = Importance) in attributes “Proximity to birds” (12), “Proximity to wildlife” (13), and “Once in a lifetime wildlife tourism experience” (14). Further, the “Abundance of wildlife” (16) appears to have exceed visitor expectations, with the significant over-performance (i.e. Performance > Importance) of that attribute locating it in Quadrant II.

4.6. Visitor satisfaction with the information/interpretation provided

The attributes “Guide’s knowledge about the river, flora and fauna” (4) and “Useful information on flora and fauna” (7) are in Quadrant III, which usually contains attributes that are considered a low priority for management action (Fig. 5). However, attributes 4 and 7 have negative performance gaps (Table 3) that are comparable to the closely allied “Interesting and informative guided tour” (5), which is in Quadrant IV (Concentrate Here). In addition, while being the least mentioned among the five aspects of the tour that visitors would like to change, 7% reported that organized guided tours and guides with sufficient knowledge about the location and associated biodiversity would have enhance their experience. For those reasons, implementing corrective management action to improve the quality of information/interpretation provided in connection with the boat tours should be a priority at Maduganga mangrove estuary.

4.7. Visitor satisfaction with the operating/destination environment

In setting priorities for corrective management action, “Overall cleanliness of the river” (1) is the worst performing attribute of the boat tour experience at the Maduganga mangrove estuary. Conspicuously located in the upper left of Quadrant IV (Concentrate Here), it is also farthest from the line of parity because of having the largest negative performance gap (Fig. 5 and Table 3). Consequently, 37% of the

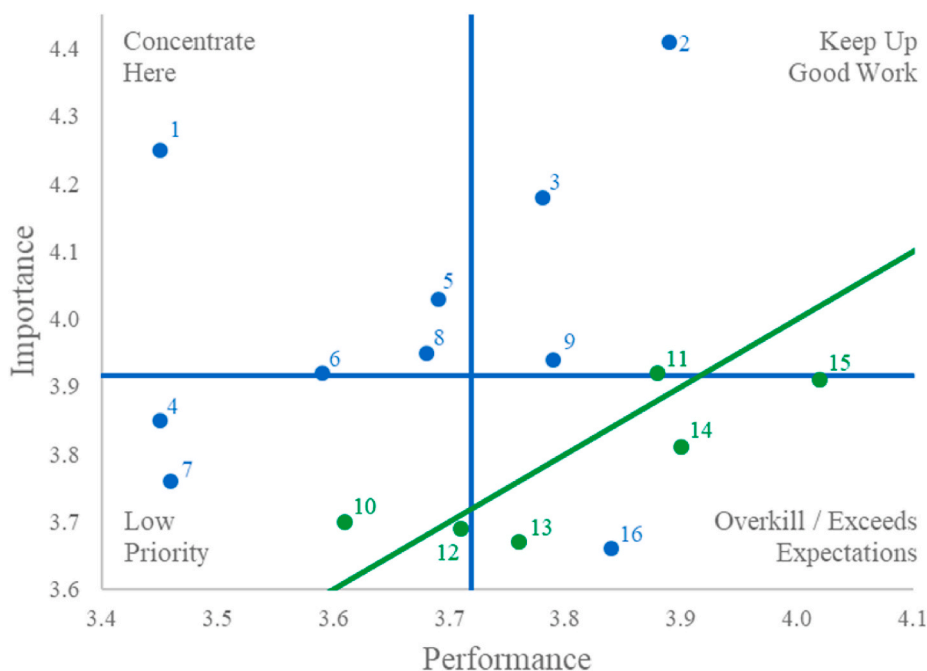


Fig. 5. IPA matrix for the attributes of the boat tours at Maduganga mangrove estuary reported in Table 3. Cross-hairs (BLUE) are placed at the mean values for the Importance and Performance of the attributes. Diagonal line of parity (GREEN) highlights the attributes with no significant gap in performance (i.e. Performance = Importance). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

Table 2
Overall level of satisfaction, personal recommendation, and revisit intention reported by respondents (N = 353).

Question	Mean/Percentage
Overall, how satisfied are you with your visit to Maduganga mangrove estuary?	3.91 (5-point Likert scale)
How strongly would you recommend this experience to friends who share your interests?	3.84 (5-point Likert scale)
Would you come back and visit Maduganga mangrove estuary again?	Yes = 83.6% No = 13.4%

^a Statistical significance at $\alpha = 0.05$ significance level.

respondents raised the need to control pollution of the river and surrounding environment as a key improvement needed at the sanctuary. In contrast, the other three operating/destination environment attributes of the “Number of other boats/visitor traffic at the river” (10), “Other visitors generally well behaved” (11), and “Number of passengers in the boats” (15) met visitor expectations (Fig. 5) with the performance of those attributes matched their importance (i.e. gap was not significant). Further, when specifically asked about the level of boat traffic observed during their tour, 80% of the respondents stated that the level of traffic was “just about right” and only 17% reported that there were “too many” boats for their liking. Those findings agree with the outcome of the IPA that visitors were satisfied with the “Number of other boats/visitor traffic at the river” (Attribute 10).

However, another question asked visitors about what they thought was the optimum number of boats they would like to see on the estuary and how many boats they observed during their tour. Approximately 88% of respondents stated that they would have preferred to see ten or less boats on their boat tour while another 40% respondents preferred to see less than five boats (Fig. 6). Those reported optimum levels of boat sightings appear at odds with 27% of respondents who reported seeing more than ten boats and 85% of visitors who saw five or more boats on their tour. The number of reported boat sightings during tours was significantly greater than respondents stated optimum level of boat traffic ($\chi^2 = 44.64$; $p < 0.001$). This finding conflicts with the outcome of

the IPA and the other visitor responses reported above.

4.8. Overall perceptions of nature-based tourism management

The expectations of visitors participating in the boat tours at Maduganga mangrove estuary are currently being met with respect to the wildlife tourism aspects of the experience (i.e. Attributes 12 to 14 and 16 in Table 3 and Fig. 5). However, the reported negative performance of attributes and contradictory responses to questions associated with the boat tour operations, the information/interpretation provided, and the operating/destination environment are negatively impacting visitor perceptions regarding management of nature-based tourism at the estuary. Respondents were asked to rank their responses to the three questions reported in Table 4 using a 5-point Likert scale anchored by 1 = highly disagree, 3 = neither agree nor disagree, and 5 = highly agree. The tight clustering of the results (narrow 95% confidence interval) about the mean values aligned to the neutral rating of “neither agree nor disagree” is explored further in the following discussion.

5. Discussion

5.1. Utility of survey data and the potential for nonresponse bias

As noted by Baruch and Holtom (2008) and Denscombe (2014), the concern with survey response rates, however high or low they may be, is the issue of the nonresponse bias that could exist in relation to the subpopulation who chose not to participate. However, as stated by Dixon and Tucker (2010) and reiterated by Koch and Blohm (2016) “No issue in survey research is more misunderstood or controversial than nonresponse.”

Historically, response rates have been used as a proxy measure of the potential for nonresponse bias to impact a social survey. This approach assumed that the higher the response rates are, the lower the nonresponse bias, because the difference between respondents and nonrespondents was essentially uniform and fixed (Groves & Peytcheva, 2008). However, recent studies that explored the relationship between response rates and nonresponse bias have challenged that thinking by

Table 3
Mean levels of Importance (I) and Performance (P) and the resulting Gap (P – I) with attributes ordered from largest negative to largest positive gap in performance.

Code	Attribute	N	I	P	Gap	t-statistic	p-value
1	Overall cleanliness of the river	353	4.25	3.45	-0.80	6.279	0.000 ^a
2	Feeling safe on the boat tour	350	4.41	3.89	-0.52	9.592	0.000 ^a
3	Clear information about visitor safety	349	4.18	3.78	-0.40	5.843	0.000 ^a
4	Guide's knowledge about the river, flora and fauna	352	3.85	3.45	-0.40	5.315	0.000 ^a
5	Interesting and informative guided tour	353	4.03	3.69	-0.34	5.138	0.000 ^a
6	Number of animals seen	353	3.92	3.59	-0.33	4.734	0.000 ^a
7	Useful information on flora & fauna	350	3.76	3.46	-0.30	3.859	0.000 ^a
8	Cost of the boat tour	353	3.95	3.68	-0.27	4.183	0.000 ^a
9	Duration of the boat tour	353	3.94	3.79	-0.15	2.360	0.019 ^a
10	Number of other boats/visitor traffic at the river	349	3.70	3.61	-0.09	1.298	0.195
11	Other visitors generally well behaved	352	3.92	3.88	-0.04	0.785	0.433
12	Proximity to birds	349	3.69	3.71	0.02	-0.038	0.970
13	Proximity to wildlife	351	3.67	3.76	0.09	-0.036	0.717
14	Once in a lifetime wildlife tourism experience	352	3.81	3.90	0.09	-0.762	0.462
15	Number of passengers in the boats	352	3.91	4.02	0.11	-1.570	0.117
16	Abundance of wildlife	353	3.66	3.84	0.18	-2.366	0.018 ^a

demonstrating that levels of nonresponse bias are variable specific (Groves, 2006; Groves et al., 2006). As such, setting acceptance levels based on high response rates to counter the potential of non-response bias and commenting on the nonresponse bias of a survey are considered problematic (Hendra & Hill, 2019; Koch & Blohm, 2016). Interpretation of low response rates is further complicated by emerging research which shows that variable specific responses differ between non-respondents who explicitly or implicitly decline participation in a survey and those situations where nonresponse results from a lack of contact with the non-respondents Koch & Blohm, 2016; Mimbs et al., 2020).

Taking into consideration the work of Mimbs et al. (2020) and other similar research, the response rate for this case study was likely to be a product of the survey protocol that resulted in contact with participants being lost after the questionnaires were distributed. The survey team distributed the questionnaires to people participating in the boat tours but relied on the boat operators to collect the end of each tour or for the participants to find the survey team to return their completed questionnaire. That survey protocol was adopted because the size and diversity of the tourism offerings at the Maduganga mangrove estuary and the temporal variability of the boat tours. Unfortunately, that approach meant contact was lost with some participants during the critical stage of retrieving their completed questionnaires.

With the limited knowledge about the population of non-respondents participating in the boat tours and the small sample size of the incomplete questionnaires (n = 18), it was not possible to empirically explore any potential biases for the approximately 50% of non-respondents to this survey. Acknowledging the necessity of being cautious regarding the setting of acceptable response rates, both the initial and adjusted response rates of this case study are above the threshold that are recommended by several authors for such surveys (Babbie, 1990; Rea & Parker, 1992; Roth & BeVier, 1998). Further, the response rates for this

Table 4
Visitor perceptions on management of nature-based tourism at Maduganga mangrove estuary (n = 353).

Statement	Mean	±95% CI
Enough is being done to protect the Maduganga and its wildlife?	3.02	0.10
Nature-based tourism on the Maduganga is well managed?	3.13	0.09
Nature-based tourism at Maduganga is a good example of environmentally responsible travel?	3.29	0.10

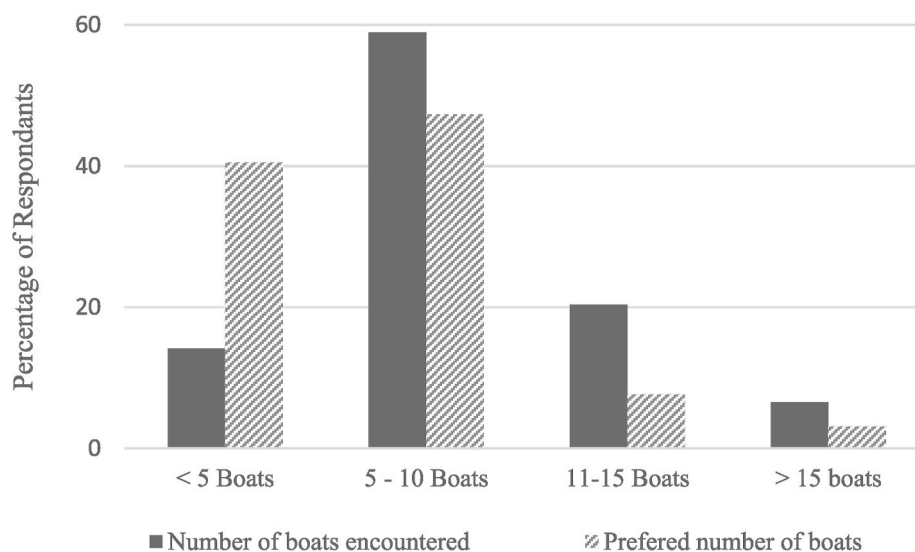


Fig. 6. Number of boats encountered by the respondents during their boat tour at Maduganga mangrove estuary and their perceived optimum number of boats (N = 352).

survey are comparable to the response rate (mean \pm 95% confidence interval of the proportion) of $52.7 \pm 3.3\%$ for surveys on individuals reported in the review of [Baruch and Holtom \(2008\)](#).

On the basis of the discussion above, while the approximately 50% response rate arising from the lack of participant contact caused by the survey protocol is a factor for this case study, informed by [Koch and Blohm \(2016\)](#) and in the absence of evidence to the contrary we assume that the impacts of any nonresponse bias are minimal for the variables analysed in the previous section. As reported below in Section 6.2 regarding the limitations and improvements relevant to this case study it would, however, have been preferable for the survey team members to have met the returning boat tours to personally collect completed questionnaires from the visitors who accepted agreed to participate.

5.2. Findings and implications of case study

Nature-based destination managers face the constant challenge of accommodating different user groups while achieving a balance between recreational uses and nature conservation ([Vaske et al., 2009](#); [Perera et al., 2012](#)). Peer-reviewed literature about visitors to Sri Lanka's natural areas has largely been targeted towards highly visited National Parks and focused on understanding visitors' environmental attitudes, on-site behaviours, preferences, perceptions of management, and visitor willingness to pay for conservation (e.g. [Newsome, 2013](#); [Perera et al., 2012, 2015](#); [Perera & Vlosky, 2013](#); [Prakash et al., 2019](#); [Rathnayake, 2015a](#); [Senevirathna & Perera, 2013](#)). In Sri Lanka, wetlands as ecotourism destinations have received less scholarly attention and only a few visitor surveys have been previously conducted at the Maduganga mangrove estuary ([Jayasankha, 2016](#); [Rathnayake, 2015b](#)). This case study adds a new dimension to the protected area visitor research in Sri Lanka by using IPA to explore the perceptions and satisfaction of visitors regarding the attributes of a nature-based tourism experience at a coastal wetland sanctuary.

The positive correlation between service quality and satisfaction have been extensively studied in the tourism literature, and they have been identified as major antecedents of visitor's future behavioural intentions ([Baker & Crompton, 2000](#); [Chen & Chen, 2010](#); [González et al., 2007](#); [Lee et al., 2011](#); [Perera & Vlosky, 2013](#); [Žabkar et al., 2010](#)). According to the literature, the quality of opportunity or performance refers to attributes of a service under the service provider's control, while quality of experience or satisfaction is a psychological outcome or emotional state of mind an individual has following a recreational experience ([Baker & Crompton, 2000](#); [Zeithmal, 2009](#)). Hence, successful destination management requires a sound understanding of visitor perceptions of the quality of a tourist destination and of their satisfaction with the experience. This case study utilized IPA techniques to examine visitor perceptions of both the importance and the quality of performance of 16 attributes of a nature-based tourism experience at the Maduganga mangrove estuary.

The outcome of the IPA-based survey revealed several important trends regarding nature-focused boat tours at the Maduganga mangrove sanctuary. The key findings can be summarized as follows. At the time of the survey, the nature-based tourism focused boat tours were providing a "once in a lifetime wildlife tourism experience" for visitors to the Maduganga mangrove estuary. However, several aspects of the experience were not meeting visitor expectations and as such have the potential to negatively impact the destination image of Maduganga and competitiveness and long-term sustainability of the tourism products offered at the sanctuary. Pollution of the river and surrounding environment is the number one priority for corrective management action at Maduganga. The condition and operation of the tour boats also needs to be investigated and management action implemented. The negative gap between the expectations of visitors regarding their personal safety and underperformance of, at least some, tour boat operations in relation to visitors feeling safe, the speed of the boats, and the potential for tour boats to negatively impact wildlife are expanded upon below. The

following section also considers visitor dissatisfaction with the quality in the information/interpretation provided in conjunction with the tours and the apparent contradiction regarding visitor perceptions of the number of boats observed during their tour and the number of boats they would like to see on the estuary.

All attributes which are under direct control of the service provider except "Number of passengers in the boats" reported negative gaps (with 7 of them statistically significant) highlighting the overall below-par standard of the service delivery. Nonetheless, survey results revealed that most visitors to Maduganga were satisfied with their overall nature-based tourism experience (measured using a single item/statement in the questionnaire). In conformity with findings in the literature ([Chen & Chen, 2010](#); [PandžaBajs, 2015](#); [Perera & Vlosky, 2013](#); [Žabkar et al., 2010](#)), this higher level of visitor satisfaction was further reflected in majority of respondents indicating their desire to revisit the destination and recommend the destination to others. However, the higher levels of overall visitor satisfaction may not reflect the real situation and concerns associated with current tourism operations at the destination. In the context of outdoor recreational experiences such as wildlife tourism, service quality attributes alone do not determine the satisfaction levels and future behavioural intentions ([Kouthouris & Alexandris, 2005](#)). Instead, situational (e.g., presence of animals, time of the day, weather, crowding) and personal (e.g., personal expectations) factors which are not related to service quality can have a significant influence on satisfaction ([Kouthouris & Alexandris, 2005](#); [Tian-Cole & Crompton, 2003](#)). As such, the results of Gap Analysis IPA give a more context-specific and realistic picture of the attributes of service quality that are below visitor expectation and need managerial attention.

5.3. Management and regulation of boat tour operations

Boat tour operators currently provide life jackets to all passengers as per mandatory safety regulations, but many boat operators pay less attention on whether every passenger is wearing life jackets prior to the start of the boat tour in providing sufficient information on visitor safety and emergency response. Hence, an overall improvement on passenger safety, safety instructions and safety features/equipment of boats should be considered as a priority.

A typical boat tour at Maduganga can take between one to 2 h depending on the tour package selected. The negative gap revealed by the Gap Analysis on boat tour duration may be a result of the largely unstandardized nature of the tour packages in the industry with typical boat tour operators at Maduganga pushing for more tours by cutting down on the time spent on a boat tour, especially on days of high visitor numbers ([Jayasankha, 2016](#)). Gap Analysis IPA further highlighted "Cost of the boat tour" as an important attribute the destination at present fails to satisfy the customers' perceived level of performance. The present inconsistency in prices of boat tours and two-tiered pricing adopted by local businesses at the destination can raise credibility concerns especially among foreign visitors and can ultimately lead to visitor dissatisfaction ([Laarman & Gregersen, 1996](#); [Walpole et al., 2001](#)). Hence, there may be a need to standardize the boat tour operations at Maduganga mangrove estuary by encouraging such service providers to clearly communicate the tour package details via printed, verbal and online means, so that the visitors will be well-informed about the tour before making the purchasing decisions.

Sustainable tourism and ecotourism advocate active contribution of key stakeholders such as tourism service providers for biodiversity conservation efforts at the destination ([Fennell, 2007](#); [Newsome et al., 2013](#); [Weaver, 2006](#)). However, no mechanisms are currently available to ensure visitor and tour operators' contribution to nature conservation. The potential of using market-based mechanisms such as visitor fees, payments for ecosystem services, environmental mortgages, intrinsic value funding and carbon abatement funding have been discussed in the literature as sustainable funding streams to assure effective environmental stewardship ([Rathnayake, 2015b](#); [Whitelaw et al., 2014](#)).

Hence, this calls for the attention and intervention of policymakers to introduce such appropriate measures to finance biodiversity conservation at nature-based tourism destinations of the country.

On the other hand, rising visitor numbers and speeding recreational boats are known to cause numerous negative impacts on avifauna inhabiting coastal ecosystems (McFadden et al., 2017; Marasinghe et al., 2020). Although IPA results positioned proximity to wildlife and birds as plus points of current tour operations at Maduganga, recreational boats getting in close proximity to wildlife, especially birds can have negative impacts on foraging and nesting (De Blocq Van Scheltinga, 2017; Marasinghe et al., 2020; McFadden et al., 2017). Numerous migratory, endemic and threatened avian species use Maduganga mangrove estuary as a roosting, feeding or breeding site. As such, it is necessary to introduce appropriate guidelines for boat tour operations to minimize disturbance to avifauna and their habitats, by taking into account the flight response distances of birds and boat speed limits (Burger & Niles, 2013; Le Corre et al., 2013; Velando & Munilla, 2011).

Compared to other attributes, the Data-Centred IPA placed “Number of other boats/visitor traffic at the river”, “Useful information on flora and fauna”, and “Guide’s knowledge about the river, flora and fauna” in the over-performance (possible overkill) quadrant. This possibly hints the visitors’ less environmentally oriented motives in appreciating what the destination has to offer. For instance, Perera et al. (2012) defined four groups of visitors to nature-based destinations in Sri Lanka based on their behavioural and motivational characteristics: ecotourists, picnickers, egoistic tourists, and adventure tourists. The dominant segment “picnickers” is characterized by those who visit nature-based destinations purely for enjoyment, with less desire to have a nature-based learning experience. Hence, it appears that the dominant visitor group to Maduganga mangrove estuary are picnickers, and this may explain visitors placing less importance on nature interpretation and learning related attributes.

5.4. Enhancing information/interpretation component of tours

Nonetheless, Gap Analysis revealed significant negative service gaps related to nature interpretation i.e. “Guide’s knowledge about the river, flora and fauna”, “Interesting and informative guided tour” and “Useful information on flora and fauna”. Nature interpretation has been recognized as an important component in sustainable nature-based tourism development as it has direct links to visitor satisfaction and place attachment (Ham & Weiler, 2012, pp. 35–44; Hwang et al., 2005; Mutanga et al., 2017; Wang, 2015; Zhang & Chan, 2016). Hence, improving the overall professional standard of boat operators and guides involved in wildlife tourism is a key priority in future destination development at Maduganga. As the sanctuary is a protected area under the control of the Department of Wildlife Conservation, Sri Lanka, managers can take the initiative, in collaboration with other relevant agencies, to introduce professional training for safari boat operators and guides to ensure ethical, legal environmentally responsible, safe and educative tour experiences (Prakash et al., 2019). Diversifying the existing tourism products to suit different visitor groups is another possibility. For instance, guided wildlife/bird watching tours can be introduced targeting ecotourists especially in the morning and evening where opportunities for birding is highest.

5.5. Managing or regulating the number of tour boats

Despite overall visitor satisfaction at Maduganga, a high proportion of visitors preferred a smaller number of boats at the river. Other studies suggest that congestion at wildlife tourism destinations is a growing concern that negatively affects visitor satisfaction (Newsome et al., 2019; Prakash et al., 2019). For instance, Rathnayake (2015b) demonstrated the positive impact of increasing the boat tour prices at Maduganga on controlling visitor traffic, while enhancing the total revenues substantially. Further research based on extensive data, directed at

determining the visitor carrying capacity of the destination and appropriate pricing strategies will be helpful in future destination development. Results further suggest that the visitors are not convinced whether the tourism operations at Maduganga are carried out in an environmentally friendly manner. These aspects need to be addressed using appropriate regulatory methods and market-based incentives in sustainable wildlife tourism development at Maduganga mangrove estuary.

6. Conclusion

6.1. Learnings from this case study

This case study utilized IPA techniques to evaluate visitor perceptions of tourism operations at a coastal wetland with the aim of gauging high and low priority/performance attributes. The visitors to Maduganga mangrove estuary are generally satisfied with their experience. Our case study has, however, identified several attributes that are performing below the expectation of visitors. Under-performing attributes relate to the quality of natural environment, perceptions of visitor safety and the quality of the interpretation provided by tour guides. Those visitor concerns need managerial attention to lift visitor satisfaction levels and ensure future destination development within the framework of sustainable tourism. According to IPA, the overall cleanliness of the riverine environment and inconsistency with higher fares charged for certain boat tours were the main aspects where the destination failed to meet customers’ expectations. This article suggests several management actions such as introducing guidelines to increasing the passenger safety in boats, enforcing appropriate speed limits for boat traffic, tour operator mediated visitor management to control approach distances and minimize recreational disturbance of birds, improving professional standards and interpretation skills of tour guides and boat operators, as well as considering appropriate pricing strategies. Furthermore, the findings emphasize the importance of environmental protection while facilitating recreation and tourism experiences.

This case study contributes to the understanding of how perceptions of ecotourists regarding the natural environment, delivery of environmental interpretation during guided boat tours, their personal safety, and the impacts of boat tours on wildlife can influence visitor satisfaction with nature-based tourism experiences at coastal wetlands in Sri Lanka. Understanding the application of IPA and how those techniques can be applied to enhance visitor satisfaction is important for coastal destinations in Sri Lanka as local ecotourism operators and managers are more likely to respond to recommendations based on the global literature if they have evidence that such measures have local context and relevance for their business.

6.2. Limitations of this case study

As previously mentioned, at a destination as large and diverse as Maduganga mangrove estuary, the survey protocol of survey team members relying on the boat operators to collect and return completed questionnaires or participants to track down the survey team to return completed questionnaires was not an optimum approach. Having survey team members meet the returning boat tours to personally collect completed questionnaires would have significantly increased the return rate. The data was collected predominantly on weekends where higher visitor numbers were anticipated at the private jetties of 12 boat tour operators who were willing to support the study. However, the characteristics and demographics of visitors at these 12 service providers are likely to accurately represent the general respondent profile. Furthermore, the sampling technique employed in the study did not capture enough non-English speaking foreign visitors as developing questionnaires in multiple languages was prohibitively expensive. Hence the sample captured in this study represents only a section of the visitors to MME. Data collected at multiple locations covering all demographic segments (especially income and nationality) would have yielded more

accurate outcomes. Despite the limitations highlighted in this paper this case study provides insight into recreational demand and activities and can inform the setting of appropriate management standards at Maduganga Mangrove Estuary and similar sites in tropical Asia.

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CRedit authorship contribution statement

Sumudu Marasinghe: Investigation, Formal analysis, Data curation, Writing - original draft, Visualization. **Priyan Perera:** Conceptualization, Methodology, Writing - original draft, Visualization, Supervision, Project administration, Funding acquisition. **Greg D. Simpson:** Formal analysis, Writing - review & editing, Visualization. **David Newsome:** Supervision, Writing - review & editing.

Declaration of competing interest

None.

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