Behavioural analysis of manta ray tourists in Eastern Indonesia

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Behavioural analysis of manta ray tourists in Eastern Indonesia

M S Hani¹, J Jompa², M N Nessa² and A T White³

¹PhD Candidate, Faculty of Fisheries and Marine Science, University of Hasanuddin
²Professors, Faculty of Fisheries and Marine Science, University of Hasanuddin
³Adjunct Professor, University of Washington

Email: msh.hutapea@gmail.com

Abstract. Indonesia has several manta ray aggregation sites, including Nusa Penida, Komodo, and Raja Ampat. The popularity of manta ray watching tourism has attracted tourists to Indonesia from around the world. Understanding tourist behaviour is vital in order to develop operational approaches and strategies for species protection and tourist satisfaction. The objectives of this study were to analyse tourist motivation, attitudes, preferences, and perceptions before, during, and after manta ray watching. Questionnaires were distributed during May-June 2018, involving 20 local operators and 43 respondents. The traveling patterns of manta tourists indicate that they rarely travel alone, most prefer 1-3 companions; they generally spent several days in the destination area, used a variety of lodging options, and selected nature as the primary reason for their visit. In Nusa Penida and Komodo, most tourists decided to go manta ray watching after arriving at their destination, in contrast to Raja Ampat. They spent a minimum of $500 and up to more than $1000 (excluding airfares). The Likert scale analysis shows three main factors affecting tourists’ decision to go manta ray watching: to see manta rays in their habitat; to view an endangered species; and to interact with the fish. Specific attitudes and behaviours of manta ray tourists included: viewing manta rays from a distance; diving, and snorkelling encounters; visiting several manta locations; willingness to pay extra for species conservation; revisiting specific locations; following procedures/code of conduct. Favourite aspects enjoyed by tourists were manta ray morphology and swimming behaviour.

1. Introduction

According to [1,2] there are two species of manta rays: the Giant Oceanic Manta Ray (*Mobula birostris*) and Resident Reef Manta Ray (*Mobula alfredi*), both found in tropical or warm temperate waters. These two rays are cartilaginous elasmobranch fish, closely related to sharks. Manta rays are characterized by a flattened body, wide head with lobes, and triangular shaped fins. The economic value of manta ray products in the international marketplace is a driver of fishing at a level which threatens the population of this fish, which is also vulnerable to other anthropogenic threats [1]. The conservation status of both manta ray species is Vulnerable in The International Union for Conservation of Nature (IUCN) Red List; in addition to the aforementioned threats, life-history characteristics such as long gestation period, late age at first maturity, and low fertility make these species intrinsically vulnerable [3]. In addition, The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) has also listed both species of manta ray under Appendix II,
meaning the fish are "not necessarily threatened with extinction, but trade in them is controlled to avoid utilization incompatible with their survival" [4].

Manta ray watching tourism is a recreational activity to observe manta rays [5]. There are twenty-five manta watching hotspots worldwide, including Indonesia. Manta rays are a major wildlife attraction in Indonesia, especially in the eastern part of the archipelago which offers a number of places where these species can be seen. Popular manta ray hotspots identified include Karang Makassar, Manta Alley, Mawan in Komodo; Manta Point and Manta Bay in Nusa Penida; Manta Sandy, Manta Ridge, Eagle Rock, Wayag, Blue Magic, and Magic Mountain in Raja Ampat. Tourists have the option of joining liveaboard boat trips or staying in land-based accommodation and joining day trips to view these fish. The operators provide different manta ray encounter activities including snorkelling, diving, and observing from a boat. The price range varies, and depends on the length of stay. In 2015, 70% of all tourists visiting Komodo National Park viewed manta rays [6].

Tourist behaviour is a major research focus in tourism studies. Understanding tourist behaviour requires identifying their attitudes before, during and after traveling. According to [7], such studies deal with a number of factors including: “motivation, destination choice, travellers' on-site experiences, satisfaction, and learning”, while tourist behaviour is defined as the attitude towards the experience of enjoying the travel/tourism that involves interaction with communities, operators, etc. According to [8], tourist behaviour means “activities directly involved in obtaining, consuming, and disposing of products and services including the decision processes that precede and follow these actions”. Analysing tourist behaviour is important in order to plan and develop a tourism product as well as in marketing and promotion. In this study, the focus of the behaviour analysis is on tourists who took part in manta ray watching tourism.

2. Method

2.1. Study area

There are three study locations involved in this research: Nusa Penida in Bali, Komodo National Park in Flores, and Raja Ampat in West Papua (Figure 1). According to a previous study [6], the warm water of these locations means that manta rays can be found the all-year-round with certain months and periods within each month offering the best viewing. Prime manta watching seasons include August to October in Nusa Penida, March to December in Komodo, and October to May in Raja Ampat.

Figure 1. Study locations (Google earth, 2018)
These locations have been identified as global sighting hotspots for these charismatic species [5]. The presence of manta ray aggregation areas within these study locations is also confirmed by [9]. These locations are protected through marine protected area (MPA) status, as well as being declared as shark and ray sanctuaries. This conservation status should support the protection of these fish from any commercial trade as well as other irresponsible fishing practices.

2.2. Data analysis
Primary data were collected in all three study locations using survey techniques. A total of 43 questionnaires (one questionnaire per family/couple) were distributed to manta ray tourists based on their willingness and availability from May to June 2018, a process which involved 20 local operators. The data were analysed statistically, with descriptive analyses using the Likert scale and distribution means.

3. Result and Discussion

3.1. Result
The results of this study comprise three sections. These are: respondent demography, physiography, and attitudes.

3.1.1. Demography. The statistical data showed that the gender of respondents was almost balanced, with 51% female and 49% male respondents. The age of respondents varied from 25-56 years old, but was dominated by the 26-35 year old age group (37%). The educational background was diverse, including vocational education, and bachelor, master, and doctoral degrees, with 48% of the respondents having graduated with a bachelor's degree. The majority (84%) of manta tourists had a monthly income of at least $1000.

3.1.2. Physiography. The mean of the distribution showed that 54% of tourists surveyed were not traveling alone, but were with 1 to 3 companions; the tourists generally spent several days in the destination areas, used a variety of lodging options, and selected nature as the primary reason for their visit. The majority (84%) of respondents stayed in the different types of land-based accommodation available, while 16% were travelling on liveaboard boats. Similar numbers of tourists made the decision to view manta rays while still in their home country (48%) and upon/after their arrival (51%). The tour operators played a significant role in influencing the tourists to join manta ray watching trips, as 47% of tourists had received relevant information about manta ray watching tourism from a tour/dive operator while the remaining 53% had gained relevant information from other sources, including the internet (28%), friends/colleagues/family (14%), as well as from hotels, at the airport, and from guides. In Nusa Penida and Komodo, most tourists decided to go manta ray watching after their arrival, while in Raja Ampat most had already made the decision in their home country based on information from dive operators. Just over half (51%) of the tourists surveyed had experienced manta ray watching more than once before visiting the study locations. In this study, 63% of the tourists spent $500-$1000 and 37% of them spent more than $1000 (37%). The Likert scale was applied to analyse main factors affecting tourists’ decision to go manta ray watching, with the three main motivation factors being to see manta rays in their habitat (77%), to view the unique morphology of manta rays (42%), and to interact with manta rays (35%).

3.1.3. Attitudes. During an encounter with manta rays, 49% of tourists would like to be quite close to the fish whereas 14% decided to view manta rays from a distance, and 18% wanted to be very close. The favourite behaviour that tourists seek to view is when the manta ray is swimming (74%), while 26% of the tourists liked to see manta rays jumping and eating. Tourists are keen to see manta rays in the wild and view their morphology (49%), admire their size (30%), and observe their social behaviour (21%). The majority of respondents (88%) confirmed that viewing manta rays is their
favourite interaction while 12% of them would like to touch and chase the rays during encounter activities involving diving (88%) and snorkelling (12%). Almost two-thirds (65%) of the tourists experienced more than 5 encounter activities during their trip while the remaining 35% experienced less than 4 encounters. Just over half (51%) visited more than 1 manta location. During their trip, 44% of respondents saw more than 4 manta rays while the remaining 56% only saw 1-3 individuals. The vast majority (90%) confirmed their intention to revisit the place and view manta rays again, as well as recommending this activity to others. Around three quarters (74%) expressed their willingness to pay an additional sum as a donation for manta ray conservation, with donations ranging between $5 and $150.

3.2. Discussion
In the context of manta ray watching tourism, tourist behaviour consists of individual attitudes during the whole tourist service process, from the purchase of the trip, during the encounter, and after the trip. The services offered are intangible and difficult for tourists to identify on their own, which is where the dive/tour operators can play a role in delivering information which impacts the decision-making processes of tourists. This situation is confirmed by the importance of inputs from other parties (operators, hotels, airport, friends, etc.), and suggests ways in which these inputs impact final decisions after the input has been evaluated [10].

Previous researchers have identified factors influencing the travel behaviour of tourists, in particular motivation factors [11]. These motivation factors can play an important part in tourist decision-making processes, and in this study with respect to the decision to go manta ray watching. A study [12] identified internal factors that affect tourist motivation based on tourist responses; these included socio-psychological characteristics, culture, and attractiveness of the actual destinations. In this case study, motivation factors seem to arise from external aspects, such as the behaviour, morphology, and conservation status of charismatic animal species (manta rays). Such recreational activities that involve animal encounters create an aura of excitement, appealing to tourists as an adventure or leisure activity, during which they may also gain social rewards [13, 14]. According to [15, 16] this aura of excitement can also affect the decision-making process of tourists, because it motivates the tourist to feel relaxed and gain pleasure from viewing the object (manta ray).

Once tourists have experienced manta ray watching tourism, they have gained a basic understanding about the product which can also contribute to their decision-making processes in conducting other similar trips in the future. It has been suggested [17, 18] that the learning aspect is an important part of consumer analysis, as it helps consumers to react in a favourable way when selecting future information/products, especially as delivering information about the product is an important stage in marketing strategy. This study found that 90% of respondents confirmed their willingness to come back and do a similar trip again.

4. Conclusion
The results of this study can be used to develop manta ray watching tourism services which maximise tourist satisfaction in terms of tourist expectations, product information, and species conservation. For example, in planning a marketing campaign using up-to-date technology (internet) to attract customers, selected information should highlight the uniqueness of these species. Market segmentation and market trends in manta ray watching tourism are important issues and avenues for future research.

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