FIELD NOTE

Tourists’ perception of marine ecosystem conservation in the Nha Trang Bay Marine Protected Area, Vietnam

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ABSTRACT This study reports field survey results on current tourist activities and perception regarding marine ecosystem conservation in the Nha Trang Bay Marine Protected Area (NTB-MPA), Vietnam. Structured questionnaire surveys to visitors (n = 166) revealed that, comparing Vietnamese and foreign tourists: (1) About half of the Vietnamese respondents were aware of the NTB-MPA while only 9.6 % of foreign respondents recognized this, (2) average respondents visited more than two islands out of the total nine islands during their stay and Vietnamese and foreign respondents tended to visit different islands with different marine activities, and (3) of six marine conservation program components presented in the present survey, both groups showed stronger support for physical enhancement of marine ecosystems rather than for sustainable local community development with slight differences in components between the two respondent groups. These results suggest that the NTB-MPA needs to fulfill both the diverse demands of tourists as well as sustainable marine ecosystem management. However, at the same time, NTB-MPA could also offer diverse opportunities to familiarize tourists with different backgrounds in both environmental and socio-economic issues in marine ecosystems and to facilitate their support for the MPA.

Key words: Marine protected area, tourism, marine ecosystems, marine conservation, Vietnam

INTRODUCTION

Marine resources play an important role in the economy of coastal countries. Marine ecosystems supply humans with goods and services including food, protein sources, medicine, and tourism to develop and sustain human life. However, marine environments in many coastal countries have degraded at different levels due to overexploitation of natural resources for economic development (IUCN-WCPA 2008, Worm et al. 2006). Various stressors, particularly anthropogenic activities have been threatening marine ecosystems all over the world (MA 2005, UNEP 2012). To conserve natural resources and ecosystems in the marine environment, marine protected areas (MPAs) have been introduced in countries that are concerned with marine environment degradation (Day et al. 2012). MPAs are primarily designed to preserve marine ecosystems, manage sustainable fisheries and ensure local livelihoods (Day et al. 2012). Marine biodiversity conservation has been prioritized in various coastal countries and they are increasingly interested in establishing MPAs in their marine territories (IUCN-WCPA 2008). However, effective and sustainable management of MPAs is still under discussion (Carr 2000, Agardy et al. 2011).

Vietnam is one of the major tropical coastal countries in the world with a 3,260 km coastline. Most areas of the 1,100 km² of coral reefs in Vietnam are threatened in terms of volume and quality of available resources. According to a study report, 96 % of the coral reefs in Vietnam which are under the management of MPAs are threatened by human activities, with nearly 75 % under high or very high threat levels (Burke et al. 2002). Thus far, the country has designated 15 coastal and marine areas in the country as MPAs. A major economic source in many of the designated areas is tourism as they embrace rich (although degrading) marine resources and diversity.

While the country has a history of managing terrestrial protected areas since 1962 with the establishment of the Cuc Phuong National Park, conserving marine environments by designation of protected areas is a relatively new effort since the establishment of its first MPA in Nha Trang Bay in 2001 (UNDP 2009). Principal ideas in the development and management of MPAs in Vietnam are specified in three important legal documents, namely, Decree 57/2008/ND-CP on regulations to manage Vietnam’s MPAs of national and international significance; Decision No. 742/QD-TTg of May 26, 2010 that approves the plan for the system of Vietnam’s marine protected areas through 2020;
and Decision No. 188/QD-TTg that approves fisheries resources protection and development programs towards 2020. However, a comprehensive legal framework for the management of the MPAs in Vietnam has not been established yet (UNDP 2009), which has resulted in a lack of effective MPA governance in the country (Van Trung Ho et al. 2014). With no such framework, both central and local government officials are not necessarily familiar with marine conservation within MPA policies. Moreover, management administration structures and MPA program components vary according to local authorities responsible for the actual management of MPAs. Rehabilitation and conservation programs were implemented in some MPAs in Vietnam primarily with overseas financial assistance from organizations such as Global Environmental Facility (GEF) and International Union for Conservation of Nature (IUCN) in the early 2000s (NTB-MPA 2014). However, no substantive activities have been enforced by central and local authorities after the termination of such programs. These situations overall lead to inadequate understanding and involvement by local authorities and other local stakeholders including fishermen, tourism sector, tourists, and communities.

Among the stakeholders, tourists play important roles in light of their short but considerable contact with marine ecosystems through their on-site activities such as snorkeling, diving, sun bathing, and seafood consumption. This particularly applies to MPAs that rely on tourism including the Nha Trang Bay MPA (NTB-MPA). Therefore, in order to satisfy both necessary recovery and conservation of marine ecosystems and the needs of tourists for leisure activities, exploring the perceptions of tourists toward conservation programs would assist policymakers to design an effective combination of programs. Known as one of the most beautiful bays in the world, Nha Trang attracts a large number of foreign as well as domestic tourists, accounting for approximately 30% of the total visitors (702,700 in 2004) (Haynes and Ha 2005). Related to the international acceptance of tourists in NTB-MPA, a previous finding suggests significant differences between foreign and Vietnamese in perceptions of the MPA problems and willingness to pay to support the MPA (Lindsey and Holmes 2002). Understanding of these tourism situations and tourists’ support for the MPA need to be updated and explored further in order to design effective and acceptable conservation programs for both Vietnamese and foreign tourists as well as local communities.

The aim of the present survey was to understand the current situation of marine tourism and tourist’s perception toward marine biodiversity conservation in MPAs. We studied Nha Trang Bay as the first and largest MPA in Vietnam and a typical MPA that is known as a tourism area internationally as well as within Vietnam.

DATA AND METHODS

Study site

Fig. 1 illustrates the location and zoning of the NTB-MPA. Nha Trang Bay is located on the south central coast of Vietnam. Beautiful beaches and islands in this area make the bay an attractive resort destination in Vietnam and Southeast Asia. The NTB-MPA consists of nine islands and surrounding marine zones and covers an area of 150 km² with outstanding tropical marine biodiversity. Mun Island, one of the nine islands, is located in the southern part of the MPA, which forms the most important core zone for protection. The island possesses a high variety of marine habitats and ecosystems, including coral reefs, mangrove forests and seagrass beds, which act as a nursing ground for marine life (Nguyen and Phan 2007). Local communities in the Nha Trang Bay islands are economically dependent on small-scale fisheries (NTB-MPA 2014). Household heads (predominantly male) in the local communities in the NTB-MPA are predominantly engaged in fisheries (76.0%) followed by aquaculture (6.0%), and adult female villagers are predominantly housewives (67.5% in 2005) (Ho 2005).

As an MPA with coral reefs in need of protection, NTB-MPA comprises three functional zones, namely: core zone (sanctuary zone and habitat rehabilitation zone), buffer zone (recreational zone), and transition zone (general use zone) (Dung 2009). In NTB-MPA, all fishing activities are banned in core zones. Buffer zones are open to traditional fishing gear except for anchoring and trawling, and planned aquaculture is under management. Transition zones are open to traditional fishing but restrict trawling activities. While contributing to recovery of coral reefs and seagrass beds to a certain extent, the restriction on fishing activities by zoning per se has induced a risk of short-term income loss among local fishermen whose fishing boats are equipped with insufficient engine capacity for operation off the protected zones (GEF 2006, Ho 2005).

The establishment of NTB-MPA was initiated by Hon Mun (Mun Island) MPA Pilot Project 2001–2005, financed by the World Bank, Danish International Development Agency (DANIDA), IUCN, and GEF (NTB-MPA 2014). In the pilot project, several community-level components as well as marine ecosystems recovery and protection including the above-mentioned zoning were implemented in order to mitigate socio-economic impacts on the local communi-
ties and, further, to enhance their quality of life. These include: alternative livelihood activities such as rattan weaving, aquaculture, agriculture, livestock raising, and ecotourism; village-based microcredit schemes to facilitate alternative livelihood, and; awareness raising about marine ecosystems and MPA. Terminal evaluations of the pilot project indicate that alternative livelihood activities and microcredit schemes somewhat contribute to mitigating the income loss from reduced fishing activities and that local people improved their awareness of their surrounding environment through participation in training courses and workshops (GEF 2006, Ho 2005). Alternative livelihood and microcredit schemes are continued in local communities by financial support from the NTB-MPA Authority. These two programs are particularly of high interest among the local communities (Mr. Hoa, Head of Bich Dam Village in Tre Island, NTB-MPA, on-site interview, February 27, 2012).

Data collection

The present study collected data through a questionnaire survey. The target population consisted of both Vietnamese and foreign tourists visiting the NTB-MPA. The sampling unit was individual. The survey team approached tourists on board the tourist boat between the bay and Mun Island and on Mun Island. The present survey distributed 200 questionnaires and collected a total of 166 responses, all of which were useable and entered into the analysis.

The questionnaire used in the present study was developed as a structured questionnaire. Respondents were provided with a questionnaire sheet either in Vietnamese or English and were asked to provide their answers. The questionnaire consisted of four sections. Part of the collected data is presented in the present study. Other data from the current survey has been published elsewhere (Kaida and Dang 2014).

The questionnaire first briefly explained the purpose of the survey (potentials of marine conservation programs in Nha Trang), followed by a question about respondent’s awareness about Nha Trang Bay as a MPA. Following the description of current status of the biodiversity and ecological environment in NTB-MPA, respondents were asked their perceived importance of the six proposed marine conservation program components, namely: increase of live coral reef cover; fish stock recovery; alternative livelihood program for local fishermen and their families; investment in waste treatment systems in the MPA islands that would avoid wastes being abandoned on the beaches or waste leakage to the sea; environmental education and awareness raising on marine protection for local residents and tourists; and self-managed village-based microcredit finance. These program components were carefully selected based on the program components implemented in the pilot project funded by GEF (NTB-MPA 2014), considering the effectiveness of marine ecosystem conservation in NTB-MPA. Respondents were asked to rate their importance for each of the six program components on a Likert scale of 1 (not important at all) to 5 (very important). In the last section, respondents were asked their socio-demographic profile such as country/province that they traveled from, gender, age, education level, and income.

Data analysis

The analysis of the present study was conducted in two steps. First, the present study determined the socio-demographic characteristics of respondents and the number of the NTB-MPA islands visited by respondents to assess the general trend of visitors in the NTB-MPA. Second, data on respondents’ perceived importance of the conservation program components were compared between six different components and two demographic groups: Vietnamese and foreign. This second step was conducted to examine whether Vietnamese and foreign tourists have different preferences.
toward a range of conservation program activities. A paired t-test was employed to confirm the statistical significance of the Vietnamese-foreign comparison.

RESULTS AND DISCUSSION

Socio-demographic characteristics of respondents

Of 166 respondents (83 Vietnamese and 83 foreign), 60% of the Vietnamese respondents came from major cities in Vietnam, Hanoi and Ho Chi Minh City, while the rest came from various regions in the country (Fig. 2). Foreign respondents came from a total of 19 different countries. Visitors from Europe were dominant (74%), followed by Australia (13%) and the United States (7%) (Fig. 3). Foreign respondents from Asian countries were few (4%) taking into consideration the shorter geographical distance and growing numbers of outgoing tourists from some countries in this region including Japan, China, and Korea. These data suggest that NTB-MPA receives Vietnamese and foreign tourists from a diverse range of regions and countries of origin but there is regional imbalance in both groups.

The gender ratios are relatively balanced for both groups. Nearly half (47%) of the Vietnamese respondents were female while 42% of foreign respondents were female. About half (49%) of the Vietnamese respondents were married while the ratio for foreign respondents is lower (34%). The average age of all respondents was 31.7 years old. The average age was slightly lower in the Vietnamese respondents (30.1 years old) than in the foreign respondents (33.4 years old). This is partially because the age distribution of the Vietnamese respondents is relatively skewed within the 20s and 30s. The majority of the respondents in both the Vietnamese and foreign groups completed university level education (61% and 75% respectively). The average monthly income levels are US$568 and US$2,187 in Vietnamese and foreign respondents respectively. While over half (55.4%) of the Vietnamese respondents were aware that Nha Trang Bay is designated as a marine protected area, only 9.6% of foreign respondents knew this.

Socio-demographic characteristics of the survey respondents suggest that the Vietnamese respondents have a considerably higher income (US$568 per month, i.e. annual income US$6,816) than the average level in Vietnam (annual US$1,407 in 2011, World Bank 2013). This may be related with relatively higher education attainment in the Vietnamese respondents compared with the general population in Vietnam. There is no critical difference in other socio-demographic characteristics between Vietnamese and foreign respondents. However, awareness of Nha Trang Bay as a marine protected area revealed a contrast: a significant larger number of Vietnamese respondents were aware of NTB-MPA than the foreign group. MPA awareness was considerably lower among the foreign respondents (9.6%). This suggests that foreign visitors do not have sufficient opportunities to obtain information about MPA and its policy before and during their stay in Nha Trang Bay while Vietnamese visitors are more exposed to such information through media and onsite information compared with English material. It is further implied that providing effective information might drastically enhance foreign visitors’ awareness and consideration for the NTB-MPA. On the other hand, the awareness ratio in Vietnamese respondents (55.4%) also suggests a potential for further MPA awareness raising among Vietnamese visitors and the general public.

Islands visited

Fig. 4 shows the number of respondents who visited islands within the NTB-MPA territory. The average number of islands visited was 2.77 for the whole sample. The number of islands visited by Vietnamese respondents was slight-
Tourists’ perception of marine ecosystem conservation in the Nha Trang Bay Marine Protected Area, Vietnam

ly lower than foreign respondents (2.73 and 2.80 for Vietnamese and foreign respondents respectively). Due to the survey protocol setting (surveyors approached tourists in and on board bound for Mun Island), all the respondents answered they visited Mun Island. A range of 49–67 respondents visited five islands each: Tre, Mieu, Tam, Mot, and Rom. Some disparities regarding the tendency for visiting these five islands were observed between Vietnamese and foreign respondents. A larger number of Vietnamese respondents (n = 32) visited Tre Island than foreign respondents (n = 17). On the other hand, Mot Island and Rom Island were more popular among foreign respondents than Vietnamese respondents (Mot Island: 29 Vietnamese and 39 foreign, Rom Island: 16 Vietnamese and 34 foreign). Only a few respondents visited the other three islands of Cau, Vung, and Noc during their stay in Nha Trang Bay.

The numbers of visitors by island in the NTB-MPA suggest that Mun Island is the most popular island among the nine NTB-MPA islands. This may be because Mun Island is the most strictly protected island and well known for the rich volume and diversity of its coral reef. Mun Island offers various marine activities such as diving, snorkeling and glass-bottom boat tours. This implies that the island may require special attention for marine ecosystem protection in the surrounding area because of its high exposure to human threats as a result of receiving a large number of visitors. Tre Island attracts the Vietnamese respondents more than foreign respondents. This may be because the island has been developed by a Vietnamese resort tourism developer as a resort complex including hotels, restaurants, pools, and an amusement park. This implies that Vietnamese visitors are interested in relaxing and fun on the beach or in an organized environment such as an amusement park, more than foreign visitors. More foreign respondents visited Mot Island and Rom Island, where the main attraction is diving and other marine leisure activities. Tam Island which received almost equal numbers of Vietnamese and foreign respondents does not focus its tourism services related to marine activities but offers non-marine sport activity opportunities such as volleyball and football fields and green environments as well as a beautiful beach. These data imply that there is a difference in island preferences between Vietnamese and foreign respondents, and this may be explained by their activity preferences on an island and its marine environment.

Perceived importance of the conservation program activities

Fig. 5 shows mean scores of perceived importance of the six marine conservation program components by all respondents, and Vietnamese and foreign respondents. Of the six components, environmental education received the highest score (4.27), followed by coral reef recovery (4.18) and fish stock recovery (4.07). Alternative livelihood (3.69), waste treatment (3.89), and microcredit finance (3.27) received relatively weaker support compared with the first three components. In particular, respondent’s perceived importance for microcredit finance was considerably lower than the other components.

A paired t-test on the perceived importance of the conservation program components showed a significant difference between Vietnamese and foreign respondent groups in some of the program components. Coral reef recovery and fish stock recovery were perceived more important among foreign respondents (4.37 and 4.18 respectively) compared with Vietnamese respondents (3.99 and 3.96 respectively) (t (164) = 2.90, p < .001 for coral reef recovery, t (164) = 1.57, p < .10 for fish stock recovery). On the other hand, waste treatment and environmental education was perceived as more important among Vietnamese respondents (4.04 and
4.42 respectively) compared with the other group (3.74 and 4.12 respectively) \( t(164) = -2.14, p < .05 \) for waste treatment, \( t(164) = -2.22, p < .05 \) for environmental education.

These results suggest that program components that are directly related to physical enhancement of marine ecosystems (coral reef and fish stock recovery) are considered very important by visitors, and this tendency is clearer among foreign respondents than Vietnamese respondents. These results are in line with a previous study that found foreign visitors in Nha Trang had higher awareness of environmental conservation compared to Vietnamese visitors (Lindsey and Holmes 2002). Perceptions by Vietnamese and foreign respondents were opposite for waste treatment and environmental education. This may be because Vietnamese visitors are aware of waste treatment as a general environmental issue in Vietnam and also might have more chances to witness abandoned waste in the MPA islands when spending their time on the beach while foreign visitors are not necessarily familiar with general waste issues in Vietnam or exposed to actual situations in the NTB-MPA islands.

Table 1 presents correlations between proposed MPA program components. Coral reef recovery and fish stock recovery were strongly and positively correlated in both respondent groups (0.534 for Vietnamese respondents, 0.578 for foreign respondents). Strong positive correlations (> 0.4) in both groups were also found in alternative livelihood and fish stock recovery (0.531 for Vietnamese respondents, 0.402 for foreign respondents) and microcredit finance and...
waste treatment (0.471 for Vietnamese respondents, 0.484 for foreign respondents). Other correlation pairs found significant and positive in both groups are: alternative livelihood and coral reef recovery; waste treatment and alternative livelihood; environmental education and coral reef recovery, alternative livelihood, and waste treatment respectively, and; microcredit finance and waste treatment.

Several correlation pairs were found only in either of the two respondent groups. In the Vietnamese respondent group, environmental education is positively correlated with fish stock recovery and microcredit finance as well as the three components that were found positively correlated with environmental education in both groups. That is, Vietnamese respondents perceived importance toward environmental education is positively correlated with all other program components. In the foreign respondent group, a negative correlation was found between microcredit finance and coral reef recovery (−0.184).

Table 1 also presents correlations of the perceived importance of the six program components with the number of islands visited. In the Vietnamese respondent groups the number of islands visited was found positively correlated with coral reef recovery (0.228). In the foreign respondent group, positive correlations were found in alternative livelihood (0.216) and microcredit finance (0.275).

The correlation results seem reasonable taking into consideration the characteristics of each program component. First, positive correlations between coral reef recovery, fish stock recovery, and alternative livelihood suggest that respondents understood the tradeoff between natural stock recovery and livelihood loss in local communities and may have shown their preference to supplement income loss of local fishermen by supporting the alternative livelihood component. Second, positive correlations between alternative livelihood, microcredit finance, and waste treatment imply support for sustainable local community management. Third, positive correlations with the number of islands visited appear in different program component pairs in Vietnamese and foreign respondents. That is, only coral reef recovery is positively correlated in the Vietnamese respondents, and alternative livelihood and microcredit finance are positive correlated for the foreign respondents. This result is interesting because the correlations in one respondent group were observed in the program components that were supported more in the other respondent group. That is coral reef recovery is considered less important among Vietnamese respondents compared with foreign respondents but this component is positively correlated with the number of islands visited, and a similar relationship is found for microcredit finance among foreign respondents.

This finding suggests that having an opportunity to visit more islands might contribute to greater understanding of marine conservation issues in the NTB-MPA. Taken together with perceptions of conservation program components by Vietnamese and foreign respondents, this finding implies opportunities, such as supplementary facilitators, might partially enhance tourist support for the program components that receive (relatively) low recognition: coral reef recovery in Vietnamese respondents and alternative livelihood and microcredit finance in foreign respondents.

In conclusion, the present field study revealed that, comparing Vietnamese and foreign tourists; (1) About half of the Vietnamese respondents were aware of the NTB-MPA while only 9.6% of foreign respondents recognized this, (2) in average, respondents visited more than two islands out of the total nine islands during their stay and Vietnamese and foreign respondents indicated a different tendency in their visiting islands with different associated marine activity characteristics in the MPA, and (3) of six marine conservation program components presented in the survey, both groups showed stronger support for physical enhancement of marine ecosystems rather than for sustainable local community development but with slightly different preferences for each component between the two respondent groups. These results suggest that the NTB-MPA, as the country’s major leisure city and its first and largest MPA, needs to fulfill both the different demands of tourists as well as sustainable marine ecosystem management. At the same time, these results imply that the NTB-MPA, through utilization of different features of the nine islands, could offer diverse opportunities to familiarize tourists of different backgrounds with both environmental and socioeconomic issues in marine ecosystems and facilitate their support for the MPA.

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