REVIEW ARTICLE

Conservation and Sustainable Use Awareness among Visitors and Tour Operators of Marine Parks: Concise Review of the Benefits and Programs for Protecting Marine Biodiversity

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ABSTRACT

This review paper highlights the level of awareness on the conservation and sustainable use of marine parks (MPs) among stakeholders in the marine tourism business. Authors present in detail the benefits, marine biodiversity (MB), and programs designed for the conservation and sustainable use of MPs. Numerous benefits of MPs range from the management of marine protected areas to the protection of natural resources, such as plants, animals, and the ecosystem. The primary role of MPs is to properly manage and conserve MB, which protects vulnerable or endangered species and habitats. Other benefits of MPs include protecting the long-term health of marine environment through the conservation of marine life. Hence, scientists are mandated by national governments to supervise and conduct research aimed at protecting and managing MPs. Likewise, numerous conservation programs have been proposed over the years to secure the conservation and sustainable use of MPs. MB conservation can be enhanced by objective zonation, promoting alternatives, and limiting visitor's use of MPs and provision of on-site waste amenities. Overall, the review of the literature showed that the provision of education, awareness and outreach programs to local communities and visitors could ensure the successful conservation of MB in MPs.

Keywords: Marine parks (MPs), marine tourism, marine biodiversity (MB), conservation of marine life, sustainable use of marine parks, objective zonation

1. Introduction

Conservation of marine resources has become a global priority. Therefore, the concept of marine protected areas (MPA) or marine parks (MPs) is now widely publicized in the literature (Addison *et al.*, 2015; Nyigulila Mwaipopo, 2008). MPs consist of sea areas that are earmarked to protect and sustain ecosystems and the organisms that thrive in such habitats. Likewise, MPs are any coastal or marine areas regulated to conserve natural resources, and historical and cultural features (Kelleher *et al.*, 1991; Nyigulila Mwaipopo, 2008). The Convention on Biological Diversity (CBD) defines an MP as “any defined area within or adjacent to the marine environment, together with its overlying waters and associated flora, fauna, and historical and cultural features, which has been reserved by legislation or other effective means, including custom, with the effect that its marine and coastal biodiversity enjoys a higher level of protection than its surroundings” (Meola *et al.*, 2019). Structurally, MPs are divided into zones with specific restrictions (such as additional fishing). Typically, the restrictions and zones in MPs are broadly categorized into sanctuary, habitat protection, and general use zones (Al-Abdulrazzak *et al.*, 2012). The sanctuary zones provide the maximum degree of protection for biodiversity. As such these zones forbid activities like fishing, dredging, aquaculture, or mooring. Similarly, the habitat protection zones provide high levels of protection, but permit only restricted recreational and fishing activities that do not impact the habitat or fish populations in the area. Lastly, the general use zones permit fishing that specifically complies with the management plan, rules, and guidelines of the MP (Kline *et al.*, 2020; Steckenreuter *et al.*, 2012).

Selection and utilization of MPs and MPAs are typically determined by governments through laws and designated agencies that specify such areas as national parks. Typically, the MPs/MPAs are selected for various purposes through clearly defined boundaries, rules, or regulatory measures. Such measures are proposed to protect habitats including mangrove wetlands, seagrass beds, mudflats, sandbanks, beaches, rocky outcrops, and fringing reefs. Also protected are coral reefs, fishes, mangroves, coastal vegetation, beautiful beaches with clear blue waters, and the peaceful and harmonious condition of the islands (Spait, 2001). Various studies have demonstrated that MPs and MPAs protect biodiversity, sustainable biodiversity utilization, enhance economic well-being, and improve the quality of life (Pittman *et al.*, 2019; Rees *et al.*, 2018).

MPs are also designed and developed to manage the pressure from anthropological activities and conflicts, through the adoption of various levels of protection. Hence, MPS are used as area-based management tools to determine the degree of protection of the selection area.

In practice, the goals of MPs/MPAs are implemented through the ecosystem and precautionary approaches, which are defined as strict protection, barred activities, or controlled or sanctioned access that permits multiple uses. Ching *et al.* (1999) summarized the followings as representing the objectives of marine parks.

To conserve and protect the marine ecosystem especially reef areas.

To ensure the sustainable utilization of the fishery resources in the coastal waters.

To protect and manage the natural ecosystem for research on biodiversity.

To ensure sustainable development of educational, recreational, and eco-tourism activities.

Despite numerous outlined objectives, there is limited knowledge on the perceptions of users on the benefits, conservation, and sustainable use of MPs. Therefore, this paper presents an overview of the conservation and sustainable use awareness among visitors and tour operators of MPs. The study also stresses the benefits, marine biodiversity, and programs designed for the conservation and sustainable use of MPs.

2. Benefits and Marine Biodiversity (MB) in Marine Parks

Benefits of MPs are numerous ranging from the management of the MPAs to the protection or conservation of natural resources and biodiversity, such as fisheries. Governments, organizations, or agencies, which oversee the MPs/MPAs encourage scientists and provide them with the mandate to perform research work, related to the protection and management of such areas. Furthermore, scientists can examine the sustainable exploration and exploitation of biodiversity for pharmaceutical and other purposes. In addition, marine resources are conserved and protected particularly the coral reefs, which represent the main points of attraction to visitors at MPs. Furthermore, marine resources and biodiversity that have been overexploited and/or facing extinction (such as turtles) are rejuvenated. Lastly, MPs serve or provide upgraded educational and recreational opportunities for the public. Marine biodiversity (MB) includes all levels and species of life within the sea, which vary across the different ecosystems (Sala *et al.*, 2006). The term also denotes the composition or richness of species at all levels within a given water habitat (Beaumont *et al.*, 2007). More specifically, it describes the variety of life in the marine environment. MB provides the basis for a wide range of recreational activities, including seabird watching, rock pooling, beachcombing, sport fishing, recreational diving, and whale-watching. These activities provide significant employment opportunities and also sustain goods and services that benefit mankind. As a result, MB has an intrinsic value since countless marine species and

habitats have been part of this planet for millions of years (Beaumont *et al.*, 2007; Wong, 1997).

Biodiversity of marine life and ecosystems is vital for life on earth. These species, environmental and ecological systems play a key role in global nutrient recycling and climate regulation. The outlined functions provide humans with numerous resources and services, as such their importance cannot be downplayed. Despite their protected status and management efforts, several threats that affect marine biodiversity exist worldwide. For example, there is growing concern about the decline in global fish stocks and the overexploitation of breeding grounds. Other concerns include the loss of habitat for marine life and the destruction of coral reefs (Beaumont *et al.*, 2007; Wong *et al.*, 2020). More recently, there were reports around the globe (Day Jr *et al.*, 2003; Mac Nally *et al.*, 2009). According to analysts and environmentalists, changes in MB within MPs are directly caused by exploitation, pollution, and habitat destruction (Polidoro *et al.*, 2011; Worm *et al.*, 2006). Other notable factors include climate change and related perturbations of ocean biogeochemistry. Large global data sets across spatial and temporal scales indicate that the decline in MB could severely affect the ocean's capacity to provide food, maintain water quality, and recover from unrest (Worm *et al.*, 2006). Loss of MB in coastal ecosystems could also hamper ecosystem-based services, such as the provision of fisheries, nursery habitats, filtering, and detoxification, which are provided by suspension feeders, submerged vegetation and wetlands (Barbier, 2012; Barbier *et al.*, 2011).

Therefore, it is imperative to conserve MB through the establishment of MPs. Hence, the primary role of MPs is to conserve MBs. MPs provide protected areas or sanctuaries for fish and other marine life (Hockey *et al.*, 1997). Also, MPs serve as protected areas, reserves, special places, or underwater parks that are managed primarily for the conservation of their ecosystems, habitats, and marine life (Day *et al.*, 2012). Furthermore, MP help to maintain the MB in habitats and recover lost species in ecosystems to a healthy functional state (Al-Abdulrazzak *et al.*, 2012). Typically, MPs provide measures used across waterways to protect vulnerable species and habitats (Aswani *et al.*, 2004; Coll *et al.*, 2013). More precisely, these include the designation of geographically defined marine areas with clearly stated objectives (Al-Abdulrazzak *et al.*, 2012; Francour *et al.*, 2001). The goal is to ensure the conservation of nature via regulation and management of legal or other effective strategies. It has been demonstrated that well-managed MPs positively impact the ecology (Huilan *et al.*, 2011).

A proper management of MPs helps to maintain MB and to protect susceptible or endangered species and their habitats. Other benefits of MPs to MB include protecting

the long-term health of the marine environment by conserving and protecting marine life, including fish, plants, and various animals. This role safeguards the habitats (e.g., sea grass meadows, reefs, and mangrove forests) that marine life rely on for sustenance and survival. Also, important natural processes and life-support systems that occur in such habitats are crucial to the recovery of degraded habitats or depleted populations of plants, fish, and other animals (Bessey *et al.*, 2018; Hastings *et al.*, 2017). In addition, MPs help to protect natural coastal landscapes and seascapes, which provide opportunities for nature-based recreational activities, such as diving, snorkeling, boating, and beach walking and nature appreciation. Lastly, MPs serve as multi-use areas that permit various activities according to different management zones. These may include activities, such as recreational and charter fishing and marine tourism: diving, snorkeling, and whale watching. Commercial activities e.g., fishing, ports development, shipping, as well as oil and gas exploration are also known to occur in selected MPs (Carlsen *et al.*, 2004; Kendrick *et al.*, 2016).

3. Conservation and Sustainable Use of MPs

Tourism is the principal natural earner of MPs (Peters *et al.*, 2009; Salm, 1985). For this reason, the popularity of recreational activities like fishing and spearfishing undermine the primary core of MPs. Furthermore, activities, such as snorkeling and diving comprise dangers to coral reefs in MPs. In practice, snorkelers and divers stand on reefs, walk over corals in shallow waters to collect coral and shell souvenirs. These activities are damaging to reefs and may result in the alteration of reef communities (Salm, 1985). Human lives depend on marine ecosystems that are healthy, resilient and productive. Hence, MPs are an essential tool in the recovery and protection of our ocean and the vital services it provides (Ching *et al.*, 1999; Wong, 1997). Likewise, MPs are an important tool in the toolbox of ocean conservation used to help reduce stress on MB and ecosystems (Day *et al.*, 2012). MPs are internationally recognized as the best tool available to protect marine environments while simultaneously permitting various recreational and commercial activities (Salm, 1985). MPs can also help to protect the long term health of the marine environment by conserving and protecting all marine life (e.g. fish, plants and other animals), their habitats (e.g. seagrass meadows, reefs and mangrove forests), and important natural processes and life-support systems (Peters *et al.*, 2009; White, 1988).

The main attractions of MPs are the natural resources. The coral reefs, fishes, mangroves, coastal vegetation, beautiful beaches with clear blue waters, and the peaceful and harmonious condition of the islands. The

combination of such marine resources or the existence of one or two becomes the main tourist attraction. MPs are designed to protect and conserve such a unique yet diverse range of plants and animals as well as their marine environments. Many of these plants and animals are unique and are found nowhere else in the world. However, due to human activities, researchers have raised questions on how MPs can be conserved while simultaneously fulfilling tourists' demands. In other words, how can sustainable tourism be continued in the long run? The issues arising in this context are, what are the threats that affect these marine parks resources? And how they can be curbed? This is where the conservation of MPs arises (Spait, 2001).

The concept of conservation is an age-long issue (Katsanevakis *et al.*, 2020; Leenhardt *et al.*, 2015). Conservation deals with issues that are very urgent and often controversial. In general, conservation is defined as the management of the human use of the biosphere so that it yields the greatest sustainable benefit to the present generation while maintaining its potential to meet the needs and aspirations of future generations (Hamber *et al.*, 2004). This definition exposes the usefulness of nature to man rather than on protecting nature for its own sake. More specifically conservation refers to the protection of wildlife and habitats from irreversible harm (Hamber *et al.*, 2004). Adapting this definition to marine tourism, the conservation of MPs refers to strategies adopted to protect such areas from irreversible harm and how tourist's activities can sustain the ecosystem. The study by Lim (1998) on sustainable tourism in Malaysia emphasized that the high numbers of tourists and increased visitation impacts several aspects of MPs. Other researchers have proposed various tips to enhance the conservation of sustainable marine ecosystems (Francour *et al.*, 2001; Lim, 1998). According to the authors, the management of MPs should adopt the following strategies.

Adoption of Objective Zonation

MPs are protected areas with multiple uses but primarily serve as conservation areas and tourists destinations. As such, both purposes need to be reconciled through procedures and processes such as zonation. The concept of zonation is a management procedure used to define the limitations, degree, or means of different zones in MPs (White, 1999). The practice seeks to protect MPs from harmful activities and confines intensive use to sites that can be sustained. In addition, zonation seeks to separate specific zones for proper control so that such areas can facilitate education and generating revenue (White, 1988). Likewise, the zonation of MPs aids the process of conservation along with the selection and control of activities at different sites (Hartoko *et al.*, 2014). The process typically includes strict protection at

various levels of use and creates sanctuaries for conservation areas by separating incompatible recreational activities. Consequently, users of MPs can have increased enjoyment and safety of different pursuits, as well as buffer core zones for protection from the adverse impacts of damaging activities. MPs are protected areas with multiple uses but primarily serve as conservation areas and tourists destinations. As such, both purposes need to be reconciled through procedures and processes such as zonation. The concept of zonation is a management procedure used to define the limitations, degree, or means of different zones in MPs (White, 1999). The practice seeks to protect MPs from harmful activities and confines intensive use to sites that can be sustained. In addition, zonation seeks to separate specific zones for proper control so that such areas can facilitate education and generating revenue (White, 1988). Likewise, the zonation of MPs aids the process of conservation along with the selection and control of activities at different sites (Hartoko *et al.*, 2014). The process typically includes strict protection at various levels of use and creates sanctuaries for conservation areas by separating incompatible recreational activities. Consequently, users of MPs can have increased enjoyment and safety of different pursuits, as well as buffer core zones for protection from the adverse impacts of damaging activities.

Provision of solid waste and sewage disposal facilities

MPs are threatened by pollution from human activities (Yeo, 2004). More recently, there has been growing concern about the pollution of marine environments by micro-and nanoplastics (Nyakuma *et al.*, 2021; Wong *et al.*, 2020).

The long term effects of such activities include risks to human health, safety and the environment. Studies have also shown that more than 8 million tonnes of plastics enter the oceans annually causing significant harm to marine species through ingestion, suffocation, or entanglement (IUCN, 2021). Therefore, the implementation of the proper solid waste and sewage disposal facilities at MPs is crucial in light of the high number of visitors and porous nature of the coastal soils (Manfredi *et al.*, 2010; Yeo, 2002).

Promoting alternatives

One important way of conserving MPs is by creating and promoting another island (Lim, 1998). The authors opine that such measures could help to reduce the pressure by visitors mounted on certain MPs. Furthermore, this proposed practice will complement MPs in sustaining MB as too many pressures exerted by visitors comes with several disadvantages.

Limiting visitors use

Given its protected status, increasing visitor use within MPs hampers the physical nature of marine parks. The inadequacy of facilities such as toilets, sewage and solid disposal system is caused by increased visitor use. In light of this, it is clear that decisions have to be made on limiting the number of visitors to MPs, as this could help conserve such areas (Lim, 1998). In addition to the above-mentioned tips in conserving the ecosystem around MPs, special programmes for monitoring and evaluation have been advocated by researchers to conserve such areas (Wong, 1997). This will enable the maintenance of a record of marine resources and social conditions over time as well as help assess the effectiveness of any conservation actions implemented by management.

4. Results and discussion

As already emphasized MPs are of immense importance to MB and the ecosystem, as such their conservation should not be undermined. According to Munga *et al.* (2010), different resource users have different views and react differently to conservation initiatives in MPs. The acceptance of MPs by different resource users can be severely hindered if the perceived needs and benefits are not realized (Sesabo *et al.*, 2006). Therefore, the decision-making, planning and implementation processes should include all stakeholders' perceptions to achieve and maintain the successful operation of MPs (Sesabo *et al.*, 2006). Hence, the perceptions of MPs conservation and sustainable use are viewed from the viewpoint of two stakeholders, namely; the tour operators and visitors.

Tour operators

Marine tour operators (MTO) are described as individuals responsible for providing information about the MPs and their management to tourists (Hockings, 1994). MTOs provide a direct educational guide, experience, and information about the MP, which provides a conduit for management to communicate with an important and growing segment of MP users (Hockings, 1994). Likewise, MTOs play an important role in preventing or minimizing the negative impacts of tourists (Subbiah, 2012). The study by Hockings (1994) found out that MTOs positively influence the existence and conservation of MPs for sustainable development. Munga *et al.* (2010) discovered that the perceptions of MTOs towards government sustainable programs on conservation of MPs were positive. The authors emphasized that this result was likely because tour operators were high-income earners. Werner *et al.* (2000) examined the perceptions of MTOs on their awareness of conserving MPAs in Abrolhos (Brazil). In their study, the MTOs showed awareness of the

significant conservation of MPAs and such information to visitors. However, the study revealed that visitors lacked information on the sustainable use and conservation of MPs. The authors also emphasized that involving representatives from all stakeholder groups in the design of coastal management plans could effectively enhance marine conservation in emerging economies/countries.

Coghlan (2012) found out that the perception of MTOs on the natural environment management and conservation in Australia barrier reef is a significant component in fostering tourism performance. Furthermore, Wong (1997) found out that MTOs agree that strict enforcement of regulations is important for protecting the marine environment. Islam *et al.* (2011) utilized the "damage schedule" approach to explore the importance of the conservation of MPAs by stakeholders of marine tourism. The authors observed that the MTOs are aware of the benefits and the importance of the MPs and resource conservation. Chuenpagdee *et al.* (2002) conducted a study on the MP located within the Yucatan in San Filipe (Mexico). The authors investigated the perception of MTOs towards conservation and how the impacts of human activities on MB differ among stakeholders within the marine business. The authors observed that that tourist boat operators and other tour personnel considered damage to forest reserves within the MP to be very important. This view stemmed from the respondent's belief that the loss of forests would decrease the value of other resources, thus hampering tourism activities in the region.

Visitors

MPs are primarily developed to protect the lasting conservation of MB and marine habitats, which is frequently emphasized by managers and operators of such areas. Nevertheless, Ballantyne *et al.* (2009) reported that knowledge on the needs, preferences and interests of the tourists that partake in such activities is lacking. The study also sought to examine the level of awareness of tourists and MTOs on issues concerning conservation and how environmental impacts concerns affect these groups. Other important objectives included the assessment of the level of impact visitors have on MPs. Few studies have been conducted to investigate user's awareness of marine conservation and sustainability of MB. For example, Ballantyne *et al.* (2009) conducted a study aimed at exploring the level of awareness, interest, and engagement in conservation issues among tourists. In addition, the study examined the willingness of tourists to accept conservation messages as part of the MP tourism experience. The authors highlighted the relative importance of the conservation-related aspects of the experience in an MP. Results showed that visitors to the conservation MP

greatly support the conservation aspects of the experience. Also, respondents placed primary importance on the minimal impact concerns, if necessary, at the expense of their own experience and personal comfort.

Another study in the Gascoigne region of Western Australia found that visitors viewed tourism in MPs as environmentally harmful. It was emphasized that marine tourism can severely impact the environment (Dowling, 1993). Nonetheless, Kavallinis *et al.* (1994) reported that tourists on the Greek coast perceived themselves as less responsible for negative environmental impacts from MP tourism as compared to entrepreneurs or residents. Petrosillo *et al.* (2007) examined the perception of tourists on the impact of tourism activity on the conservation of MP in Italy. Results revealed that both perception and awareness of MP conservation among tourists are low. Other studies that attempted to examine the perceptions of visitors on conservation and sustainable use of MPs include willingness of tourists to pay for marine conservation. For instance, Peters *et al.* (2009) found that most visitors were favorable toward introduction of fees or an increase in MPs where charges already exist to sustain the marine ecosystem. In a related study, Yacob *et al.* (2009) found that ecotourism visitors to two MPs in Malaysia were willing to pay for conservation, which was ascribed to their awareness of the benefits of marine conservation. The authors also emphasized that their findings provide a guideline to MPs in developing management policies that enhance ecotourism contribution to sustainable development and conservation in Malaysia.

Dearden and co-workers (2007) investigated the awareness of divers' impact on reef conservation in Thailand. Divers who saw damage felt that diving harmed the reef and were willing to cooperate in reef conservation. These results ascertain the potential of diving as becoming a positive force for reef conservation but indicate the need for greater investment in diver education. Dodds *et al.* (2010) examined MPs in Thailand and Indonesia to seek perceptions of tourists on environmental issues at their level of awareness. In addition, the extent to which tourists feel responsible for conserving or protecting natural resources and their willingness to partake in management was also examined. Lastly, the study investigated the commitment of tourists to pay for environmental conservation. It was revealed that the majority of tourists to MPs expressed their willingness to pay for sustainability practices but disagreed on the organization primarily responsible for implementing sustainability measures.

Lindsey and collaborators (2002) conducted a study to examine how local and foreign tourists supported the protection of MPs in Nha Trang (Viet Nam). Tourists thought rubbish on the beaches, water pollution, and

vendors on beaches posed problems; hence, they believed that protection of MPs was a good idea. However, foreign tourists significantly perceived environmental problems when compared to Vietnamese tourists. Likewise, respondents who acknowledged that environmental problems exist were more likely to support the concept of MPs, despite the potential for possible economic effects with distributive consequences. Similarly, Mathieu *et al.* (2003) examined tourist awareness of marine conservation by investigating their willingness to pay for marine protection in Seychelles. Results revealed that visitors accepted to pay for marine protection indicating that they are aware of the need for marine conservation. Another study on tourist willingness to pay for tourist conservation was conducted by Arin *et al.* (2002) in the Philippines. This study evaluated the level of awareness of divers on the benefits of coral reefs and their willingness to pay for marine conservation and MP protection. It was also found that most of the interviewed tourists indicated that NGOs are the credible organizations to collect and manage entrance fees.

Lim (1998) investigated the conservation awareness of two groups of tourists: snorkelers and divers. It was found that marine conservation awareness among divers is quite high as compared to the average snorkeler. Authors emphasized that the opportunity to get near to reefs and gain insight in their associated life inculcates greater appreciation and understanding for the fragile marine environment. Dive operators felt that visiting divers to Pulau Payar MP are aware of the sensitivity of the reef environment, and most (83.33%) felt that their actions whilst diving reflect this. Wong (1997) investigated the recreational value of coral reefs to avoid further degradation of reefs surrounding Pulau Payer (Payer Island) in Malaysia. The huge stream of visitors caused severe problems with sewage pollution and solid waste disposal. A contingent valuation study was undertaken using the payment card method. A questionnaire survey was conducted among 234 tourists to elicit their demand for tourists' willingness to pay an entry fee to the MP. As many as 91% of the tourists were willing to pay an entrance fee to conserve the MPs. The average mean WTP per entry was estimated at RM16 (\$4.96). Ballantyne *et al.* (2009) investigated environmental awareness of degradation, motives, and interest in the conservation of Marine Park and botanic gardens by visitors in Coot-tha botanic gardens and MPs. Botanic garden visitors reported relatively low levels of interest in and reduced commitment to conservation issues than visitors to the MPs. Jiang *et al.* (2007) investigated public awareness, educational and conservational purposes of MPs based on 120 respondents from St. Catharine's (Canada) based on

either visitor or no visitor questionnaire. Visitors had less awareness of conservational issues. Hence, the studies reviewed above have implications for decision-makers, as the formulation of development policies will need to consider social, environmental and consumer awareness perspectives.

5. Programs for Conservation and Sustainable Use of MPs

Marine conservation awareness programs constitute a new opportunity to pilot innovative techniques that involve local communities in protecting and managing their natural resources (Levine, 2004). The relevance of awareness on conservation and sustainable use of MB cannot be disputed based on evidence in various regions worldwide. This observation is a result of accrued benefits attached to conservation awareness by stakeholders within the MP business. Hence, authors have identified several marine conservation programs to improve stakeholder awareness and enhance proper decision making on ways to foster and sustain marine biodiversity by MP management. Two important programs as evidence in the marine literature are stakeholder education and participation programs. According to Frost *et al.* (1988), education is an effective management program to enhance awareness of conservation needs. Authors disclosed that the provision of education, awareness and outreach programs to local communities and visitors in MPs was responsible in some cases for the successful conservation of biodiversity (Ormsby *et al.*, 2005). A study in Bwindi Impenetrable National MP in Uganda also confirmed that environmental education enhanced management effectiveness in the parks. Furthermore, education and awareness programs play a vital role in building support for protected areas in general and particular management actions. Padua (1994) also highlighted environmental education programs as a panacea for raising awareness and the benefits of conservation among MP stakeholders. Therefore, the researchers emphasized that awareness education programs should be encouraged particularly in developing countries that still hold great portions of the planet's biodiversity. Fletcher and coworkers (2009) also agree on that education awareness programs serve as a tool for enhancing conservation awareness to the public. Their study was conducted in the United Kingdom within marine museums.

Another awareness program that seeks to improve awareness about marine conservation is stakeholders' participation. According to Geoghegan *et al.* (2002), the rationale for stakeholder participation programs in the planning of conservation and includes the followings: The quality of management decisions that integrate the knowledge, needs, and aspirations of all stakeholders.

The feasibility of management decisions that are accepted and owned by stakeholders.

The empowerment and democratization arising from people and organizations participating in formulating and implementing policy and management decisions.

Beaumont (1997) uncovered that when marine stakeholders' participation programs were initiated in MPs, the benefits of conservation awareness increased. This is particularly true for tourists, even prior to their visit. Hence, the author emphasized that the benefits accrued goes beyond visitor awareness but also helps management decisions on improving marine management. In Malaysia, Ching *et al.* (1999) conducted a training program on reef care to improve the awareness of dive operators about reef conservation and benefits to MB. The program occurred in several phases, whereby divers were trained on how to understand and communicate effectively to visitors the main conservation goals. Another program that has shown an auspicious contribution to marine awareness conservation is the "Projeto TAMAR-IBAMA" (Marcovaldi *et al.*, 1999); it was initiated in 1980 to investigate and implement the conservation of sea turtles. The success of the program is based on local participation of the fishing villages, including the employment of former egg poachers to patrol the beaches and protect the nests, initiating education programs, and implementing ecotourism. Other programs that have been initiated to improve conservation awareness include the Menai Bay Conservation area program of Zanzibar (Tanzania). This program was established by the World Wildlife Fund (WWF) to address the growing problem of illegal fishing in the area. The primary aim of the program is to sustain the biological resources of Menai Bay through the establishment of a multi-user marine conservation area. It was also aimed at ensuring local participation in the conservation and monitoring of the protected area and to increase public awareness and education, as well (Levine, 2004).

6. Conclusions

We provided an overview of the conservation and sustainable use awareness among the visitors and tour operators of marine parks (MPs). The benefits, marine biodiversity, and programs designed for the conservation and sustainable use of MPs were also presented in detail. Review of the pertaining literature showed that the benefits of MPs are numerous, ranging from the management of the marine protected areas (MPAs) to the protection or conservation of natural resources and biodiversity, such as fisheries. Hence, organizations and government agencies managing the MPs/MPAs encourage and support scientists with the mandate to carry out research particularly on the protection and

management of such areas. Scrutinized studies also revealed that loss of marine biodiversity (MB) in coastal ecosystems could also hamper fish supplies, nursery habitats, filtering and detoxification processes provided by suspension feeders, submerged vegetation, and wetlands. The ecosystem-based services afforded by MB conservation necessitate the establishment of MPs. Therefore, the primary role of MPs is to properly manage and conserve MBs, which ultimately protect susceptible or endangered species and their habitats. Other benefits of MPs to MB include protecting the long-term health of the marine environment by conserving and safeguarding marine life, such as fish, plants, and various animals. Scientific literature shows that the conservation of MBs can be accomplished via the adoption of objective zonation, provision of solid waste and sewage disposal facilities, promoting alternatives, and limiting visitors' use of MPs. Hence, numerous conservation programs have been proposed over the years to ensure the preservation and sustainable use of MPs. Overall, the review of the literature showed that the provision of education, awareness and outreach programs to local communities and visitors in MPs could provide the successful conservation of MB.

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