The Role of Education for Sustainable Development in Maltese Marine Protected Areas: A Qualitative Study

Mark C. Mifsud and Marielle Verret

Abstract

The marine environment plays a crucial role in sustaining life on Earth as well as supporting human well-being. An array of ecosystem services are obtained from the marine environment and efforts have been taken to safeguard these invaluable services, namely through the institution of Marine Protected Areas (MPAs). The success of MPAs depends heavily on social factors, and therefore Education for Sustainable Development (ESD) can play a vital role in supporting MPAs by fostering related environmental knowledge, attitudes and values among local communities. This study explored the perceptions of key stakeholders in Malta with regards to the current state of play surrounding MPAs and ESD as well as its future direction. The research methodology had qualitative underpinnings and included 12 extended semi-structured interviews with key stakeholders. The study found that there is a lack of ESD addressing the marine environment in Malta but that stakeholders perceive ESD as being of critical importance in achieving effective MPAs. The research indicates that cooperation between stakeholders is the preferred approach to managing the MPAs. Based on the research findings, it is recommended that ESD surrounding the marine environment be further promoted within Malta through various means in order to promote MPA success and increase the engagement of local communities in marine conservation efforts. A contextualized Education

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Centered Management (ECM) model that illustrates the various connections and influences that lead to an effective MPA is proposed.

Keywords
Marine protected areas · Education for sustainable development · Qualitative framework · Stakeholder perceptions · MPA management

1 Introduction

The oceans cover about 70 % of our planet (Bollmann et al. 2010) and marine ecosystem services play a vital role in sustaining human wellbeing (UNEP 2006). However, it is clear that anthropogenic activity has severely altered marine biodiversity impeding its ability to provide these marine ecosystem services (Worm et al. 2006). In addressing the loss of marine biodiversity, spatial tools such as MPAs have been used increasingly throughout the world and MPAs are now generally regarded as an essential tool for marine conservation (Cullis-Suzuki and Pauly 2010).

Acknowledging the interconnectedness that exists between the world's population and oceans (Behnam 2013), there is evidence that social factors determine an MPA's success (Leisher et al. 2012). The International Union for the Conservation of Nature (IUCN) Guidelines for MPAs emphasize the need to gain the public's support through education and to generate a sense of ownership, which along with community involvement should serve as the main management tools (Kelleher 1999). The guidelines also suggest that educational efforts are important as they can result in the reduction of MPA enforcement costs (Kelleher 1999). Regarding the Cairns section of the Great Barrier Marine Park, Marine Park, Alder (1996) found that education programs were less expensive than enforcement, and also resulted in a wider community impact. Furthermore, a study by Thomassin et al. (2010) on Reunion Island stated that if local communities are accepting of an MPA, then the MPA managers can focus more on conservation activities instead of those related to enforcement.

The Mediterranean Sea is an important site for conservation as it is a hotspot for marine biodiversity (e.g. Coll et al. 2010; Mangos and Claudot 2013), and is characterized by high rates of endemism as well as habitat diversity (e.g. Abdulla et al. 2009; Coll et al. 2010; Portman et al. 2013). However, emerging threats such as overfishing, habitat loss, pollution, invasive species, climate change, as well as their interaction, are resulting in the loss of marine biodiversity in the Mediterranean (e.g. Coll et al. 2010; Lejeusne et al. 2010). A study undertaken by Coll et al. (2012) looked at areas of concern for marine biodiversity in the Mediterranean Sea and compared them to the locations of existing MPAs. The authors found that no more than 2 % of the Mediterranean's areas of concern for marine biodiversity are currently protected under an MPA, indicating a lack of representative coverage for existing MPAs in the same basin.

1.1 Marine ESD and Higher Education

The integration of sustainable development within higher-education institutions has increased in these last years. Such efforts include highlighting sustainability as a key theme within teaching, learning and research policies; increasing course content addressing sustainability; promoting initiatives encouraging sustainable energy and waste practices among students and teachers Nonetheless, evidence of efforts to include sustainable development related to the marine environment within European universities appears to be limited. These efforts include processes such as those by Chalmers University of Technology in Sweden that included "Marine and Maritime" as one of five knowledge clusters in a strategy implemented to achieve change for sustainable development (Holmberg et al. 2012), and the Nautical Faculty of Barcelona at the Universitat Politècnica de Catalunya that integrated sustainable development within all curricula (Castells et al. 2011).

2 Background to the Study

With regard to the local situation, the Maltese islands have a landmass of 316 km^2 (Government of Malta 2002) in total and a population of about 421,364 (National Statistics Office 2013). Therefore, Malta is densely populated and as it is an island with a large coastline when compared to its area, the marine environment is a central component of the local environment.

2.1 Marine ESD in Malta

In Malta, the ESD movement began in the 1960s and was lead by various NGOs (Pace 2002; Mifsud 2010). However, several challenges have undermined the prosperity of EE among the Maltese islands, namely: the competitive educational system; the non-committal policy of the Maltese government; and the prevalent colonial mentality (Mifsud 2010). Regarding the colonial mentality's influence, Mayo et al. (2008) state that it has led people to narrow their view to that of 'my home' as opposed to 'my environment'. Pace (1997) and Mifsud (2012) have both pointed to the need for increased involvement of the Maltese public within decision-making processes.

In 2007, the 32nd Pacem in Maribus conference was held in Malta to commemorate the 40th anniversary of Arvid Pardo's speech to the United Nations regarding the oceans as the Common Heritage of Mankind. The conference's outcome document, the Malta Declaration, called for intensified education efforts surrounding sustainable ocean governance, especially for women and youth. In examining Malta's National Curriculum Framework (NCF) (2012), Education for Sustainable Development (ESD) features as one of the learning areas for junior and secondary students. Though there is no explicit reference to the marine

environment, the learning area's description states that the learner's environment should be "locally relevant and culturally sensitive" (MEDE 2012, p. 56).

Pace (2002) discussed the situation regarding ESD surrounding marine resources in Malta. The author identified important lacunas, including the lack of marine educational experiences for children. In addition, Pace (2002, p. 4) stated that although ESD does feature within Maltese schools, "very little attention is given to the local marine environment". Despite this lacuna, the author did acknowledge the existence of post secondary programs related to the marine aspect. Interestingly, Pace (2002) suggests that the lack of inclusion of Malta's marine environment within ESD can be attributed to the country's reliance on British teaching materials. Again, influences from the colonial mentality appear to still be in existence today.

2.2 MPAs in Malta

Mangos et al. (2010) found that Malta benefits from the Mediterranean's marine ecosystems at a value of 83 million Euros per year. Currently in Malta, there are five designated MPAs: Grigal ta' Malta, Filfla, Rdum Majjiesa, Mgarr ix-Xini and Dwejra, collectively extending over an estimated 180 km^2, or 5 % of Malta's territorial waters (Fig. 1).

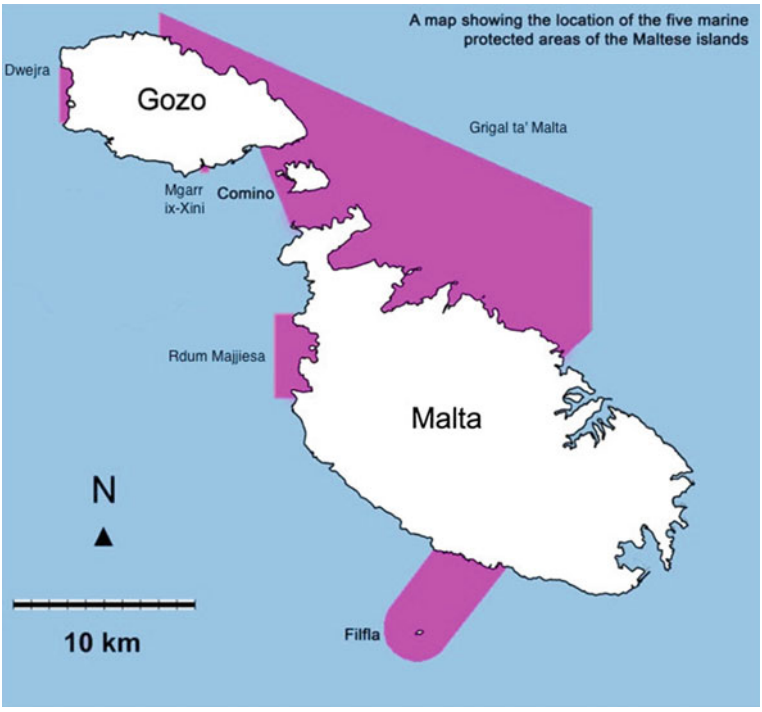

Fig. 1 Map depicting the location of Malta's 5 MPAs

Although management plans have already been drafted or are currently being drafted for all five Maltese MPAs, none have been implemented yet (Verret 2014). In examining the already drafted management and action plans for Malta's MPAs, some provisions have been made for education. However, Deidun (2011, p. 8) states that there has been a "complete lack" of EE initiatives associated with Malta's MPAs. In Malta, the designated MPAs have been designed to represent 80 % of Malta's *Posidonia oceanica* meadows (MEPA 2010). This seagrass species is endemic to the Mediterranean and is particularly important in supporting marine biodiversity since it is an ecosystem engineer (e.g. Michel et al. 2011; Personnic et al. 2014). Among its functions, the seagrass meadows provide important fish habitat (Kalogirou et al. 2010), promote water quality and act as a carbon sink (Pergent et al. 2012).

3 Methods

This study adopted the mixed-methods approach as the research methodology, combining the collection of both quantitative and qualitative data. A questionnaire targeting the Maltese public was developed to collect quantitative data, while semi-structured interviews were carried out with key stakeholders for the qualitative data collection. For the purposes of this paper, only the qualitative portion of the research will be considered. The stakeholders to be interviewed were identified based on a literature review of ESD in Malta and by a review of the existing management and action plans for Malta's MPAs. These include an action plan for Dwerja as well as management plans for Filfla and Rdum Majjiesa (Verret 2014). The literature review of ESD in Malta allowed for the identification of key stakeholders involved in the delivery and management of ESD initiatives on the island (Fig. 2).

The semi-structured interviews were conducted face-to-face and included thirteen questions. In total, twelve interviews were undertaken and included within the study. Two of the twelve stakeholders interviewed submitted their responses via e-mail since they were unable to meet in person. The interview questions were developed to address four main themes:

- Marine Education for Sustainable Development
- Marine Protected Areas in Malta
- Stakeholder Involvement in the Management of MPAs
- Implementation of Malta's MPAs

The verbatim transcriptions were subsequently analyzed in two phases: an individual question analysis followed by an overall thematic analysis. The first phase of analysis allowed comparisons to be made between the answers from different stakeholders to each individual question, identifying patterns based on key words. The overall thematic analysis was conducted afterwards and entailed coding the responses from the different stakeholders under umbrellas of different themes. This process included responses across all questions, as opposed to being limited to the individual question. Employing both analyses ensured that the main findings

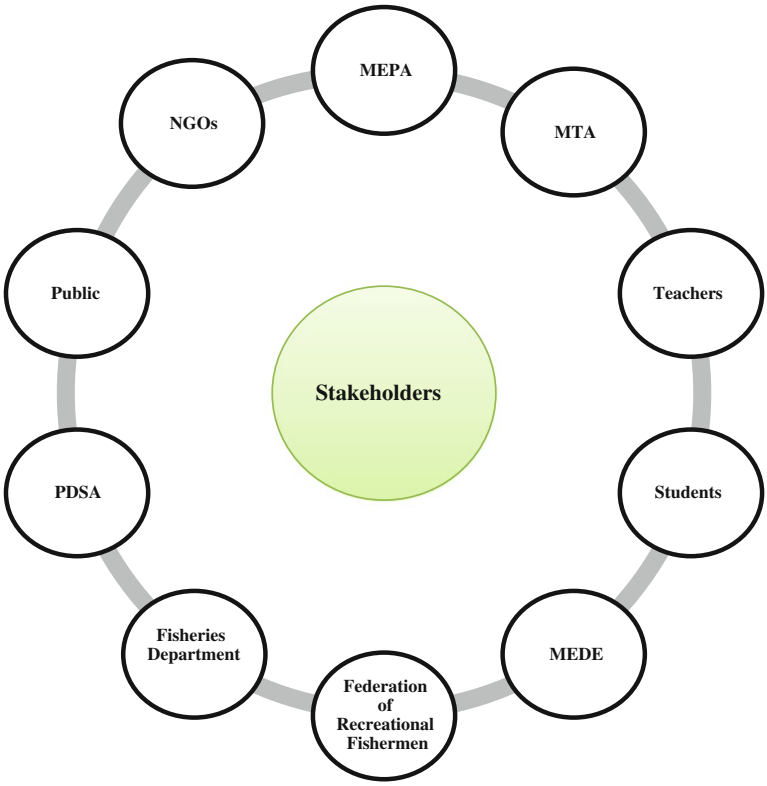

Fig. 2 Stakeholders selected for the interviews

from the transcriptions were identified without excluding segments of data. The observations selected for inclusion within the context of this paper represent those that demonstrate the strongest identified themes across all interviewed stakeholders. The observations are presented under three overarching findings and are preceded by a short description speaking to the specific quotations.

The undertaken research included a number of limitations. First of all, the authors hoped to include an interview with an economic operator from Gozo to further represent this island within the study, however it was not possible to contact an appropriate representative within the allocated timeframe. Secondly, the interviews were conducted in English due to the researcher being a non-Maltese speaker, limiting the expression of stakeholders to English only. Lastly, this study represents a qualitative baseline study on the topic of ESD and MPAs in Malta, therefore stakeholders were encouraged to discuss issues in a general manner as opposed to being prompted to discuss specific issues in a more detailed fashion. The authors were conscious of these limitations from the beginning of the study and therefore the interview procedures and the wording used were continuously analysed in order to minimise these limitations as much as possible.

4 The Findings

This is the only study employing interviews to investigate specifically the relationship between ESD and MPAs in Malta. All stakeholders were asked the same set of questions and a variety of views surfaced surrounding different issues related to marine ESD and MPAs in Malta.

4.1 The Need for Marine ESD

Stakeholders pointed to a lack of ESD surrounding the marine environment in Malta and suggested that more attention is currently being paid to the terrestrial environment:

> …come to think of it, land protected areas, yes we do hear about Natura 2000 sties, but when it comes to marine ecosystems we're not really exposed to that information. [Science Teacher].

> Environmental Education and Malta's marine environment, it started but what we have been consolidating so far is Environmental Education that is more related to land issues. [Nature Trust Malta].

> Perhaps in current education, environmental education programs, it [marine environment] is not a highlight. [Ministry for Education and Employment].

Stakeholders made it clear that though marine ESD in Malta is lacking, they perceive it as highly important:

> …proper marine education, since we are a nation surrounded by sea, should be at the top of our bloody list. [Professional Diving School Association].

> I think it [link between EE and marine conservation] needs to be strengthened. But given that Malta is an island, it is of great importance. [Ministry for Education and Employment].

> to seek to conserve and establish measures without either educating in parallel or without having an educated audience, the conservation would likely to be a failure. [Malta Environment & Planning Authority].

Though interviewees identified the lack of marine ESD in Malta, they recognized the potential benefits associated with it. The interviewees appeared to believe that marine ESD could lead to increased appreciation and in turn, conservation of Malta's marine environment:

> Education can help people love the environment and eventually they will care for it more. [Malta Tourism Authority].

> …if we educate students about the marine environment, about the environment in general, land or marine, they're obviously the future generation which are going to care for the environment, which are going to conserve the environment. [Science Teacher].

> So yes I do believe that education, it starts from early years education to create appreciation. Because once it is almost instilled in you, at a young age, then it becomes something automatic to safeguard the marine environment and the terrestrial environment. [Undergraduate Student from the University of Malta].

The fact that ESD can support marine conservation efforts seems to be understood among stakeholders but they also recognize the need for it to be reinforced in order to for there to be benefits to Malta's population and marine environment.

4.2 The Relationship Between MPA Enforcement and ESD

The issue of enforcement also came to light during the interviewees' responses. Stakeholders appeared to appreciate the importance of enforcement surrounding Malta's MPAs but also identified the existing lack of it:

> There's a vague idea of what they have in mind but there's no management and no enforcement. On any of the 5 MPAs in Malta. [Federation of Recreational Fishermen].

> I know that there are 5 MPAs in Malta and I recently discovered that they are 5 Natura 2000s and they are part of the Natura 2000 network. However, there are no conservation measures yet so basically for now they are just on paper. [Fisheries Department].

> No regulations, nobody enforcing, I mean why create it in the first place. [Professional Diving School Association].

Furthermore, the link between enforcement and education was highlighted. The interviewees made it clear that they value both education and enforcement, and it would be ineffective to address one without addressing the other.

> I also believe that if regulations were introduced, then that would give the protection of the MPA a good push start and the education can compliment this. There would also need to be enforcement which is an area that Malta lacks. [Nature Trust].

> …we need to get enforcement going in some way. You need to get an educational campaign going at the same time because you cannot enforce without education, they go hand in hand. [Professional Diving School Association].

With regards to reasons for the lack of implementation and enforcement of Malta's MPAs, stakeholders identified the lack of political support and resources as the main reasons:

> I mean, because if you create a certain awareness, then the politician has to take some sort of action about it. [Interview with a postgraduate student from the University of Malta].

> Resources, this is important resources. [Malta Environment and Planning Authority].

> So these are so intensive as a project, of such a large magnitude that you need the resources, the human resources, the financial resources, to implement, to start doing these collection of data for example. [Interview with an ESD representative from Nature Trust].

4.3 Collaborative Approach to Management of Malta's MPAs

All respondents identified that stakeholders should work cooperatively in the management of Malta's MPAs, suggesting that this would heighten their success:

> …when entities or representatives from different entities are working independently, from various experiences, I think there is a lot of fragmentation of the concept and overlapping. And in that way, there is needless energy, human resources, they're not being used effectively. While if cooperatively I think we manage the issue or the situation better. [Ministry for Education and Employment].

> It's cooperation that gives results otherwise there will always be stakeholders that loggerheads with each other. [Nature Trust Malta].

> If you don't involve all stakeholders and if you go and impose a ready- made policy onto stakeholders, I think that would be a recipe for disaster. [Postgraduate Student from the University of Malta].

Additionally, practical ways to promote stakeholder involvement were suggested by multiple stakeholders:

> …I think that they should be involved as much within a central committee there should be a body for example a committee that is consulted on a regular basis and then the committee takes decisions, may not necessarily involve the stakeholders but consultation and the serious consideration of this and the outcome of such consultation is considered. [Malta's Environment and Planning Authority].

> But as I said, like it needs to be genuine individuals or organizations coming together. So, it could be like a board or something, specifically to take care of this kind of issue. [Member of the Public].

> However, sometimes you need to see which stakeholders you have and maybe also do meetings individually. [Fisheries Department].

Stakeholders did identify some existing conflicts between the various organizations and so establishing a cooperative approach to management could aid in bridging these conflicts:

> We do have some conflicts with the commercial fishermen and we do also have conflicts with the diving society. [Interview with a representative from the Federation of Recreational Fishermen].

> I think there is quite a conflict of interest from all stakeholders. As in everything else. [Interview with an undergraduate student from the University of Malta].

The Malta Environment & Planning Authority (MEPA) is entrusted with the authority to designate, manage and enforce Malta's MPAs. Stakeholders appeared aware that MEPA is the authority responsible for the designation and management of MPAs. However, some interviewees suggested a lack of trust in the organization, questioning its ability to effectively manage Malta's MPAs:

> MEPA, when it comes to other issues, I don't really trust… Because MEPA is quite bureaucratic and there's a lot of, some people, in my opinion they're a bit of mafias… [Member of the Public].

> So they are not there at this stage, they said that at an eventual stage they will do something but I'm sure that they [MEPA] won't do anything. [Professional Diving School Association].

5 Discussion

As demonstrated by the findings, stakeholders in Malta recognize the lack of ESD surrounding the marine environment, validating what was found during the literature review (i.e. Pace 2002). Though stakeholders strongly value marine ESD, they also highlighted the need to address issues of implementation and enforcement surrounding the local MPAs. Since collaboration was identified as the preferred approach to managing Malta's MPAs, it is hoped that stakeholders can work together towards promoting marine ESD as part of their activities. A set of eight recommendations (see Box 1) to strengthen the relationship between ESD and MPAs in Malta is offered based on analysis of literature and the findings of this study. These recommendations were constructed to address existing gaps and build on identified opportunities in order to foster a sense of ownership among the Maltese public by encouraging their involvement in MPA management. It is proposed that the actions embedded within the recommendations be undertaken by a host of relevant stakeholders in Malta, including the Malta Planning and Environment Authority (MEPA); local schools; the Centre for Environmental Education and Research (CEER); the Ministry for Education and Employment (MEDE); local communities as well as other stakeholders.

In terms of areas for future research, it would be interesting to conduct similar interviews with stakeholders once an or all MPAs in Malta are implemented. The findings of such a study could shed light on the effectiveness of implemented MPA management mechanisms and assess whether marine ESD is being sufficiently integrated within Malta. As one of the first studies examining specifically marine ESD in Malta, it is essential that further research be conducted to evaluate the country's progress as it related to this field and to provide updated recommendations for positive change. For an island state like Malta, marine ESD could provide many benefits to both the country's human population and marine resources, heightening its sustainability as we move into the future.

Box 1: Recommendations to strengthen relationship between ESD and MPAs in Malta

Recommendations to strengthen relationship between ESD and MPA's:

1. Expand the scope of current ESD programs in Malta to include the marine environment, a central component of the local environment. This process is expected to be more efficient than creating new ESD programs targeting specifically the marine environment.

2. Establish a mechanism allowing stakeholders to work cooperatively towards the management of Malta's MPAs since cooperation was identified as the preferred management approach during the interviews.
3. Address issues of implementation and enforcement surrounding Malta's MPAs. Stakeholders emphasized the need to establish MPA rules and regulations before being able to seriously discuss associated ESD initiatives.
4. Create partnerships between different entities in Malta to promote and deliver ESD related to MPAs. The combined levels of knowledge, experience and resources from a variety of organizations could facilitate the delivery of ESD programs.
5. Increase collaboration between the University of Malta and MPA managers to meet data collection requirements for the MPAs. Students could participate in data collection for baseline studies and monitoring, which could present financial as well as educational benefits.
6. Promote information about Malta's marine environment to the public using media platforms, such as local television networks.
7. Explicitly include the marine environment under the National Curriculum Framework (NCF)'s ESD learning area. Currently, the NCF contains ESD as a learning area for junior and secondary students but does not mention the marine environment.
8. Utilise Malta's identity and heritage as an island nation as a basis for marine ESD. This could foster an increased sense of ownership and responsibility towards the marine environment among the Maltese public.

6 Conclusion

To conclude, this study found that key stakeholders in Malta recognize the need for increased ESD efforts related to the marine environment; that enforcement and education surrounding MPAs cannot exist in silo from one another; and that a collaborative approach to the management of MPAs is preferred. This baseline study identified essential issues that need to be addressed in order to improve the relationship between ESD and MPAs in Malta. The qualitative methodology employed to uncover these findings may be applied in other countries following careful contextualization. Identification of local key stakeholders in other countries may help build a regional database that may be helpful to governance networks and delivery mechanisms related to education and marine conservation. Further research should be conducted to enhance the identified observations through comparative studies and assess changes that unfold in future scenarios.

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