

Perceptions of Gozitan people about Marine Protected Areas- a Quantitative Study

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Abstract: Marine Protected Areas (MPAs) serve to protect marine and coastal ecosystems and processes. An effective management plan is crucial for these objectives to be reached and various principles and methods are necessary including education, outreach and awareness building. Due to the limited scope of research on MPAs in Gozo, this study was constructed in order to shed light on the knowledge and values Gozitan people have on MPAs and how education can enact change that leads towards increased social responsibility. Two Gozitan areas with a MPA in their locality (Xaghra and San Lawrenz) and a locality without a MPA (Victoria) were identified as being ideal for this study. A mixed method approach was adopted for this study and entailed the collection of data from qualitative and quantitative aspects. This paper will focus on the quantitative part of the research that consisted of extended questionnaires distributed in the three localities. The analysis of the quantitative data was carried out through SPSS and included descriptive analysis for each question followed by inferential statistics. The study shows that there is lack of knowledge with regards to MPAs and that the value associated with them is mainly ecological. Moreover, results show that there is a general demand for more education and awareness on MPAs. In response to these findings, a model is presented that visually illustrates the links discovered through this research. A number of possible activities involving different stakeholders who could contribute towards incorporating ESD principles in marine education and in fostering social responsibility are presented through a list of recommendations.

Keywords: Marine Protected Areas, Quantitative Research, Ecosystem Services, Social Responsibility, Education for Sustainable Development.

1. INTRODUCTION

The Mediterranean is one of the priority eco-regions in the world. It covers 0.82% of the ocean surface and is home to 17000 identified marine species. It hosts up to 18% of the global marine biodiversity and boasts of important endemism. It is also known for the reproduction of various pelagic species amongst which the Atlantic Bluefin tuna, the great white shark, sea turtles and other mammal fauna (Gabrié et al., 2012, p. 99).

Moreover, while the Mediterranean's shallow coastal waters protect the key species and sensitive ecosystems like the seagrass beds and corallogeneous assemblages, the deep waters are home to a unique and fragile fauna. In fact, IUCN considers the latter species as threatened or endangered (Gabrié et al., 2012) due to land artificialisation, over exploitation of resources, the proliferation of introduced non-native species, the human impact and even climate change (Mangos et al 2010; MedPAN, UNEP/MAP & RAC/SPA, 2016).

However, the risks linked to biodiversity loss are not only ecological but also moral, sociocultural and economic. In fact, the Millennium Ecosystem Assessment (2005) associates biodiversity with 'the ongoing provider of ecosystem services and the well-being of the individuals who enjoy them'. From the economic side, it was calculated that Mediterranean riparian countries gain around 26128 million Euro per year from the marine ecosystems (Mangos et al., 2010, p. 9).

MPAs in Malta:

The first Marine Protected Area declared under the Environment Protection Act in Malta dates back to 2005 and covers the area between *Rdum Mejjiesa* and *Ras ir-Raħeb* in Malta. This area forms part of the EU Natura 2000 Network of Protected Areas. Two years later, the area in the limits of *Dwejra*, Gozo was recognised too for its richness in biodiversity (MEPA (a)).

In the year 2010, four areas were officially given protection and declared as MPAs. These include: the stretch area in the North East of the islands, *Mgarr ix-Xini*, *Dwejra* and the area from *Għar Lapsi* to the island of *Filfla*. MEPA (2010) says that the designation of such areas is of utmost importance also to ensure that future generations can enjoy the benefits of such marine environments. Collectively Maltese MPAs cover 191km² (Gabrié et al, 2012) that is 5% of Malta's territorial waters (Mifsud & Verret, 2015).

All five MPAs carry the label of 'Special area of conservation of international importance'. The area around *Filfla* is considered as a National Park (Category II) by IUCN with the objective of protecting the natural biodiversity along with its underlying structure, supporting environmental processes and promoting education and recreation. All other sites, including the area from *Għar Lapsi* till *Filfla* are listed with the Category IV - habitat/species management areas. The objective of these areas focuses on the maintenance, conservation and restoration of habitats and species (Gabrié et al., 2012, p.194).

Malta's MPAs are primarily protected due to the *Posidonia oceanica* beds which are endemic for the Mediterranean and constitute an important marine autotrophic ecosystem (Borg et al., 2005). According to Nature Trust (2015), this Neptune's grass in the Maltese waters is in a rather good state though some of the species inhibiting it, including the *Pina nobilis*, are currently under threat.

Malta benefits from the Mediterranean Sea's marine ecosystem services and gains approximately 83 million Euro per year. Such benefits derive from fisheries, renting sources for recreational support, benefits related to climate regulations like CO₂ absorption, protection against erosion and waste treatments (Mangos et al., 2010, 21).

In the MPAs concerning this study, mainly the sites of *Dwejra* and *Ramla*, there are not any people employed specifically for the MPAs. There are the cleaners who are in charge of cleaning the area and the public convenience in the vicinity. These are workers employed by either the government through the Public Cleansing Department or else employed by the respective Local Council (N. Formosa, personal communication, March 7, 2018). However, one finds hawkers in the areas that sell food and beverages or rent deck-chairs and umbrellas. These self-employed citizens get the necessary permits from the Health Authorities and the Trade Licencing Unit to operate (Commerce Department, 2018).

Both sites are popular with locals and tourists alike and are among the most highly frequented areas in the Maltese Islands. Unfortunately, statistics show only the number of tourists visiting the areas and data concerning locals is non-existent. In 2015, the number of inbound visitors in Malta amounted to 1,807,269 with an expenditure of €1,643,944. The main expenses incurred were related to food and beverages (57.1%), followed by recreation including excursions and site visits (10.8%). Other statistics show that the majority of tourists visit the islands for the sun (26.8%), sun and culture (18.9%) and diving (6.3%). With regards to the most popular cultural activities, there is sightseeing (83.4%) and the most favoured outdoor sport is swimming (42.2%) (Malta Tourism Authority, 2016 (a)).

Another study indicates that in 2016, out of 1,196,630 tourists that visited Gozo, only 190,600 resided on the island for one night or more. However, it also proved that 50.8% of the tourists were returning after a day tour or a cruise trip visit (Malta Tourism Authority, 2016 (b)). This same report shows that the majority visit Victoria (94%) while 69.4% visited San Lawrenz and the Azure Window and 66.1% visited *Ramla*.

Nevertheless, designation on its own or retrieving the economic benefits are not sufficient. Management of such MPAs is of utmost importance and it is the duty of individuals to safeguard such unique natural environment (MEPA, (b)). But in order to safeguard such heritage, the locals need to know about its value, importance and necessity and it is also the duty of the authorities, to educate. Figure 1 illustrates the locations of the Maltese MPA's.



Figure 1: The five Marine Protected Areas in Malta

When the last MPAs were launched in 2010, Environment Protection Officer Cousin explained that the areas will ‘enjoy high degree of environment protection’. However, he continued that activities happening or being planned in such areas will not be prohibited though permissions need to be granted. Assessments need to be carried out prior to certain events due to possible negative impacts on the biodiversity of the sites (MEPA, 2010; MEPA (b)).

Management of MPAs in Malta:

The first Action Plan for Dwejra dates back to 2005 and was prepared by MEPA, NTM and WWF Italia. This plan covers both the terrestrial and marine areas. (Dwejra Action Plan, 2005). In 2006, a Draft Management and Monitoring Report was issued for the island of Filfla and was based on scientific data (MEPA, 2006).

Moreover, with a co-financing of 1.3 million euro from EU Agricultural Fund for Rural Development, ERA launched the ‘Natura 2000 Management Planning for Malta and Gozo’ in December 2016. This established management plans and provides legal provisions for almost all the Natura 2000 sites across the islands. Conservation orders were considered for smaller sites. With regards to MPAs Management Plans, there is an ongoing consultation process that terminated in May 2017 (ERA, 2017).

However, as evident in modern literature on MPAs management, the new direction leads towards ecosystem-based Marine Spatial Planning. This ‘term’ appeared in 2006 by the EU Commission Green Paper that acknowledged MSP as a ‘key instrument in managing the growing and increasingly competitive marine economy while at the same time safeguarding biodiversity’ (Deidun et al., 2011). Indirectly, the concept of MSP was introduced in Agenda 21, Chapter 17, that talks specifically on integrated management and sustainable development of coastal zones including economic zones and involvement of local stakeholders in the management (UN Sustainable Development, 1992).

Education and MPA’s:

Undoubtedly, education is an essential component in managing MPAs. The main conservation organisations like the WWF, CI and TNC invest in education and outreach activities in and around MPAs with the aim to provide knowledge and consequently change attitudes and behaviour (Gabri   et al., 2012).

Leisher et al. (2012) carried out one of the first studies to assess the efficacy of using education and outreach activities to improve community knowledge and attitudes about MPAs. Their results showed that people who lacked knowledge about conservations were the primary beneficiaries. Moreover, the youths were more receptive to conservation and absorbed provided information more quickly. Youths are an important stakeholder in acquiring knowledge (Jonsson, 2005). Driskell (2002) considers education for youths as a ‘wise long-term investment to sustain conservation efforts’.

2. METHODOLOGY

For this study, a mixed-method approach was taken however, this paper will focus on the quantitative data of this research. In fact questionnaires were administered. Based on the traditional view of mixed methods, interviews may be combined to questionnaires to triangulate or validate findings in a way that they may mutually corroborate (Bryman, 2008, p. 608). However, Fielding's (2012) concept of further analysing the data for a 'wider' image was taken into consideration.

The following research questions were constructed to provide answers to existing lacunae:

- What knowledge do Gozitans presently have on Marine Protected areas?
- Which values are attributed to the specific MPAs in Gozo?
- How can education be the means to enact change and transform the present behaviour into a sound environmental knowledge and awareness?

The research design of this study originated in March 2016 and included a pilot study for both the quantitative and qualitative research. This served to what Teijlingen & Hundley (2001) call a 'trial run'. It was done in preparation for the major study and was considered instrumental for checking about failures, ambiguities or complications. The researcher approached ten participants for the questionnaire and one interviewee for the pilot study. The questions were easily understood and consequently the original format was retained.

The questionnaires were carried prior the interviews and consisted of a 'self-administered questionnaire', as classified by Bryman (2008, p. 216), that requires the respondents to answers the questions themselves. It was prepared in English and Maltese language and administered to residents in Xaghra, San Lawrenz and Victoria. These included Maltese citizens and foreign residents in the mentioned localities.

It consisted of 10 questions and an allocated space for any possible comments. The first part focused on the socio-demographic data: Gender, Age, Locality, Nationality and Occupation. The second part dealt with awareness whereas the third part was based on values and opinions. The final part was left for participants' comments.

Sampling Strategy:

For the data collection, Gozitans from two MPA zones and from a non-MPA zone were approached. The selected zones can be viewed in Figure 2. This was done with the intention of perceiving the awareness, values and even opinions of participants' with the possibility of comparing the results. The participants chosen were from the localities of Xaghra that lies on top of the largest north-eastern stretch of MPA in Malta; from San Lawrenz, that incorporates Dwejra and is found in the western coast of Gozo and Victoria, the main town of the island that confines with other villages and not with beaches.



Figure 2: Map of Gozo showing the three localities involved in this study

The population in the three localities adds up to 10824 (NSO. 2015). Victoria has the largest population in the island with 6229, followed by Xaghra with 3968 and San Lawrenz with a population of 627. A visual representation of the population of the three localities of the study is illustrated in Figure 3.

Population:

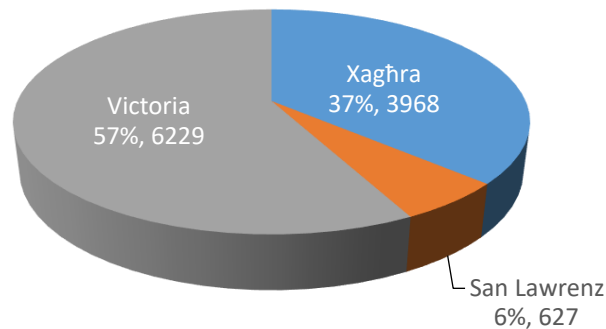


Figure 3: The population of the three localities of the study

The sample size was statistically calculated at 371 to ensure a confidence interval of 5 and a confidence level of 95%. The researcher managed to get 375 replies.

Probability Sampling was employed because, apart from being the most important procedure in social survey research, it allows generalisation of findings and gives the possibility to anyone from the population to be chosen to participate (Bryman, 2008, p.

168, 171). When it came to the distribution of questionnaires, the Stratified Random Sampling was adapted. The participants were randomly selected from each locality and from different age groups and gender.

The questionnaires were designed in an electronic format. The researcher used the Google Forms which resulted as a useful tool for both the researcher and the participants. Google Forms are free of charge, user-friendly and provide a wide range of question types. They allow an unlimited number of participants and entries are collected in an Excel Spreadsheet that provides instant analysis both quantifiable and in graphs or charts. This was providential in supervising the entries. The researcher could notice which groups were missing for compilation.

The distribution of the electronic formats of the questionnaire was done by email or through online chats provided by the social media providers. Participants were encouraged to forward the link of the questionnaire to acquaintances from their localities or from the other participating localities.

Limitations of the Study:

Although every possible avenue of reducing limitations was explored and the research design tried to limit the weaknesses, limitations can still be identified. A limitation could be related to the online survey research that has both benefits and drawbacks. Online questionnaires are effective for gathering information quickly, are relatively inexpensive and can be distributed to geographically dispersed participants. However, this method is not suitable for all types of research (Sue & Ritter, 2012, p. 12) and not even relevant for the whole population. Moreover, as previously envisaged, 107 participants, mainly those 50+ were contacted in person or through acquaintances and were given a printed version of the questionnaire to fill in at their convenience. The reasons vary – some were computer illiterate or did not have access to internet while others preferred hard copies.

3. RESULTS

This study tried to compare participants residing in localities with MPAs sites (Xaghra and San Lawrenz) with those living in a non MPA site (Victoria). On the whole, replies were quite similar and the interest in the topic was generated among all participants. This may be due to the fact that they associate the sites with the island's heritage and identity.

All quantitative data gathered was analysed using SPSS. The questions were classified under two categories: knowledge and values and opinion.

Descriptive Statistics:**Knowledge**

The majority of Gozitans have heard of the term 'MPA' though the majority found it hard to name one. The following table shows the replies given to the question asking for the number of MPAs in Malta. Only 3.5% (13 participants) gave a correct reply. The results of this question are illustrated in Figure 4.

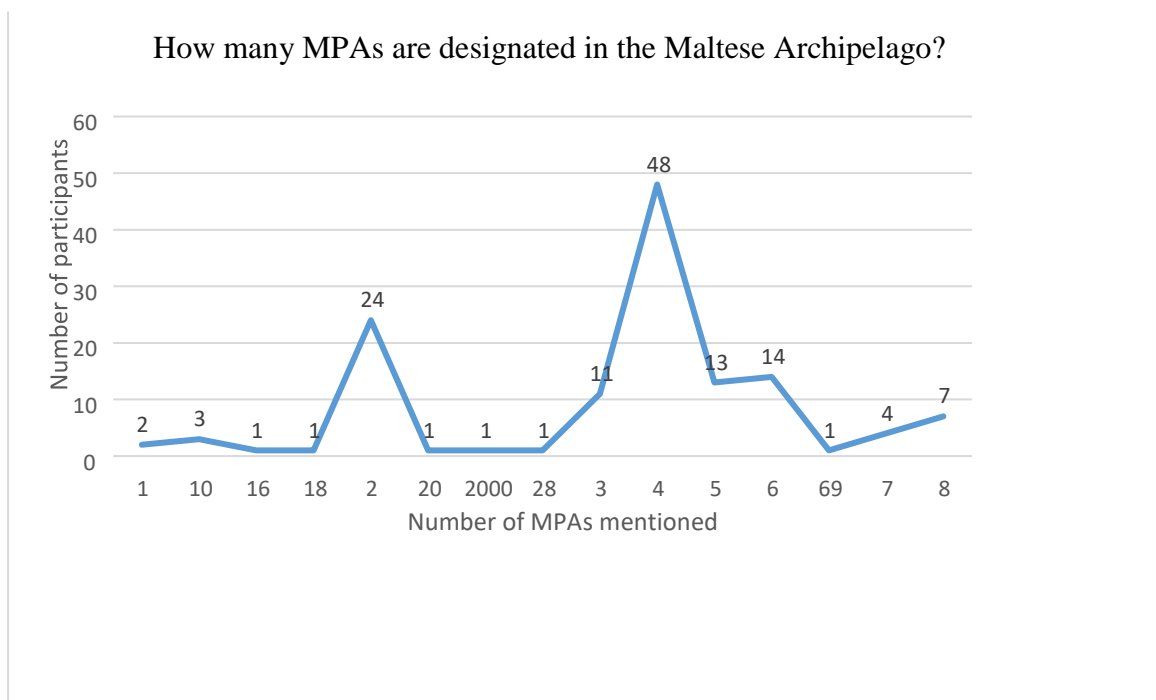


Figure 4: Participants' replies to question (7)

With regards to the characteristics of the MPA, only 40.5% replied that *Posidonia Oceanica* is the most important. This result marked third following the top places occupied by fish and other marine creatures (75%) and historical/natural environment (44.5%).

Dwejra resulted the most popular and known MPA site with the Gozitans. In a study carried out by Verret & Mifsud (2015) Filla resulted the most popular. However this could be due to the fact that replies of previous study on MPAs derived mainly from residents in Malta.

Values & Opinion:

The majority appreciate that MPAs cater for biodiversity, for the seagrass meadows and that they are important for both the locals and foreigners. They showed also the need for further information through schools and awareness campaigns.

Interesting is the result of participants who want to be involved in the Management Plans and in favour of keeping alive certain customs and traditions related to MPAs. However, lack of connection with the economic activities related to MPAs was seen. It was also evident that people do not know what it entails to have these MPAs.

Inferential Statistics:

The inferential statistics looked at the association between the socio-demographic indicators (locality, gender, age, nationality and occupation) with the other questions in the questionnaire.

Table 1 summarises the socio-demographic factors that were associated with the number of significant results from Kruskal Wallis Tests. Age proved to be the socio-demographic factor with the highest number of significant results.

Table 1: number of significant results obtained per socio-demographic factor

Socio-Demographic Factor	Number of Significant Results
Gender	1
Age	8
Locality	5
Nationality	3
Occupation	5
Total	22

Knowledge:

Gender resulted to be the least significant since only one correlation is valid that considers the Local Council as a source of information ($p=0.016$).

Age was the most significant ($p=0.025$, $p=0.002$, $p=0.008$, $p=0.00$, $p=0.032$) and the valid answers were all related to source of information. Results indicate that participants, irrespective of their age, still consider sources of information as important. The sources include: television, radio and social media.

Location resulted to be linked with the Local Councils, Interpretation Centres and popular site with swimmers ($p=0.00$, $p=0.001$, $p=0.019$). This indicates that locals still believe in the Offices within their locality as sources of information.

Even nationality was significant when compared with the Local Councils and Tourist Offices as source of information ($p=0.04$, $p=0.019$). The researchers think that majority still rely on fact-to-face communication rather than online sources. With regard to occupation, only two significant results were obtained One concerns the information sources ($p=0.02$) and the other related to the characteristics of MPAs ($p=0.002$). This may indicate that those who have a full time job are more likely to get information through the media rather than by going around offices.

Values and Opinion:

Age resulted significantly related to three statements that mentioned schools, educational campaigns and the locals' involvement in the MPAs management ($p=0.002$, $p=0.00$, $p=0.003$). This indicates the need for more awareness and involvement.

Location was significant to two statements: the locals' involvement and the prohibition of swimming, fishing, sports and cultural activities in MPAs ($p=0.008$, $p=0.016$). This indicates that a sense of ownership or else of pride exists though one needs to see up to what extent!

With regards to nationality, the only valid correlation is linked to the statement in favour of keeping alive past customs, traditions and legend ($p=0.018$). This shows that a value for matters that give identity still prevails.

There is also a correlation between the statements concerning biodiversity, schools and educational campaigns in relation to occupation ($p=0.045$, $p=0.002$, $p=0.012$)

The results can be grouped into three main areas that lead the in the establishing of recommendations for future research.

1. The results show that there is a general need and eagerness for awareness of MPAs though participants from San Lawrenz were the most knowledgeable on the subject. On the other hand, participants from Xaghra were the most knowledgeable with regards to the characteristics of MPAs.
2. From the comments received, it seems that participants retain various perspective which do not necessarily coincide with reality.
3. Youths were the less knowledgeable on the topic. This was also evident in the qualitative part. However what is worse, according to the researcher, is the fact that they found it difficult to give an opinion. The problem may be more deeply rooted and may be linked with their thinking process. They seemed unable to express themselves and this is undoubtedly against ESD principles that bring to the forefront communication, discussions and fora.
4. The main value given to MPAs was that ecological.

Results in the qualitative and quantitative analysis were similar and in fact the qualitative helped to further strengthen the results obtained from the quantitative.

4. RECOMMENDATIONS

Table 2 presents a set of six recommendations brought forward from this study. Though the recommendations are classified in three sections – knowledge, value and education – they are all interconnected. Consequently, Figure 5 provides a list of possible initiatives and ‘expert bodies’ that should be involved in order to create consciousness and responsibility.

Table 2: The Recommendations

Knowledge	1. More information provided by authorities that currently are in charge of MPAs.
Value	2. Effective management that puts at the forefront the ecosystem services. 3. A green economy that safeguards, exalts the natural heritage and provides job opportunities. 4. Appreciation of the cultural value.
Education	5. Strengthening of ESD principles and practices. 6. Education and awareness campaigns on MPAs.

<p>Recommendations:</p> <ul style="list-style-type: none"> i. Communication Strategy (ERA, UoM, CEER) ii. Marine education in schools (MEDE, CEER) iii. Marine Biology Courses in Gozo (UoM, Gozo Campus) iv. Outreach and on site activities (ERA, Local Councils) v. Underwater documentaries in prime-time hours on TV (UoM, diving companies) vi. Religion lessons linked to the marine environment (Church Authorities, MEDE) vii. Courses for people in authority like politicians, policy-makers and journalists (ERA, UoM) viii. Investment in Interpretation Centres and proper signage (Local Councils, ERA) ix. Nutrition and cooking sessions linked to the MPAs (Local Councils, NGOs, Institute of Tourism Studies, Health Promotion Unit) x. More wrecks or underwater museums to attract divers (Diving Schools, Local Councils, Art Funds) xi. More resources or guidelines for teachers, youth leaders, Private Sector on including ESD in teaching, at work or at leisure (UoM, CEER, MEDE)
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Figure 5: Possible initiatives

5. CONCLUSION

This research gives a clear picture of the present awareness and perceptions of MPAs and marine education in Gozo. To safeguard MPAs and their ecosystem services, action needs to be taken before it might become too late. The study also shows that the global vision of Gozitan people towards Education for Sustainable Development needs to improve.

From a personal point of view, this study provided an enriching experience particularly during meetings with different individuals during the interviews. It helped also the researcher to appreciate more the marine environment and encouraged her to work more in the field of ESD.

It is hoped also that this study serves as a starting point for appropriate and necessary actions to enact change towards protection, appreciation and above all, sustainable use and enjoyment of the marine natural heritage.

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