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LIFE BaHAR for N2K (LIFE12 NAT/MT/000845)

Action A8- Livelihood Analysis and

Guidance Document





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1. Background to the Study

This study was conducted in fulfilment of LIFE BaHAR Action A8 deliverables. LIFE BaHAR is a project funded by LIFE+ titled "Benthic Habitat Research for marine Natura 2000 site designation" (LIFE BaHAR for N2K, LIFE12 NAT/MT/000845), and is co-financed by the EU LIFE+ Funding Programme (LIFE + Nature) and project beneficiaries (the Environment and Resource Authority (ERA), Ministry for the Environment, Sustainable Development Climate Change (MESDC), Fundacion Oceana, and the Department of Biology of the University of Malta) together with Department of Fisheries and Aquaculture, the partner responsible for carrying out this study.

The main objectives of this Action was:

to implement one of the many actions of the LIFE BaHAR for N2K project by adopting a participatory approach to the implementation and management of the newly designated marine proposed Sites of Community Interest (pSCIs) through the conduction and delivery of a Livelihood Analysis assessment.

Further objectives included:

- Meeting/interacting with the relevant stakeholders in order to involve them and adopt a participatory approach to the eventual implementation and management of the marine pSCIs;
- Identifying conflicts within the identified pSCIs;
- Analysis of the potential of different approaches to ensuring fulfilment of strategic ecosystem conservation objectives (the development of the conservation objectives is outside the scope of this contract; and shall be carried out by the project partners in parallel with the implementation of this contract);
- Analysing alternative practices, and where applicable, alternative livelihoods.

This report draws on in-depth interviews with a number of stakeholders and specifically on potential impacts of marine protected areas on their livelihoods. It was prepared in parallel with semi-structured interviews/meetings (discussion following a structured list of questions whilst allowing the conversation to flow) and presentations with stakeholders and includes the synoptic analysis and outcomes of the meetings/interviews, together with a desk study on current management practices in Marine Protected Areas (MPAs) through a number of case studies and a list of recommendations. This report therefore focuses on:

- Relevant management practices.
- Case studies (mainly from the Mediterranean region).
- Concrete recommendations of best practice in approaches to be taken in order to adapt participatory attitude in implementation and management of eventual designated sites.
- Recommendation on fair procedures (negotiations) to reach agreement with stakeholder to take alternative livelihood (if required).
- Recommendations on alternative livelihoods

The best practice recommendations put forward in this report are purely hypothetical and scripted for discussion purposes between authorities and stakeholders.

The process of deciding which best practices would be of greatest overall environmental benefit and whose implementation is considered feasible in the local context will take place post project and in consultation with the stakeholders.

2. Introduction

2.1 Introduction to livelihoods and MPA management

Livelihoods are usually defined as:

"...the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household" (Allison E., Ellis F., 2001).

A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain its capabilities and assets both now and in the future, while not undermining the natural resource base (Chambers and Conway, 1991).

The term 'livelihoods', can have different meanings ranging from 'enhanced' livelihoods, to 'complimentary' livelihoods, or 'alternative' livelihoods in a continuous spectrum depending on the actual amount and type of change occurring in the livelihood of the economic stakeholder.

Enhanced Livelihoods

Primarily focus on adding value to ongoing traditional or historical activities through improved management. This implies, keeping current livelihoods alongside effective management practices.

Complimentary Livelihoods

A diversification strategy that includes elements of adopting "supplemental" strategies (making current practices more sustainable). This strategy is less risky than alternative livelihoods.

Alternative Livelihoods

Change in livelihood and enhanced management. Usually the least desirable option of the three. When changes in livelihood strategies are required, they should draw on and respect people's interests and capacities.

Adapted from Pomeroy, 2013

Marine protected areas (MPAs) are a widely used tool for marine conservation. In coastal areas, it has become clear that the success of MPAs requires a combination of effective management and conservation frameworks. Furthermore, sustainability also requires the maintenance of livelihoods, and a governance system that allows for effective participation of coastal communities, fishing people, and other users when designing and implementing MPAs (Charles & Westlund, 2016).

MPAs are an important management tool that can help local livelihoods, depending on how they are developed, designed, and implemented. It is not unusual for economic stakeholders to resist the establishment or expansion of MPAs. This may happen because economic stakeholders may fear a reduction in their livelihood and a decrease in their ability for access to the marine environment as a resource. The establishment of MPAs may therefore result in conflicts between economic stakeholders and state agencies. For example, conflicts may arise between fishers and the tourism sector. This could take place when when the objectives and programmes of an MPA favour tourism at the expense of other sectors (Canari, 2005).

Research generally points towards the effective importance of incorporating stakeholders in meaningful participation for effective marine conservation planning and management (Pomeroy, & Douvere, 2008; Voyer, Gladstone, & Goodall, 2012). Some researchers state MPAs are more likely to meet their biological and social goals if the human dimensions are integrated into the MPA design and evaluation process (Pollnac *et al.*, 2010). MPA management strategies that find the "middle-ground" between government-led and community-based approaches may be most effective (Jones, 2002; Westlund, 2016).

More difficult to implement and succeed in achieving MPA objectives \rightarrow					
Enhanced livelihood	Complimentary livelihood	Alternative livelihood			
 respects stakeholders and their way of life – more probability of achieving MPA objectives 					

Adapted from Pomeroy (2013)

2.2 The Context – Economic operators

Economic operators are those whose livelihoods are stongly dependant on the marine environment. These include fisheries and dive centres, which are the two main sectors, as well as smaller sectors such as water sport centers, maritime schools and boat trip operators.

Non economic operators are entities that, although they have an interest, are not economically dependent on the marine environment, and includes NGOs, recreational clubs and organisations, as well as regulatory entities. The economic and non economic operators surveyed by this study are found in Table 8 of this report.

This section will provide a brief overview of the main economic operators, to provide context for the interviews and livelihood analysis undertaken.

2.2.1 Fisheries

Maltese fisheries represent a typically Mediterranean artisanal type. They are not species selective and are frequently described as multi-species and multi-gear fisheries (polyvalent). This means that fishers switch from one gear to another several times throughout the year (FAO, 2005). The social and cultural importance of the Maltese fishing industry far outweighs its economic contribution, which is equivalent to about 0.1 percent of the national Gross Domestic Product (FAO, 2005).

The most active fishing ports in the Maltese islands are located in the Southwest area with more than 1047 boats registered. The most common size of boats utilised are boats up to 5 metres in length or from 5-10 metres in length. The main fishing port in Malta is Marsaxlokk Harbour in the southeast of the island, while the most important fishing port on the island of Gozo is Mgarr Harbour, where over 70% of the island's fleet berth.

		Size class: Metres			
	Total	<5	5 - <10	10 - <15	≥15
Maltese Islands	2,943	1,306	1,493	93	51
Malta	2,499	1,087	1,288	75	49
Valletta Area	536	189	315	14	18
Southwest Area	1,047	326	640	50	31
West Area	273	218	55	0	0
North Northeast Area	643	354	278	11	0
Gozo and Comino	444	219	205	18	2

Table 1: Fishing Vessels by Length and port of berth

Source: National Statistics Office (2016)

There are four fishers' cooperatives in Malta and all professional fishers are affiliated to one of them. *Ghaqda Koperattiva tas-Sajd Ltd.*, *Koperattiva Nazzjonali tas-Sajd*, Marsaxlokk Artisinal Fisheries and the Fish Trawler Owners Association offer various services between them to all professional (full-time and part-time fishers), including fish purchasing and sales (including exports and imports); supply of ice, fishing tackle and other inputs; cold storage facilities; insurance coverage, and facilities for packing and processing of fish.

		Size Class: Metres			
	Total	<5	5 - <10	10 - <15	≥15
Maltese Islands	2,943	1,306	1,493	93	51
MFA	399	49	239	61	50
MFB	617	198	411	8	0
MFC	1,927	1,059	843	24	1
Malta	2,499	1,087	1,288	75	49
MFA	319	35	186	50	48
MFB	480	134	340	6	0
MFC	1,700	918	762	19	1
Gozo and Comino	444	219	205	18	2
MFA	80	14	53	11	2
MFB	137	64	71	2	0
MFC	227	141	81	5	0
Source: National Statistics Office (2016).					
Notes: 1. MFA stands for Professional Fishing Vessels - Full-time. 2. MFB stands for Professional Fishing Vessels - Part-time. 3. MFC stands for Non-Commercial Fishing Vessels i.e. Recreational					

 Table 2: Registered Fishers by Registration Type and Boat Size

In the stakeholder analysis, representatives from all four separate committees of the fishers' cooperatives were interviewed:

Name of co-operative	Registered members	Notes
The Għaqda Koperattiva tas-Sajd	represents more than 200 registered members.	(100 are MFA, 100MFB)
Marsaxlokk Artisinal Fisheries	represents approximately 20 members	(10 MFA, 10MFB)
The Koperattiva Nazzjonali tas- Sajd	represents approximately 400 members	(300 MFA, 100 MFB)
Fishing Trawlers owners association	11 trawlers registered	Some trawlers registered with the other cooperatives as well

The total number of registered MFAs and MFBs in Malta is 399 and 617 respectively (NSO, 2016). Therefore there are 1016 commercial fishing registrations. The interviewed cooperatives include a minimum of (200 + 20 + 400). The interviewed fishers therefore represent a minimum of 620 commercial fishing registrations. This represents a minimum reach of 60% of commercial MFAs and MFBs registrations.

The total number of registered Trawlers in Malta is 17 (NSO, 2016). The Fishing Trawlers Owners Association represent 11 registered trawlers. (There are also other registered trawlers in the other two main associations). This represents a minimum reach of 65% of commercial trawler operations.

			Size class	: Metres	
	Total	<5	5 - <10	10 - <15	≥15
Trawlers	17	0	0	0	17
MPV (Multi purpose vessel)	1,333	330	890	80	33
Other fishing vessels	1,593	976	603	13	1
Luzzu	279	36	232	11	0
Kajjik	924	670	254	0	0
Firilla	21	5	16	0	0
Bimbu	40	3	37	0	0
Other	329	262	64	2	1
Total	2,943	1,306	1,493	93	51
			Source: N	National Statistics	Office (2016).

Table 3: Fishing vessels by length and type

The average Maltese fishing vessel is generally under 10 m, with the exception of the trawlers, which are in excess of 15 m. The traditional boats include the *luzzu* and *kajjik*, with the latter being more common. Multi-Purpose Vessels (MPVs) are a relatively recent addition to the fleet and generally have fibreglass hulls.

The total annual volume of fish landings has been decreasing throughout the last few years indicated by the latest NSO report. In fact total landings from the Maltese islands have decreased from 1303 tonnes in 2010 to 867 tonnes in 2014 (a decrease of 33.5%).

		Year				
	2010	2011	2012	2013	201 4	
Malta ¹	939	758	706	771	731	
Gozo and Comino	365	425	336	228	136	
Total	1,303	1,183	1,042	998	867	
Source: National Statistics Office (2016).						
1 Including landings of vessels ov	vned by persons residing in m	nainland Malta	and landings of	foreign-flagge	d vessels.	

Table 4: Annual volume (tonnes) of fish landings at the official market by region

The annual wholesale value ($\in 000$) of fish landings at the official market by region has also been decreasing throughout the last few years indicated by the latest NSO report. In fact the total wholesale value of fish landings in the Maltese islands have decreased from €6,531,000 euro in 2010 to €5,419,000 in 2014 (a decrease of 17.0%).

Table 5: Annual wholesale value (€000) of fish landings at the official market by region

	Year				
	2010	2011	2012	2013	2014
Malta ¹	5,528	5,268	5,275	5,048	4,634
Gozo and Comino	1,003	908	979	1,041	785
Total	6,531	6,175	6,253	6,089	5,419
Source: National Statistics Office (2016).					
¹ Including landings of vessels owned by persons residing in mainland Malta and landings of foreign-flagged vessels.					
	Source: Department of Fisheries and Aquaculture.				

The annual volume of fish landings in tonnes at the official market shows a general decrease in the amount of tonnes of fish landings(from 1303 tonnes in 2010 to 867 tonnes in 2014), with the most pronounced being Coryphaena hippurus (from 430 tonnes in 2010 to 173 tonnes in 2014).

Table 6: Annual volume (tonnes) of fish landings at the official market

	Year				
	2010	2011	2012	2013	2014
Blue fin tuna (<i>Thunus thynnus</i>)	131	81	121	80	79
Bogue (Boops boops)	13	23	21	17	18
Small-spotted catshark (Scyliorhinus caniculus)	26	27	38	25	26
Dorado (Coryphaena hippurus)	430	194	137	275	173
Stone bass (Polyprion americanum)	15	9	11	10	10
Swordfish (Xiphias gladius)	331	307	229	338	299
Other species	314	500	453	234	246
Total	1,303	1,183	1,042	998	867
			Sc	ource: National Stati	stics Office (2016)

The annual wholesale value of fish landings also show a general decrease (€6,531,000 to €5,419,000) but the decrease is not as extensive as indicated by the reduced tonnes of fish caught. This is mainly because of the increased price per kg of which slightly compensates for this decrease.

	Year				
	2010	2011	2012	2013	2014
Blue fin tuna (<i>Thunus thynnus</i>)	756	617	1,299	670	666
Bogue (Boops boops)	34	59	51	43	49
Small-spotted catshark (Scyliorhinus caniculus)	67	71	84	64	66
Dorado (Coryphaena hippurus)	1,049	851	842	1,101	924
Stone bass (Polyprion americanum)	719	743	487	322	221
Swordfish (Xiphias gladius)	119	93	101	90	85
Other species	2,382	2,133	1,723	2,313	1,925
Blue fin tuna (<i>Thunus</i> thynnus)	1,404	1,609	1,666	1,486	1,482
Total	6,531	6,175	6,253	6,089	5,419
			S	ource: National Stat	istics Office (2016).

Table 7: Annual wholesale value ($\notin 000$) of fish landings at the official market

2.2.2 Dive Centres

The Maltese Islands offer a wide choice of dive centres with a track record of some 30 years in the industry. Professional, qualified diving staff are trained to teach all levels, from beginners to instructor courses (MTA, 2017). Dive centres are located across the Islands. Most centres run courses leading to internationally-recognised diving qualifications. The most common are the Professional Association of Diving Instructors (PADI), the British Sub-Aqua Club (BSAC) and the Confederation Mondiale des Activites Subaquatiques (CMAS) (MTA, 2017).

The Professional Diving Schools Association (PDSA) was originally formed in 1982 in order to represent the interests of the diving community in Malta (PDSA, 2017). Its aim was to liaise with the Maltese government and its various departments, on all matters connected with scuba diving, presenting a common and coherent view point. The various members of the Association have a genuine concern for issues such as diver safety, diver education and the environment; all areas that require constant monitoring (PDSA, 2017). In a study carried out on PDSA members (n=29), it was found that the owners of the dive centres in Malta are mainly

Maltese (48%) or from the UK (28%). However there are owners from a variety of other European countries (EMCS, 2017).



Graph 1: Nationality of Dive Centre Owner

Source: EMCS (2017)





Source: EMCS (2017)

The majority of dive centres (28%) appear to have been in the business for over 20 years while 24% have been operating for less than 5 years (EMCS, 2017).





Source: EMCS (2017)

The industry employment figure increases by about 75% in the high season. Seasonal employment increases from 6% in the low season to about 25% in the high season. In the low season 43% of all those employed are full timers, while in the high season this decreases to 31% (EMCS, 2017).

Graph 4: Number of people employed - high season



Source: EMCS (2017)







A number of dive centres (14%) indicated to have taken in access of 2,500 individuals diving, while 48% of dive centres took less than 1,000 individuals diving. Most of the dives are shore dives (75%) (EMCS, 2017).

Graph 6: Nationality of clients at Dive Centres



Source: EMCS (2017)

Most clients at Dive centres come from the UK (29%), followed by Scandinavia (16%) and France (11%). It also appears that the German market has declined considerably over the years (EMCS, 2017).

Graph 7: Turnover



Source: EMCS (2017).

About 24% of Dive Centres had a turnover in excess of €200,000 in 2017, while another 24% indicated a turnover below €100,000) (EMCS, 2017).

2.2.3 Water Sports centres

This sector was consulted through the Water Sports Association which, as of mid 2018, is made up of twenty members. Most of the companies enlisted in this association have five to eight employees per company and most employ part timers during the summer months. One or two full timers remain employed during the winter months for maintenance purposes. The most active seasons are from March to November. Traditionally water sports includes canoe, banana rides, jet skis, paddle boats, parasailing, speed boat trips, self drive speedboats, day trip boats and chartering of sailing yachts and cabin cruisers. Blue Wave Watersports Centre and the Water Sport Association were interviewed in order to obtain data on this sector.

2.2.4 Maritime schools

Around 10 martime schools are currently operating in Malta, that give courses leading to the issue of nautical licenses. In order to obtain a nautical licence, theory and practical sessions are held with the trainee, in order to familiarise one with the rules regarding operating small vessels in the marine environment. Operations are carried out throughout the year, with the summer months being the busiest season of the year. Maritime Malta is a private school that through the Maritime Institute, has started carrying out courses on small ship regulation for the provision of nautical licences. This business currently employs one full time employee and three part time employees.

2.2.5 Boat trip operators

There are a number of companies that operate in the tourism and leisure sectors and offer boat trips around the islands. One such company from this sector that was interviewed was Hornblower cruises. This company is a local family run business which has been in operation since 1984. The business is run by 5 full time employees who operate the cruise vessel at sea. This enterprise currently owns one vessel which transports people from Bugibba to Comino and Gozo. Cruises are run between the end of March and the beginning of November.

3. Methodology

3.1 Methodology of the Stakeholder Interviews

The methodology for this study included extended interviews with a number of stakeholders employing constructivist/interpretivist approaches.

Having already considered the importance to use qualitative research, a number of interview questions were drafted and eventually approved from both the Department of Fisheries and Aquaculture (DFA) and the Environment and Resources Authority (ERA). A number of interviews took the structure of a focus group or group interview as more than one representative from the same association was present. A stakeholder list was forwarded by the DFA. The way interviews were set up ensured the following advantages:

- Allowed for more in-depth data collection and comprehensive understanding.
- Body language and facial expressions were more clearly identified and understood this also helps in selecting the 'verbatim' from the various stakeholders.
- The possibility of probing for detail.
- Visual aids like the MPA maps can be used to support the interview.
- Interview length is usually much longer since the participant has a greater commitment to participate.

The stakeholders were invited to a stakeholder meeting which was held at the Outlook Coop's premises during the end of January. During the stakeholder meeting, the LIFE BaHAR for N2K was discussed and the focus of the stakeholder interviews was introduced.

This led to the final interview structure which was devised as follows:

Interview structure:

- 1. Site selection was according to the wishes of the stakeholders. Most interviews were held at the stakeholder premises.
- 2. A general introduction of the people present was given.
- 3. A one to one interview usually involved the interviewer and interviewee sitting and facing each other while. When more than one person was present, they usually sat in a circle of chairs facing one another.
- 4. Questions were asked to the group in general.
- 5. The conversation was allowed to move on with a the minimum amount of intervention from the interviewer.
- 6. The interview was digitally recorded and transcribed by the interviewer.
- 7. The language used was Maltese or English, depending on the preferences of the participant. Most interviews were held in Maltese. English featured more prominently in the diver and NGO interviews.
- 8. Interview questions were sent (digitally) to the stakeholders at least three days prior to the actual meeting.

The stakeholders involved in this action are listed in the table below.

Economic Stakeholders	Non-economic Stakeholders
Fishing Trawlers Association	Armed Forces of Malta (AFM)
Ghaqda Kooperattiva tas sajd	Civil Protection Department
Koperatttiva Nazzjonali tas sajd	Continental Shelf Department
Marsaxlokk Artisanal Fishers	Police Environment Division, Administrative Law Enforcement
Adventure Diving Centre	Transport Malta
Malta Blue Diving Centre	Birdlife Malta
Orange Dive Systems	Din l-Art Helwa
Professional Diving School Association	Sharklab- Malta
Gnejna Water Sports	The GAIA Foundation
Blue Wave Watersports	Majjistral Park
Water Sports Association	Calypso Diving Club
Hornblower Cruises	Federation of Underwater Activities Malta
Maritime Training Malta	Ghaqda Sajjieda Dilettanti

 Table 8: List of stakeholders interviewed as part of action A8

An introduction was made by the researcher, introducing who he/she is, the research parameters and the participants' role. Permission was asked to digitally record (all accepted). The **interview question battery** was as follows:

- 1. What are the main activities that you carry out and involve the sea? (ice breaker). Can you please explain further? (probing question)
- 2. Can you please specify the main locations used and the seasonality of the activity (if any)?
- 3. Have these changed in any way through time? (probing question)
- 4. Is this activity your main income to sustain you and your family? Can you explain further please? (probing question)
- 5. Do you think it is important to safeguard the sea and its environment and achieve sustainable use? Why?
- 6. Have the previous Marine Protected Areas affected your livelihood in one way or another? Can you please explain further? (probing question).
- 7. These are the areas in which new MPA's are now being considered (Figures 1a and 1b Maps of survey areas containing sites of ecological potential refer) Do you think these will have any impact on your activity? (the maps that will be shown to the stakeholders are not proposed MPA boundaries, but are areas that may contain new MPAs. During the interviews this will need to be made clear to stakeholders).
- 8. During which month of the year will you be most affected? Which locations will affect you most?
- 9. Do you think your activities could be impacting the marine environment in any way?
- 10. Do you think your activities could be impacting the reefs and caves in any way?
- 11. Do you think it is possible to find an alternative to reduce the impact? Do you think that this can be done personally or through help by the authorities?
- 12. What types of alternatives do you suggest?
- 13. Do you have any suggestions on the new MPA's you would like to relay to the authorities?



Figure 1a - Map of inshore sites hosting areas of conservation potential [Source: LIFE BaHAR website – Presentation by Dr Knittweis-Mifsud at the LIFE BaHAR conference, September 2017]



Figure 1b - Map of offshore sites hosting areas of conservation potential [Source: LIFE BaHAR website – Presentationby Dr Knittweis-Mifsud at the LIFE BaHAR conference, September 2017]

The author acted as the moderator or interviewer in all interviews and tried to create a permissive and nurturing environment that encourages honest perceptions and points of view, without pressuring participants to vote, plan or reach consensus. The interviews were then transcribed in the original language and the verbatim used eventually translated into English. The scripts were then examined thematically.

3.2 Methodology of Desk Study

The purpose of the desk study is to give an overview of management practices in other MPAs. Further, it also broadly reviews best practices that aim to find a balance and ensure sustainability between conservation and livelihoods.

This review provides a case study analysis of MPA management both within and outside the Mediterranean, focusing on best practices. The focus has been on MPAs which have been established for an extended period of time such as Egadi (1991), Port Cros (1963), Cinque terre (1997) and Miramare (1973). This way a robust desk study can be carried out on tried and tested case studies which have been deemed successful in ensuring livelihood sustainability and achieving conservation targets. MPAs from outside the Mediterranean have also been included in order to allow comparison and particular attention has been given to studies that through their physical or human geography would be more relevant to the Maltese islands. The focus was on 'case studies' rather than a broad survey review as this was considered to more correctly align with the requirements of the tender dossier. This section provides a descriptive review of the practices in each MPA. Eventually these practices are combined with the findings from the stakeholder analysis, adapted to the Maltese context and presented in the recommendations section of the report.

The search utilised MPA portals of different countries in the Mediterranean, government funded studies, studies published in books and academic journals, thesis' and official documentation from a number of different entities including the following:

- International Council for the Exploration of the Sea
- International Union for the Conservation of Nature
- United Nations Environment Programme (UNEP)
- The Food and Agriculture Organization (FAO)
- The International Union for Conservation of Nature (IUCN)
- Monitoring Mediterranean Marine Protected Areas (MMMPA)
- Commission internationale pour l'exploration scientifique de la mer Méditerranée (CIESM)
- Mediterranean Protected Areas Network (MEDPAN)
- Adriatic Protected Areas Network(ADRIAPAN)
- Academic journals including:

- Aquatic Conservation: Marine and Freshwater Ecosystems
- o Journal of Marine Science and Marine Policy.

4.1 Mediterranean Case Studies

Case Study 1

Egadi Islands - MPA (Sicily)

The Italian Ministry of the Environment established the Egadi Islands Marine Protected Area on December 27, 1991. The area includes the islands of Favigana, Levanzo and Marettimo as well as the islets of Maraone and Formica. In 2010, the MPA regulations were officially approved by the Minister of the Environment. Egadi is the largest marine reserve in Europe, encompassing about 54,000 hectares or 208.5 square miles (National Ocean Service, 2017).



The Egadi MPA is divided into 4 zones with different degrees of protection:

- Zone A, Full Protection (no take fishing zones, yet swimming and guided dive tours permitted);
- **Zone B,** General Protection (fishing, sailing, bathing and guided dive tours permitted);
- Zone C, Partial Protection (with prior authorization, permits anchorage, bathing, diving, sport and small commercial fishing);
- Zone D, Partial Protection (with prior authorization, also permits trawl and seine fishing).

Synopsis of management practices:

Some of the management practices implemented in these MPAs include the following:

- 1. Local fishers practice artisanal fishing activities, which are considered quite sustainable. Local artisanal fishery (trammel nets, longlines, creels) is allowed in the B and C zones (97% of the MPA) (Donati, 2016).
- 2. External fisheries and industrial fishery (trawling, seiners) are not allowed in the MPA, and are restricted to the D zone (Donati, 2016).
- 3. The management approach followed is a bottom-up management where there is direct involvement of fishers (Donati, 2016).
- 4. The MPA created a label for the environmental certification of tourist services (accommodation, catering, rental of boats, cars and bikes, sightseeing tours, passenger sea and land transport, fish-tourism, diving, bathing facilities). About 70 operators have already obtained the label (Donati, 2016).



- 5. The creation of mooring areas all over the archipelago, for sailing boats up to 24 metres. More than 180 buoys to moor in safety, to prevent damage to the *Posidonia oceanica* seagrass and coral seabeds caused by anchors, ensuring the chance to moor in most of the bays.
- The placement of repopulating anti-trawling bollards, to reduce illegal coastal trawling, that can damage sea beds, destroy *Posidonia oceanica* seagrass and deplete fish stocks. Illegal trawling in the A zone is almost completely reduced.



- 7. The establishment of an ethics code of conduct for sustainable fisheries (Donati, 2016).
- 8. Other management practices that ensure the sustainability of the MPA and ensure stakeholder participation include the establishment of 9 mooring camps in the 3 islands, to prevent seabed damage caused by free anchoring, and also as a service for recreational boating; the identification and classification of 71 dive sites ; the creation of a visitors centre and environmental education projects with local schools; field work and conservation projects with environmental associations and research and students staged in collaboration with the University of Palermo (Donati, 2016).

Case Study 2

Port-Cros National Park (France)

Port-Cros National Park (French: Parc national de Port-Cros) is a French National Park established on the Mediterranean island of Port-Cros, east of Toulon. The National Park and the surrounding MPA (1288 ha) was established in 1963, with the aim of preserving the area's natural heritage, promote scientific research, educating the public, and serving as an example of conservation management and as a reference site. The park is one of the first national parks in Europe that united terrestrial and marine protection zones (National Parks of France, 2016).



The Port-Cros National Park has full direct management of the areas that are entrusted to it by the State and the Conservatory of the Coastline.

Synopsis of management practices:

The Port-Cros Marine Protected Area aims to achieve improvements in economic stakeholder livelihood whilst meeting conservation targets. This was sought to be achieved through partnership with artisanal and recreational fishers.

- 1. Artisanal fishing is allowed through the establishment of joint management by park authorities and artisanal and recreational fishers (Cadiou, 2009).
- 2. Trawling, and spear fishing have been banned (Cadiou, 2009).
- 3. The MPA has its own commercial fishing regulations in a fishing charter based on the fishers' guild rules. The charter represents an agreement between the fishers and MPA managers. Fishers have to sign the charter each year and abide by its rules in order to be authorized to fish inside the MPA (Cadiou, 2009).
- 4. Between 1990 and 2004, in incremental steps, recreational fishing has been almost completely phased-out (Cadiou, 2009).
- 5. Three main factors have been key to the regulation of the remaining recreational fishing:
 - a. A scientific awareness of the large catches taken by recreational fishing (Morales-Nin *et al.*, 2005);

- b. The incompatibility of recreational fishing with the image of a national park;
- c. The regulation of recreational fishing is understood to be a management tool to help make an increase in restrictions on artisanal fishing acceptable (Cadiou, 2009).
- 6. A zoning system that regulates or forbids certain fishing and recreational activities (Cadiou, 2009).



Case study 3:

Cinque Terre – MPA (Italy)

The Cinque Terre MPA was established with a decree of the Ministry of Environment of December 12th, 1997, and it includes the municipalities of Riomaggiore, Vernazza, Monterosso and a small part of Levanto. The establishment of the MPA is provided by two national laws: Regulations for the Safeguard of the Sea (no. 979 of December 31st, 1982) and Framework Law on Protected Areas (no. 394 of December 6th, 1991).



Synopsis of management practices:

The Cinque Terre MPA has achieved success through building trust and positive relations with stakeholders and effective outreach activities.

- 1. The Park has adopted means aimed at sharing its strategy for managing the environmental and cultural heritage of the territory with local stakeholders, such as:
 - a) The production of a Sustainability Report which contributes to making the activities of the Park transparent towards the resident community, building a relationship of trust and continuous dialogue with it.
 - b) Obtaining the European Charter for Sustainable Tourism (ECST), recognition in 2015. This is a methodological tool to improve the management of sustainable tourism in Protected Areas. The Charter is a formal collaboration between the public and private sectors, and includes a strategy that encoumpasses the environment, the population, local businesses and visitors (Parco Nazionale delle Cinque Terre, 2018).
- 3. A zonation system, which includes three zones from integral natural reserve to the general natural reserves in Punta Mesco and Capo Montenero. The zones are less restrictive on activities the further away one moves from the 'core' areas. Various activities are regulated

and this is clearly communicated to the general public through a variety of means including social media (Parco Nazionale delle Cinque Terre, 2018).



- 4. The establishment of a project of sustainable water tourism for disabled scuba divers and snorkels (an underwater trail, guided by a rope, on the seabed of the MPA). The trail, a circle design lying at a depth of 18 meters is easily accessible to every type of visitors, including disabled divers. The Park assists disabled scuba divers through a specialized tour with expert guides and with the support of underwater microphones and special masks (Parco Nazionale delle Cinque Terre, 2018).
- 5. An Environmental Education Center in the Cinque Terre National Park in Manarola, is dedicated to children and citizens to promote increased knowledge and awareness of the territory. The Centre also helps in the planning and implementation of awareness campaigns about the sustainable development and offers support to the government in promoting best practices for better management of the territory (Parco Nazionale delle Cinque Terre, 2018).
- 6. Obtaining certification of the environmental management system according to the requirements of the UNI EN ISO 14001, preparatory to the Eco-Management and Audit

Scheme (EMAS) registration (Parco Nazionale delle Cinque Terre, 2018).

- The setting up of an application form for each activity (both commercial and recreational) at the MPA. Any lawful activity requires an application form to be filed in. There are fees for most activities but commercial fishing in certain zones is fee exempt (Parco Nazionale delle Cinque Terre, 2018).
- 8. Resident recreational fishers must submit record books of their captures for the monitoring of the recreational fishing activity every year. Failure to submit these record books will result in their authorisation being revoked (Parco Nazionale delle Cinque Terre, 2018).

Case study 4

Miramare Marine Protected Area (Italy)

The Miramare MPA was created in 1973, and was established by a Ministry of the Environment decree in 1986, thus becoming the first marine park in Italy. The MPA consists of thirty hectares of sea, the reserve's three environments (tidal zone, reef zone and sandy/muddy floor) are home to a rich diversity of fauna and flora. Throughout the year, the World Wildlife Fund for Nature (WWF) managed visitor centre organizes guided tours, seawatching classes and many other activities to help raise awareness in adults and children (Adriapan, 2012).



Synopsis of management practices:

The Miramare MPA achieved sustainability through adequate legislation and regulations to protect the MPA with associated educational services. The rules focus on the enforcement of the MPA as a whole, but are not specific to its species and/or habitats. Other regulations apply for species/habitat protection both inside and outside the protected environment, whereby damage to a protected feature can result in tough penalties (Adriapan, 2012).

- 1. Clearly defined enforcement procedures consisting of:
 - a) 24/7 video surveillance of the stretch of sea encompassing the MPA, carried out by the Coast Guard;
 - b) A framework agreement and procedural schemes between the various authorities at sea, in order to have patrolling activities over extended areas, including a specific agreement with the Coast Guard to increase their presence in the MPA and its surroundings, especially in the summer;
 - c) For example, in the 2011 summer period (July to September) the Coast Guard patrolled the MPA for an average of 6-8 hours per day, for a total of at least 36 hours per week, plus a night and holiday service;
 - d) Over the remaining months surveillance activities continued on a regular basis though with a different schedule, given the smaller numbers of recreational and professional boats;
 - e) MPA staff are not allowed to carry out any enforcement activities, but their ongoing presence in the field gives the same results as patrolling activities, as any infringement is immediately reported to police, who are asked to intervene.

(Adriapan, 2012)

- 2. A two zone zoning system that regulates both commercial and recreational activities:
 - Zone A:

Transit and anchoring prohibited.

Swimming and the diving prohibited.

Professional and sport fishing or any form of taking prohibited.

Accessing beaches prohibited.

Removing underwater flora and fauna prohibited.

• Zone B:

Fishing is prohibited in any form with the exception of sports activities carried on from the land.





- 3. A Marine Environmental Education Centre has been set up to raise awareness inside the MPA. Its activities comprise school environmental education, tourist visits and training courses in the fields of biology, ecology and marine management (Adriapan, 2012).
- 4. The education services, which inform on best practices, are used by schoolchildren, people, snorkelers, scuba divers and other stakeholders (Adriapan, 2012)

Case study 5

Isola della Asinara (Sardinia)

Asinara is located at the north-western tip of Sardinia. It is a territory of 51.9 km² with a length of 17.4 km and a width which ranges from 290 m at Cala di Sgombro to 6.4 km of the northern part, as well as 110 kilometres of coast length. In 1997 Asinara was established as a National Park, and is now a nature reserve. Its natural beauty, unspoiled by the sparse human settlement, made it an ideal candidate for protection. In 2002, the offshore waters of the national park were zoned and designated as Italy's newest MPA, encompassing 79 km of coastline around the island and 110 km² of its coastal waters (Parco Nazionale dell'Asinara, 2018).



Synopsis of management practices:

The Isola della Asinara MPA aims to achieve sustainability through the following management measures:

- Since 1999, visiting Asinara Island is only possible through organized and guided tours (Parco Nazionale dell'Asinara, 2018).
- 2. Swimming is permitted only on three beaches; the docking of private boats is forbidden.
- 3. There is a zoning system on Asinara Island that restricts activity as follows:
 - a. The core of the protected area is identified as Zone A, the "integral reserve", and it is a "no-entry, no-take" zone, usually prohibiting access except for scientific research and prohibiting all removal and harvest of plants and animals (Parco Nazionale dell'Asinara, 2018).
 - b. Zone B, the "general reserve", surrounds Zone A to provide a buffer to human activities and for the ecological resources within the MPA. Generally in Zone B, human access is allowed but is limited for example by permits for boating and diving. Fishing is restricted to recreational fishing or, sometimes, permitted for local fishers only (Parco Nazionale dell'Asinara, 2018).
 - c. In Zone C, the "partial reserve", access is open to most general navigation.
 Fishing using trawling nets or spear fishing is prohibited (Parco Nazionale dell'Asinara, 2018).



Case Study 6

Pantelleria – a MPA in the making

The process through which local stakeholders and the authorities built up a community, with the active participation of citizens and stakeholders, is a study in community capacity building and resilience which can offer best practice processes to similar scenarios. This case study demonstrates the future of MPAs should involve the active participation of local communities through the recovery and preservation of sustainable practices pertaining to local traditions.

Management synopsis:

The management is focusing practices on Pantelleria to include the following:

An experimental participatory process, based on civil society, started in 2013. This process was designed as follows:

- Listening to the needs of the stakeholders of the sea fishers, diving centres, free divers, tourist operators and people of the island - who developed an idea of protection based on the needs of their sector/activity (Rampini, 2015).
- Creating the "Tutela Pantelleria" Work Group, including each sector's/activity's representatives, which developed a common proposal of protection to be submitted to the authorities.. The management process depends not only on its structure, but also on the ability of people to relate to each other and have a common perspective (Rampini, 2015).
- 3. The model adopted for Pantelleria is mainly aimed at creating a community of interest around the protection of a common resource that is the island's territory (Rampini, 2015).
- 4. At present, the group is focusing on traditions as a key element for an MPA that aims at safeguarding the environment and biodiversity. The Work Group aims at becoming a link between civil society and institutions using the proposal as the starting point of an open, participatory debate (Rampini, 2015).
- 5. Participatory processes are fundamental to rebuilding local identities through the protection of cultural and environmental heritage, strengthening confidence with institutions and developing a sustainable local economy (Rampini, 2015).

4.2 Synoptic Effective Management Practices in MPAs Around the World

No-take areas help fisheries on the Great Barrier Reef

The re-zoning of the Great Barrier Marine Park in 2004 increased No-Take-Zones (NTZs) from 4.6% to 33.3% of the total area.

The 5-year re-zoning process involved significant consultations with the public and key stakeholders, including recreational and commercial fishers. This minimized the opportunity costs to users, built on traditional knowledge, and thus ensured better implementation of, and compliance with, the re-zoning plan.

There was a positive contribution of NTZs to sustainable fisheries in the Great Barrier Reef through a positive effect on target fish species, fish fecundity and larval export (Wiegel, 2014).

Redesigning the zones of Karimunjawa National Park (Indonesia)

Re-designing the zoning plan of the Karimunjawa National Park MPA involved fishers and a broader array of stakeholder input, and initiating a rights-based management approach where

only local fishers have access to nominated species under a suite of management measures/conditions.

Today, both the design of the MPA and the management systems being implemented have the joint goals of ensuring biodiversity conservation alongside the promotion of sustainable fisheries productivity (BTNK, 2012).

Fishers and community members actively participate in managing these areas, undertaking joint patrols and implementing a unique hotline phone number for the communities.

Compliance with NTZs has increased by nearly 40% since 2010, and already local fishers are reporting up to 10% increases in the abundance of squaretail coral trout (*Plectropomus areolatus*) and camouflage grouper (*Epinephelus polyphekadion*) (BTNK, 2012).

Multi stakeholder participatory approach (Guinea-Bissau)

Collaboration first developed at the local level around consultative forums that brought together community stakeholders and decentralized authorities. The purpose was to allow key interest groups to reach a collective agreement relating to access rights and permitted fishing techniques. This agreement took the form of a comprehensive zoning scheme among five zones (Wiegel, 2014). This scheme accounts for the diversity of fishers and types of fishing that occur within these zones thanks to a participatory, decision-making process which was initiated in the Urok MPA (established in 2005), and which will be extended to other MPAs. Collaboration also developed at the institutional level where various entities share complimentary responsibilities for MPA management and enforcement (Wiegel, 2014).

Co-participatory management at 26 assessed Mediterranean MPAs

A joint project between park managers, researchers, and WWF recently looked at the key factors determining the successes or failures of artisanal fisheries management in coastal MPAs. For the 26 MPAs that have been assessed, preliminary results show that fisher engagement at each MPA site is the single most important attribute that leads to effective management that encompasses ecological, economical, and socio-cultural components (Di Franco *et* al., 2014).

A good management framework, together with ecological principles related to the MPA location, as well as good enforcement and compliance, is key to ensure that the MPA is functional and can deliver fisheries benefits within and beyond its borders. Well managed

MPAs show an increase or a stabilization of Catch Per Unit Effort (CPUE) over years (Di Franco *et* al., 2014).

5. Main findings

5.1 Findings of the stakeholder analysis - general findings from all stakeholders

- 1. All stakeholders are concerned about the importance of sustainability of the marine environment they understand the importance of rules to achieve this.
- 2. Spearfishing is an issue that has to be properly regulated and enforced It has been identified as a problem by both professional/recreational fishers and divers.
- 3. Perception is that enforcement measures and are lacking and that administrative law enforcement is understaffed and requires more resources.
- 4. Regulations are unclear or worse considered to be inexistent to most stakeholders¹.
- 5. Recreational fishers also appear to be perceived as problematic to the sustainability of the sea. The 'S' registration especially, as they appear to be fishing when they are not allowed to (S registration are those fishers who are registered as sports fishers).
- 6. There are communication and trust issues between some stakeholders (mainly the three fishing co-operatives and the PDSA) and the authorities.
- 7. There are communication and trust issues between some stakeholders (the three fishing co-operatives between themselves and the same three co-operatives and diver associations in general).
- 8. Bunkering is frequently mentioned as destructive to marine life permanent moorings mentioned as a mitigating measure.
- 9. All stakeholders want to be more involved in the decision making level not only at the consultee level.

5.2 Findings of the Stakeholder Analysis - Specific Findings from Economic Stakeholders

Synopsis of the main findings:

¹ It should be noted that MPA management measures have yet to be developed, and relevant regulations drafted.

- 1. Fishers cooperatives and associations are the main economic stakeholders that are of the opinion that new MPA's will have negative impact on their livelihood for both offshore and inshore areas, based on the possibility that management measures may introcuce prohibitons or limitations on current activities within certain zones.
- 2. Water sports centres and stakeholders have reported a possible minor negative impact arising from the inshore zone 2 (Figure 1a on page 18 refers), based on the possibility that management measures may introcuce prohibitons or limitations on current activities within certain zones.
- 3. Dive centres have reported a possible minor negative impact from inshore zone 1 (Figure 1a on page 18 refers), based on the possibility that management measures may introcuce prohibitons or limitations on current activities within certain zones.
- 4. Maritime schools, boat trip operators and water sports centres have predicted nearly no impact from both the inshore and offshore MPAs. But this also depends on the regulations which will be considered for implementation.
- 5. The activities carried out by stakeholders are mainly carried out between March and November of each year. Economic stakeholders do more maintenance and less activities at the sea during the winter months.
- 6. Most economic stakeholders are family run businesses and employ less than 10 employees each. In the case of fishers, a large number of fishers are a one-man business.
- 7. More than 50% of fishers in two associations, and more than 80% of fishers in the other association are full timers, with their main income being derived from fishing activities.
- 8. Trawlers are usually owned by Maltese Nationals but the people working on board, (as discussed by the relevant stakeholders) are usually non EU nationals.
- 9. Trawlers who trawl for fish will be affected less by the offshore zones than the ones that fish for king prawns.
- 10. The majority of dive centres employ less than 10 full-time employees. They may employ part-timers during the summer season.
- 11. Water sports centres usually employ around 5 full-timers with extra part-timers who are employed in summer. The full-timers are usually decreased in the winter season.
- 12. The majority of economic stakeholders want to have increased dialogue with the authorities and discuss the actual regulations on the eventual MPAs in order to be able to discuss possible alternatives.

5.3 Main findings from desk study analysis and case studies

Case studies illustrate that successes are often achieved through enhancing livelihoods rather than changing them. This mainly involves relatively minor changes in stakeholders' activities which can be achieved through increased participation, awareness, education and the setting up of a proper management framework that ensures regulation and enforcement. Awareness and education activities are also extended to other stakeholders not only economic ones. This benefits the economic stakeholders by decreasing issues of conflict and trust through discussion.

Fishery related findings from the Case Studies

- Local fishers allowed to practise artisanal fishing activities, (which are considered sustainable) (Donati, 2016).
- Recreational and industrial fishery (trawling, seiners) are not allowed in the MPA, or restricted to non-core zones (Donati, 2016).
- Establishment of the joint management of artisanal and recreational fishing in MPAs (Donati, 2016).
- Some case studies show that trawling, spear fishing and recreational fishing can be limited and sometimes completely banned (Cadiou, 2009).
- The MPA has its own commercial fishing regulations enshrined in a fishing charter based on the fishers' guild rules. The charter represents an agreement between the fishers and MPA managers. Fishers have to sign the charter each year and abide by its rules in order to be authorized to fish inside the MPA (Cadiou, 2009).
- The establishment of an ethics code of conduct for sustainable fisheries, or the adaption and implementation of one that already exits, such as the internatioally accepted UN-FAO 'Code of Conduct for Responsible Fisheries' (Donati, 2016).

Management

- The management approach followed is a bottom-up management with real involvement from fishers (Donati, 2016).
- Creation of a MPA label for the environmental certification of services (Donati, 2016).
- Creating a strategy for managing the environmental and cultural heritage of the territory with local stakeholders (Donati, 2016).

- The creation of permanent mooring areas to prevent damage to the sea beds (*Posidonia oceanica*, corals) caused by anchors (Donati, 2016).
- The placement of repopulating anti-trawling bollards, to reduce illegal coastal trawling (Donati, 2016).

Reports and Permits

- The production of a Sustainability Report which contributes to making the activities of the Park transparent towards the resident community, building a relationship of trust and permanent dialogue (Parco Nazionale delle Cinque Terre, 2018).
- Obtaining certification of the environmental management system according to the requirements of the UNI EN ISO 14001, preparatory to EMAS registration (Parco Nazionale delle Cinque Terre, 2018).
- The setting up of an application form for each activity (both commercial and recreational) at the MPA. Any lawful activity requires an application form to be filed in. There are fees for most activities but commercial fishing in certain zones is fee exempt (Parco Nazionale delle Cinque Terre, 2018).
- Resident recreational fishers must submit the record book of their captures for the monitoring of the recreational fishing activity monthly/quarterly/yearly), depending on the level of control required and man power available in the monitoring of new MPAs. If the fisher does not comply their licence will be cancelled (Parco Nazionale delle Cinque Terre, 2018).

Enforcement and Regulation

- 24/7 video surveillance of the stretch of sea encompassing the MPA, carried out by the Coast Guard (Adriapan, 2012).
- A framework agreement and procedural schemes between the various authorities at sea, in order to have patrolling activities over an extended area (Adriapan, 2012).
- A specific agreement with the Coast Guard to increase their presence in the MPA and its surroundings, especially in the summer (Adriapan, 2012).
- MPA staff is not allowed to carry out any enforcement activities, but their ongoing presence in the field gives similar results as patrolling activities, as any infringement is immediately reported to police, who are asked to intervene (Adriapan, 2012).

Education and Awareness

- A Marine Environmental Education Centre set up to raise awareness inside the protected area could be created. Its activities could comprise of school environmental education, tourist visits and training courses in the fields of biology, ecology and marine management (Adriapan, 2012).
- Teach stakeholders best practices, especially schoolchildren who will be the foundation of future initiatives (Adriapan, 2012).
- Environmental education projects with local schools to raise awareness in collaboration with stakeholders (Donati, 2016).

Participatory Methodology

- Listening to the needs of the "stakeholders" of the sea fishers, diving centres, free divers, tourist operators and people of the island who developed an idea of protection based on their own specific needs (Rampini, 2015).
- Creating a work group, including each category's representatives, which developed a common proposal of protection to be submitted to institutions. The human aspect is an integral part of MPA management. A process depends not only on its structure, but also on the ability of people to relate to each other and have a common perspective (Rampini, 2015).
- Participatory process is fundamental to rebuild local identities through the protection of traditions and environment, strengthen confidence with institutions and develop a sustainable local economy (Rampini, 2015).
- The establishment of sustainable projects that target various stakeholders to increase as sense of ownership and sustainable participation in encouraging blue economy initiatives through various incentives would be beneficial for future management. This would create opportunity for sustainable economic growth through marine activities, whilst encouraging stakeholders to participate further in the management and protection of local waters (Rampini, 2015).

5.4 Preliminary findings from the training courses carried out with stakeholders (14 different entities represented)

Training courses were carried out with stakeholders new MPAs. Part of the the training courses carried out consisted of putting forward to stakeholders a variety of situations that might arise as a result of the newly created MPAs. Stakeholders were asked to rate these management/conflict diminishing/alterantive livelihood options on a five point scale ranging from strongly disagree to strongly agree. This was done as a pilot study which assed the measures stakeholders would prefer to see implemented in new MPAs in view of their activity or livelihood being impacted, whilst taking into account long term sustainability priorities. This activity would also provide stakeholders with an idea of what measures might be implemented. These training courses were firstly carried out with all economic stakeholders who have a stake in the marine environment and then specific focus was given to economic operators, whos livelihoods would be influenced by the creation of new MPAs. These economic operators consisted of fishers and divers. Fishers interviewed consisted of the associations listed in section 2.2 and divers interviewed consisted of the PDSA. The results from these training courses are presented below;

Table 9:	Findings from	the training	course with	all stakeholders
Table 7.	r mungs n on	i me iranning '	course with	an stakenoluers

	Rating %				
Possible management/conflict diminishing/alternative livelihood option	Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
Increasing effective enforcement by building capacity and resources in the relevant government entities.				14	86
More efficient and clearer methods of informing stakeholders of existing legislation.				43	57
GPS coordinates of all MPAs with relevant information supplied to all stakeholders			7	14	78
Permanent ecological moorings placed in particular zones for various stakeholders.		7	14	21	57
Establishment of a zoning no take system that restricts certain activities in particular core areas of the MPAs.			14	14	64
Fishing gear to use biodegradable technologies to reduce ghost fishing.			42	14	43
Increase availability of grants and subsidies to fishers to diversify livelihood.		14	28	28	28
Creation of an MPA eco label (certification) awarded to economic stakeholders that clearly identifies operators that are sustainable operators in their particular activities.		7	35	35	21
Enabling complementary activities such as Pesca- tourism, which involves professional fishers welcoming a certain number of tourists on to their boats in a tourism-recreation activity to discover the world of fishing.	7	7	28	42	14
A closed fishing season in certain areas		7	7	14	71
Dedicated marine enforcement units covering both surface and underwater activities		7		21	71
Banning recreational fishing from certain areas in MPAs.	7		21	28	42

5.5 Preliminary findings from the Economic Specific Training sheets – Fishers

	Rating %				
Possible management/conflict diminishing/alternative livelihood option	Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
Increasing effective enforcement by building capacity and resources in the relevant government entities.			25	50	25
More efficient and clearer methods of informing stakeholders of existing legislation.				50	50
GPS coordinates of all MPAs with relevant information supplied to all stakeholders				25	75
Permanent ecological moorings placed in particular zones for various stakeholders.					100
Establishment of a zoning no take system that restricts certain activities in particular core areas of the MPAs.				50	50
Fishing gear to use biodegradable technologies to reduce ghost fishing.	25	25		50	
Increase availability of grants and subsidies to fishers to diversify livelihood.				25	75
Creation of an MPA eco label (certification) awarded to economic stakeholders that clearly identifies operators that are sustainable operators in their particular activities.		25		50	25
Enabling complementary activities such as Pesca- tourism				75	25
A closed fishing season in certain areas	25		25	25	25
Dedicated marine enforcement units covering both surface and underwater activities				75	25
Banning recreational fishing from certain areas in MPAs.				25	75
Help fishers catch and market different species			50	25	25
Establishment of zones within MPAs that restrict certain fishing activities			25	50	25

Table 10: Findings from the Economic Specific Training sheets – Fishers

5.6 Preliminary findings from the Economic Specific Training sheets – Divers (PDSA)

The possible management/conflict diminishing/alternative livelihood option put forward to PDSA consisted of the following:

• Increasing effective enforcement by building capacity and resources in the relevant government entities.

- More efficient and clearer methods of informing stakeholders of existing legislation.
- GPS coordinates of all MPAs with relevant information supplied to all stakeholders
- Permanent ecological moorings placed in particular zones for various stakeholders.
- Establishment of no-take zones to ban fishing from core areas of the MPAs.
- Creation of an MPA eco label (certification) awarded to economic stakeholders that clearly identifies operators that are sustainable operators in their particular activities.
- Dedicated marine enforcement units covering both surface and underwater activities
- Banning recreational fishing from certain areas in MPAs.
- Entry to particular caves restricted to certified divers only.
- Clear underwater signage indicating cave features and diver experience grade requirements.
- Clear travelling lines and potential environmental issues signage setup in particular caves.
- Control at sea boosted by volunteers.

The results obtained in the interview with divers indicated that they strongly agreed with all the proposed management/conflict diminishing/alternative livelihood options put forward. PDSA were the association that was worked with for training courses since they represent 29 dive schools, the largest Dive centre association in the Malta. The results show that PDSA believe that its members will not have their livelihoods impacted in a negative manner. On the contrary PDSA are seeing the implementation of new MPAs as a positive for their industry. This is most likely in foresight of an increase in focus on tourism related activities and improved conservation coastal and marine attributes, from which divers derive their livelihoods. In view of caves potentially being closed off, it is being foreseen that divers will be able to adapt by targeting different locations for diving, such as wrecks and other local coastal dive sites.

6. Recommendations

6.1 Recommendations on relevant management practices

The below presents a synopsis of successful management measures and participatory approaches during planning and implementation of MPAs based on analysis of multiple

methodologies, and the feedback received from economic stakeholders that participated in this project action. It should be noted that applicability and feasibility of any measures/practices in the local context will be considered post project, in consultation with stakeholders.

Key Legend: SA (Strongly Agree) A (Agree) DK (Don't Know) D (Disagree) SD (Strongly Disagree)

• Implementation of a Zoning System

The implementation of a zoning system, which aims to move certain activities away from the core areas (zones of high productivity, spawning grounds and nurseries). This should be done following consultation with all stakeholders. It is understood that local commercial fishing cooperatives are in favour of zoning (50% SA and 50%A), 100% of Dive Centres are in favour, while 78.5% of all relevant stakeholders are in favour as well)

• Measures Relating to Fishing Gear

Measures relating to fishing gear (for example: use of biodegradable material). This practice is acceptable by 57.2% of relevant stakeholders but the commercial fishing community is divided on this with 50% A, 25% D and 25% SD. The trawlers association are against this measure.

• Implementation of a Closed Season

The implementation of a closed season or ecological rest period is acceptable for the majority of relevant stakeholders (71.4% SA, 14.3% A) while fishers (especially the Trawlers Association) are divided on this (25% SA, 25% A, 25% DK and 25% D).

• Increasing effective enforcement

Increasing effective enforcement by building capacity and resources in the relevant government entities. Relevant stakeholders were very much in agreement with this management measure (85.7% SA, 14.3% A). This measure also finds support from the fishers (25% SA, 50% A).

• Permanent ecological moorings

The implementation of permanent ecological moorings placed in particular zones for various stakeholders was unanimously approved by the commercial fishers and the divers (100% SA).

• Pesca-tourism

Enabling pesca-tourism, which involves professional fishers welcoming tourists to their vessels for a fishing experience.-. This measure was very much acceptable to the fishers co-operatives (25% SA, 75% A) while still acceptable to lesser extent to other relevant stakeholders (42.9 SA, 14.3 A).

• Increasing Capacity Building

Further increasing capacity building in fishers in order for them to be able to apply for grants to diversify livelihood was acceptable to the majority of commercial fishers (75% SA, 25%A) and also to the relevant stakeholders albeit to a lower extent (28.57% SA, 28.57% A).

• Fishing Gear to Reduce Bycatch

Fishing gear should be employed (utilised) in such a manner to reduce bycatch, was slightly accepted by the relevant stakeholders (28.6% SA, 14.3% A) and accepted by fishers (75% SA, 25% A).

6.2 Complimentary/Alternative Livelihood Practices and Recommendations

Complimentary activities to livelihoods are found in the below list of options (It must be noted that local levels of acceptance were not tested in the preliminary study):

From the interviews and the desk study it appears that it is not always best for economic stakeholders to abandon their current activity but to diversify their livelihood (Donati, 2016).

- Fishers establish and develop micro-tourism facilities along the waterfront off fishing villages.
- Development of ecotourism and community-based tourism products like boat tours with fishers to see how they fish, how they work.
- Development of soft adventure activities (for example, the services of tour guides in the sea).
- Development of water-taxi services by fishers in strategic locations.
- Fishers develop glass-bottom boat services.
- Establishment of a yacht mooring service which is run and managed by stakeholders.
- Fishers and fishers' cooperatives create events like weekend seafood festivals and related recreational events.
- Establishment of a monitoring project which assesses the number of protected species through direct involvement with local fishers. The fishers boats could be used for used for surveillance; research activities and cleaning interventions.
- Active participation in MPAs through involvement with management and educational activities in and around MPAs.

6.3 Best Practice Recommendations to Stakeholders

The marine environment hosts important natural resources which are utilised by many different stakeholders. To be able to continue benefiting from the ecosystem services that the sea provides, it is essential that the marine environment is protected and managed sustainably. In order to achieve this, participation from all stakeholders is essential. Each stakeholder can contribute by using best practice in their activities when operating in Maltese coastal and offshore waters. Some examples of best practices are recommended here for stakeholders to take into account:

- Any form of waste should be disposed of in an appropriate manner.
- Fishing gear should not be discarded at sea.
- If fishing gear becomes entangled with the seabed, this should be retrieved where possible, as it could cause significant harm to the marine ecosystem.

- If fishing gear becomes entangled with the seabed habitats and cannot be retrieved, a report is to be submitted to the relevant authorities.
- Where possible and appropriate, biodegradable material should be used to reduce impacts from lost/abandoned fishing gear.
- Fishing gear should be employed (utilised) in such a manner to reduce bycatch.
- Fishers can contribute to data collection on the marine environment and assist injured protected species, thereby being stewards of the seas.
- Water sport and boat trip operators and owners should respect the integrity of caves and not disturb wildlife and marine species found in and around such natural features.
- Divers should only enter particular caves if they have the necessary experience and training, and should avoid highly diverse and sensitive caves.
- The number of divers visiting caves on a daily basis should be recorded and limited by the dive schools and centres.
- Information should be made available in relation to cave features and diver experience grade requirements, during diver training and at dive site locations.
- Permanent ecological moorings can be installed in particular sensitive zones for use by various stakeholders.

6.4 Recommendations of Best Practice Towards the Adoption of a Participatory Approach.

- Many stakeholders operating in the marine environment have a seasonal income, with the majority of work found during the summer months. For this reason less stakeholders will be available to meet during this period. The bulk of management cooperation meetings with stakeholders should be predominantly held between November and March.
- Stakeholders should be made to focus more on the need to first understand the problem (protecting biodiversity) rather than focusing on potential consequences (reduced

fishing areas). The links of biodiversity protection and their livelihood should be made apparent.

- Key messages should be tailored for different target audiences by taking a strategic approach. A proper communication and education strategy should be drawn up by an Environmental Education expert.
- The use of fishers, divers and other stakeholders to endorse the planning process and deliver key messages should be given high priority. The use of high profile national celebrities to endorse the planning process or deliver key messages should be explored but given less importance than the actual stakeholder 'champions'.
- There should be a trained media spokesperson on the team who knows the topic and how to present it well. The idea of having fishers presenting to fishers should be actively explored.
- Compromise on all sides is usually essential, but it is recognised that some individuals may see solutions in terms of winners and losers.
- Organise exchange visits to other MPAs to train general stakeholders and economic stakeholders on sustainable MPA management. These individuals can then be utilised as catalysts for knowledge sharing with their respective colleagues.
- Ensure that there is a continuous impetus to improve the capacity of local operators through training workshops. The workshops' intended focus should be structured into relevant various areas as the implementation of the MPA progresses.
- There should be an understanding that fishers comprise a number of subgroups including full time commercial, part time commercial and recreational (Pomeroy and Douvere, 2008).
- Skilled and experienced fishers can be extremely valuable management partners and knowledgeable teachers and leaders of other fishers. This expertise should be sought in collaborative partnerships.

Part of list adapted from: Day (2016)

6.5 Recommendation on Fair Procedures (negotiations) to Reach Agreement

Following stakeholders interviews, information sessions and training courses with stakeholders it is evident that stakeholders feel that enforcement and communication between all parties involved in marine activities are major issues that need to be tackled.

Alternative livelihoods which enhance or complement existing activities are acceptable for all fishers (75% SA, 25%A). Fishers opposed no-take zones in view of the potential impact on their livelihoods.

Fishers appear to have more options when social support systems are effective. For example, access to good education provides more opportunity for retraining in interesting and well-paying careers. Courses that help fishers understand complimentary activities to fishing should be regularly held.

There are many management measures that should be taken before productive fishing areas are completely closed: these were discussed in Section 6.1 and may include protection of nursery areas, time closures, modifications in fishing gear and control of relevant shore-based impacts.

Programmes to help fishers improve their livelihoods when faced with restrictions and closures should distinguish between full-time and part-time fishers and give priority to full-time fishers.

If stakeholders and authorities utilise the following issues as the baseline for negotiations, negotiations should produce more fruitful results with stronger management ties between all those managing and utilising MPAs.

6.6 Overarching Principles for Recommendations

MPA management can be successful if it promotes the appropriate behaviour of users of the marine area in question. Such approaches should recognize the values, concerns, knowledge and customary practices of stakeholders through providing for active participation in MPA management processes from the beginning Fiske (1992); Kelleher (1999).

These processes should involve the development of appropriate policies and inter-agency relationships, and the application of various conflict management and consensus building approaches. Due importance should be afforded to the ecological, cultural, socio-economic, educational and political milieu of the region in which the MPA is located. Participation of the main stakeholder groups in the decision-making process is crucial to give opportunities to relevant stakeholders to take part in decisions (not only as consultees). This will increase ownership and compliance.

A Management Option Continuum is being presented in which the possible extremes of management to change behaviour are presented: on the one side management that involves extrinsic approaches with stakeholders, while on the opposite side of the spectrum is a management option which in principle is more based on intrinsic motivation.

Management Option Continuum	
	Emphasis on stakeholder
Emphasis on Enforcement	participation and cooperation
	~
Executive cross sectoral authority	Community-based partnership
Education to justify restrictions and	Education to manuate summant.
Education to justify restrictions and	Education to promote support
promoto compliance	and participation
promote compnance	and participation
Reliance on comprehensive	Science used for guidance
Renance on comprehensive	Belence used for guidance
scientific information	where appropriate and
	une appropriate and
	available

Source; Jones, 2002

7. Conclusion

In the case studies presented, succesful management practices were achieved by increased participation of economic stakeholders in decision making, small changes to activities and zonation. The success of MPAs in achieving sustainability are not easily quantify but most of the reported successes stem from better relations between all participating parties in activities concerning the marine environment and along with an increase in marine life and diversity of species. The control of recreational fisheries, increasing economic stakeholder awareness and the involvement of stakeholders in management of the MPA all helped to ensure long-term sustainability of both the ecological and socio-economic resources of the MPAs. Drastic changes in livelihoods had an inclination to fail. It is only through further cooperation and dialogue between interested parties, along with strict enforcement of illegalities, that appropriate management of the marine environment can take place.

These recommendations which came out of this report are a result of the desk study and stakeholder interview analysis. The suggestions produced will be considered and assessed for feasibility for application to the local context.

References

- Adriapan, 2012. Miramare Marine Protected Area. Retrieved March 19, 2018, from http://www.adriapan.org/index.php/en/adriapan-map/19-east/11-miramare-marineprotected-
- Allison, E.H., Bene, C., Andrew, N.L. (2011). Poverty reduction as a means to enhance resilience in small-scale fisheries. In Pomeroy, R.S., Andrew, N.L. (eds). Small-scale fisheries management: Frameworks and approaches for the developing world. CAB International. UK. 216-247.
- Allison, E., and Ellis F., (2001). The livelihoods approach and management of small-scale fisheries. Marine Policy 25:377-388.
- BTNK. (2012). Zonasi: Taman Nasional Karimunjawa. Kementerian kehutanan Direktorat Jenderal Perlindungan Hutan dan konservasi alam. Balai Taman Nasional Karimunjawa: Semerang, Java, Indonesia.
- Bynoe P., (2005). Keynote address on '*Sustainable Livelihoods to the Commonwealth Youth Forum*'. Suncrest Hotel, Malta, November 19th 2005.
- Cadiou, G., Boudouresque, C. F., Bonhomme, P., and Le Dire´ach, L. (2009). The management of artisanal fishing within the Marine Protected Area of the Port-Cros National Park (northwest Mediterranean Sea): a success story? – ICES Journal of Marine Science, 66: 41–49.
- Canari Policy Brief No. 5 January 2005. Marine Protected Areas and Sustainable Coastal Livelihoods, Fernandes Industrial Centre, Administration Building Eastern Main Road, Laventille Trinidad and Tobago.
- Chambers, R and G Conway (1991) Sustainable Rural Livelihoods. IDS Discussion Paper 296. December. London
- Charles A., Westlund L., (2016). Fishing livelihoods as key to marine protected areas: insights from the World Parks Congress. Aquatic Conserv: Mar. Freshw. Ecosyst. 26 (Suppl. 2): 165–184
- Connell S., (1997). Empirical-Analytical Methodological Research in Environmental Education: Response to a negative trend in methodological and ideological discussions. *Environmental Education Research* (3), 2, pp 117 132
- Day C.J., (2016). Blue Solutions: Public participation to strengthen and legitimise planning processes. Retrieved March 22, 2018, from http://panorama.solutions/en/solution/public-participation-strengthen-and-legitimize-planning-processes
- Di Franco A, Bodilis P, Di Carlo G, Piante C, Thiriez P, Francour P, Guidetti P. (2014). Fishers engagement, a key element to the success of artisanal fisheries management in Mediterranean marine protected areas Weigel J., *et al.*,Marine protected areas and

fisheries: bridging the divide. Aquatic Conservation: Marine and Freshwater Ecosystems.

- Donati S., (2016). Marine Protected Areas An urgent imperative. A dialogue between Scientists and policy makers. Retrieved March 17, 2018, from http://italyun.esteri.it/rappresentanza_onu/resource/doc/2016/03/italy.pdf
- EMCS (2017). Performance of the Diving Industry in Malta. Unpublished data. Msida, Malta.
- Fiske. S.J. (1992) Sociocultural aspects of establishing Marine Protected Areas. Ocean Coast. Manage. 18. 25—16.
- Jones P., (2002). Marine protected area strategies: issues, divergences and the search for the middle ground. Reviews in Fish Biology and Fisheries 11: 197-216. 2002. Netherlands.
- Kelleher. G. (1999) Guidelines for Marine Protected Areas. IUCN. Gland. Switzerland and Cambridge. UK.
- Mifsud M. and Verret M., (2015) 'Perceptions of the Maltese Public towards Local Marine Protected Areas'. *Journal of Teacher Education for Sustainability*, vol. 17, no. 1, pp. 48-57
- Morales-Nin, B., Moranta, J., García, C., Tugores, M. P., Grau, A. M., Riera, F., & Cerda, M. (2005). The recreational fishery off Majorca Island (western Mediterranean): some implications for coastal resource management. *ICES Journal of Marine Science*, 62(4), 727-739.
- MTA, (2017). VisitMalta.com Dive Centres. Retrieved June 20, 2018, from https://www.visitmalta.com/en/dive-centres
- National Ocean Service. (2017). Monterey Bay National Marine Sanctuary. Retrieved March 16, 2018, from https://montereybay.noaa.gov/international/italia/egadimpa.html
- National Parks of France (2016). Esprit Parc National. Retrieved April 13, 2018, from http://www.espritparcnational.com/en/national-parks/port-cros-nationalpark?language=en
- NSO, (2016). Agriculture and Fisheries 2014. Valletta: National Statistics Office, ISBN: 978-99957-29-50-9
- Parco Nazionale dell'Asinara, 2018. Parco Nazionale dell'Asinara. Retrieved April 20, 2018, from http://www.parks.it/parco.nazionale.asinara/Eindex.php
- Parco Nazionale delle Cinque Terre, 2018. Parco Nazionale delle Cinque Terre, Area Marina Protetta. Retrieved April 18, 2018, from http://www.parconazionale5terre.it/index.php
- PDSA, 2017. PDSA, Malta, Gozo and Comino. Retrieved June 20, 2018, from http://pdsa.org.mt/

- Pomeroy R, Douvere F., (2008). The engagement of stakeholders in the marine spatial planning process. Marine Policy 32: 816–822
- Pomeroy, R. S. (2013). Sustainable livelihoods and an ecosystem approach to fisheries management. *Coral Triangle Support Partnership, Jakarta*.
- Rampini G., Raichi A., (2015). Pantelleria Island: a testing ground for a participatory approach aimed at fostering the creation of an MPA proposed and developed by local inhabitants. Tutela Pantelleria Workgroup as Invisible Cities Social Empowerment Association, Via Bartoli 14, Trieste, 34148. Italy.
- Voyer, M., Gladstone, W. & Goodall, H. 2012, 'Methods of social assessment in Marine Protected Area planning: Is public participation enough?', Marine Policy, vol. 36, pp. 432-439.
- Weigel J., Mannle K., Bennet J., Carter E., Westlund L., Burgener V., Hoffman Z., Simão Da Silva A., Abou Kane E., Sanders J., Piante C., Wagiman S., Hellman A., (2014). Marine protected areas and fisheries: bridging the divide. Aquatic Conservation: Marine and Freshwater Ecosystems
- Westlund, L., Charles, A., Bartley, D. M., Fletcher, W. J., Garcia, S., Govan, H., & Sanders, J. (2016). Fishing livelihoods as key to marine protected areas: insights from the World Parks Congress. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 26, 165-184.