ECOSYSTEM SERVICES,
SOCIO-ECONOMIC VALUES AND ORGANIZATIONAL PROFILES OF **MEDITERRANEAN MPAS**

WWF is one of the world's largest and most respected independent conservation organizations, with more than 5 million supporters and a global network active in over 100 countries. WWF's mission is to stop the degradation of the Earth's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

CONTENTS

KEY POINTS
ECOSYSTEM SERVICES, SOCIO-ECONOMIC VALUES AND ORGANIZATIONAL PROFILES OF MEDITERRANEAN MPAS

ABOUT THIS PUBLICATION

This study outlines a framework for **assessing the socio-economic benefits** of Mediterranean MPAs, which was piloted in six MPAs: Placing monetary value on these benefits is complex and inexact, but evaluating and monitoring them can support better **communication, stakeholder engagement and decision-making**. This in turn enables MPA managers to design and implement more effective management strategies, which deliver better socioeconomic and ecological outcomes.

- Understanding of socioeconomic benefits and stakeholder attitudes
- Greater stakeholder engagement
- Improved management
- Better outcomes and social legitimization

MPAS STUDIED

The 3 EU MPAs have an official mission and long-term strategic management plans, developed through stakeholder consultation.

The 3 North frican MPAs are not yet officially gazetted and don't have operational management plan.

TELAŠĆICA NATURE PARK

TORRE GUACETO MPA

TAZA NATIONAL PARK

EGADI ISLANDS MPA

GOURAYA NATIONAL PARK

TABARKA

BENEFITS OF MPAS

ECOLOGICAL
Ecological conservation benefits (e.g. air quality, climate regulation, conservation of biodiversity and ecosystems, fish stocks)

ECONOMIC
Economic benefits (e.g. increased turnover, revenue, profits, employment, impact on marine tourism)

SOCIAL
Social benefits (e.g. job creation, impact on local communities, opportunity for education, training and cultural experiences)

MPAs can secure these benefits for us and future generations only if they:

- effectively protect **critical habitats, species and ecological functions**
- are integrated in **ecologically coherent and well-managed networks**
- are part of a **broader management framework that minimizes cumulative impacts** on the environment.

NATURE-BASED TOURISM

In Tabarka and the Egadi Islands , the diving sector has an important influence on the local tourism economy, showing that protecting natural capital can foster sustainable economic opportunities. In the other MPAs, nature-based tourism has yet to reach its full potential.

Estimated recreational value of nature-based tourism **€4.11 – € 7.78**. Nature-based tourists said they would be willing to pay a daily fee of between **€4.11 and €7.78** on average to fund marine conservation projects.

WE INTERVIEWED

375
NATURE-BASED TOURISTS

€4.11– €7.78

NATURE-BASED TOURISTS SAID THEY WOULD BE WILLING TO PAY A DAILY FEE OF BETWEEN €4.11 AND €7.78 ON AVERAGE TO FUND MARINE CONSERVATION PROJECTS

ESTIMATED RECREATIONAL VALUE OF NATURE-BASED TOURISM

MPA	Value
Egadi Islands	€5,793,438
Telašćica	€272,253
Torre Guaceto	€175,482
Gouraya	€79,940
Tabarka	€6,121,317
Taza	€60,585

SMALL-SCALE FISHERIES

In five of the six MPAs, small-scale fishing is an important economic activity for the local community. In the North African MPAs, fishers say numbers and quality are decreasing. By contrast, fishers in Torre Guaceto – who are closely involved in co-managing the MPA – catch more high-quality fish that they sell at a higher price. While there are some conflicts between the fishing community and MPAs, all fishers interviewed believe they have an important role to play in protecting biodiversity.
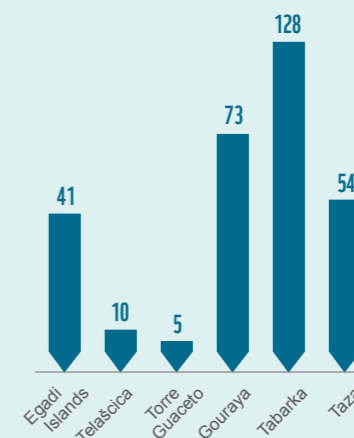
WE INTERVIEWED

124
LOCAL SMALL-SCALE FISHERIES

NUMBER OF AUTHORIZED VESSELS

MPA	Vessels
Egadi Islands	41
Telašćica	10
Torre Guaceto	5
Gouraya	73
Tabarka	128
Taza	54

AVERAGE PRICE OF THE CATCH (€)

MPA	Price
Egadi Islands	9
Telašćica	6
Torre Guaceto	20
Gouraya	7
Tabarka	6
Taza	5

TOTAL ANNUAL CATCH PER CAPITA (KG)

MPA	Catch
Egadi Islands	1589
Telašćica	1200
Torre Guaceto	1325
Gouraya	255
Tabarka	899
Taza	1080

AVERAGE PER CAPITA TURNOVER (€)

MPA	Turnover
Egadi Islands	14301
Telašćica	7200
Torre Guaceto	26500
Gouraya	17885
Tabarka	5394
Taza	5400
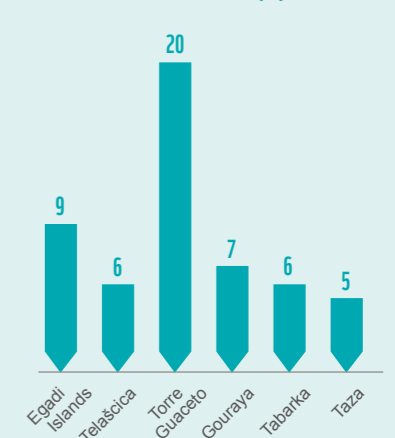
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INTRODUCTION

Marine and coastal ecosystems provide a variety of benefits, from food and climate regulation, to the crystal-clear waters and marine landscapes that are the basis for tourism and leisure activities. Marine protected areas (MPAs) are recognized worldwide as fundamental tools to protect these ecosystems, maintaining the value of the services that they produce.

An MPA is defined as an **"area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment"** (Keller, 1999).

In 2004, the UN Convention on Biological Diversity (CBD) set the ambitious target of protecting at least 10% of each marine ecological region worldwide. The UN Sustainable Development Goal 14 and CBD Aichi Target 11 under the Strategic Plan for Biodiversity 2011–2020 explicitly recognize the need for networks of effective MPAs. While this goal remains unreached, it has boosted the growth of several MPA systems (Worboys, 2015). In recent years, the establishment of MPAs has constantly increased in importance, thanks to the strategic role they play in both preserving marine and coastal biodiversity and managing fishery resources and recreational ecosystem services (e.g. diving, snorkelling, recreational fishing tourism). They are considered important strategic tools for both conservation and sustainable management of marine and coastal resources and the related ecosystem services.

Several studies have shown the intrinsic link between the ecological dimension of marine and coastal ecosystems, the socio-economic dimensions and the organizational characteristics of MPAs (De Groot at al. 2010; Glaser, 2006; Haines-Young & Potschin, 2013; Jax et al, 2013; Remoundou et al. 2009; Scianna et al., 2015, Gill et al., 2017). An effective MPA is expected to pursue ecological conservation goals while taking account of economic, social and cultural issues; however, there is a lack of knowledge about how to effectively organize and manage these dimensions within different contexts.

These aspects are particularly relevant in the Mediterranean context. Though it covers less than 1% of the global water surface, the Mediterranean is one of the richest seas in terms of biological diversity. At the same time, few places are under greater stress from human activities such as marine transportation, pollution and overfishing in the Mediterranean Sea (Halpern et al., 2008).

By 2016, according to the latest Mediterranean MPA Status report[1], 1,231 MPAs and other effective area-based conservation measures (OECMs) had been established in the Mediterranean, covering 7.14% of the total surface. However, an effective level of protection remains a long way off, with just 0.04% of the Mediterranean covered by no-take (or no-fishing) areas.

To affirm the role of MPAs, it is important to enhance their socio-economic reputation and legitimization within the community. Often, people see the rules and restrictions that MPAs apply, but are less aware of the numerous long-lasting benefits that they can generate. A science-based communication strategy is needed to foster the positive role that MPAs can play in the long term, from a socio-economic point of view as well as an environmental one.

1%
THOUGH IT COVERS LESS THAN 1% OF THE GLOBAL WATER SURFACE, THE MEDITERRANEAN IS ONE OF THE RICHEST SEAS IN TERMS OF BIOLOGICAL DIVERSITY

1 http://medpan.org /marine-protected-areas/mediterranean-mpas

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THE BENEFITS ASSOCIATED WITH MPAS CAN BE DIVIDED INTO THREE CATEGORIES:

ECOLOGICAL
Ecological conservation benefits (e.g. air quality, climate regulation, conservation of biodiversity and ecosystems, fish stocks)

ECONOMIC
Economic benefits (e.g. increased turnover, revenue, profits, employment, impact on marine tourism)

SOCIAL
Social benefits (e.g. job creation, impact on local communities, opportunity for education, training and cultural experiences) (Haines et al., 2018)

While the conservation benefits are often underestimated by the public, and receive little media coverage, the economic and social benefits tend to be even less visible. If it is easy to calculate the volume of business and seasonal employment generated by a large five-star hotel, estimating the turnover and jobs generated by a long-term conservation strategy is much more complex and challenging. From a social perspective, conservation can often generate "better" jobs for local people, especially young people – for example, by creating opportunities for micro-entrepreneurship in hospitality or running excursions.

The European Commission recently carried out a comprehensive literature review and qualitative analysis of MPA benefits. Despite the impossibility of representing and calculating all the benefits, the study states that "MPAs benefits that are calculated are significantly higher than estimated costs" (Haines et al., 2018).

Within the context of the MedMPA Network project, funded by the European Commission, WWF established a collaboration with CoNISMa to carry out an assessment to improve the knowledge on MPA socio-economic benefits and their contribution to territorial development.

This report is the outcome of three years of research, from February 2016 until July 2019. With this exploratory study, we aim to provide findings that can help MPA managers and policy-makers to monitor and evaluate core socio-economic benefits. This will help create a scientific knowledge base that can support effective communication strategies and stakeholder engagement, and evidence-based decision-making and governance.

Our study outlines a methodological and cognitive framework for assessing the direct and indirect socio-economic benefits associated with the presence of MPAs in the Mediterranean. Highlighting the importance of socio-economic assessment can generate increasing interest from key stakeholders and raise political support. This process can be particularly useful for existing and future MPAs that are less institutionally and organizationally developed, particularly in those Mediterranean countries where marine conservation is still at a very early stage of development.

The first chapter defines the purpose of the study and the theoretical framework for the research. This is followed by a brief outline of the methodology applied; full details of the methodology and the study questionnaires are included as an appendix. Emerging findings from the case studies are presented and analysed in chapter 3, along with lessons learnt. This is followed by a conclusion. Detailed descriptions of each of the six case studies and related findings are included as an annex.

SECTION 1

THEORETICAL FRAMEWORK AND PROJECT PURPOSE: FROM ECOSYSTEM SERVICES TO MPAS KEY ECOSYSTEM SERVICES
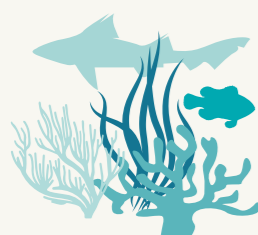
1.1. MARINE AND COASTAL ECOSYSTEMS AND THEIR SOCIO-ECONOMIC BENEFITS

Ecosystems contribute to the general well-being of societies, from an ecological but also from an economic point of view. Assessing their economic contribution in terms of monetary value can be a useful way to highlight both the natural resource-related benefits they bring, and the costs associated with ecosystem damage.

Academics attribute a wide range of values to ecosystems, and therefore to MPAs – from ecological to social, economic, cultural and even spiritual values (Maes et al., 2013). Socio-economic governance of ecosystems and the evaluation of these different dimensions are a pillar of the EU 2020 Biodiversity Strategy, goals and associated actions (European Commission, 2011)[2].

The overall value of a marine ecosystem is not exactly identifiable, and estimates come with a high degree of uncertainty. They can vary considerably depending on the case in question, and the values attributed to the ecosystem by different stakeholders depending on the use they make of it.

For an economic stakeholder, an ecosystem or its components may have a very low value. Take as an example a fish as single element of the ecosystem. When a fish is caught and sold by non-local fishers, with a very efficient but at the same time ecologically destructive fishing method, the final value of that fish will be little more than the cost of production, which in this case is very low. This economic value may also flow out of the local area if the fish – as often happens – is sold in a wholesale market and consumed far away.

For a "sustainabiliticus" stakeholder (Russ, 2014), the concept of value can be very different. Here, if our fish is left to live, it can add value by reproducing to maintain or increase the species population. The same fish can also have an aesthetic value, and may attract snorkelers or scuba-divers.

Evaluating MPAs' ecosystem services also raises serious technical and methodological challenges. The perspectives, approaches and methods used to assess an MPA's economic value can vary significantly, giving results that are also similarly variable.

Three main international classification systems have been developed to define and assess ecosystem services: the Millennium Ecosystem Assessment (MA); The Economics of Ecosystems and Biodiversity (TEEB; Sukhdev, 2008; Kumar, 2012) and the Common International Classification of Ecosystem Services (CICES; Haines-Young & Potschin, 2011). These divide ecosystem services into a number of groups. Provisioning, regulating and cultural services are common to all three classifications. The MA adds supporting services; TEEB refers to habitat and amenity services, while CICES includes maintenance services. Each group is subdivided into several categories of services (e.g. the MA divides provisioning services into food, fresh water, fibre, timber, genetic resources, biochemical and ornamental resources; TEEB divides them into food, water, raw materials, and genetic, medicinal and ornamental resources).

EVALUATING MPAS' ECOSYSTEM SERVICES ALSO RAISES SERIOUS TECHNICAL AND METHODOLOGICAL CHALLENGES

2 European Parliament resolution of 20 April 2012 on our life insurance, our natural capital: an EU biodiversity strategy to 2020 (2011/2307(INI)

Table 1: Groups of ecosystem services according with the three main international classifications

MA	TEEB	CICES
Provisioning	Provisioning	Provisioning
Regulating	Regulating	Regulating and maintenance
Cultural	Habitat	Cultural
Supporting	Cultural and amenity	

Obviously, the services provided vary considerably according to different typologies of ecosystems. According to the Mapping and Assessment of Ecosystem Services (MAES; Naidoo et al., 2008; Plieninger et al., 2013) framework there are three major ecosystem categories (terrestrial, freshwater and marine). These can be further subdivided, with marine ecosystems comprising marine inlets and transitional waters, coastal, shelf and open ocean.

Table 2: Typologies of marine ecosystems and representation of land cover (spatial dimension) according to CICES classification

Marine inlets and transitional waters	Coastal	Shelf	Open ocean
Coastal wetlands (e.g. saltmarshes, intertidal flats), lagoons, estuaries and other transitional waters, fjords/sea lochs, embayments.	Coastal, shallow-depth marine systems that experience significant land-based influences. Depth up to 50-70 metres.	Marine systems away from coastal influence, down to the shelf slope. They experience more stable temperature and salinity regimes than coastal systems, and their seabed is below wave disturbance. Depth up to 200 metres.	Marine systems beyond the shelf slope with very stable temperature and salinity regimes, in particular in the deep seabed. Depth beyond 200 metres.

Whatever categorization system is used, the array of services provided by marine ecosystems is vast. All methods and approaches highlight that the value produced by ecosystems is far greater than the cost of conservation activities; every euro invested in conservation yields far greater benefits in ecosystem services. For example, the European Commission calculates that the benefits generated by the marine Natura 2000 network of MPAs reached €1.5 billion per year in 2011 (European Commission, 2016).

These frameworks can be applied by different organizations or institutions for different scopes: ministries, municipalities, industries and MPA managers can use these methodologies to evaluate the socio-economic effects of their environmental strategies.

The present research aimed to identify a cognitive, theoretical, methodological and technical approach that meets the specific needs of MPAs in the Mediterranean – recognizing that they are often small organizations with very limited financial and human resources, but have great potential to deliver natural and socio-economic impacts.

1.2. MPAS AND SOCIO-ECONOMIC BENEFITS EVALUATION: PRIORITISING STAKEHOLDERS' NEEDS

Previous studies have highlighted the intimate link between ecological systems and socio-economic systems in Mediterranean MPAs, so that they can be considered as a whole socio-ecological system (Ostrom, 2009). The vast majority of Mediterranean MPAs fall into the second category of marine ecosystems under the MAES (2013) classification, namely coastal ecosystems that experience significant land-based influence, where natural and human systems are inseparable (Micheli & Niccolini, 2013).

Starting from the above-mentioned frameworks (MA, TEEB, CICES), we looked at recent studies that directly address MPAs, such as the recent European Commission Study on the Economic Benefits of Marine Protected Areas (Haines et al., 2018), and the 2015 MedPAN workshop on socio-economic, that brought together 17 experts, including researchers, MPA managers, decision-makers and key stakeholders (Rodriguez-Rodriguez et al., 2017, see Box).

THEORETICAL BACKGROUND – MEDITERRANEAN EXPERTS' PERSPECTIVE

- *Although sustainable development of MPAs is desirable and should be sought, it should not be forgotten that **the primary aim (mission)** of MPAs is the **protection of nature.***

- ***Not everything can be monetized.** The evaluation of the socio-economic benefits has limits, it is impossible to give a financial value to the living in general or to other aspects like well-being or cultural heritage. Moreover, monetizing everything would involve a number of risks, such as giving a destruction potential to all that holds financial value, and divert conservation professionals from their primary mission of preservation.*

- *It is very **difficult to assess the socio-economic benefits** of MPAs **in a complete and consistent manner**, given the great variability.*

- *It is key to **engage** with all the **relevant socio-economic stakeholders** at the local scale. Local players should be involved and mobilized around projects related with economic evaluation.*

- ***Clear, long-term vision** should guide management and communication with stakeholders*

Box: Theoretical background – Mediterranean experts' perspective on socio-economic evaluation of MPA benefits (Source: Rodriguez-Rodriguez et al., 2017)

According to this perspective, we considered as key benefits those that affect stakeholders with whom MPA managers can actively engage. This makes it possible for MPA managers to identify and pursue a long-term holistic vision for the entire socio-ecological system, considering socio-economic benefits within their conservation mission.

Creating a socio-economic knowledge base (and databases) on key stakeholder categories offers MPA managers useful information to improve their environmental decision-making processes (National Research Council, 2005). It also enables them to effectively answer one of the key policy questions prioritized by the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES): *"How should we incorporate the economic and non-economic values of ecosystem services into decision-making and what are the benefits of doing so? And what kind of information (e.g. what kind of values) is relevant to influence decision-making?"* (MAES, 2013).

It is unrealistic for MPAs to attempt to measure many of the ecosystem services identified above. A realistic strategy of assessment and evaluation should address a few carefully selected categories, where evaluation could help to strengthen the whole conservation strategy.

This requires us to look not just at the theoretical and methodological aspects of ecosystem services evaluation but also to take a stakeholder perspective. To apply the ecosystem services framework to the MPA context, we used the "key stakeholder framework" developed by Micheli and Niccolini (2013). Following the well-known "stakeholder theory" (Freeman, 2014), we categorized stakeholders into key, relevant or other on the basis of the influence they have on the MPA. Key stakeholders are "actors with strong influence on and frequent interactions with the human and natural components of the MPA".

With these two complementary perspectives, it is possible to focus on a few selected ecosystem services that directly affect stakeholders with whom the MPA can actually carry out communication, engagement and co-management strategies to support its mission of nature conservation. Using this innovative cross-perspective, our analysis provides a "pilot methodology" to evaluate the key economic benefits linked to MPAs' conservation strategies, focusing on those related to some key stakeholders (Micheli & Niccolini, 2013) and sectors.

1.3. KEY STAKEHOLDER SELECTION AND ENGAGEMENT IN MPA MISSION

Key stakeholders are identified following a managerial and strategic perspective, looking at the influence (Freeman, 1984; Mitchell, 1997) that they can exercise on the MPA's mission fulfilment and the proximity of their activities to key components of the ecosystems preserved by the MPA (Freeman, 2018; Micheli & Niccolini, 2013). Due to their relation, proximity and direct influence on ecological and biodiversity targets, key stakeholders must be considered by MPAs as possible fundamental allies instead of threats.

We have selected two key stakeholder categories (targets) that are normally closest to the key ecological targets in the Mediterranean Sea: the local small-scale fisher (SSF) and the nature-based tourist (NBT). This enabled us to evaluate the socio-economic benefits related to their activities and understand their role within the socio-economic systems of MPAs. These stakeholder categories are the most studied and mentioned in the literature about socio-economic benefits of MPAs (e. g. Haines et al., 2018).
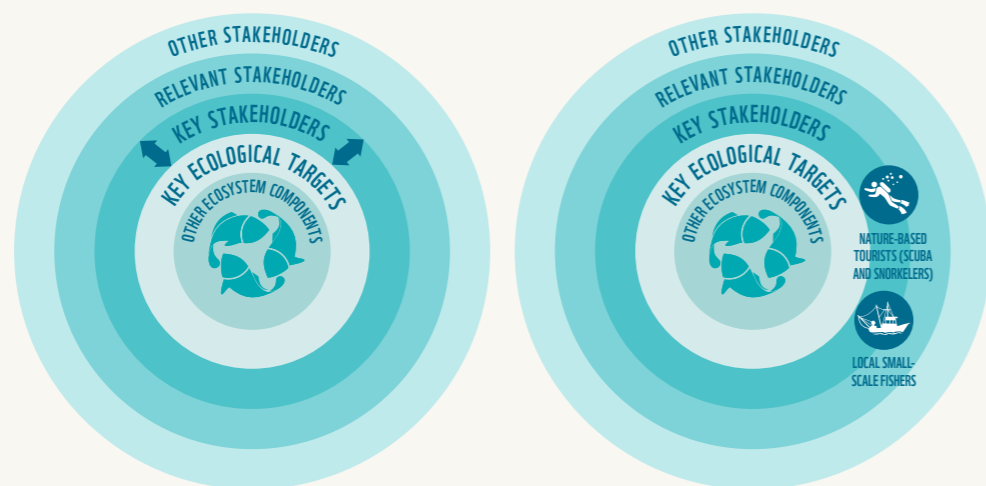
Figure 1: : MPA stakeholder classification
(Source: adapted from Micheli & Niccolini, 2013)

Figure 2: Key stakeholder selection

Nature-based tourists are defined as people that travel "for the purpose of enjoying natural attractions and engaging in a variety of nature-based activities – from scuba diving and bushwalking to simply going to the beach" (Nature Based Tourism in Australia Manifesto). In MPAs, nature-based tourists are attracted not only by the beauty of the coasts and seascapes (like "seaside tourists"), but also and particularly by the beauty of wildlife and ecosystems, especially underwater. They are interested in activities where they can be immersed in the nature, such as scuba diving, snorkelling, whale-watching and coastal canyoning. Nature-based activities are associated with good health and wellbeing (White et al., 2019).

We focused our investigation on the categories of tourists whose responsible behaviour can contribute to the resilience and conservation of the place they visit. This can also be classified as "ecotourism", defined by the IUCN as "environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features) that promote conservation, have low visitor impact, and provide for beneficially active socio-economic involvement of local populations" (Ceballos-Lascuráin, 1996). We selected scuba divers and snorkelers as the target of our analysis. We are conscious that MPAs also provide services for other categories of tourists, such as seaside tourists; while these services may have a greater economic impact, these stakeholders have a less direct relationship with the MPA.

Local small-scale fishers usually fish with small boats and use non-destructive fishing techniques, allowing the spread of a culture of sustainable fishing. Through their fishing activities, they provide for their families and generate profits that benefit the local community. SSFs are a key stakeholder category not only for their physical proximity and influence on the ecosystems, but also for their cultural relevance: they hold "heritage knowledge" about the traditions of the place and "field knowledge" that can be useful to MPA managers for effective governance. They are the most important potential allies for marine ecosystem management. The EU Conservation Strategy (Target 4) also prioritizes the fishing sector in meeting key conservation targets.[3]

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[3] http://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm

Both nature-based tourism and local small-scale fishing activities can be a source of revenue and benefits, particularly for local populations (PISCO & UNS, 2016). The above-mentioned European Commission study on the economic benefits of MPAs (Haines et al., 2018) included a systematic literature review of studies on socio-economic benefits in Mediterranean MPAs. The authors found 44 research projects on economic benefits of fisheries and 33 on maritime tourism, and stated that *"no existing evidence could be identified … of benefits by MPAs to blue economy sectors other than fisheries and tourism"* (Haines et al., 2018). However, some MPAs may choose to identify other "key" stakeholders, such as recreational fishermen or owners of small passenger boats.

It should be noted that our focused methodology does not attempt to account for the whole plethora of ecosystem services produced by an MPA – from reduced erosion to global climate regulation. These services could be incorporated into future works. For now, our methodology is intended to help MPA managers to build the core of their ecosystem services evaluation and socio-economic monitoring system. This will provide the foundation of a knowledge-based decision-making system that supports engagement with key stakeholders and builds MPA legitimacy.

Understanding attitudes of key stakeholders (such as SSF and NBT) can help MPA managers to implement policies and strategies that meet environmental and socio-economic objectives (Niccolini et al., 2018). This can create a virtuous circle of engagement, effectiveness and social legitimization (figure 3). In this framework, socio-economic evaluation can offer useful information to build effective communication strategies and networks of stakeholders harmonizing their objectives in a synergistic and symbiotic way.
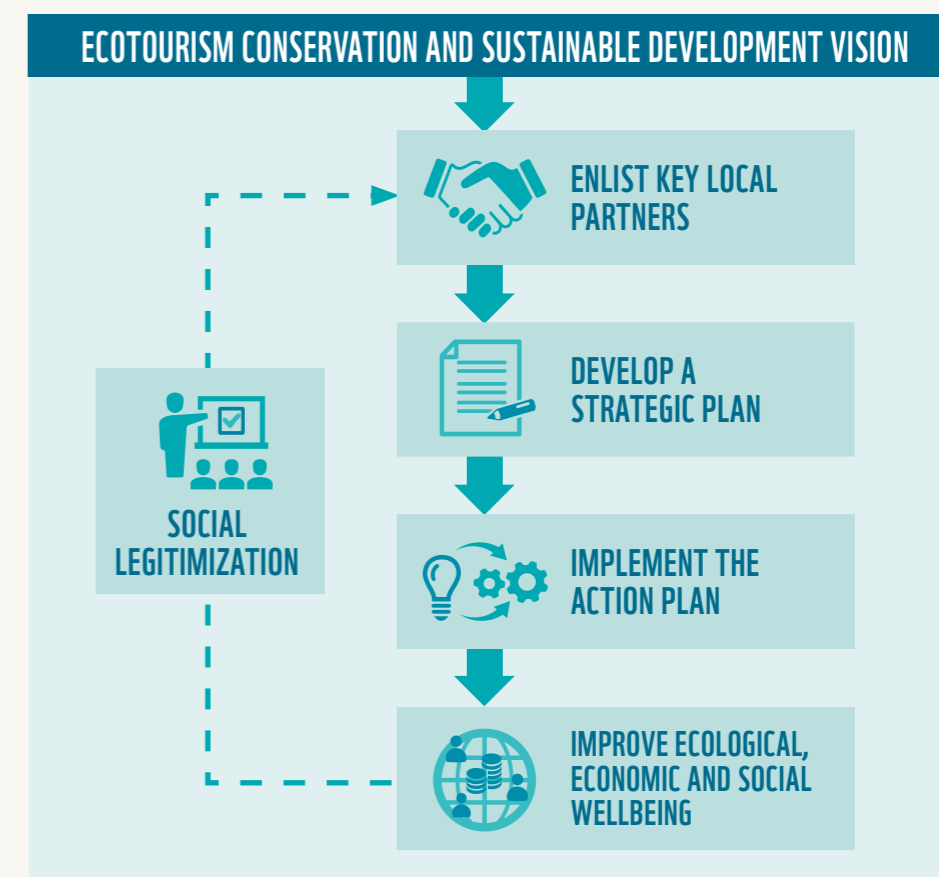

Figure 3: Possible strategic model for interpreting MPA effectiveness (Source: adapted from Micheli & Niccolini, 2013; Niccolini, et al., 2018)

1.4. THE ORGANIZATIONAL CHALLENGE

To orient stakeholders and their social-ecological system (Ostrom, 2009) towards conservation and sustainable development goals usually requires social actors (organizations) with resources and authority. MPAs need these "organizational mediators", normally represented by non-profit and public organizations, to support management and catalyse stakeholder engagement. They help inform, engage, orient and regulate stakeholders towards objectives of ecological, social and economic well-being, which private individuals often fail to identify or pursue in a coordinated way.

Recent studies confirm that the institutional and organizational maturity of an MPA, particularly in terms of human and financial resources, highly impacts its ecological performance (Gill et al., 2017). According to Gill et al., financial capacity and staff capacity are highly predictive of an MPA's ecological performance. In this study, MPAs reporting adequate staff capacity had an ecological performance on average 2.9 times greater than MPAs with inadequate or no staff capacity. Scianna et al. (2019) enlarged the perspective to other organizational variables but reached similar conclusions. These organizational factors go beyond simple legal measures, since legal status is a necessary condition for an MPA's existence (Keller, 1999).

SECTION 2

METHODOLOGY (SUMMARY)
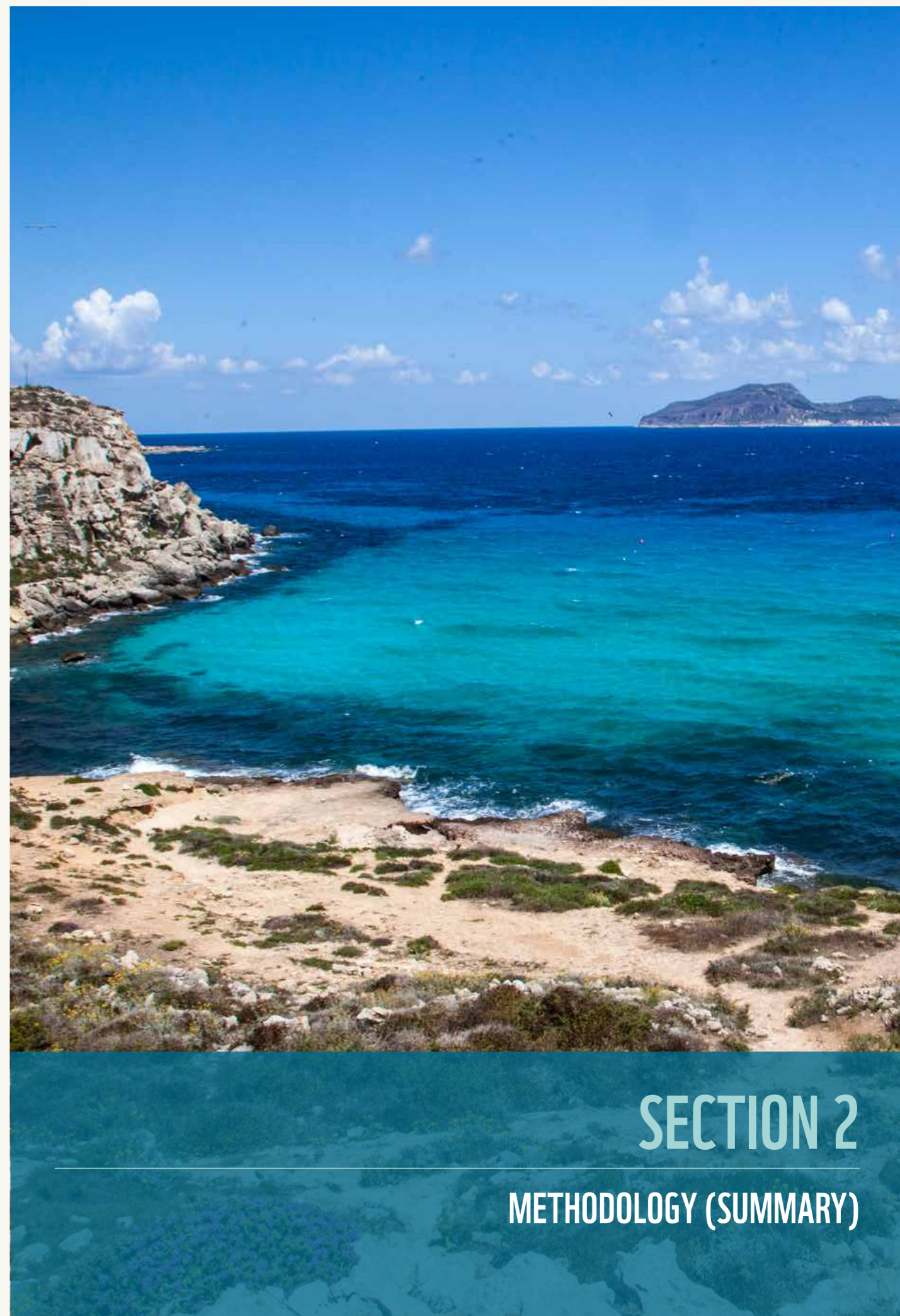
METHODOLOGY

Our exploratory study aims to identify an adaptive methodology for evaluating key economic benefits, potentially applicable in different Mediterranean MPAs. To reach our scope we identified some key socio-economic and organizational dimensions of MPAs that can affect the effectiveness of marine and coastal ecosystem conservation strategies.

Our research context is represented by the Mediterranean MPAs. We have identified eight Mediterranean countries (Italy, France, Spain, Slovenia, Croatia, Greece, Tunisia, Algeria) that we considered to have the representative features of much of the Mediterranean area.

Once we identified macro national contexts, to use a multiple case study analysis approach we selected six MPAs on the base of the criteria of feasibility, environmental performance and degree of comparability. We believe they are interesting cases of study for the application of our pilot methodology. The selected sites are Egadi Islands, Telašćica Nature Park, Torre Guaceto MPA, Gouraya National Park, Taza National Park and Tabarka Marine and Coastal Protected Area. Three of these (the European ones) are existing MPAs, while the other three (the non-European ones) are still in the phase of finalizing the institutional process to create the MPA.

As described in the theoretical framework, the research focuses on two target groups that play a significant role in the socio-economic system around the MPA: local small-scale fishermen (SSF) and nature-based tourists (NBT).

The survey organization and especially the questionnaire design were driven by the selection of the indicators, subdivided into key and significant indicators. Before starting the field survey, desk research analysed existing documents that contain information useful to build an initial profile of the six case studies.

Since information regarding the size of the target population was not available, probabilistic sampling techniques could not be applied. The sample was randomly selected, asking the surveyor to diversify the methods of administration with regard to the time and place of the interview.

The data collection phase was spread over two periods, June-August 2017 and March-October 2018, for both target groups. In total 375 nature-based tourists and 124 fishermen were interviewed. The questionnaire was pre-tested in order to ensure the accuracy of the completed forms.

The existing data collection and field interviews provided the key elements for the construction of the ecosystem services evaluation, drawing the socio-economic and institutional framework for each MPA's context.

In order to give an estimation of the value of NBT we chose a travel cost method. This method estimates the value that the NBT attributes to the experiential use of the ecosystem by calculating what they spend on reaching the MPA and doing the recreational activity. The average cost incurred to reach the area becomes the basis for building a demand curve through which it is possible to derive the consumer surplus, which corresponds to the recreational value.

We also developed an economic evaluation of the fishing activities inside the research contexts, though the estimation of the overall turnover generated by the SSF sector. Our aim was also to get a comprehensive description of the SSF sector in the six different contexts, encompassing the diversity and specific conditions under which SSF operate.

LINK

A detailed description of the methodology used is enclosed in **Appendix I**.

4 For a detailed description of the interviews of each case studies see the Appendix II.
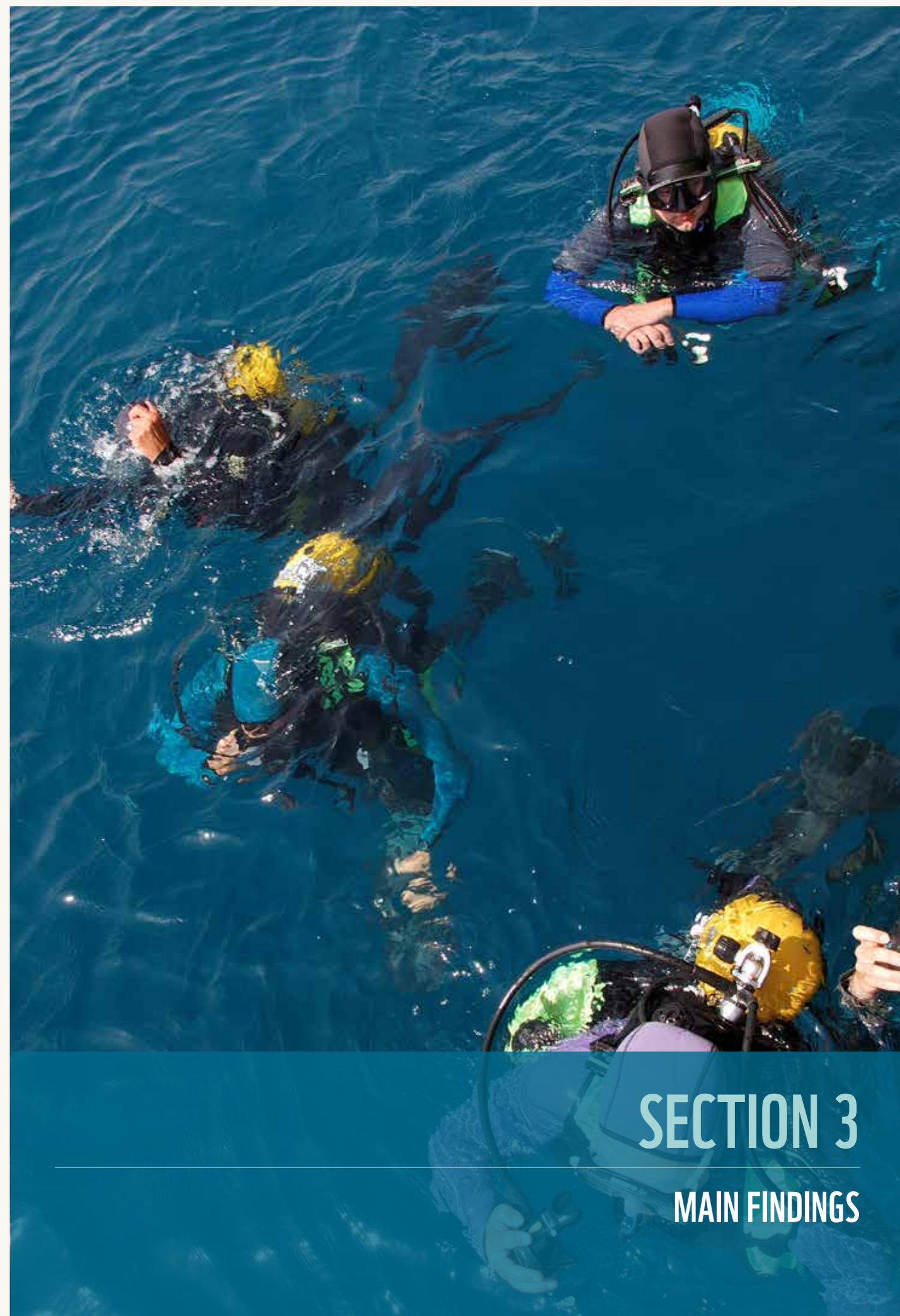
SECTION 3

MAIN FINDINGS

3.1 GLOBAL OVERVIEW

The table opposite gives an overview of the data collected for each of the six MPAs, including indicators to evaluate:
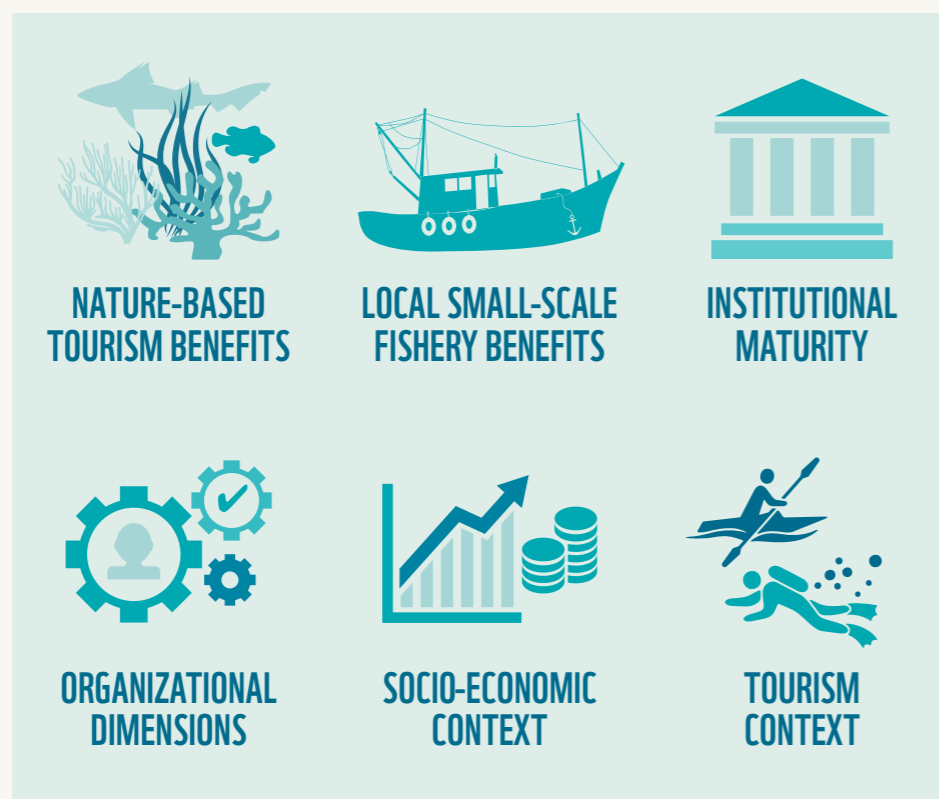

NATURE-BASED TOURISM BENEFITS

LOCAL SMALL-SCALE FISHERY BENEFITS

INSTITUTIONAL MATURITY

ORGANIZATIONAL DIMENSIONS

SOCIO-ECONOMIC CONTEXT

TOURISM CONTEXT

The analysis that follows identifies the key features that define the similarities and differences between the six case studies. This comparative analysis provides information that can guide the development of managerial and governance tools that recognize and enhance the socio-economic benefits provided by MPAs.

5 Data are referred to neibouring communities
6 Data are referred to neibouring communities
7 Data are referred to neibouring communities

Table 3: Variables and available indicators for each case study

VARIABLES AND INDICATORS		EGADI ISLANDS	TELAŠĆICA	TORRE GUACETO	GOURAYA	TABARKA	TAZA	AVERAGE ALUE
	Individual travel cost for NBT (NBT TC4) (€)	1,854	1,089	779	197	767	202	815
	Individual TC4 for the entire vacation (€)	1,995	1,289	829	212	658	222	868
	NBT recreational value 4 (NBT RV4) (€)	5,773,000	272,000	175,000	80,000	6,121,000	61,000	2,080,000
	Total RV4 (€)	6,236,000	322,000	186,000	85,000	7,139,000	66,000	2,339,000
KEY ECOSYSTEM SERVICES PROVISIONING (SSF)	Number of fishing boats	163	10	5	73	128	54	85
	Average price of catch (€)	9	6	20	7	6,2	5	1,446
	Total annual catch per capita (€)	1,589	1,200	1,350	2,555	899	1,080	12,780
	Average per capita turnover (€)	14,301	7,200	26,500	17,885	5,394	5,400	625
	Global SSF turnover (€)	2,331,000	64,000	132,000	1,305,000	690,000	5,400	
INSTITUTIONAL	Official international recognition	YES	YES	YES	YES	NO	YES	
	National legal framework for MPAs	YES	YES	YES	YES	YES	YES	
	Legal date of establishment (gazetted)	1991	1988	1991	NO	NO	NO	
	MPA regulations	YES	YES	YES	NO	NO	NO	
	Clear boundaries	YES	YES	YES	YES	YES	YES	
ORGANIZATIONAL	Full-time staff capacity (FT employees)	15	24	10	NO	NO	NO	
	Seasonal staff capacity (seasonal employees)	45	15	5	NO	NO	NO	
	Volunteers capacity	15	NO	NO	NO	NO	NO	
	Governance body	Public	Public	Public	NO	NO	NO	
	Mission	YES	YES	YES	NO	NO	NO	
	Management (or strategic) plans Smooth-hound	Management plans	Management plans	Management plans	NO	NO	NO	
	Management plan implementation Smooth-hound	YES	YES	YES	NO	NO	NO	
	Budget capacity (annual financial resources) (€)	1,147,035	1,159,680	1,146,265	NO	NO	NO	
	National networks of MPAs	YES	YES	YES	NO	NO	NO	
SOCIO-ECONOMIC	Number of resident population	4,292	740[5]	87,820[6]	959,100	48,993		
	Population age structure by major age groups (0-14;15-64; 65 +)	9.9%; 63.5%; 26.6%	12.0%; 62.5%; 25.5%	13.5%; 64.7%; 21.8%	22.5; 70.9; 6.6%	22.7; 63.2; 14.0%		
	Unemployment rate	9.54%	9.0%	18.6%	12%	17-29%		
	Composition of economy (% agriculture & fishing)	20.1%	9.6%	26.9%	20.3%	No data		
MACRO TOURISM (REGION OR PROVINCE)	Annual tourist movement (visitors)	637,540	1,624,401	250,967	9,843,370	231,960	7,200,000	
	International visitors	31.7%	85%	26.0%	No data	No data	No data	
	National visitors	68.3%	15%	74.0%	100%	100%	100%	
MPA TOURISM	Arrivals (No. of tourists)	48,756	123,327	166,992	98,798	231,000	No data	
	Low season arrivals (monthly)	150	No data	0	2,872	No data	No data	
	High season arrivals (monthly)	10,025	No data	99,243	54,790	No data	No data	
	Overnight stays	216,412	No data	No data	239,242	481,049	No data	
	Average stay (days)	4.1	10.5		5	10.3	6.8	
	Tourism capacity (residences/beds)	64/3,121	No data	No data	72/4,495	11/2,998	No data	
	Catering capacity (# of restaurants)	23	No data	No data	No data	9	No data	
NB TOURISM CHARACTERISTICS	Numbers of NBT estimated	3,125	250	225	400	9,304	400	
	Age <20; 20-30; 31-40; 40-50 (%)	14; 18; 23; 16	17; 24; 24; 9	1 ; 9; 29; 44	3; 6; 50; 18	9; 28; 32; 21	2; 19; 57; 18	
	University educated	42%	45%	No data	82%	59%	78%	
	Employed	32%	38%	No data	62%	37%	49%	
	Nationality (foreign)	11%	67%	5%	3%	34%	4%	
	Aware of MPA's existence	86%	95%	84%	21%	46%	23%	
	MPA was a key reason for deciding to visit	56%	12%	80%	15%	17%	43%	
	Recognize MPA as tool for conservation	83%	81%	79%	82%	46%	84%	
	Appreciation of natural resources (water)	20%	67%	65%	23%	17%	67%	
	Willingness to pay (€, % of respondents)	3-5€, 42%	1-2€%, 29%	3-5€, 79%	5-10€, 53%	3-5€, 32%	5-10€, 55%	

3.2 COMPARATIVE ANALYSIS BETWEEN THE SIX CASES

The systemic data analysis is followed by a more specific comparative analysis and an interpretation of the results, which offers some interesting outputs and insights.

3.2.1 INSTITUTIONAL AND ORGANIZATIONAL CHARACTERISTICS

In the four countries of our assessment, there is a clear national legislative framework for the establishment of MPAs, and all six MPA boundaries have been already identified (figure 4).

Figure 4: Map of the 6 MPAs (only the location)

However, the legislative process for the establishment of the MPA is in a significant different stage. For the three European MPAs, this process was completed more than 20 years ago with publication in the official gazette ('gazetting') and the creation of ad hoc regulations to manage each MPA. The existing legislative frameworks have the potential to regulate human activities and to protect marine biodiversity. By contrast, the non-EU MPAs are still in the process of finalising the institutional process to create the MPA. In Tunisia, the site of Tabarka is included as priority site for conservation in the national strategy of MPA (APAL 2010), whereas, in Algeria, the terrestrial National Parcs of both Gouraya and Taza, in 2018, have started the official procedures for extending their borders at sea in order to create new MPAs.

Organizational differences are therefore evident between the North and South Mediterranean contexts. All three European MPAs have an operational managing body, in the North African sites the existing managing bodies have management competences only in the terrestrial part. The three European MPAs have a "governance by government" (Worboys, 2015) through public (municipality) or hybrid (mixed public/non-profit consortium) organizations, mainly managed with a top-down approach. From a structural point of view, the EU MPAs are normally managed with a functional type structure that allows them to cover various aspects of management with ad-hoc skills and competences (figure 5).
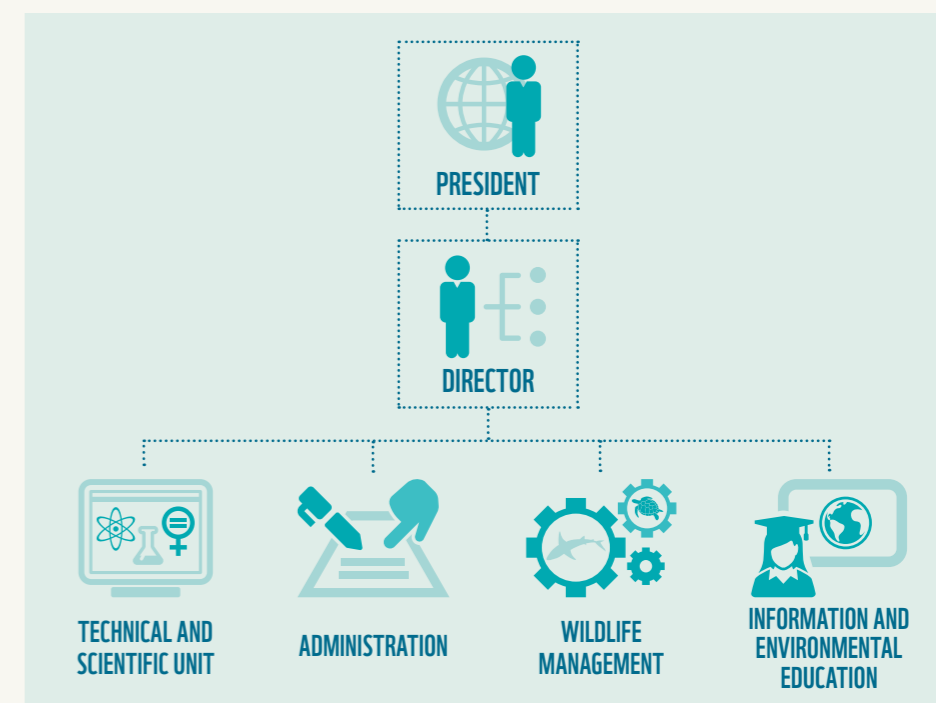

Figure 5: Typical functional organizational chart of a European MPA

In addition, only the European MPAs have adequate staff and budget capacities, two of the most relevant predictors of MPA efficacy (Gill et al. 2017, Scianna et al., 2019). Regarding personnel, it should be noted that EU MPAs mainly recruit non-permanent employees (internships, short-term contracts). A significant presence of volunteers was observed exclusively in the Egadi Islands MPA.

In the three non-EU sites, a number of national or international initiatives have been promoted to create the pre-condition for a future proper management of the site (i.e. environmental and socio-economic assessments, stakeholder engagement, voluntary regulations, local economic development[8]). However, if the administrative blockages are not addressed and the three sites are not going to be officially established, there is a serious risk to lose the credibility that it has built up over the last years.

The gap between EU and non-EU MPAs is also clear when it comes to strategic maturity. All three European MPAs have an official mission and a management plan to implement it, which the non-EU ones lack. Both the Croatian and Italian MPAs have developed integrated, long-term and strategic management plans (with objectives and indicators to monitor the effective implementation), through a stakeholder consultation and engagement. Both processes were led by the national Ministry of Environment in collaboration with WWF (ISEA project and MedPAN South projects).

3.2.2 THE NBT ACROSS THE SIX DESTINATIONS

Although all six MPAs share the same Mediterranean Sea, each has its own social, cultural and economic context. It is important to take this contextual information into account in any comparative analysis of the tourism sector.

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8 See MedPAN South, SEA Med, and MedMPAnetwork projects

By consulting the national databases of each country, we extrapolated information about general annual tourist movements, choosing the smallest geographic scale available. For Telašćica and Egadi Islands we collected data about tourism movements in the provinces in which the protected areas are located, for Torre Guaceto and Tabarka we collected data from the municipalities, while for the Algerian MPAs we used regional data. As shown in the graph below, the difference of geographical scale led to greater values for these two MPAs: Gouraya recorded more than 9 million visitors, followed by Taza with 7 million.
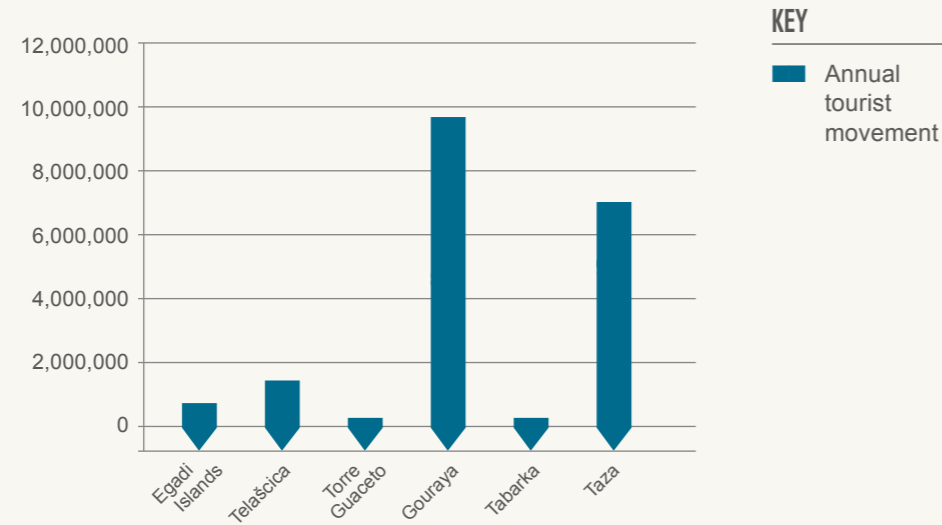

Figure 6: MPAs' context and their annual tourism movement (visitors)

Strong seasonality characterizes all contexts, creating a mass-tourism effect in the peak season. A complete mass tourism characterization is evident in the area of Taza and Gouraya. Beach tourism is the most important form of tourism, although in Telašćica we observed a presence of multi-target tourism (especially nautical and cruise tourism). In the two Italian MPAs we found mainly domestic tourism starting in June and ending in September, with a low presence of international visitors; Telašćica had more international visitors. Algerian MPAs only receive domestic tourism. Compared to the southern part of Tunisia, Tabarka is a quiet tourist destination with few holiday resorts.

As discussed in the methodology section, the survey included an interview with 375 tourists. The following histogram shows the distribution of interviews in the six MPAs.
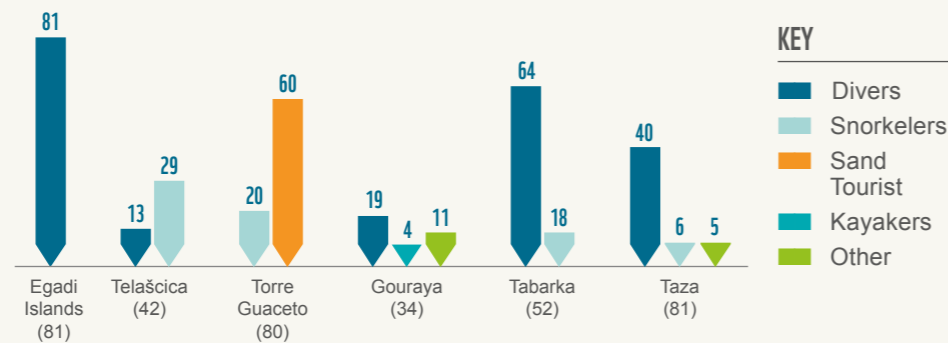

Figure 7: Distribution of the interviews in the 6 MPAs

Analysing the interviewees' country of origin, the Italian and even more the Algerian MPAs show a strong national tourism demand, while the presence of foreign tourists rises in Tabarka and becomes prevalent in Telašćica (figure 8). This would appear to match broader regional or provincial trends: macro data for the European MPAs regarding the composition of tourists by country of origin shows a prevalence of national visitors around Egadi and Torre Guaceto, compared to 85% of international visitors around Telašćica.
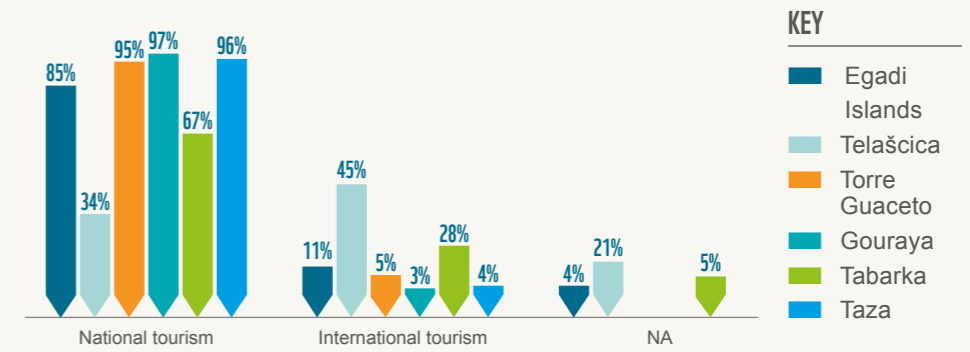

Figure 8: National and international origin of the NBTs in the six MPAs

Observing the average age of tourists, there is a gap of 4.5 years between the North African and European MPAs. This may be attributable to differences in demographic factors, such as life expectancy. The number of young people is particularly high in the North African MPAs, in particular in Gouraya and Taza where almost 80% of respondents were under the age of 40, though all age groups participate in NBT. Torre Guaceto had the highest average age of tourists (42 years) and the highest percentage (62%) of over-40s. This is probably influenced by the type of sample interviewed, consisting of snorkelers and beach tourists rather than scuba divers, who generally require a higher level of physical fitness.
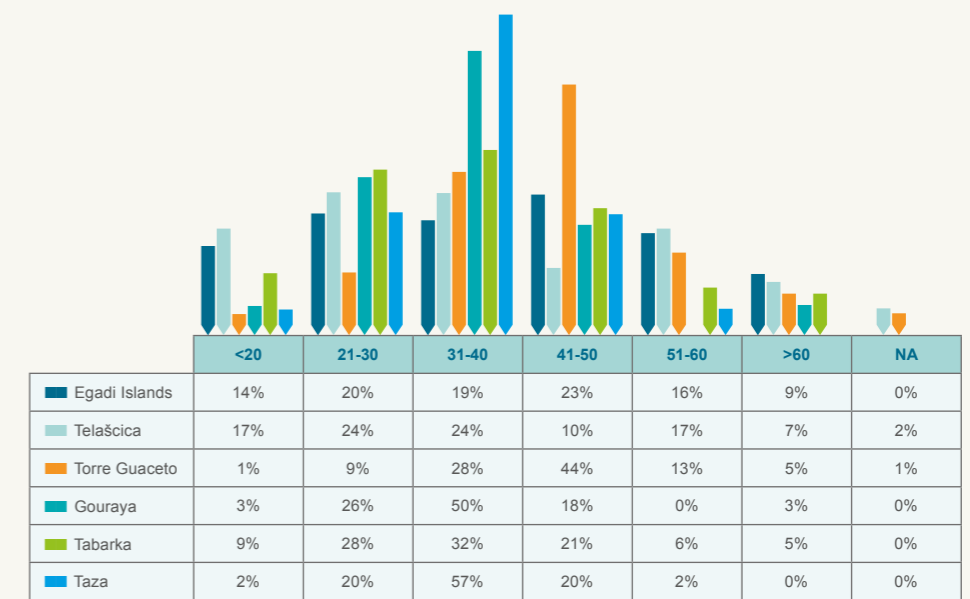

	<20	21-30	31-40	41-50	51-60	>60	NA
Egadi Islands	14%	20%	19%	23%	16%	9%	0%
Telašcica	17%	24%	24%	10%	17%	7%	2%
Torre Guaceto	1%	9%	28%	44%	13%	5%	1%
Gouraya	3%	26%	50%	18%	0%	3%	0%
Tabarka	9%	28%	32%	21%	6%	5%	0%
Taza	2%	20%	57%	20%	2%	0%	0%

Figure 9: Distribution of NBT by age groups (percentages)

FEATURE INFLUENCING CHOICE OF DIVING/SNORKELLING SITE								
	Water quality	Presence of spectacular species	Abundance & diversity of fish	Presence of particular underwater scenery	Safety	Opportunity to do other activities	Proximity to accommodation	Presence of MPA
EGADI ISLANDS	20%	18%	16%	16%	3%	6%	11%	9%
TELAŠĆICA	57%	50%	40%	33%	17%	19%	10%	31%
TORRE GUACETO⁹	32%	0%	47%	47%	0%	53%	50%	50%
GOURAYA	23%	15%	6%	23%	24%	7%	4%	0%
TABARKA	17%	14%	15%	17%	9%	7%	12%	8%
TAZA	67%	25%	53%	67%	55%	6%	24%	2%

Table 4: Factors that influence the choice of diving/snorkelling site

Table 4 shows the main reasons NBTs choose to visit the six MPAs. Taza's divers and snorkelers especially appreciate the water quality (67%), the underwater scenery (67%) and safety (55%); while in Telašćica, the choice of the diving/snorkelling site is mainly influenced by the water quality (57%) and spectacular species (50%). For Egadi, Gouraya and Tabarka, the results do not indicate a preponderance for one or more choice factors, though they show a slight prevalence for water quality (20% for Egadi; 23% for Gouraya; 17% for Tabarka) and for underwater scenery (23% for Gouraya and 17% for Tabarka). As in Taza, safety was an important factor in Gouraya (24%); the emphasis given to security in these two Algerian MPAs is noteworthy.

The presence of an MPA in itself does not seem to be an important choice factor, only in Telašćica and Torre Guaceto it results important for the 31% and 20% of respondents. For the non-European MPAs this may be expected since the MPAs are still not legally gazetted and future plans not yet properly promoted, but it is surprising that for some EU MPAs (such as Egadi) fewer than 10% of NBTs mentioned the presence of the MPA as an important factor of choice.

Figure 10 shows the awareness and attitudes of interviewed tourists toward conservation in the six MPAs. Due to their higher level of institutional and organizational maturity, in the European MPAs there is a higher level of awareness about the presence of an MPA in the chosen tourist destination. Nevertheless, it is interesting to note that some effort is undergoing in Gouraya, Taza and Tabarka to promote the establishment of a new MPAs, as some of the interviewed tourists showed some level of awareness. Finally, in all six MPAs a large proportion of those surveyed see MPAs as a key tool to ensure the conservation of marine ecosystems.
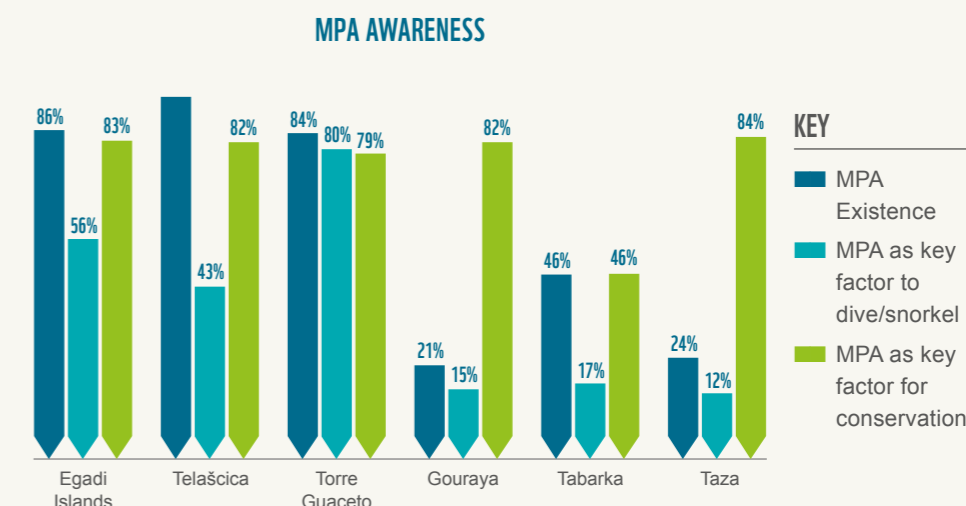
MPA AWARENESS

Figure 10: Awareness towards conservation

The evaluation of ecosystem services related to NBT in the six MPAs reveals different levels of development of this type of tourism and, consequently, different levels of impact for the local economy. Taza and Gouraya show a low level of recreational value of NBT activities. Compared to the beach tourism, diving and snorkelling activities are in their early stage of developed in two MPAs of Algeria. The recreational value in Telašćica and Torre Guaceto identifies the existence of a NBT niche, but it still does not have the maturity and development to significantly impact the local economy. In Egadi and Tabarka, the high level of recreational value suggests that NBT is a significant niche sector able to orient the whole local tourism industry towards sustainable goals.
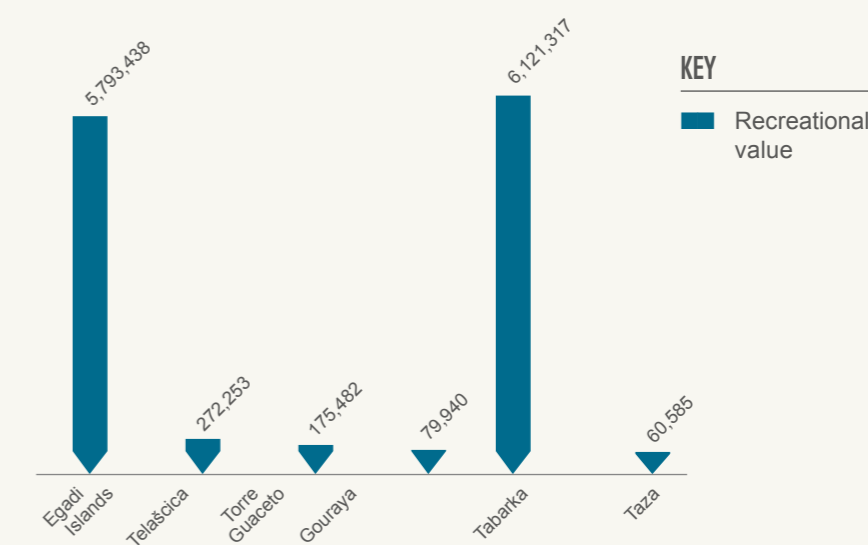

Figure 11 Recreational value estimated (TCM) (in €)

9 In this MPA has been used a slightly different question to collect the data.

Most NBT segments, particularly diving, are selective forms of niche tourism that cannot be performed by the masses. Nevertheless, from a socio-economic point of view, the findings show that nature-based tourism can help the local economy

The last question in the comparative analysis is around the willingness to pay (WTP) for marine conservation. WTP is an important way to assess the value of ecosystem services, especially during the process of establishing an MPA. From the analysis, a fairly homogeneous picture emerges: a high percentage of visitors demonstrate a positive attitude toward the possibility of paying an extra amount for conservation projects. As shown in the figure 12, in Torre Guaceto, Egadi and Tabarka the higher percentage of preferences is €3-5 per dive, while in Telašćica it is €1-2 per dive. In Gouraya and Taza the highest response rate is concentrated in the € 5-10 range.
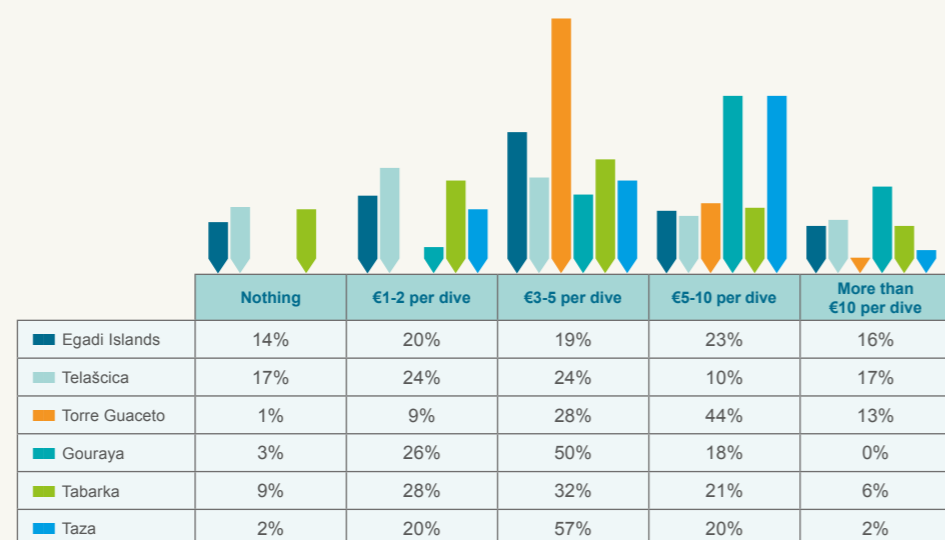

	Nothing	€1-2 per dive	€3-5 per dive	€5-10 per dive	More than €10 per dive
Egadi Islands	14%	20%	19%	23%	16%
Telašćica	17%	24%	24%	10%	17%
Torre Guaceto	1%	9%	28%	44%	13%
Gouraya	3%	26%	50%	18%	0%
Tabarka	9%	28%	32%	21%	6%
Taza	2%	20%	57%	20%	2%

Figure 12: Willingness to pay in the 6 MPAs

Table 5 confirms the results described above, showing the highest average WTP of €7.78 for Gouraya and the lowest of €4.13 for Telašćica.

	EGADI ISLANDS	TELAŠĆICA	TORRE GUACETO	GOURAYA	TABARKA	TAZA
Average WTP	€ 4.39	€ 4.13	€ 4.74	€ 7.78	€ 4.11	€ 5.73

Table 5: Average willingness to pay in the 6 MPAs

3.2.3 THE SSF CHARACTERISTICS OF THE SIX CASE STUDIES

The analysis of the local small-scale fisheries in the six MPAs shows quite a heterogeneous socio-economic framework. Although each case study has its own identity, the comparative analysis allows us to identify some similarities and at the same time to underline some relevant differences.

In Gouraya, Taza and Tabarka small-scale fishing seems to be a key economic activity for the local community, despite the perceived decreasing number and quality of fish catches resulted from interviews. In Egadi Islands, SSF is a significant activity for local economy. In Torre Guaceto we found successful SSF management, with positive effects on the local economy and on the health conditions of the marine and coastal ecosystem. In Telašćica, SSF is scarcely developed and we should consider that the resident population is very low.

While involvement in artisanal fishing usually begins at an early age, most of the interviewed fishermen were between 41 and 60 years old. Only Tabarka had a significant percentage of young fishermen (14%) between 20 and 30 years old. These results seem to suggest that one challenge for the future survival of artisanal fishing is to promote the practice among the young generations.

Most of the respondents had a low-medium level of education (primary or middle school diploma). All the fishers interviewed in Telašćica had a high school certificate, while in Taza, Tabarka and Gouraya we found a small percentage of fishermen that did not receive any school education and, at the same time, a small percentage with a high level of education.
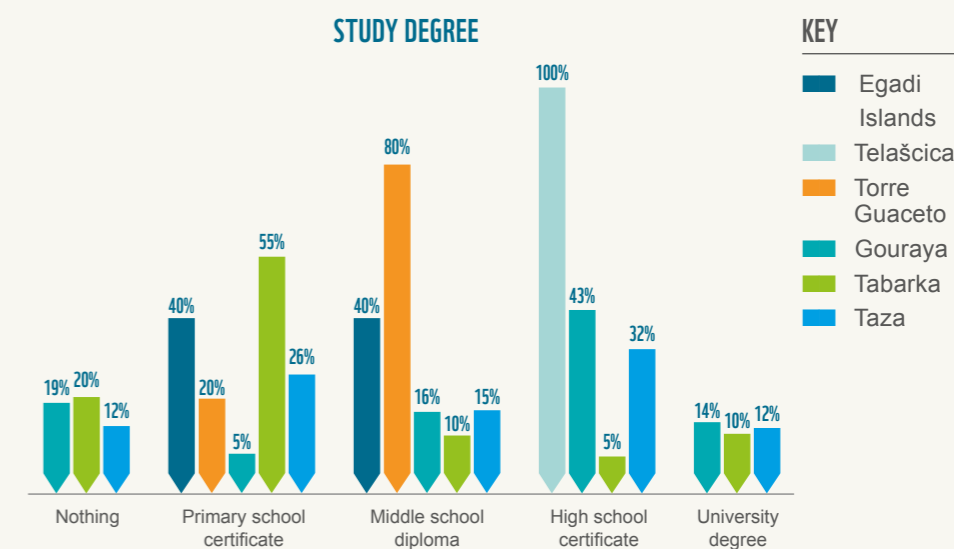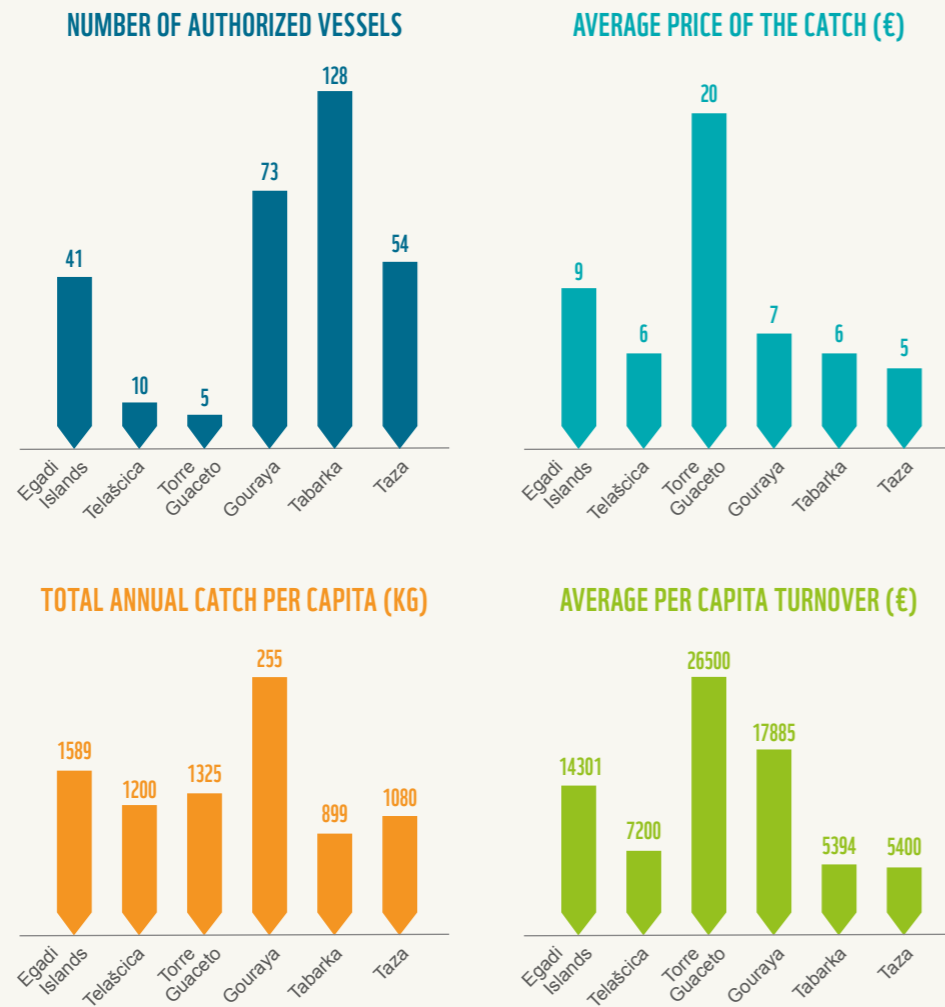

Figure 13: Study degree of the SSF

The box below synthesizes the main findings related to the structure and features of the SSF sector in the six case studies. Torre Guaceto has the fewest authorized artisanal vessels, while Tabarka has the most, presumably partly due to the lack of an authority protecting the MPA. Despite this, data shows that Tabarka has the lowest estimated total annual catch per capita (899kg), while in Torre Guaceto the small fleet has the highest performance (1,325kg).

NUMBER OF AUTHORIZED VESSELS

AVERAGE PRICE OF THE CATCH (€)

TOTAL ANNUAL CATCH PER CAPITA (KG)

AVERAGE PER CAPITA TURNOVER (€)

Box 1 Structure and features of SSF

The strong SSF management in Torre Guaceto is also clear when comparing the average price of the catch and the average per capita turnover. In Torre Guaceto a fisherman can sell his catch at around €20/kg while in other areas the price is less than €10/kg. In Telašćica, Taza and Tabarka the catch is sold at €5-6/kg. This gap is mainly due to the significant difference in the quality of the catch composition between the MPAs (figure 14). Most of the catch in Torre Guaceto (42%) is "first class fish", while in Taza, Egadi and Tabarka "third class fish" is more common. The economic performance of the relatively small MPA of Torre Guaceto is the result of many years of effective management of the fishery sector of the MPAs, through a well-protected no-take zone. The enhanced fisheries' productivity, notably through the "spill-over" effect and larval dispersal, has been largely proved for this MPA (PISCO and UNS, 2016).
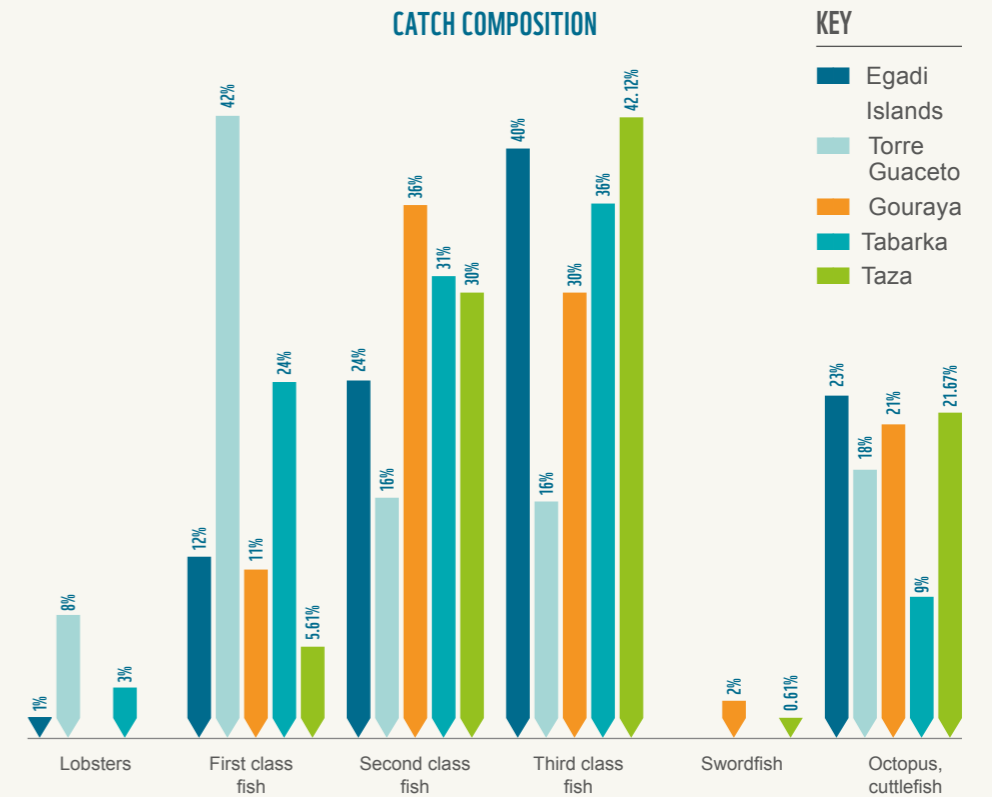
CATCH COMPOSITION

Figure 14: Catch composition

Examining the results related to fish sales, we find the presence of restaurants, local people or tourists in all the case study areas. In Tabarka 90% of the catch is sold to local fishmongers, while in Gouraya and Taza a high percentage is sold to wholesalers.

Therefore, although the total annual catch per fisherman is higher in the large harbour of Gouraya, fish from the smaller Torre Guaceto MPA has a higher quality and is sold at higher price.
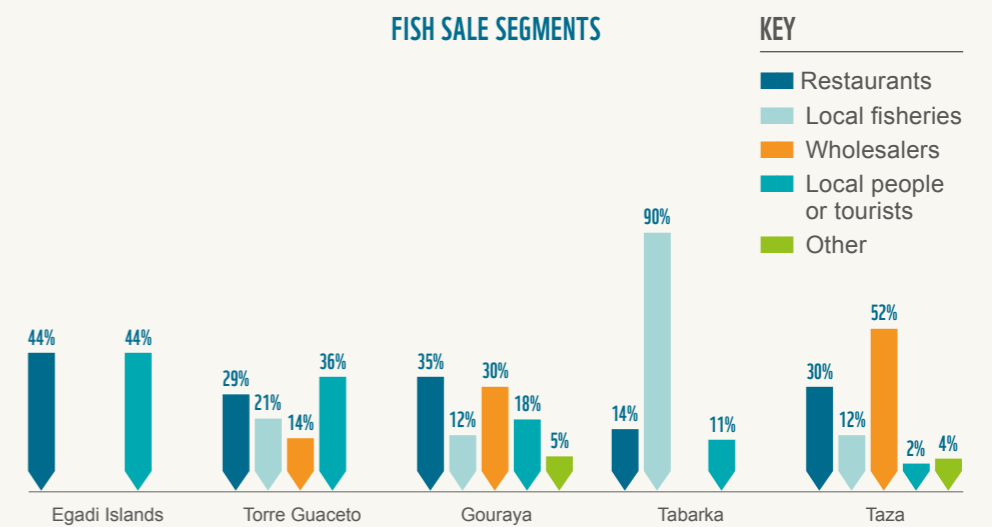
FISH SALE SEGMENTS

Figure 15: Fish sales

The three figures below synthesize the results of the SSFs' attitude toward the MPA, in terms of its overall management activity, social impact and governance. The perception of SSFs affects their support to the MPA's activities and, more generally, its mission (Bennet et al., 2019).

SSFs in the non-European MPAs show a moderate dissatisfaction for all three dimensions, though we find high scores of "no judgment" for the social impacts and governance, presumably due to the low level of institutional and organizational maturity of the MPAs. Torre Guaceto has the highest score across all three dimensions. Telašćica fishermen assign a high score to the MPA's overall management, but do not express any judgment about its social impacts and governance.

SSF from Egadi Islands show a negative attitude toward the MPA, with particular dissatisfaction concerning its social impacts. This may be due to the large number of people economically dependent on artisanal fishing in the MPA and, at the same time, the perceived lack of stakeholder engagement in the pre- and post-creation phases of the MPA (D'Anna et al 2016). This seems to have contributed to a low level of trust and dissatisfaction with some of the conservation and sustainable development initiatives set up by the MPA.

OPINION ABOUT MPA SOCIAL IMPACTS

KEY
■ Very satisfied ■ Satisfied ■ Neither ■ Dissatisfied ■ Very dissatisfied
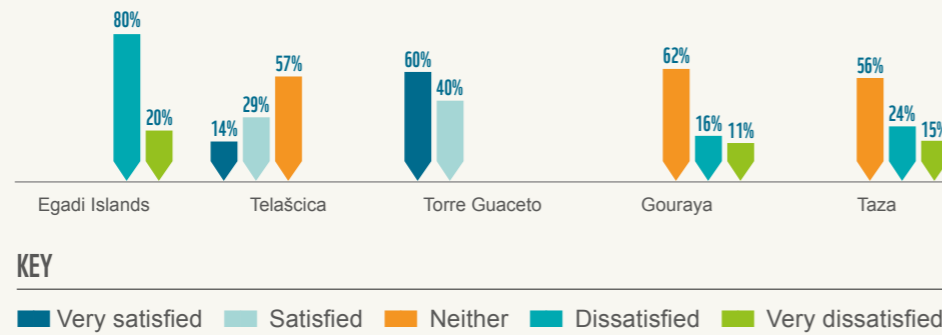
OPINION ABOUT MPA OVERALL MANNAGEMENT ACTIVITY

KEY
■ Very satisfied ■ Satisfied ■ Neither ■ Dissatisfied ■ Very dissatisfied

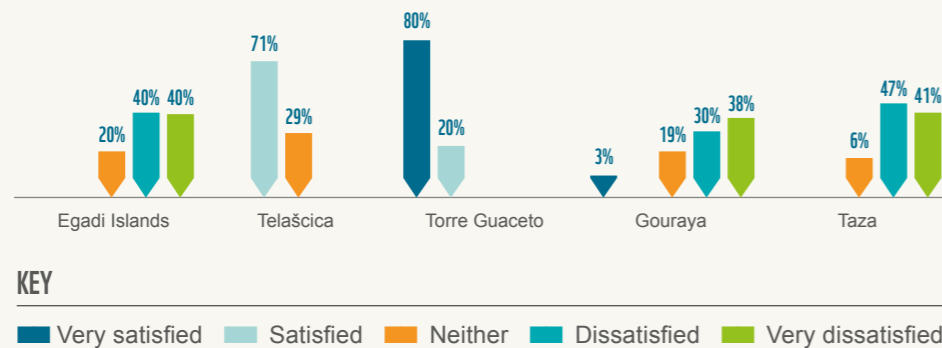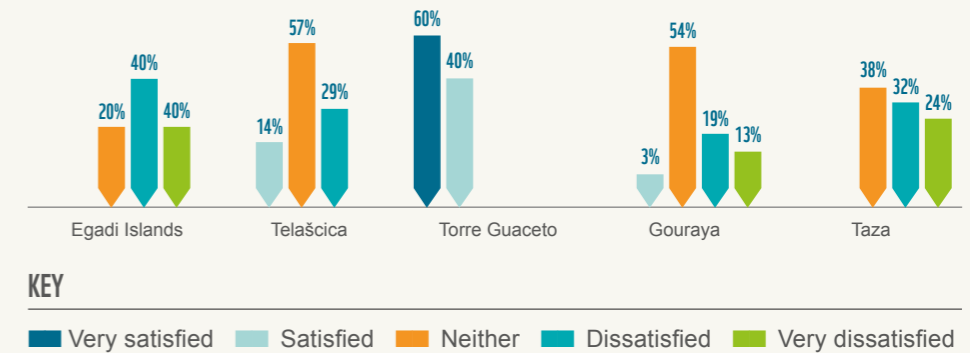*Figure 16 a, b, c: Fishermen's awareness of the MPA management activities and impacts*

OPINION ABOUT MPA GOVERNACE AND DECISION-MAKING

KEY
■ Very satisfied ■ Satisfied ■ Neither ■ Dissatisfied ■ Very dissatisfied

The variable "Degree of sharing MPA mission" was measured on three different dimensions, shown in the three graphs below. Overall, all the case studies demonstrated a good level of sharing the MPA mission from the fishery sector. Regarding the protection of biodiversity, there is a positive attitude especially in Egadi and Torre Guaceto (with 80% in full agreement). In the non-European areas we found small percentages of negative attitudes, which can be easily explained by the MPAs' low level of institutional maturity.

FISHERMEN PROTECT BIODIVERSITY: DEGREE OF AGREEMENT

KEY
■ Fully agree ■ Somewhat agree ■ Somewhat disagree
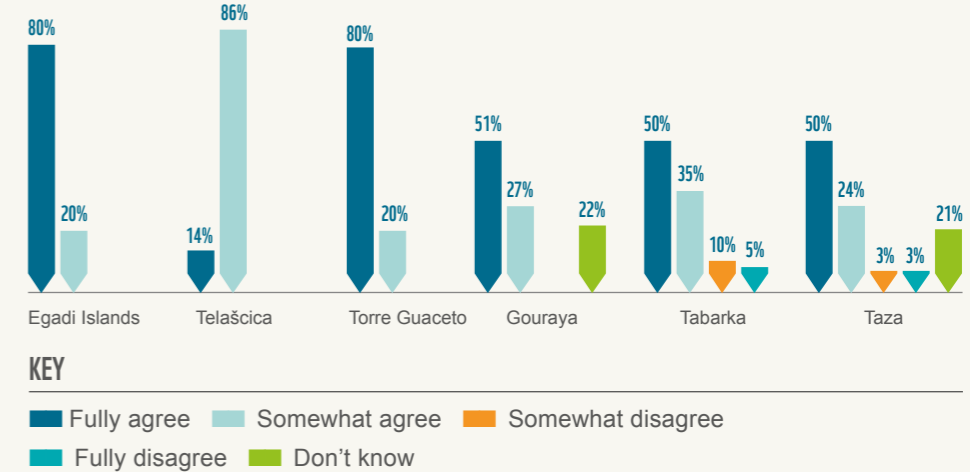■ Fully disagree ■ Don't know

Figure 17: Degree of sharing MPA mission: fishermen protect biodiversity

The degree of agreement in relation to the role of fishermen in reducing illegal fishing shows a greater variability. In Egadi all the fishermen interviewed fully agree about this potential role, followed by Tabarka and Taza (65%) and Gouraya (59%). In Torre Guaceto and Telašćica there is less agreement on this point, especially because the fishermen claim that they have neither the tools nor the authority to take concrete actions against illegal fishing.

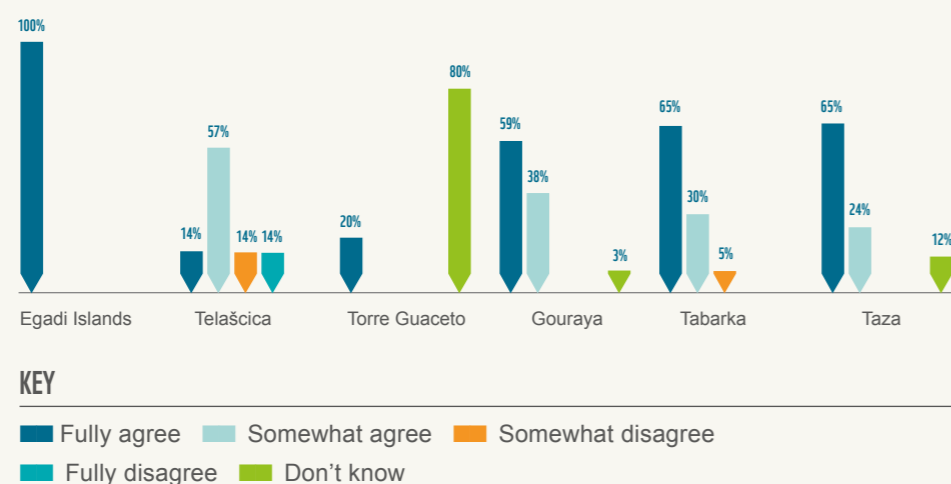## FISHERMEN REDUCE ILLEGAL FISHING: DEGREE OF AGREEMENT

Figure 18: Degree of sharing MPA mission: fishermen reduce illegal fishing

The possibility of practising educational activities seems still to be unfamiliar to fishermen, apart from a few successful experiences in Torre Guaceto, where the MPA collaborates with fishermen in educational activities even in schools. In some other MPAs there is a good level of perception of the potential role that fishermen could play as environmental educators (Tabarka and Telašćica).

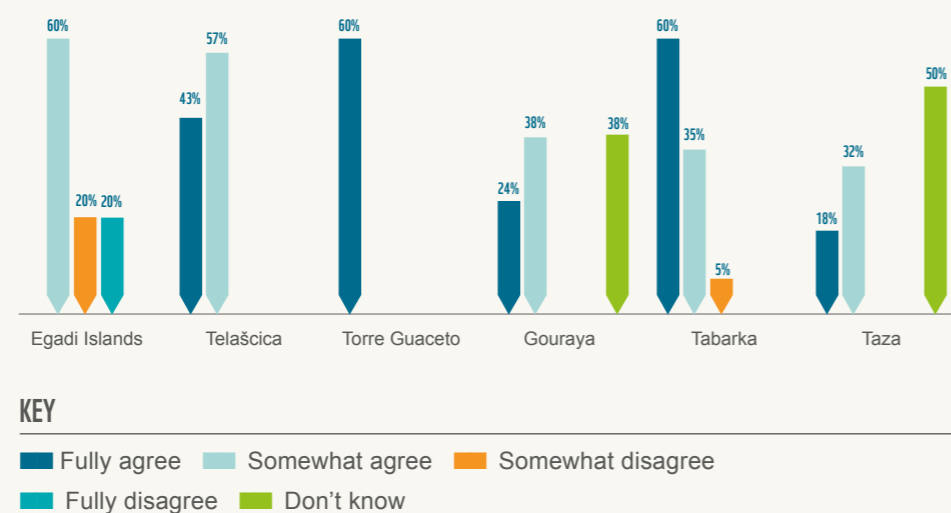## FISHERMEN PRACTICE EDUCATIONAL ACTIVITIES: DEGREE OF AGREEMENT

Figure 19: Degree of sharing MPA mission: fishermen can practise educational activities

SECTION 4

CONCLUSIONS

CONCLUSIONS

Each of the six case studies has its own distinguishing features, not only due to the different historical, cultural, economic and social contexts, but also to the institutional, organizational, touristic and fisheries characteristics. Here, we summarize our main findings.

4.1. INSTITUTIONAL AND ORGANIZATIONAL MATURITY

MPAs on opposite shores of the Mediterranean present deeply different stages of institutional and organizational maturity.

The European MPA system provides a mature legislative and organizational context, with regulations, organizational resources, and strategic and management plans to face the main challenges in the balance between conservation and sustainable development. Non-EU MPAs need to develop a more mature institutional framework, by creating concrete conditions to extend their organizational and management responsibility at sea.

Both Torre Guaceto and Egadi MPAs are effective MPAs. Torre Guaceto is a successful example where the results of an effective co-management of natural resources, based on a synergy between fishers, managers, researchers and NGOs, has directly enhanced biodiversity protection and associated ecosystem services (Guidetti and Claudet, 2010). In Egadi, a true stakeholder engagement process has started only recently. Although the fishery regulation is producing a positive effect on the marine environment, a lot should be done to gain the trust from the local community and properly address conflicts among the stakeholder groups (D'Anna, 2016). The MPA management was weak and inefficient until 2010, when the new MPA director imparted a new direction to the management based on greater transparency and participation. More incentives and a wider participation of stakeholders are deemed essential to a more effective management of the MPA.

The process to create the new MPAs in Algeria and Tunisia has started but is critically delayed. Long-term MPA regulations and management plans should be approved and the areas legally gazetted. After this step, enforcement, staff and budget capacity are needed to ensure effective conservation and governance of the areas. These delays and weaknesses might also have direct effects on the ability of SSF and NBT to generate economic benefits to the coastal communities living alongside these MPAs.
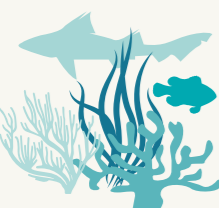
4.2. NATURE-BASED TOURISM

Despite their different socio-economic contexts, all the MPAs analysed face some common touristic challenges, particularly due to the mass tourism model and the related seasonality. The type of tourism existing in each MPA seems to strongly reflect the nature of regional and national tourism.

The main subject of this analysis, the diving sector, shows different levels of development but is generally still under-developed and has limited effects on local income. This is probably due to the complexity and selectivity of this form of tourism, which normally involves people with a high level of education and in good health, as

well as requiring expenditure on training and equipment. Only in Egadi (Italy) and Tabarka (Tunisia) is this sector is well developed. In the two Algerian MPAs – after a long period of inactivity due to the political context – the sector has just recently relaunched, with the MPAs now receiving around 400 divers.

Other tourism niches, like snorkelling, may offer simpler low-impact ways to connect with the underwater world in well-protected MPAs. In Gouraya and Taza, educational underwater paths have been created; they are run by local NGOs and diving centres and are showing a promising example of sustainable nature-based tourism.

A holistic and comprehensive evaluation of recreational ecosystem services in MPAs would require an in-depth preliminary analysis of the specific kinds of tourism activities in the area, and a detailed analysis of those present in the MPA. Nevertheless, MPAs can be seen as important tourist attractions, especially for divers and snorkelers. The touristic activities they support reflect the nature and composition of tourism in the larger area where they are located. MPAs can influence the whole touristic offer in this wider area by orienting it in a nature-based, sustainable direction.

GENERAL FEATURES	NBT FEATURES
Mass (beach) tourism (domestic or foreign)	Diving/snorkelling sector not yet fully developed
Seasonal tourism (high summer season)	Limited effects on local income Good willingness to pay
	High education level Young age composition, particularly in Tunisian and Algerian MPAs
	High level of awareness of MPA's role in conservation of marine ecosystem

Regarding the economic evaluation, the European MPAs appear to attract fairly well-off tourists, though they do not target a luxury market. Specifically, diving had a high impact only on Egadi. Compared to Torre Guaceto and Telašćica, Egadi is characterized by geographical features that have facilitated the development of the diving industry (easy accesses and a variety of interesting features). This has been seen in other European MPAs, where spectacular underwater conditions, high conservation standards and appropriate regulations and incentives have led to a lucrative development of the diving sector. Tavolara Punta Coda Cavallo MPA (Sardinia, Italy), for instance, attracts more than 10,000 scuba divers every year, generating a recreational value of more than €10 million (Niccolini et al., 2011).

In the Algerian cases, NBT is local and less valuable from a strictly economic point of view: the shorter distances travelled by tourists, fewer overnight stays and shorter duration of the stays, coupled with the fact that NBT is in a start-up phase, lead to lower economic values compared to other MPAs. Those aspects were analysed qualitatively and are also well captured quantitatively by the travel cost method (TCM). In comparison, Tabarka in Tunisia shows an interesting mix of local and international tourism. For decades regional and national coastal tourism has been oriented toward international tourists, though this is reflected less in the NBT niche of divers. As a result, the TCM values and the economic results for Tabarka are far superior to those of the Algerian MPAs. Again, it is important to take into account the socio-economic context, including in this case Tunisia's greater international tourist tradition.

The level of institutional and organizational maturity of MPAs can also influence the perception and the socio-economic performance of NBT. The very low rank assigned to the presence of an MPA as a key factor in choosing to visit the non-EU MPAs, for example, should not be read as a lack of sensitivity towards conservation and protected areas in general. Rather, it may easily be linked to the general absence of formal recognition, regulations and knowledge about coastal and marine resources protection. Significantly, Taza had the lowest percentage of NBTs indicating the presence of the MPA as a main choice factor, yet they expressed the highest sensibility to conservation initiatives, with high willingness to pay extra amounts.

Tourists' willingness to pay more in support of marine conservation varied among the sites; however, we should highlight that the minimum amount visitors would pay is €4, which is higher than the average daily tax in European cultural cities.

Key finding: the economic evaluation of NBT-related ecosystem services partially reflects the nature and composition of the marine tourism present in the regions and nations in which the MPAs are located. In two studied MPAs, the diving sector has an important influence on the local tourism economy, showing that protecting natural capital can foster sustainable economic opportunities.

4.3 THE LOCAL SMALL-SCALE FISHING SECTOR

The analysis conducted confirmed that SSF is a key or significant sector in the six Mediterranean cases from a social, economic and cultural point of view. The crucial challenge is for MPAs to improve the quality of life for SSFs, particularly allowing them to increase the volume and quality of the catch.

In the non-European areas, the MPAs' low level of organizational and institutional maturity inhibits SSFs from managing the resources they depend on. The lack of authorities, regulations, plans and policies for SSF undermines sustainability objectives, but also prevents the SSF sector from increasing the value of the catch, strongly affecting the local economy. This can be crucial, especially in the Algerian cases where the impact of MPAs on local economies is still tied to provisioning services like fish production. Recreational services like NBT are present but have limited economic impact in terms of income generation.

In the three European contexts, the SSF sector is quite different. In the Egadi Islands there is a consistent number of authorized vessels, and the MPA manages a complex situation where numerous users are in competition for the same resources. In Telašćica, even if SSF is characterized by a subsistence economy, enhancing sustainable fishing is a key activity in the MPA. In Torre Guaceto, thanks to the presence of a small community of SSFs and to their engagement in a co-management process, a virtuous circle has been realized. This positive experience of finding a balance between fishermen's and conservation needs could be a best practice for other MPAs with similar features in the Mediterranean Sea. Torre Guaceto also exhibits a high level of institutional and organizational maturity, supporting SSF involvement in co-management.

Generally, SSFs will have a positive perception of the MPA if it is associated with a higher availability and quality of fish or is seen as an effective tool for illegal fishing reduction. In this way it is possible to positively involve the SSF community, who may initially perceive the MPA as a threat that limits their ability to fish in the area. Communication is critical in order to underline the potential benefits and to involve SSFs in the MPA's mission.

MPAs could have a strategic role to protect, through their regulations, not only the ecosystems, but also artisanal fishing traditions. The advanced age of artisanal fishers and the significant decrease in catch and income per vessel have led to dramatic reductions in artisanal fishing fleets in many Mediterranean countries (Guidetti et al., 2010). Institutionally mature MPAs, if well equipped with staff and budget, can become effective mediators to implement a virtuous, mutually reinforcing loop between marine conservation and a productive, sustainable SSF sector.

The results of the SSF analysis are also influenced by the socio-economic context. The size of the fleets in the North African MPAs is, for example, certainly connected to an economic context where the primary sector still makes up a significant proportion of economic activity.

The level of institutional and organizational maturity of MPAs seems to influence the perception and also the socio-economic performance of SSF. The presence of a managing body and staff, but above all of the tangible outputs – such as regulations, management plans, surveillance and direct engagement with SSFs – can support the sector's ecological, social and economic sustainability. An MPA that is able to establish and enforce shared regulations and management plans, drawn up through engagement with SSFs, can improve perceptions and awareness, and create conditions in which SSF activities are economically advantageous and environmentally sustainable.

Key finding: MPAs' institutional and organizational maturity influences SSF perception of MPAs and the socio-economic performance of the sector. Although in studied sites a conflict between the MPA and the fishery community is always present to a certain degree, all interviewed fishers consider themselves to have an important role in protecting biodiversity. Both MPAs and most of the fishers seems to share the same mission. Only by promoting the co-management of the natural resources can MPAs address these conflicts and find solutions to rebuild fish stocks and secure SSF livelihoods.

4.4. GENERAL CONSIDERATIONS

This research has confirmed that the evaluation of MPAs' ecosystem services and socio-economic benefits is a complex issue. **Placing monetary values on intangible and non-financial aspects and dynamics, such as the well-being of tourists, is inexact and clearly an oversimplification.** Some of the most important intrinsic values of MPAs (such as the value of species that are rare but of little tourist interest) are not well captured in socio-economic evaluation methodologies, which in their actual application are incomplete and inaccurate.

Nevertheless, it is essential that MPAs use appropriate methodologies to regularly and robustly collect and process socio-economic information in order to minimize the uncertainties and to obtain economic estimations that, even if not certain, could be at least "probable". This requires a level of institutional, regulatory and organizational maturity and skills (in-house or outsourced).

In fact, most of MPAs lack resources to perform socio-economic monitoring activities and to fully use the information deriving from socio-economic analysis. From a financial point of view, MPA budgets do not allow existing funds to be used for these activities. Ad-hoc funding sources may be available (as in "Environmental Accounting" projects carried out in the Italian MPAs) but these are normally not enduring. In terms of human resources, MPAs normally do not have specialist competences to perform these

activities and must use consultants or external experts. It is therefore fundamental for MPA managers to develop collaboration competencies, enhancing partnerships with universities or other organizations, including NGOs, that can provide access to this expertise. The actual outputs of the quantitative assessment of ecosystem services may be of limited use to MPA managers and policy-makers.

Evaluation of MPAs' ecosystem services and socio-economic benefits can provide MPA managers and policy-makers with valuable information to make more informed, evidenced-based decisions and develop effective strategies.

The economic value of nature-based tourism or the small-scale fishing sector should be well communicated to stakeholders at **different levels in order to better influence the future strategies for managing and governing an MPA.**

What may be more useful is the process of evaluating these ecosystem services. A science-based assessment requires accurate knowledge of the various sectors and stakeholders that interact with the MPA, as well as the wider socio-economic context. This will give MPA managers and policy-makers a lot of valuable information to make more informed, evidenced-based decisions, effective regulations and realistic plans.

It should be reiterated that the monetary evaluation of ecosystem services is a tool, not an end in itself. It should not lead us to think that the MPAs should obtain the maximum financial return, in particular in the short term. Many unsustainable strategies could generate high monetary returns, but compromise the quality of ecosystems in the long term.

However, MPA managers can make stronger decisions if these are based not only on ecological knowledge of natural environments, but also on socio-economic knowledge of those who interact directly with these natural environments. This can set up strategies born from a real engagement of these key actors, in a way that leads to a mutual reinforcement of the objectives of marine conservation, and well-being and economic growth for those who live and work in close contact with the MPA. This in turn can increase the level of stakeholder engagement, and therefore the social legitimization of the MPA, which can attract greater support, including increased financial and human (e.g. volunteer) resources Understanding attitudes of key stakeholders (such as SSF and NBT) can help MPA managers to implement policies and strategies that meet environmental and socio-economic objectives (Niccolini et al., 2018). This can create a virtuous circle of engagement, effectiveness and social legitimization (figure 20).
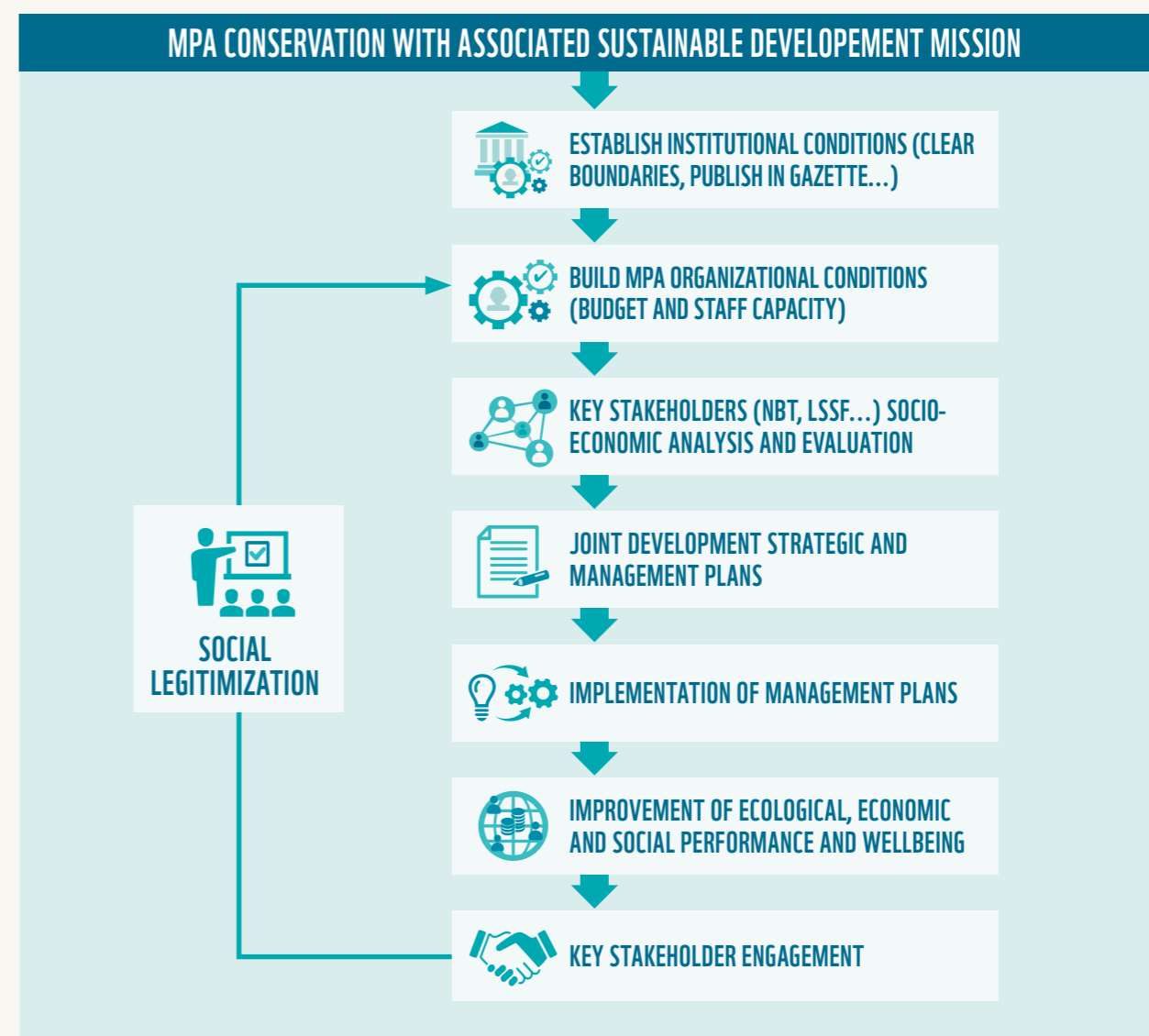

Figure 20: Virtuous loop between key stakeholder engagement and MPA holistic effectiveness

Figure 21: MPA as ecological, social, economic system driven by the MPA conservation mission and a key stakeholders engagement strategy

REFERENCES

Alban, F., Appéré, G., & Boncoeur, J. (2006). Economic analysis of marine protected areas: a literature review. Booklet n.3. 51pp.

APAL 2010. Programme de développement des Aires marines et Côtières en Tunisie (http:/apal.nat.tn)

Bennett, N. J., Di Franco, A., Calò, A., Nethery, E., Niccolini, F., Milazzo, M., & Guidetti, P. (2019). Local support for conservation is associated with perceptions of good governance, social impacts, and ecological effectiveness. Conservation Letters, e12640.

Bohrnstedt, G.W., Knoke, D. (1994), Statistics for social data analysis, Peacock Publishers

Boubekri, I., & Djebar, A. B. (2016). Marine protected areas in Algeria: future marine protected area of "Taza" (SW Mediterranean), continuing challenges and new opportunities facing an integrated coastal management. Ocean & Coastal Management, 130, 277-289.

Ceballos-Lascuráin, H. (1996). Tourism, Ecotourism, and Protected Areas: The State of Nature-based Tourism Around the World and Guidelines for its Development. IUCN, Gland, Switzerland.

Corbetta P. (2003), La ricerca sociale: metodologie e tecniche, Il Mulino, Bologna

D'Anna, G., Vega Fernández, T., Pipitone, C., Garofalo, G., Badalamenti, F (2016) Governance analysis in the Egadi Islands Marine Protected Area: A Mediterranean case study Marine Policy

Marine Policy 71, 301-309

De Groot, R. S., Alkemade, R., Braat, L., Hein, L., & Willemen, L. (2010). Challenges in integrating the concept of ecosystem services and values in landscape planning, management and decision making. Ecological complexity, 7(3), 260-272.

Eagles, P. F., McCool, S. F., Haynes, C. D., & Phillips, A. (2002). Sustainable tourism in protected areas: Guidelines for planning and management (Vol. 8). IUCN, Gland, Switzerland.

European Commission (2011). Our life insurance, our natural capital: an EU biodiversity strategy to 2020. COM (2011) 244. Brussels, Belgium.

European Commission Directorate-General for Environment (2016). Marine protected areas bring multiple benefits. Environment for European, 59, 3.

Freeman, R. E. (1984). Strategic management: A stakeholder perspective. Pitman, Boston, 13

Freeman, E. R., Civera, C., Cortese, D., & Fiandrino, S. (2018). Strategising stakeholder empowerment for effective co-management within fishery-based commons. British Food Journal.

Gill, D.A., Mascia, M.B., Ahmadia, G.N., Glew, L., Lester, S.E., Barnes, M., et al. (2017). Capacity shortfalls hinder the performance of marine protected areas globally. Nature 543, 665–669.

Glaser, M. (2006). The social dimension in Ecosystem Management: Strengths and weaknesses of human-nature mind maps. Human Ecology Review, 13(2), 122-142.

Guidetti et al. (2010). Assessing the potential of an artisanal fishing co-management in the Marine Protected Area of Torre Guaceto (southern Adriatic Sea, SE Italy). Fisheries Research 101, 180.

Guidetti, P. & Claudet, J. (2010) Comanagement practices enhance fisheries in marine protected areas. Conservation Biology, 24: 312-318.

Haines, R., Pantzar, M., Hattam, C., Russi, D. (2018). Study on the economic benefits of Marine Protected Areas. Publications Office of the European Union, ISBN: 978-92-9202-378-2.

Haines-Young, R., & Potschin, M. (2011). Common international classification of ecosystem services (CICES): 2011 Update. Report to the European Environmental Agency, Nottingham, UK.

Haines-Young, R., & Potschin, M. (2013). Landscapes, sustainability and the place-based analysis of the ecosystem services. Landscape Ecology 28(6), 1053-1065.

Himes, A. H. (2007). Performance indicator importance in MPA management using a multi-criteria approach. Coastal Management, 35(5), 601-618.

Halpern, B. S., Walbridge, S., Selkoe, K. A., Kappel, C. V., Micheli, F., D'agrosa, C., ... & Fujita, R. (2008). A global map of human impact on marine ecosystems. Science, 319(5865), 948-952.

Jax, K., Barton, D. N., Chan, K. M., De Groot, R., Doyle, U., Eser, U., ... & Haines-Young, R. (2013). Ecosystem services and ethics. Ecological Economics, 93, 260-26.

Kelleher, G. (1999). Guidelines for Marine Protected Areas, IUCN, Gland, Switzerland and Cambridge, UK.

Kumar, P. (2012). The economics of ecosystems and biodiversity: ecological and economic foundations. Routledge.

Maes, J., Teller, A., Erhard, M., Liquete, C., Braat, L., Berry, P., ... & Paracchini, M. L. (2013). Mapping and Assessment of Ecosystems and their Services. An analytical framework for ecosystem assessments under action, 5, 1-58.

Marsh, G. P. (1864). Man and Nature, Ch. Scribner, New York.

Micheli, F., & Niccolini, F. (2013). Achieving success under pressure in the conservation of intensely used coastal areas. Ecology and Society, 18(4).

Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. Academy of management review, 22(4), 853-886.

Millennium Ecosystem Assessment (2005). Ecosystems and human well-being: synthesis. Island Press, Washington DC.

Naidoo, R., Balmford, A., Costanza, R., Fisher, B., Green, R. E., Lehner, B., ... & Ricketts, T. H. (2008). Global mapping of ecosystem services and conservation priorities. Proceedings of the National Academy of Sciences.

National Research Council. (2005). Valuing ecosystem services: toward better environmental decision-making. National Academies Press.

Niccolini, F., Giannini, M., Cavallini I., Contini M. (2018). The European protected areas approach to organizing ecotourism: A study of benchmark protected areas. In: Azara, I., Michopoulou, E., Niccolini, F., Taff, B., & Clarke, A. (Eds.) Tourism, Health, Wellbeing and Protected Areas. CABI.

Niccolini, F., Marzo, D., De Benedictis, L. (2015). Analisi della filiera del pescato dell'Area Marina Protetta di Tavolara Punta Coda Cavallo e potenziali leve per lo sviluppo. Report dell'Area Marina Protetta.

Niccolini F., Marzo D., Palumbo F. (2011), Ecoturismo, sviluppo socio-economico e conservazione. La cernia bruna come driver dell'Area Marina Protetta di Tavolara Punta Coda Cavallo, MPA Internal Report

Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. Science 325, 419-422.

PISCO and UNS - Partnership for Interdisciplinary Studies of Coastal Oceans and University of Nice Sophia Antipolis (2016). The Science of Marine Protected Areas (3rd edition, Mediterranean). www.piscoweb.org. 22 pages.

Plieninger, T., Dijks, S., Oteros-Rozas, E., & Bieling, C. (2013). Assessing, mapping, and quantifying cultural ecosystem services at community level. Land use policy 33, 118-129.

Porter, M. & Kramer, M. (2011). The big idea: Creating shared value. Harvard Business Review.

Remoundou, K., Koundouri, P., Kontogianni, A., Nunes, P. A., & Skourtos, M. (2009). Valuation of natural marine ecosystems: an economic perspective. Environmental Science & Policy, 12(7), 1040-1051.

Rodriguez-Rodriguez, D., Kersting D., Webster C. (2017), Healtier seas, healthier people – Socioeconomic benefits of Marine Protected Areas. MedPAN. Marseille, France.

Rosales, R. M. P. (2018). SEAT: Measuring socio-economic benefits of marine protected areas. Marine Policy, 92, 120-130.

Russ, M. (2014). Homo Sustainabiliticus and the "new gold". In M. Russ (Ed.) Value creation, reporting, and signalling for human capital and human assets: Building the foundation for a multi-disciplinary, multi-level theory (pp. 1–6). Palgrave-Macmillan, New York, USA.

Scianna, C., Niccolini, F., Gaines, S. D., & Guidetti, P. (2015). 'Organization Science': A new prospective to assess marine protected areas effectiveness. Ocean & Coastal Management, 116, 443-448.

Scianna, C., et al. (2019). Organization science improves management effectiveness of Marine Protected Areas. Journal of Environmental Management, 240, 285-292.

Stake, R. E. (2013). Multiple case study analysis. Guilford Press, New York, USA.

Sukhdev, P. (2008). The economics of ecosystems and biodiversity. www.teebweb.org

White, M. P., Alcock, I., Grellier, J., Wheeler, B. W., Hartig, T., Warber, S. L., ... & Fleming, L. E. (2019). Spending at least 120 minutes a week in nature is associated with good health and wellbeing. Scientific reports, 9(1), 7730.

Worboys, G. L., Lockwood, M., Kothari, A., Feary, S., & Pulsford, I. (Eds.) (2015). Protected area governance and management. ANU Press, Canberra, Australia.

Yin, R. K. (2009). Case study research: Design and methods (applied social research methods).
Sage, London and Singapore.

WEB

https://biodiversity.europa.eu/maes
http://ec.europa.eu/environment/marine/index_en.htm
http://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm
https://fishmpablue-2.interreg-med.eu
http://medpan.org
http://web.unep.org/unepmap
www.ecotourism.org.au/assets/Uploads/Manifesto-v5.0.pdf
www.medtrends.org
www.protectedplanet.net/marin

APPENDICES

METHODOLOGY AND QUESTIONNAIRES

APPENDIX – I
METHODOLOGY

Using a multiple case study analysis approach (Yin, 2009; Stake, 2013), we performed an exploratory study designed to investigate key socio-economic and organizational dimensions of MPAs that can affect the effectiveness of marine and coastal ecosystem conservation strategies.

The multiple case study analysis has been developed in six Mediterranean MPAs. The exploratory study is specifically focused on identifying an adaptive methodology for the evaluation of the key economic benefits and organizational leverages, which could be potentially applied in different Mediterranean contexts.

Detailed descriptions of the assessment results for each MPA are provided as separate annexes.

Our methodological scope: make an exploratory study to identify an adaptive methodology for evaluating key economic benefits and organizational leverages, potentially applied in different Mediterranean contexts (MPAs)

1. MPA CASE STUDIES

At the beginning, we identified eight Mediterranean countries (Italy, France, Spain, Slovenia, Croatia, Greece, Tunisia, Algeria) that we considered to have the representative features of much of the Mediterranean context. Having analysed their macro national contexts, we selected six sites as case studies from four of the identified countries, on the basis of three criteria:

1) Feasibility

2) Environmental characteristics

3) Degree of comparability.

Three sites were already established MPAs. The other three were terrestrial protected areas in the process of expanding their borders at sea to create new MPAs. We evaluated these MPAs as interesting cases of study for the application of the pilot methodology (Phase 0). The six sites we selected were:

Existing MPAs

- Egadi Islands Marine Protected Area (Italy)
- Telašćica Nature Park (Croatia)
- Torre Guaceto Marine Protected Area (Italy)

Future MPAs

- Gouraya National Park (Algeria)
- Tabarka Marine and Coastal Protected Areas (Tunisia)
- Taza National Park (Algeria)

For the purpose of this publication, both existing and future MPAs are described as MPAs.

The selected MPAs are highly representative of the Mediterranean situation. Like the vast majority of Mediterranean MPAs, they are coastal ecosystems, represented by coastal, shallow-depth marine systems that experience significant land- based influence (MAES, 2013).

Figure 1: Geographical setting of the 6 MPAs

Our methodological core choices:
- Multiple case-study analysis on six highly representative Mediterranean MPAs from four countries
- Quali-quantitative methodology with mixed sources of data

2. METHODOLOGY SELECTION AND DATA COLLECTION

Phase 1 – Indicators selection for the contextual analysis

For each case study, key research variables needed to be identified in order to characterize the MPAs from a contextual (geographical, social and cultural) and organizational (structural, institutional, managerial and strategic) point of view. To reach this aim and also to identify the research criteria and tools, we performed a critical evaluation of the most relevant scientific literature available on the topic. Altogether, we used a quali-quantitative methodology with mixed sources of data: i) data collection from national, regional and local statistics for contextual analysis, and ii) field interviews.

In the contextual analysis, methods for data collection, study and characterization of complex socio-economic and organizational contexts, such as the MPAs, can be very onerous and necessarily partial. Therefore, within the available resources to carry out the research, we did a strict selection of both the key MPA stakeholders and key socio-economic and organizational indicators needed to characterize the context of the survey. Specifically, the focus of the analysis remained on the key stakeholder sectors of nature-based tourism (NBT) and local small-scale fishing (SSF). To outline a systemic socio-economic picture, we selected only the key economic levers able to potentially generate well-being for the local community. Finally, variables were selected taking into account also the need to calculate the economic value of the key segment/activity.

Phase 2 – Data collection

Collection of existing data

The characterization analysis of the MPAs' socio-economic contexts was conducted through collecting descriptive and statistical reports on previous socio-economic studies related to the MPAs, translating from the original languages. Regarding organizational and managerial information, strategic and/or management plans and other available information on relevant administrative characteristics, such as organizational charts and personnel availability, have been collected by relevant administrations.

Moving to the analysis of the two selected key stakeholder categories, we aimed to profile the key segments from both a strategic and economic point of view. Regarding the SSF, we developed a sort of "SSF identikit" for each MPA with some indicators useful to characterize the sector. This information was mainly collected through direct interviews with MPA managers and employees before starting the evaluations or, in some cases, before conducting the questionnaire.

Questionnaire development

After this stage, we focused on the construction of questionnaires. In order to gather the different aspects that characterize the various research contexts, slightly different questionnaires were developed for the two key stakeholder categories.

- For SSF, we partially used the questionnaire that we created in collaboration with the research team involved in the "FishMPABlue II"project[1]. This questionnaire was used for Egadi Islands, Torre Guaceto and Telašćica, while for the non-EU MPAs (Gouraya, Tabarka, Taza) we developed a slightly different questionnaire, adapted to the regional contexts.

- For NBT, we developed a specific questionnaire carried out in Telašćica, Egadi Islands and the non-EU MPAs. In Torre Guaceto we got information from an existing questionnaire administered in the same period by another project's team working on environmental accountability with a totally compatible methodology.[2]

For both key targets we translated the questionnaire in the MPAs' national languages. The questionnaires follow as an appendix.

Before starting the survey, we organized a pre-testing in order to assess the clarity of the questionnaires. The only issue encountered during this phase was related to different interpretations or approaches used in administering the questionnaires. Therefore, to avoid future misunderstandings on how to fill in the questionnaires, we created and shared guidelines for all the involved interviewers.

1 http://fishmpablue-2.interreg-med.eu
2 We are grateful to Francesco De Franco of the Torre Guaceto MPA and Francesca Visintin of EFrame.

Regarding fishermen, in the pre-testing phase we experienced a significant level of reluctance that made it difficult to reach some targets of our analyses. This was probably due to the low level of confidence or trust of some subjects to undergo interviews, mostly for privacy reasons. To alleviate this problem, we made it clear that the information collected would be treated anonymously and in an aggregate form. The main constraint experienced in testing the NBT questionnaire related to the reachability of the tourists. To overcome this difficulty, we preliminarily worked with field tourist operators (such as scuba diving centres).

Field assessment

Given the exploratory nature of the study, we have not applied stratified sampling techniques (Bohrnstedt et al., 1994; Corbetta, 2003). However, some elements of randomness were included in the choice of the people to be interviewed, asking the surveyor to diversify the methods of administration with regard to the time and place of the interview. Data regarding the interviews made in the six MPAs is summarized in the following table.

MPAs	Number of interviews	
	Nature-based tourists	Fishermen
Egadi Islands	81	21 (5) + aggregated data from consortium[3]
Telašćica	42	7
Torre Guaceto	20+60[4]	5
Gouraya	34	37
Tabarka	82	20
Taza	51	34
Overall sample	375	124

Table 1: Interviews matrix (number for each MPAs)

Although lack of resources made it impossible to carry out full training, written guidelines were designed and provided to field interviewers (see Appendix IV). In some cases, constraints such as the lack of MPA personnel made it difficult and/or time consuming to find people to collect socio-economic data.

For NBT, the field research was conducted mainly during the 2017 and 2018 summer months, by giving a questionnaire to a sample of divers and snorkelers at the end of their experiences.

A face-to-face survey was also conducted with 124 SSF that operate inside the six protected areas. The data collection took place in September and October 2017 and between July and October 2018. The survey was designed to gather information about fishermen's opinions and perceptions about the relationship with the protected area, their fishing activity and its economic aspects.

3 The systemic socio-economic analysis is based on 21 interviews. The strict economic analysis uses data from 5 interviews and global data provided from the local consortium of fishermen (Cooperativa San Giuseppe).
4 As explained in the case study description, for Torre Guaceto Marine Protected Area, NBT have been integrated with other MPA tourists.

For Torre Guaceto MPA we used the high-quality questionnaires designed for the environmental accounting project focused on snorkelers, integrating the data with information collected from beach tourists.

In Egadi MPA the existing data had with substantial information gaps, so we engaged an additional interviewer to conduct field research during the summer, by administering a questionnaire to a sample of 81 NBT interviewed at the end of the dive experience and to 5 additional SSFs. In the three non-EU MPAs questionnaires were done by specialized consultants.

Even if researchers personally spoke with fishermen and tourists, the data was treated anonymously. Data warehouses were populated in a confidential way, without documenting individuals' personal information and without the possibility to track the identity of the interviewed person. Surveys were administered by interviewers taking notes on paper. Periodically, original paper questionnaires were scanned by the interviewers and emailed to a team of experts that had previously developed a database. Scanned copies were analysed by the team that populated the database and developed the data mining process.

3. DATABASE OF SOCIO-ECONOMIC INDICATORS AND INSTITUTIONAL CONTEXT

Assessment of ecosystem services must always be considered embedded within the socio-economic and institutional context. Therefore, before starting the selection and the evaluation of the key ecosystem services it is essential to characterize the socio-economic system.

For each MPA we produced a customized table of key socio-economic indicators based on existing data collection and field interviews. Some considerations should be highlighted here:

- Given the lack of statistics on small units of socio-economic analysis, such as municipalities or MPAs, some information was collected at regional level, in order to observe the socio-economic trends of the area in which the MPA is inserted.

- From the strictly social point of view, we characterized the demographic structure and the employment of the area in which each MPA is located. From an economic point of view, we collected information on some key indicators, focusing on the structure and features of the tourism and fishing sectors.

- MPA institutional and organizational dimensions and indicators were collected based mainly on the framework developed by Gill et al. (2017). We decided to include some institutional variables (such as when the MPA was legally established/gazetted, MPA regulation or boundaries) and organizational ones, such as the structure (staff capacity, derived from organization chart) and the strategy (strategic and management plans, presence of an official mission). Additionally, we considered some internal financial variables (budget capacity).

The whole framework is summarized in the following tables. The presented tables outline the general starting point of all the analyses and was adapted to the legal, social and economic characteristics of the individual MPA contexts.

ISSUES	INDICATORS	Code	Possible source
SOCIAL DIMENSIONS			
Demographic structure	Number of resident population	KS1	National statistics (censuses)
	Population age structure by the following major age groups (0-14; 15-64; 65+)	KS2	National statistics (censuses)
Unemployment	Unemployment rate	KS1	National statistics
ECONOMIC DIMENSIONS			
Composition of the economic system	Size and type of local enterprises	KE1	Chamber of Commerce registers
Structure and features of tourism sector	Annual tourist movement	KT1	Regional tourism statistics
	Annual number of scuba divers	KT2	MPA reports
	Annual number of snorkelers	KT3	MPA reports
	International visitors	KT4	Regional tourism statistics
	National visitors	KT5	Regional tourism statistics
Structure and features of artisanal fisheries sector	Number of fishing days	KF1	Fishermen's associations registers
	Daily catch	KF2	Fishermen's associations registers
	Total annual catch	KF3	Fishermen's associations registers
	Total catch inside MPA	KF4	MPA reports
	Type of catch	KF6	Fishermen's associations registers
	Average fish price	KT5	Fishermen's associations registers
GOVERNANCE			
Organizational structure & features (staff capacity - human resources)	Full-time staff capacity	KO1	Organizational chart
	Seasonal staff capacity	KO2	Organizational chart
	Management body	KO3	Organizational chart
Strategy and planning	Mission	KP1	Strategic plan - mission statement
	Strategic projects or programmes to enhance conservation and local sustainable development (management plan implemented)	KP2	Strategic plan
INSTITUTIONAL DIMENSIONS			
International relevance	Official international recognitions (SIC, ZPS, I.B.A.)	R1	International institutions' websites
Legal framework	Existence of a national legal framework for MPAs	I0	National law
Legal status	Legal date of establishment (gazetted)	I1	Official gazette
Internal regulation	MPA regulations	IR1	MPA documents
Geographical definition	Clear boundaries	B1	National law

Table 2: Framing the socio-economic and institutional context – Possible key indicators useful to characterize the MPA context

ISSUES	INDICATORS	Code	Possible source
SOCIAL DIMENSION			
Demographic structure	Family type and size	RS1	National statistics (censuses)
	Migration balance	RS2	Municipality documents
ECONOMIC DIMENSION			
Structure and features of tourism sector	Number of annual arrivals and overnight stays	RT1	Regional tourism statistics
	Seasonality (number of arrivals in high and low season)	RT2	Regional tourism statistics
	Hotel facilities and beds by category	RT3	Regional tourism statistics
	Number of restaurants	RT4	Regional tourism statistics
Structure and features of artisanal fisheries sector	Type of fishing techniques	RF1	Fishermen's associations registers
	Numbers employed	RF2	Fishermen's associations registers
GOVERNANCE DIMENSION			
Organizational structure and features	Volunteer capacity	RO1	MPA volunteers reports
Strategy and planning of the governance structure	Management or strategic plans	RP1	MPA management plans
Finance (financial resources)	Budget capacity – Annual availability and allocation of financial resources	RF1	MPA annual budgets

Table 3: Framing the socio-economical and institutional context – Possible additional and relevant indicators useful to characterize the MPA context

4. ECOSYSTEM SERVICES EVALUATION

Making monetary evaluations of benefits related to the use of goods and services associated with coastal and marine areas is a complex issue and an uncertain process. The same uncertainty is experienced in the evaluation of other intangible concepts, such as customer satisfaction, environmental awareness and public involvement in conservation issues. For the same reasons, direct measures are rarely used in the estimation of the hypothetic value of natural resources. In order to set up and realistically apply methodological tools and techniques, it is essential to consider the limited human and financial resources available in an MPA, and to develop "ad hoc" methods, adapted to individual contingencies, even though these may be less rigorous from a strictly orthodox statistical point of view. Plus, methods of calculation (even the more corroborated ones) are not applicable in the same way in every context, and involve necessary simplifications.

EVALUATING NBT

Before starting with the evaluation of the ecosystem services related to NBT, it is important to frame the tourism sector with some indicators and investigate the profile of this key stakeholder segment in the context where the MPA is located. We analysed the structure and features of the tourism sector using with the key and relevant indicators reported in table 3.These indicators can very often be collected through document analysis.

Additionally, to be truly useful to MPA managers, socio-economic investigations must be able to obtain information about key stakeholders' profiles; opinions, knowledge and awareness; real needs and expectations; and when possible, the aspirations, suggestions, ideas and even feelings of those who influence and are influenced by the protected area. These relevant characteristics to define the profile of NBTs are normally collected through interviews.

To this end, our analysis was not limited to the collection of information strictly necessary for the calculation of ecosystem services value, but we also collected information on age, education, employment, nationality, MPA awareness, MPA as key decisional factor, MPA as tool for conservation and appreciation of natural resources. Some of these characteristics, such as the place of residence, average days of vacation and willingness to pay, were also essential parameters used to calculate the recreational value of NBT through the travel cost method (TCM), explained below.

The ecosystem services that are beneficial to the NBTs are different. They refer mainly to the beauty and the related enjoyment of the ecosystem itself. They are considered according to the international above-mentioned classifications as cultural factors or amenities and include physical and experiential interactions with wildlife, ecosystems and seascapes. The recreational experience may also be enriched with intellectual, cultural, educational and aesthetic values derived from the ecosystem.

The most relevant indicator to monitor to correctly evaluate these ecosystem services is the number of NBTs during the year, identified as "flow".

NBT key indicator (flow): yearly number of nature-based tourists

The estimation of this essential indicator is normally not simple, due to the often weak reliability of the official statistics. For scuba diving, the only solution for researchers was to refer to the registers held by diving centres on the total number of dives or divers. A correcting value of a certain percentage was added, if during the analysis a differential was observed between the actual number of users and the diving centres' records.

In the last decades, researchers have developed different methodologies to estimate, in monetary terms, the value attributed by NBT tourists to ecosystem services. In the present study, moving from the background information collected in the first phase of the research and from a series of considerations related to the feasibility, we chose the travel cost method (TCM) as the most suitable methodology for most of the cases. According to this method, the costs and time that people incur to reach the site and do the recreational experience can be used to infer the value of that site.

Coherently with the scope of this study, the method does not calculate the net impacts, avoiding any comparison with costs.

Statistical precision of the TCM depends on the sampling technique used. If the MPA managers or researchers had adequate funds available to make a statistically significant estimate, it could be effective to apply the so-called "stratified sampling technique", which involves the determination of some sample quotas according to a specific dimension (for the TCM, for example, different travel costs could be used depending on the distance from the place of origin).

Estimating the NBT recreational value using the TCM

The TCM estimates the recreational value of a natural site through the analysis of the relation between the number of visitors (demand function), the transport costs and opportunity costs of the time spent travelling to reach that site. The basic assumption of this method is that time and costs related to travel can be used to build the "implicit price" for visiting that site. The relationship between the price and the frequency of visits to the site represents the demand function for that site. There are two ways to estimate this function:

- "Zone TCM", based on the data collected through the division of the space in concentric zones around the study site.

- "Individual TCM", which uses individual visitors' data.

This study used the individual TCM to provide a pilot assessment of the economic benefits related to recreational activities such as diving and snorkelling in each MPA. The method includes four components, each of which refers to different economic sectors related to the business of diving/snorkelling.

Travel cost subsection	Subsection elements
TC1	Car transport cost + ferry/plane transport cost + fast ferry/hydrofoil transport cost + ticket to dive
TC2	TC1 + overnight cost
TC3	TC2 + expenditure for other activities/services
TC4	TC3 + willingness to pay an additional amount of money to fund conservation projects

Table 4: Travel cost structure

Going into details, the method proposes an estimation of five average costs. First, the average cost that each tourist bears to reach the place of dive (cost of transport) and to carry out the activity (ticket to dive); second, the cost of staying overnight in the indicated place of stay (cost of stay); third, expenditure on eating and/or other services such as bike/car rental; fourth, the average willingness to pay an extra amount to fund conservation projects in the area.

The table on the opposite page illustrates all the elements that were considered and the sources for gathering the information for each case study.

Travel cost subsection	Subsection elements	Source
TC1=	Car transport cost	Calculation of distance from place of residence and cost estimation with the "ViaMichelin" internet portal, calculating road routes, relative road tolls and fuel cost for the journey.
	Ferry/plane transport cost	Estimation from hypothetical flight from place of residence and nearest (at least) medium-sized airport. Average value between high-season and low-season flight, using Skyscanner.it prices. If needed, added car transfer from airport to MPA area (calculated as shown above for car transport cost).
	Ferry/fast ferry/hydrofoil transport cost	Estimation of the average price of ferry ticket from the nearest embarkation ferry port to the port of landing. For the insular MPAs we added the estimation of the ferry ticket (passengers + car) or fast ferry/hydrofoil ticket (only for passengers). Average value between high season and low season through consulting the website of the major ferry companies operating on the routes of interest.
	Bus ticket	Estimation of the average price of the ticket for those tourists that claim to use the bus as means of transport to reach the dive site, using the major bus companies operating on the routes of interest.
	Cruise cost	Estimation of the average price of the ticket of the cruise, including taxes and port fees, consulting the major cruise companies operating on the routes of interest.
	Ticket to dive	Cost of a one-day diving experience, with all equipment. Average between available information obtained from diving centres (if more than one centre, average between different prices in both high and low season) and prices estimated by survey respondents (question "Daily expenditure of diving/snorkel")
TC2	TC1 + overnight cost	On the basis of the type of accommodation identified by the respondent, online analysis of average price for - Hotel: average daily high/low season prices for all kinds of hotel available for the area - Second home/resident: estimated daily cost of living in the area, considering utilities cost calculated with online data - Rented house: daily cost for renting, calculated from the cost of monthly rent available online - Camping: average daily high/low season prices for available camping - Sailboat: average daily high/low season prices for mooring and gasoline for available ports.
TC3	TC2 + expenditure for other activities/services	Average price for food, considering an average kind of meal in both expensive and low-price restaurants available in the area. If other services were available (for example bike/car rental), the average daily prices of these activities were added to the food costs.
TC4	TC3 + willingness to pay an additional amount of money to fund conservation projects	Weighted average amounts indicated by respondents, who were asked to choose between: - Nothing - €1-2 per dive/snorkel - €3-5 per dive/snorkel - €5-10 per dive/snorkel - More than €10 per dive/snorkel This additional amount of money is related to the dive ticket.

Table 5:Detailed travel cost structure

The last component of TC1 (ticket to dive), the overnight costs (TC2-TC1) and the expenditure for other activities/services (TC3-TC2) are generated by the NBT inside the local economic system. For these components, indirect and economic induced multipliers could also be calculated and added to the benefits generated by NBT in the local economy.

In fact, every form of tourism, including NBT, produces direct, indirect and induced effects on the local economy. The direct effect is that generated in the local economy thanks to the purchase of goods and services locally produced (ticket to dive, overnight cost and expenditure for other activities/services). The indirect effect is given by the expenses made by tourist operators in the local economy to procure goods and services (food, maintenance and repairs, other services...). The induced effect is generated by the increase in income of these previous operators (tourist operators and local suppliers) deriving from tourist activities, which can increase their consumption, including in the local economy by purchasing goods or services locally. The value of this multiplier effect varies between nations and contexts.[5]

In general, the identification and estimation of the average daily value of the TC1 is first of all characterized by a "re-building" of the different "travel profiles", based on the means of transport used and the information that each respondent gave.

Box 1 - Empirical focus: The Egadi Islands travel profiles

The estimation of the journey for those tourists that used the car to reach the place of stay was obtained by consulting the information available on the ViaMichelin website.

Regarding the estimation of the ferry ticket to reach Sicily, the study identify three main ferry ports: Genova for tourists that come from Northern Italy, Livorno for tourists that come from Central Italy and Naples for tourists that come from Southern Italy. For tourists that used the car as the main means of transportation, the study provided also an estimation of the average price of the ferry used to reach Egadi MPA from Trapani ferry port. There were some divers that used the bus to reach the Egadi MPA. In order to take into account this information in the overall estimation of the TC1, the study identified Segesta as the bus company that connects Palermo with the Trapani port. The price of the bus ticket is €9.60 (one way). For those who used the plane as a main mean of transportation, the study provides an estimation of the average price of the plane ticket (one way) from the nearest airport to the place of residence to Trapani airport. For the details of cost, see Annex I.

In some cases, it is difficult to find the different cost items. For the calculation of the TC, it was necessary to find further information through consulting various websites. In particular, for the non-EU MPAs we consulted websites such as www.numbeo.com, in order to estimate some subsections of TC1 and TC2, while some information about the prices of the tickets to dive was obtained using the Facebook pages of the dive centres.

With regard to travel expenses, it was decided to extrapolate the prices of the various transport, accommodation and catering services by consulting online databases. Where it was not possible to find the information on the web, average prices provided by the respondents were used.

The last cost item, TC4, refers to a hypothetical increase of cost related to the willingness to pay (WTP). This was measured by asking the individuals whether they would be willing to pay an additional fee for diving in the area to fund biodiversity conservation and environmental protection projects. Based on the questionnaire responses, a weighted average cost was calculated. This weighted average value was multiplied by the number of dives indicated by each respondent and then added to the previous travel cost component (TC3).

After the estimation of the various cost items (TC1, TC2, TC3, TC4), it was necessary to calculate their average value. The calculation of this value was made both on the basis of the cost of the holiday for only the days dedicated to diving (TCII), and the entire cost of the holiday (TC). These values were then multiplied by the total annual visits[6] to give an estimate of the recreational value of both the diving days and the entire holiday period.

Recreational value (RV)	
RVX	TCX *N° ANNUAL VISITS (AV)
RV1	€ TC1* AV
RV2	€ TC2 * AV
RV3	€ TC3 * AV
RV4	€ TC4 * AV
TRV	∑TCx* AV

Table 6: Estimation of the recreational value of scuba diving

The recreational value is useful to build the final TCM output, the demand curve, which shows the relation between the travel cost and the number of visitors. The demand curve can be represented on a Cartesian plane, in which the number of annual visitors is shown on the x axis, while on the y axis are the different costs previously identified.

To have a clearer idea of the benefits directly generated by NBT it is useful to construct two demand curves: the first expressing the estimated recreational value of scuba diving on only the days of diving, and the second the total recreational value associated with the divers' whole holiday in the MPA. The areas of the rectangles in the figures therefore represent the different components of the value of NBT.

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[5] In an economic study carried out in the Tavolara Punta Coda Cavallo MPA (Italy), this multiplier was 1.89 (Visintin et al., 2019).

[6] Information on the total annual visits was provided directly by the MPA or through the diving centres.
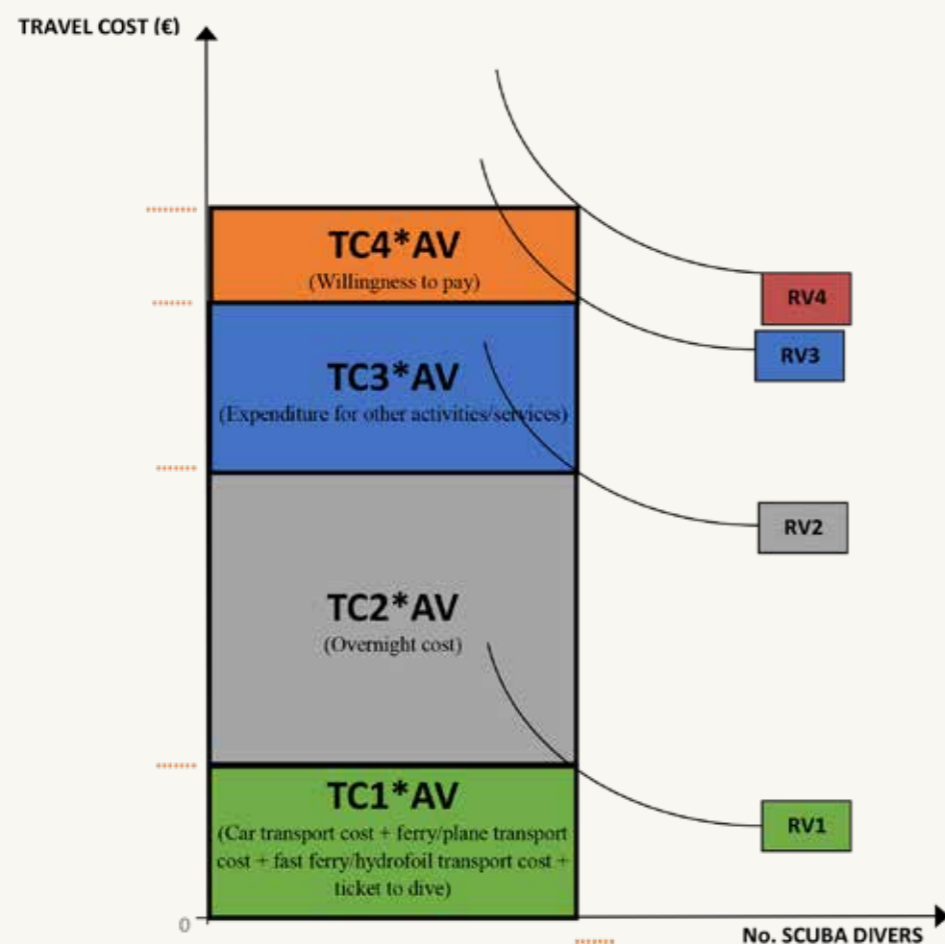
Figure 2: Recreational value of scuba diving – Demand function

The survey provides important knowledge on the characteristics and potential of NBT for the local economy and even for the MPA stakeholder engagement strategy. The development of a structured NBT can help in taking a forward-looking and responsible approach, which can enhance the local natural resources and increase their attractiveness.

EVALUATING THE LOCAL SMALL-SCALE FISHERY (SSF) SECTOR

As for NBT, before considering the strictly economic evaluation of SSF it is essential to observe their opinions, knowledge and perceptions about the MPA and its management (Bennet et al., 2019).

To evaluate the provisioning ecosystem service related to local SSFs, the first step is calculating the *"average annual fishing volume"*. This can be calculated as the product of the *"daily catch volume"* and the *"number of fishing days"*. The first element (daily catch volume) was calculated from the data collected from the interviewees as a weighted average, while the second (number of fishing days) was extrapolated from official statistics. From this data, we calculated the average annual fishing volume per capita.

SSF key indicator (flow): average annual fishing volume

Secondly, the analysis focused on estimating the average selling price of the catch. From the information gathered in the field, it emerged that each fish market presents different categories of value for the fish. Normally the main price ranges depend on the species and the size. Although there is a certain variability depending on the context and the subjects among whom the transaction takes place, normally we find the following categories:

1. First-class fish, considered to be particularly popular species on the market (such as sea bream, sea bass and red snapper) and medium-large sizes. Normally the catch is neither common nor abundant.

2. Second-class fish, usually composed of species whose market demand is lower or smaller (medium-small size) fish of the first-class species.

3. Third-class fish, "poor" fish with a significantly lower market price – often difficult to prepare and cook, but the basis of some local recipes.

4. Other categories, normally consisting of individual species, such as cuttlefish, octopus or lobster.

In order to estimate the average selling price of the fish, the percentage incidence of each category of fish needed to be considered. The survey asked respondents to indicate the "Composition of the catch" (meaning the average % of each fish category in the daily catch) and the "Average selling price of the catch" according to the different categories. In the cases in which the selling prices were not indicated, official selling prices in the area were used for the calculation. Responses can also be checked against official selling prices in order to validate the data provided by the respondents. Once this information was obtained, the overall average selling price was determined by calculating a weighted average selling price based on the composition of the catch by type.

Third, it was necessary to estimate the size of the local SSF sector, identifying the official number of SSF authorized to operate within the protected area. This information was extrapolated from official reports from the MPA or local institutions. Where the MPA was not yet formalized, the information was also gathered from other sources, including unofficial reports.

This enabled us to give two estimations: the average SSF turnover per capita, and the total turnover of the SSF sector. First, the average daily catch per capita was multiplied by the average annual number of fishing days to give the average annual catch volume for each fisher. This was then multiplied by the average selling price of the catch, to give the annual per capita turnover. To estimate the overall turnover for the SSF sector, this average per capita turnover was multiplied by the number of authorized vessels in the assessed area. The complete calculation is shown in the table.

Average volume daily catch (kg)	A
Average number of fishing days/year	B
Average volume catch/year (per capita)	C=A*B
Average sales price of the catch (€/Kg)	D
AVERAGE PER CAPITA TURNOVER (€)	E=C*D
Number of authorized vessels	F
AVERAGE TURNOVER OF SSF SECTOR (€)	G=E*F

Table 7: Per capita and total turnover of the SSF sector

As discussed for certain components of the travel cost (such as the ticket to dive, the overnight costs and the expenditure on other local services), the turnover of SSF is generated inside the local economic system. As explained above, the indirect and economic induced multiplier could be added to the benefits directly generated by SSF in the local economy. We decided to not add this induced and indirect multiplier in order to focus the attention on the core services and benefits directly generated by the selected key stakeholder categories.

METHODOLOGICAL GUIDELINES

The following tables provide some possible methodological instructions useful to MPA researchers aiming to set up a socio-economic monitoring and evaluation system for the selected key ecosystem services.

I – Methodological choices	
Why	Evaluate key ecosystem services
What	Choose the proper evaluation methodology for the specific socio-economic benefits of the MPA
How	Identify one or more methods of evaluation of socio-economic benefits generated by the MPA on the basis of the analysis of the existing literature and the peculiarities of the context
Description	Study of the existing literature on the methods of evaluation of the economic benefits connected to the MPA and create an evaluation system that takes into account the characteristics of the area under investigation
Critical issues/ constraints	a. Difficulty in identifying the most feasible methodology b. Presence of very different contexts from the economic and social point of view in Mediterranean MPAs

Table 8: How to choose an appropriate methodology

II - MPA background information	
Why	Knowledge acquisition
What	Ensure a systematic knowledge base on the MPA for preliminary characterization
How	Find a series of documents/data useful to setting up a preliminary knowledge base of key and relevant information
Description	Collect (also making specific requests to the competent offices) the following documentation: a. reports, statistics, and/or studies carried out previously relevant for the study being carried out b. organizational charts and management or strategic plans
Critical issues/ constraints	a. Administration's liability to provide the requested information b. Difficulty and time needed in obtaining information from local contacts or administration

Table 9: How to get the information

III – Questionnaire administration	
Why	Data collection
What	Provide a system of instructions and information on how to administer the questionnaires
How	Create a system of written instructions that the people in charge of conducting the questionnaires must follow to ensure greater understanding of the questions and limit any misunderstandings that may undermine the collection of data. A short specific training should be designed to ensure a proper understanding of the task.
Description	Create a short half-page guide which clearly illustrates how to fill in and conduct the questionnaire to be followed up with an ad-hoc training session.
Critical issues/ constraints	a. Find professional and not-too-expensive personnel to administer the questionnaire b. Difficulty of understanding some instructions for social and cultural reasons

Table 10: How to administer the questionnaire

IV – Creation of a monitoring system	
Why	Monitoring
What	Create a monitoring system of field surveys
How	Create a feedback system that periodically provides updates on the progress of surveys in order to identify opportunities and critical issues in a timely manner
Description	Create a questionnaire (information sheet) that each person in charge of surveys should periodically fill out and send to the research managers
Critical issues/ constraints	a. Lack of collaboration between the various subjects to send periodic reports b. Difficulty in doing regular reports due to MPA's limited human and financial resources

Table 11: How to build the monitoring system

As mentioned above, it is difficult to assess the socioeconomic benefits of MPAs in a complete and consistent manner. In order to make this audacious goal more realistically achievable by MPA managers, we advise managers to pay attention to the following when conducting investigations.

KEY CONSIDERATIONS FOR INTERVIEWS

■ *Questionnaire shortness and simplicity.* Use a maximum of 15-16 questions, formulated in a really clear and understandable manner. Considering that for our study six sites were assessed at the same time, it was not possible to carry out proper training for every interviewer. This led to some difficulties in the interpretation of 2-3 more complex questions and additional time needed to clarify the answers.

■ *Questionnaires pre-arrangement.* Arranging some guidelines for interviewers is really useful, especially in order to avoid each interviewer interpreting questions differently. Guidelines and procedures used for conducting our survey are enclosed in the Appendixes.

■ *Professional administration of the questionnaires.* It essential to recruit skilled interviewers, avoiding any self-compilation of the questionnaire from interviewees. The self-compilation, even if less expensive, normally produces mistakes and misunderstandings. Often some questions are invalidated due to mistakes made during the self-compilation process. This can be considered the most crucial point.

■ The *training of the interviewer* should solve some confusion, especially in parts of the questionnaire in which it is possible to find spontaneous comments that show the interviewee's lack of confidence ("I don't know", "no idea"), particularly regarding the MPA concept. For example, in one of study sites (Tabarka), it was not possible to understand if the presented cost estimations of NBT were realistic, because the high variability of results shows a possible mismatch between annual and daily costs.

■ The *data collection of monetary information* can be difficult. Respondents often feel uncomfortable and so are reticent to provide information about how much they gain or spend. Some of the recommendations are:

- Include these sensitive questions at the end of the questionnaire, when the interviewer has normally gained a bit of confidence from the interviewee.

- Train the interviewers to assure the interviewee that the data is collected only for scientific purposes and will be stored anonymously, always highlighting the privacy of information.

- For small samples and if the MPA has highly professional interviewers trained in qualitative survey techniques, open conversations with the interviewer making notes following the discussions can be good techniques to obtain economic and monetary data.

If, despite all these precautions, the answers to the questionnaires will not reach significant percentages, the data should be collected indirectly through other sources (i.e. grey literature, tourist operators' official websites, social networks) that though less accurate can still provide good approximations.

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7 In the case of Tabarka, from the data analysis of questionnaires, it was clear that a few questions had been misunderstood by interviewees. In questions 8 and 18 it was asked to rank features/preferences from one to three. In some cases, no rankings or more than one feature/preference in first position made the analysis not significant (the solution in those cases was to assess the frequency of the single feature/preference). Similarly in Telašćica, the elaboration of the data collected from the divers shows that sometimes the interviewees were left alone filling the survey, as shown for example by the percentage of tourists whose origin is unknown.

APPENDIX – II QUESTIONNAIRE

DIVERS/SNORKELERS

Within the "Mediterranean MPA Network" project, WWF is conducting a survey to evaluate the ways in which people come into contact with Marine Protected Areas and appreciate their benefits.

Response to this request is voluntary and information will be published respecting the anonymity of the respondent. The survey should take around 15 minutes.

Thank you for taking the time to participate in this survey.

DIVERS/SNORKELERS SURVEY

Questionnaire no: _____

Date: _____

MPA/Diving site/Diving centre: _____

Type: Diver ☐   Snorkeler ☐

I. MOTIVATIONS AND KEY FEATURES OF TRAVEL EXPERIENCE

1. Where are you staying? _____

2. Are you aware of the existence of a Marine Protected Area? Yes ☐ No ☐

3. How many days are you going to spend in this place?

4. How many of days are you going to dive/snorkel in the Marine Protected Area? _____

5. Did the existence of the Marine Protected Area influence your decision to come and dive/snorkeler here?
Yes ☐   No ☐   I don't know ☐

II. GENERAL INFORMATION ON NBT EXPERIENCE (DIVES.....)

6. How many dives/snorkel experiences did you do this year in total? _____

7. How many of these dives/snorkel experiences took place in this Marine Protected Area? _____

8. What influenced the choice of this dive/snorkel site? Please indicate the first
   (1), the second (2) and third (3) most important feature.

   ☐ a. Water quality

   ☐ b. Presence of spectacular species (gorgonians, red corals, Palinurus elephas,…)

   ☐ c. Abundance and diversity of fish

   ☐ d. Presence of particular underwater scenery (caves, cliffs)

   ☐ e. Safety

   ☐ f. Opportunity to do other activities (fishing, trekking, sailing, …)

   ☐ g. Proximity to the accommodation

   ☐ h. Presence of a marine protected area

9. Have you dived/snorkelled in other marine protected areas?

   Yes ☐   No ☐   I don't know ☐

10. Do you think divers/snorkelers can damage marine ecosystems?

   Yes ☐   No ☐   I don't know ☐

10a. If you answered YES, please indicate according to your opinion, which is
    the main reason.

   ☐ a. Dive/snorkel sites are crowded in some period of the year

   ☐ b. Behaviour of some divers/snorkelers

   ☐ c. Other (specify) _____

11. Do you think the existence of a marine protected area ensures ecosystem
    conservation?
    Yes ☐   No ☐   I don't know ☐

III. EVALUATION OF LOGISTICS AND COSTS

12. What type of accommodation did you choose for your stay?

Hotel ☐   Second home property ☐   Rented house ☐

Camping ☐   Other (specify) ☐

13. How did you reach the accommodation?

By car ☐   By plane ☐   By train ☐   Other (specify) _____

14. How many people are travelling with you and are sharing the same budget?

_____

15. What is approximately the budget for your holiday
    (considering also the people that travel with you)?

   a. Annual expenditures for diving/snorkel activities (gear, license, insurances,
      other expenditures) _____

   b. Daily expenditure of diving/snorkel _____

   c. Accommodation expenditures _____

   d. Daily average expenditures for transportation and parking _____

   e. Daily average expenditures for food _____

   f. Other daily expenditures _____

IV. WILLINGNESS TO FUND CONSERVATION PROJECTS

*Imagine to have the chance to contribute personally to the conservation of the
marine and coastal eco system…*

16. What would be maximum you would be willing to pay, in addition to the usual
    expenses, to fund conservation projects of marine ecosystems?

Nothing ☐   € 1-2 per dive/snorkel ☐   € 3-5 per dive/snorkel ☐

€5-10 per dive/snorkel ☐   More than € 10 per dive/snorkel ☐

17. If your answer was NOTHING, what is the main reason are not willing to support conservation projects for marine ecosystems?

☐ a. No need to promote conservation projects

☐ b. Ecosystem conservation is a responsibility of the government

☐ c. Diving/snorkel has no impact on marine ecosystem

☐ d. I don't want to have additional financial charges

☐ e. Other reason (specify)_____

☐ f. I don't know

18. If we ask you to allocate some funds to support marine protected area management projects, how would you distribute this funds over the following? Please, indicate the first (1), the second (2) and third (3) most important activities

☐ a. Enforcing regulations

☐ b. Reducing water pollution

☐ c. Environmental education

☐ d. Monitoring and scientific research

☐ e. Improving facilities (restrooms, garbage bins, ...)

☐ f. Creating strict conservation areas

☐ g. Other activities (specify) _____

V. TOURISTS GENERAL INFORMATION

19. Age:

20 years old ☐   between 21 and 30 ☐   between 31 and 40 ☐

between 41 and 50 ☐   between 51 and 60 ☐   over 60 ☐

20. Sex:

F ☐   M ☐

21. Where do you live?_____

22. Province:_____

23. Occupation:

☐ a. Freelance professional

☐ b. Entrepreneur

☐ c. Employee worker

☐ d. Student

☐ e. Retired

☐ f. Other

24. Study degree

☐ a. Primary school certificate

☐ b. Middle school diploma

☐ c. High school certificate

☐ d. University degree

☐ e. PhD

Thank you!

APPENDIX – III
QUESTIONNAIRE

FOR FISHERMEN

Within the "Mediterranean MPA Network" project, WWF is conducting a survey to evaluate the ways in which people come into contact with Marine Protected Areas and appreciate their benefits.

Response to this request is voluntary and information will be published respecting the anonymity of the respondent. The survey should take around 15 minutes.

Thank you for taking the time to participate in this survey.

Questionnaire no:_____

Date:_____

MPA Name:_____

1. What are the main features of your vessel/s?

Boat (n°)	Length (metres)	Tonnage (GT)	Engine power (KW)

2. Which fishing methods do you usually use?

a. trammel net ☐   b. gill net ☐   c. longline ☐

d. other (specify)_____

3. What is the composition and average selling price of the catch?

	% (Tot = 100%)	Average price
Lobsters		
First class fish		
Second class fish		
Third class fish		
Swordfish		
Octopus, cuttlefish		
Other (specify)		

4. What is the average volume of daily catches?_____Kgs

5. What percentage of your catches comes from the authorized fishing zone of the protected area [%]

6. Who do you usually sell the fish? (Indicate the average percentage of sales for each category)

[%] a. Restaurants

[%] b. Local fisheries

[%] c. wholesalers

[%] d. Local people or tourists

[%] e. Other reason (specify) _____

7. How much on average do you spend on fuel to carry out your business?

_____/years

8. Indicate annual fixed costs:

Boat (maintenance and repairs)	
Fishing gears (maintenance and repairs)	
Other fixed costs (Harbour dues, licence, insurance, management costs)	

9. How long do you fish in the MPA?_____

10. Could you tell us which are the constraints and benefits related to the institution of the MPA ?

Main constraints:_____

_____

_____

_____

Main benefits:_____

_____

_____

_____

_____

11. Please read the following statements and rate your opinion about your level of satisfaction or dissatisfaction:

	Very satisfied	Satisfied	Neither	Dissatisfied	Very dissatisfied
Overall management of the MPA					
Social impacts of the MPA (e.g. increase in your revenues, social acceptance etc.)your revenues, social acceptance etc.)					
Governance and decision-making process of the MPA					

12. What do you think has been the impact of the MPA on your incomes?

☐ the MPA has led to an increase on your incomes

☐ the MPA has not had an effect on your incomes

☐ the MPA has led to a decline on your incomes

13. Please, describe the relation with other users

	Very bad	Acceptable	Good	Excellent	No relation
Recreational fishermen					
Other professional fishermen					
Divers					
Beach tourist					
Other users (specify):					

14. Since the institution of the MPA, the volume of your catch is:

Increased ☐   Decreased ☐   Unchanged ☐

According to your opinion, why?: _____

15. Since the institution of the MPA, the quality of your catch is:

Increased ☐   Decreased ☐   Unchanged ☐

According to your opinion, why?: _____

16. On the whole, how do you evaluate the impact of the MPA on your fishing activity?

☐ Very positive

☐ Rather positive

☐ Rather negative

☐ Very negative

☐ No impact

17. In your opinion, which is the overall level of poaching inside the MPA?

☐ high

☐ medium

☐ low

☐ no compliance

18. Do you think that poaching is impacting small scale fishery inside the MPA?

☐ highly impacting

☐ medium impacting

☐ low impacting

☐ not impacting

19. Would you agree to the creation of a quality brand of MPA fish?

Yes ☐   No ☐

20a. Why?:

_____
_____
_____
_____
_____
_____

21. Please indicate to what extend you agree with these statements:

	Fully agree	Rather agree	Rather disagree	Fully disagree	Don't know
The small scale fishermen could help to protect biodiversity					
The small scale fishermen could cooperate with the MPA authority to identify and reduce illegal fishing					
The small scale fishermen could be willing to practice fishing with educational aims or other educational activities to promote conservation goals					

GENERAL INFORMATION

22. Age: _____

23. Where do you live?: _____

24. Average annual: _____

25. Study degree

☐ Nothing

☐ Primary school certificate

☐ Middle school diploma

☐ High school certificate

☐ University degree

26. Family composition:

☐ Spouse

☐ N° minor children

☐ N° adult children

☐ Other people charged

APPENDIX – IV
PROCEDURES AND GUIDELINES FOR CONDUCTING THE SURVEY

REASON FOR THESE PROCEDURES AND GUIDELINES

Questionnaires are one tool for gathering information that enable researchers to implementing strategies and make decisions.

Sometimes happens that the way you ask a question can lead to biased answer, because people think that if they answer in this way they will be accepted and liked.

Some types of answers may be impossible to analyze in a way that will provide adequate information.

In order to produce valid and reliable information, the administration of a survey must be carried out with fundamental principles.

The purpose of these Guidelines is to help the interviewer to gather the information and to fill the questionnaire in a correct way.

QUESTIONNAIRE STRUCTURE

The questionnaire consists in 5 sections:
I. Motivation and key features of travel experience;
II. General information on dives;
III. Evaluation of logistics and costs;
IV. Willingness to fund conservation projects;
V. General information.

Create a climate that provides an understanding of the survey's purpose. Explain that University of XXX and WWF are conducting a survey to evaluate the ways in which people come into contact with Marine Protected Areas and appreciate their benefits. Respondents should feel that their opinion is important. Remind them that the survey is voluntary and anonymous and encourage them to answer the questions honestly.

In order to manage the expectation, mention the length of the survey and thank people for taking the time to participate.

GENERAL RULES FOR FILLING UP THE QUESTIONNAIRE

Every questionnaire should be recorded in order to have a univocal correspondence. For this reason, the interviewer should create a code to fill the information "Questionnaire n°".

It is also fundamental to formalize a unique criterion to fill in the questionnaire in order to avoid misunderstanding. For that reason, we suggest to put a tick in the box by the answer you choose (if there is more than an alternative, you can put more than a tick), instead of delete the "wrong" answer or the "right answer".

Finally, we prefer to have the original filled questionnaire. Please, scan the questionnaire as pdf format and send it. Any other information which the interviewer feels relevant may also be enclosed on separate sheet with the questionnaire and translate in English.

ANNEXES

ANALYSIS OF THE SINGLE CASES

ANNEX CONTENTS

WWF

REPORT
2019

ANNEX I

EGADI ISLANDS MARINE PROTECTED AREA

I.1. THE INSTITUTIONAL, SOCIO-ECONOMIC AND ORGANIZATIONAL CONTEXT

Excluding the Pelagos Sanctuary, the Egadi Islands MPA is the largest in the Mediterranean Sea. The socio-economic context is quite complex due to its geographical, cultural and economic features. The Egadi Islands are located 7km from the western coast of Sicily, between the cities of Trapani and Marsala, in the province of Trapani.

Figure 1: Geographical location of the Egadi Islands MPA

Established in 1991, the MPA encompasses three islands (Favignana, Levanzo and Marettimo), and two rocky outcroppings (Formica and Maraone). It covers approximately 54,000 hectares and about 22km of protected coastline.

The tables below and opposite summarizes some key institutional, ecological, socio-economic and organizational indicators.

Category	Typology	Code	Description
Official international recognitions	SIC	RI1	SIC ITA010004 "Isola di Favignana", SIC ITA010002 "Isola di Marettimo", SIC ITA010003 "Isola di Levanzo", SIC ITA010024 "Fondali dell'Arcipelago delle Isole Egadi"
	ZPS	RI2	ITA010027 "Arcipelago delle Egadi – Area marina e terrestre"
	Important Bird Area (I.B.A.)	RI3	ICod. IT157 "Egadi Islands"
Legal date of establishment (gazetted)		I1	27th December 1991 (Ministerial Decree)

Table 1: Key institutional aspects of Egadi Islands

Category	Typology	Code	Description
Key ecological resources	Ecosystems of international relevance	EE1	Posidonia prairie among the most extensive (12,536 ha) and preserved in the Mediterranean
	More representative species	ES1	Coralligenous and precoralligenous habitats and vermetid "trottoirs"
Key cultural resources	Archaeological sites	CA1	Underwater archaeological site of Cala Minnola (Levanzo) (I Sec B.C.) and wreck of the Cannons at Marettimo (1600)

Table 2: Key natural and cultural resources of Egadi Islands

Category	Indicator	Code	Measure	Source
Demographic structure	Number of resident population	KS1	4,292	National census
	Population age structure by major age groups (0-14;15-64; 65 +)	KS2	0-14: 423 (9.8%) 15-64: 2,726 (63.5%) 65 +: 1,143 (26.7%)	National census
Employment	Unemployment rate	KS1	9.54%[1]	National census

Table 3: Key social dimensions of Egadi Islands

Category	Indicator	Code	Measure	Source
Composition of the economy	Composition of local activities	KE1	Commerce & Logistics: 26.6%; Catering and Hotels: 15.9%; Agriculture & Fish: 20.1%; Buildings: 9.9%; Industry: 6.7%; Other Services 20.8 %	Comune di Favignana (2017)
Composition of the economy	Size of local entrepreneurial activities	RE1	1 employee: 137 2 employees: 51 3 + employees: 22	[2]
Structure and features of tourism sector (province)	Annual tourist movement	KT1	637,540 (TP Province)	Tourism regional census
	Numbers of divers	KT2	3,125	MPA report[3]
	International visitors	KT4	201,914 (31,7%)	Tourism regional census
	National visitors	KT5	435,626 (68,3%)	Tourism regional census

Table 4: Key relevant economic dimensions of Egadi Islands

Category	Indicator	Code	Measure	Source
Structure and features of tourism sector (MPA)	Annual number of arrivals and overnight stays (days)	RT1	Arrivals: 48,756 Overnight stays: 240.754 Average stay: 4.09	[4] Ufficio Statistico Provincia di Trapani (2015)
	Seasonality (monthly peaks)	RT2	Low season: 150 (Jan) High: 10,025 (Aug)	[5]
	Tourism capacity	RT3	64 residences (hotels etc..) 3,121 beds	Tourism regional census
	Catering capacity	RT4	23 certified restaurants	Tourism regional census

Table 5: Key touristic dimensions of Egadi Islands

1. www.tuttitalia.it/sicilia/93-favignana/statistiche/indici-demografici-struttura-popolazione, www.piazze.it/Sicilia/Trapani/Favignana
2. http://sicilia.indettaglio.it/ita/provincie/tp/cifretp.html
3. MPA official website.

Category	Indicator	Code	Measure	Source
Organizational size and structure	Full time (permanent and temporary) staff capacity	KO1	15	MPA organizational chart
	Seasonal staff capacity (employees)	KO2	45 (summer)	MPA organizational chart
	Governance body	KO3	Municipality	MPA
Strategy	Mission	KP1	Natural environment conservation, environmental education and awareness raising, research, monitoring, integrated coastal management, sustainable development promotion, particularly of compatible tourism	MPA report
	Implementation of the management plan	KP2	- Master Project - Establishment of 17 mooring camps - Environmental certification of tourist services - "Monitoring of the sea" monitoring project - Monk seal observatory - First aid centre for sea turtles - "Marettimo blue mile" - Promotion of responsible and eco-sustainable sport-tourism	Strategic plan

Table 6: Key organizational aspects of Egadi Islands MPA authority

Category	Indicator	Code	Measure	Source
Organizational size and structure	Number of volunteers	RO1	12	MPA report
Strategy	Management plans	RP1	Management plans + ISEA	MPA – Comune di Favignana (2015); AMP Isole Egadi (2015)
Financial resources	Budget capacity – Annual availability of financial resources	RF1	1,147,035.79 Euro	MPA budget
Official collaborations	International agreements	CI1	MOA with NOAA Monterey Bay National Marine Sanctuary (USA)	MPA
		CI1	MedPAN member	MPA
	National networks	CN1	Sicilian Marine Protected Area Network member	MPA

Table 7: Relevant organizational aspects of the Egadi Islands MPA authority

I.2. HIGHLIGHTING THE ECONOMIC VALUE OF NATURE-BASED TOURISM: THE SCUBA DIVING SECTOR

As shown in the previous tables, tourism represents a significant sector for the MPA and the whole province of Trapani where it is located. In 2014, 637,540 tourists arrived in Trapani. The international tourism component is significant, with 31.7% (201,914) of foreign arrivals. Data shows an extremely high concentration of tourists in the high season. Globally, there were 2,212,516 overnight stays in the province, 1,623,893 domestic and 588,623 international.

Internal tourism in the MPA is very complex. The nature of the archipelago offers numerous opportunities for tourists. Nautical tourism is constantly growing, as shown by the increasing authorizations issued for recreational navigation, anchorage and moorings (Comune di Favignana, 2017) and boat rentals, as shown in the following tables.

Activity	2010	2011	2012	2013
Navigation	901	682	1,090	1,275
Anchorage	938	687	853	1,537
Mooring	-	-	500	750
Total	1,839	1,369	2,443	3,562

Table 8: Authorizations issued for yachting, anchoring and mooring from 2010 to 2013 (elaboration from Comune di Favignana, 2017)

2010	2011	2012	2013
94	54	218	250

Table 9: Number of authorizations for boat rental issued between 2010 and 2014 (elaboration from Comune di Favignana, 2017)

A further growing touristic activity is recreational fishing, as shown by the data on the number of fishing licences issued.

Activity	2010	2011	2012	Total
Resident	172	408	456	1,036
Homeowners	34	154	220	408
Non-resident	383	562	1,024	1,969

Table 10: Number of fishing sport licences issued from 1 July 2010 up to 2012 (Elaboration from: Bio&Tec Soc. Coop., 2013)

Egadi Islands MPA offers different opportunities for strictly NBT, from canyoning to whale and dolphin watching, to snorkelling. Scuba diving has been identified as the most significant and representative type of nature-based tourism. In the area there are 77 dive sites (figure 2), of which the main ones are around the island of Favignana. There are eight diving centres inside the MPA.

Figure 2: The main diving points of Favignana (from Cocito et al., 2015)

1 Scalo vecchio
   di Punta Marsala
2 Secca Fondale
3 Secca del Toro Canyon
4 Secca del Toro Parete
5 Punta Longa
6 Manuzza
7 Nonna Venus
8 Galeotta 1
9 Galeotta 2
10 Palo degli Spirografi
11 Scoglio Corrente
12 Grotta di Cala Rotonda
13 Costiera di Ponente
14 Punta Sottile
15 Faraglioni

To study the sector, 81 questionnaires were carried out during the summer of 2018.

The analysis shows that the divers' ages are well distributed in the main ranges, with the pick of 23% between 30 and 40 years old. The average education level is high, with 74% of tourists with a high school certificate or university degree.
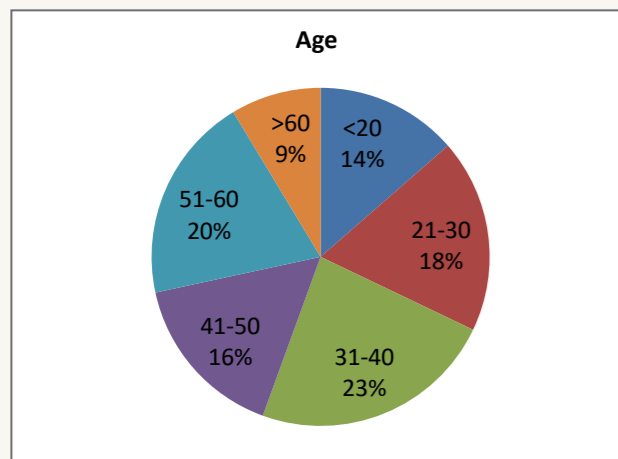
Figure 3: NBT age
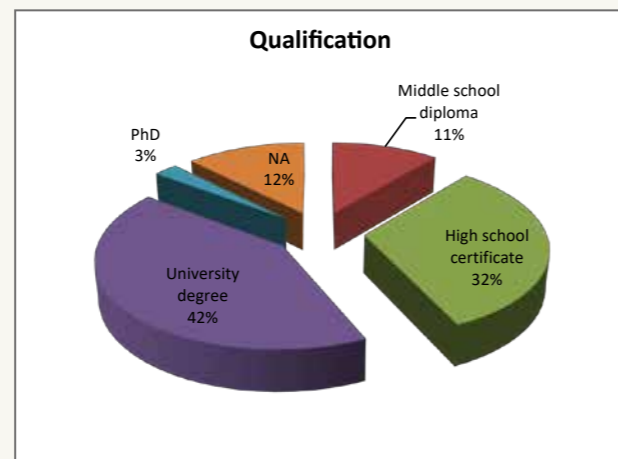
Figure 4: NBT education

The analysis of the results shows the presence of a mainly domestic tourism: 85% of tourists are Italian, with the largest number (21%) from the Sicily region and a fair presence of tourists coming from central Italy (Lazio 15%). Foreign tourism seems to be underdeveloped despite the presence of numerous low-cost companies flying to the nearby airport of Trapani.
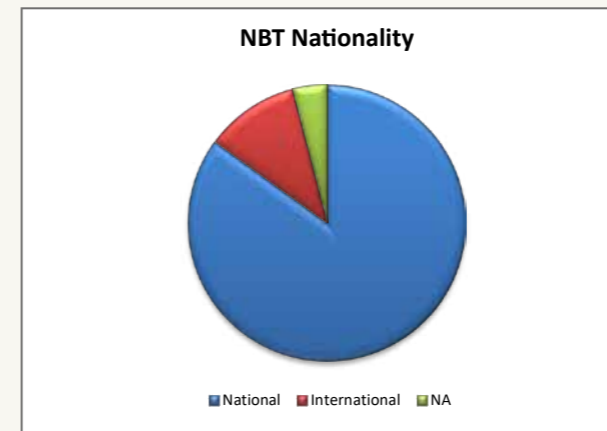
Figure 5: NBT nationality
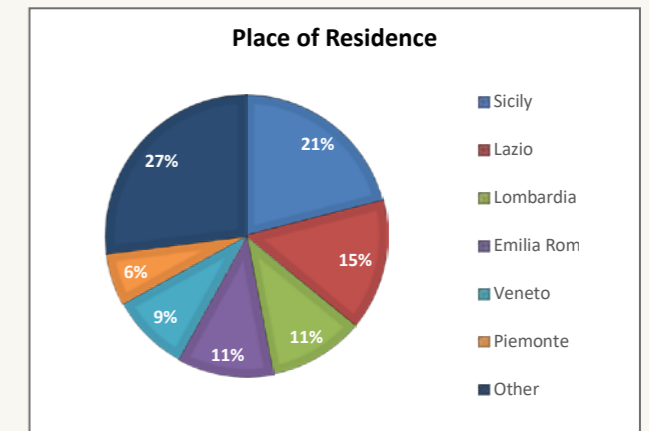
Figure 6: NBT place of residence

Regarding MPA awareness, the results show a good level of consciousness of the presence of the MPA (86%). However, the motivations for diving in the MPA are multiple and not always linked to the presence of a protected area.
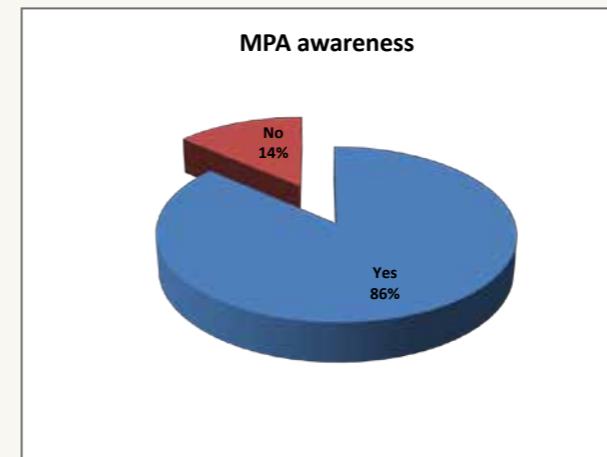
Figure 7: MPA awareness for NBT
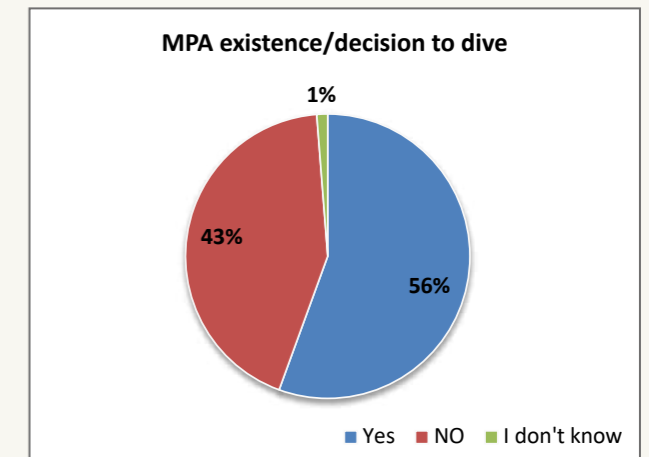
Figure 8: MPA as key element for influencing NBT decisions to travel

Even if only 9% of the people interviewed indicated the presence of the MPA as a choice factor, the other most important factors are nonetheless closely related to the MPA's specific features, such as the water quality (19.7%) and the presence of "spectacular" species (18%).
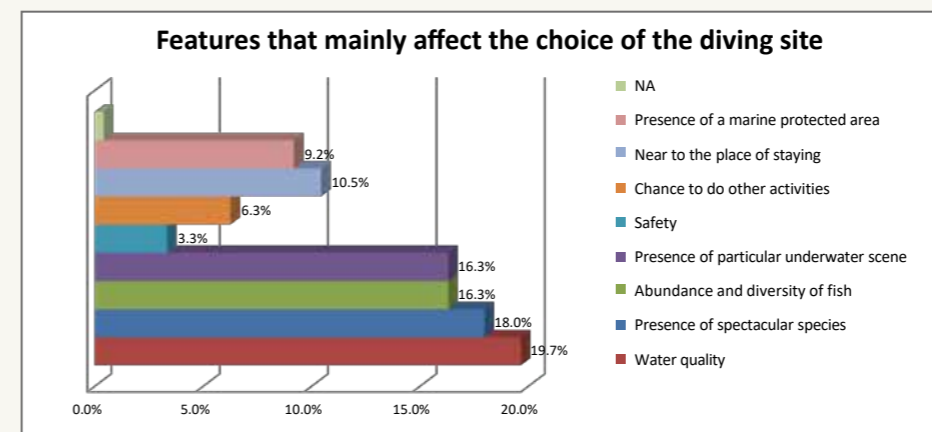
Figure 9: MPA main features affecting the choice of diving site

Supporting this, 83% of the people interviewed believe that the existence of the MPA ensures ecosystem conservation.

The last section of the questionnaire aimed to evaluate the attitude towards nature conservation through the so-called "willingness to pay" (WTP). The results show that 42% of people interviewed are willing to pay €3-5 more per dive in order to support the MPA's conservation mission.
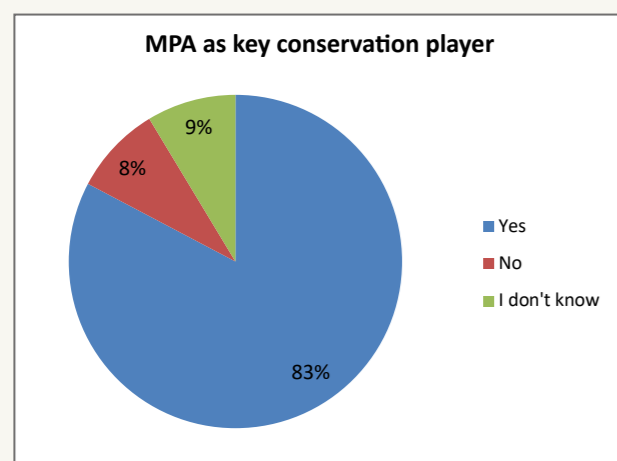
Figure 10: MPA as enabler for conservation
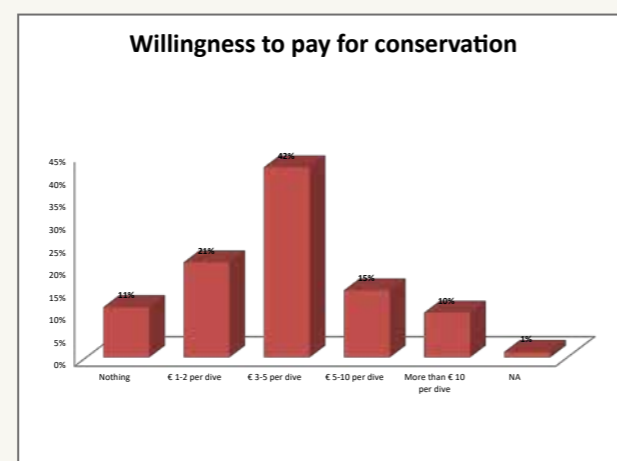
Figure 11: Willingness to pay for conservation

The activities considered most suitable to allocate funds to support MPA management projects are environmental education (24%) and reduction of water pollution (23%).
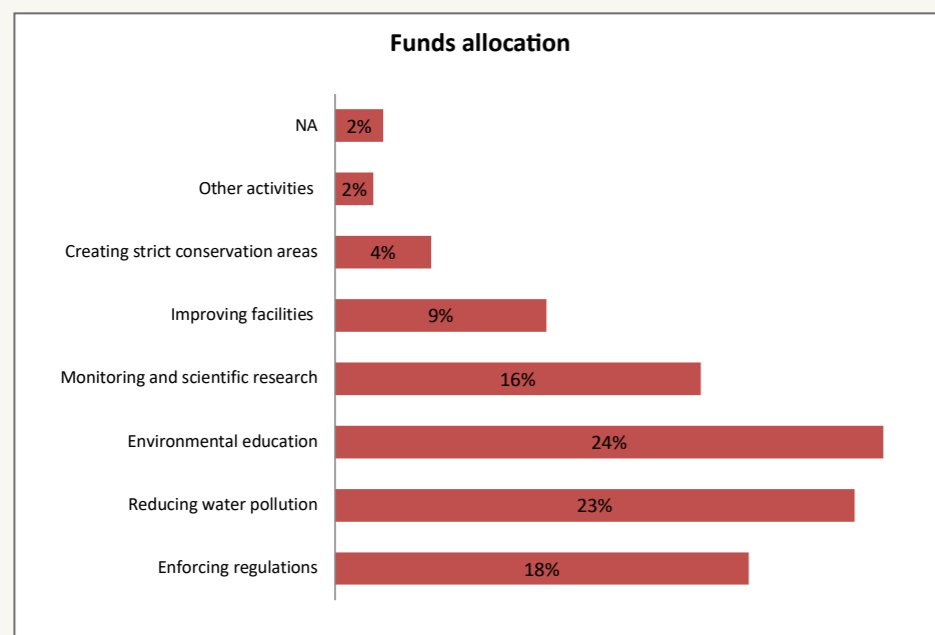
Figure 12: WTP: activities for funds allocation

Regarding the scuba tourism value assessment, as described in detail in the methodology (see Appendix 1) we identified four components of the travel cost. The table opposite identifies and details the structure and sources used to calculate this.

Travel cost subsection	Subsection elements	Source
TC1	Car transport cost	Calculation of distance from place of residence and cost estimation with ViaMichelin.it
	Plane transport cost	Estimation from hypothetical flight from respondents' place of residence to Trapani airport. Average value between high-season and low-season flight, using Skyscanner.it prices
	Ferry/fast ferry/hydrofoil transport cost	Estimation of the average price of ferry ticket from the nearest embarkation ferry port to Palermo/Trapani/Egadi ferry port
	Bus ticket	Estimation of the average price of the bus ticket to reach Trapani port from Palermo (Segesta transport company)
	Ticket to dive	Cost of a one-day diving experience, with all equipment. Average prices estimated by diving centres
TC1	= TC1 + Overnight cost	On the basis of the type of accommodation identified by the respondent, online analysis of average price for - Hotel: average daily high/low season prices for three-star and five-star hotels - Second home/ resident: estimated daily cost for living in the area, considering utilities cost calculated with www.numbeo.com - Rented house: daily cost for renting, calculated from the cost of monthly rent available on www.numbeo.com - Camping: average daily high/low season prices for available camping
TC3	= TC2 + Expenditure for other activities/services	Average price for food, considering the average prices of meals in both mid-range and "inexpensive" restaurants available in the area, obtained from www.numbeo.com
TC4	= TC3 + WTP	Weighted average amounts indicated by respondents

Figure 13: Travel cost structure and sources for Egadi Islands analysis

After the estimation of the four TC components, it was necessary to look for information related to the number of annual dives by consulting dive logs. This information was necessary to extrapolate the number of annual visits, in order to estimate the demand curve. At a conservative estimate, the MPA has recorded around 25,000 dives per year. This information is useful to estimate the number of annual scuba divers – about 3,125.[6]

It was then necessary to assess the average value of each travel cost (TC1, TC2, TC3, TC4).

These average values refer to the cost of both the days in which the dives were carried out, and the entire period spent in the Egadi Islands, as described in the following tables.

TC1	TC2	TC3	TC4
Car transport cost + ferry/plane transport cost + fast ferry/ hydrofoil transport cost + ticket to dive	TC1 + overnight cost	TC2 + expenditure for other activities/ services	TC3 + willingness to pay an additional amount of money to fund conservation projects
€ 315.62	1,369	2,443	3,562

Table 11 Travel cost value for the days in which the dives were carried out

TC1	TC2	TC3	TC4
€ 457.34	€ 1,443.78	€ 1,959.25	€ 1,995.63

Table 12 Travel cost value for the for the entire period spent in Egadi MPA

6. The number of annual divers (3,125) is estimated using the ratio of total annual dives and average annual dives per person.

These values have been multiplied by the number of annual scuba divers (3,125) in order to get an estimation of the recreational value of diving Egadi Islands MPA. These are summarized in the tables below.

Recreational value (RV) for the days in which dives were carried out		
RVX	TCX *N° ANNUAL SCUBA DIVERS	TOTAL AMOUNT
RV1	€ 315.62 * 3,125	€ 986,313
RV2	€ 1,302.06 * 3,125	€ 4,068,938
RV3	€ 1,817.53* 3,125	€ 5,679,781
RV4	€ 1,853.90 * 3,125	€ 5,793,438

Table 13 Recreational value for the days in which the dives were carried out

Recreational value (RV) for the entire period spent in Egadi		
RVX	TCX *N° ANNUAL SCUBA DIVERS	TOTAL AMOUNT
RV1	€ 457.34 * 3,125	€ 1,429,188
RV2	€ 1,433.78 * 3,125	€ 4,511,813
RV3	€ 1,959.25 * 3,125	€ 6,122,656
RV4	€ 1,995.63 * 3,125	€ 6,236,344

Table 14 Recreational value for the entire period spent in Egadi MPA

From this, two demand curves (figures 14 and 15) have been created, the first expressing the estimated recreational value of scuba diving for the days in which the dives were carried out and the second estimating the recreational value associated with the divers' whole visit to Egadi. The areas of the rectangles represent the areas of profit for the market and the extra profit related to the hypothetical willingness to pay for conservation.
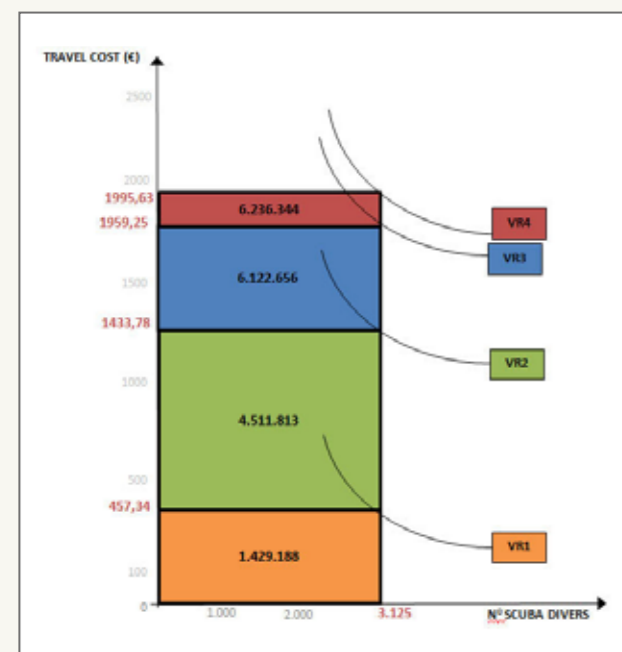
Figure 14: Recreational value associated to the entire period spent in Egadi – Demand curve
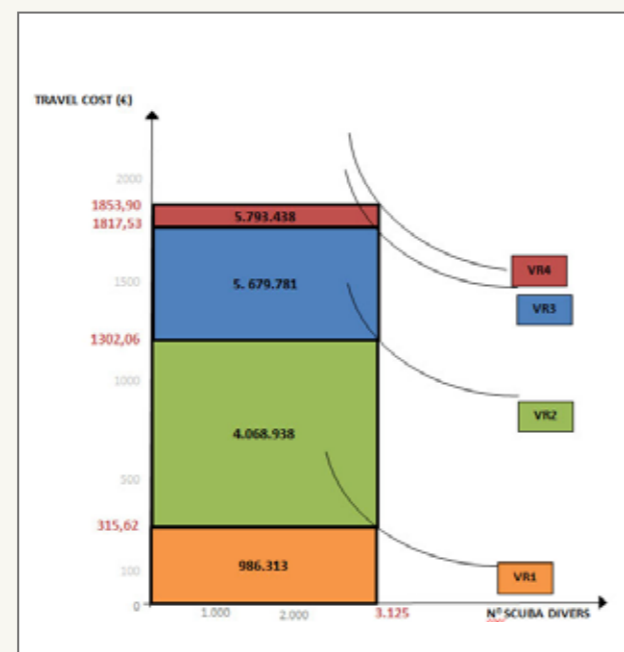
Figure 15: Recreational value associated to the days in which the dives were carried out – Demand curve

It is important to underline that these findings are a conservative estimate of the recreational value that nature-based tourism (the scuba diving sector, in this case) is able to produce, due to the reduced sample size and the latent feature of the variable of the study.[7]

I.3. THE SMALL SCALE FISHING SECTOR: ECONOMIC STRUCTURE AND PERFORMANCE

In Egadi Islands, the professional fishing fleet resident in the MPA is composed of 41 boats, of which more than half come from the main island of Favignana, with the remainder from Marettimo and only three from the smaller island of Levanzo.

The peculiarity of the Egadi situation, compared to the other European MPAs, is that an additional 122 vessels from the nearby cities of Trapani and Marsala also fish in the MPA. Altogether there are 129 authorized vessels that practise artisanal fishing (trammel nets and long lines) and 34 authorized vessels that practise industrial fishing (trawling only in D area). The most used fishing methods are trammel nets (85%) and longlines (79%).[8]
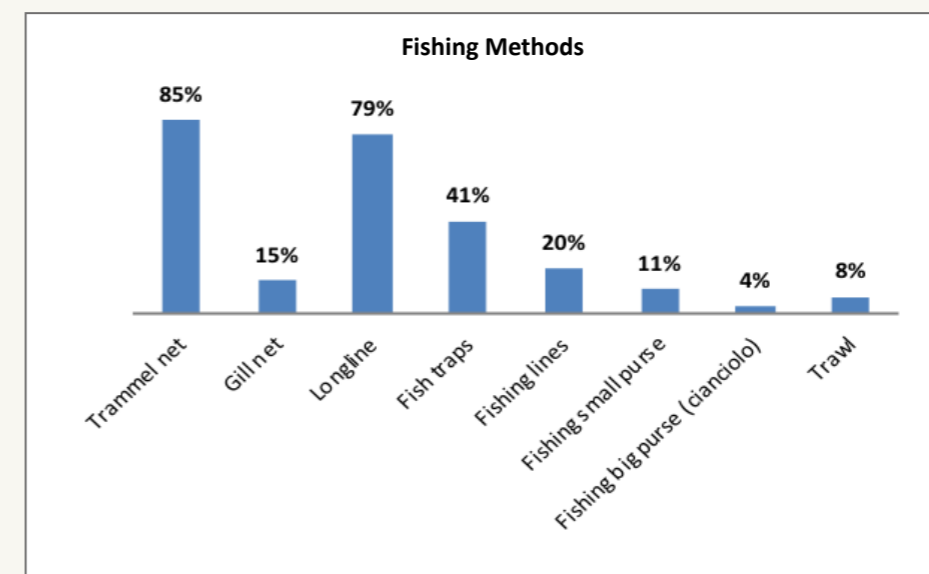
Figure 16: Fishing methods in Egadi Islands

For the study of the sector we mixed three sources of data: a survey of 20 fishermen made by one of our researchers and the team of the Fish&MPABlue2 project; five other face-to face interviews; and data provided by the local fishing cooperative (Cooperativa San Giuseppe). As reported in the graph below, the average composition of the catch shows a predominance of so-called third-class fish (40%), following by second-class fish (24%) and octopus and cuttlefish (23%).

7. A variable is latent when is not directly observable. To measure a latent variable researchers identify indicators that represent the variable (Goodman, 1974).
8. The percentages as a whole exceed 100% because the same boat operates during the year with several different gear types (Source: data provided by the MPA. Update December 2016).
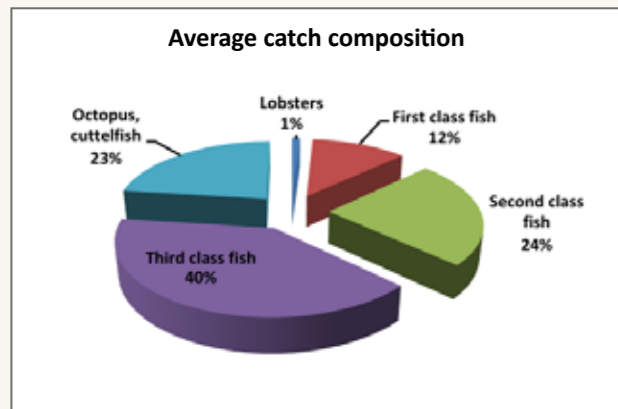
Figure 17: Average catch composition
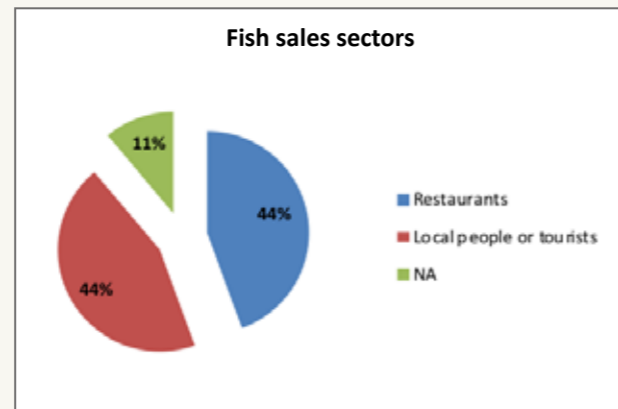
Figure 18: Fish sales sectors

Fishermen did not perceive positive benefits from the MPA institution. This generalized discontent is presumably linked to a perceived low level of stakeholder involvement in the MPA authority's approach. According to fishermen when the MPA was established, residents and fishermen were not given enough opportunities to take part in MPA design and "most have been adamantly opposed to its existence from the beginning" (Himes, 2007). In fact, 80% of the respondents believe that the MPA quite negatively affects the community activities and the overall sense of well-being.

The interviewed fishermen claim to sell most of the catch to restaurants (44%) and to local people or tourists (44%).

Fishermen have a low-level of acceptance of the MPA: 60% of those interviewed said that the MPA is leading to decreases in the number of fishes, without having positive effects on habitat conservation.

Figure 21: Fishermen's attitudes to MPA's social impacts

Figure 19: Fishermen's attitudes to MPA's conservation impact

The graph below shows the results regarding the perception of small-scale fishermen towards the MPA. They have a low level of trust in the MPA's ability to allow ecosystem conservation and abundance of fish and to reduce illegal fishing. On the other hand, they believe that the MPA is able to attract a greater number of tourists, but this phenomenon doesn't positively influence the economic welfare of the SSF community. According to the interviewed fishermen, the creation of a quality brand for MPA fish is not necessary because they already sell their catch at the best possible price by enhancing the product.

From an economic point of view, the study noted that 80% of small-scale fishermen feel that the MPA has led to a decline in their income, but at the same time they observed an increase in earnings and job opportunities in other employment sectors (e.g. tourism).

Figure 19: Fishermen's attitudes to MPA's conservation impact
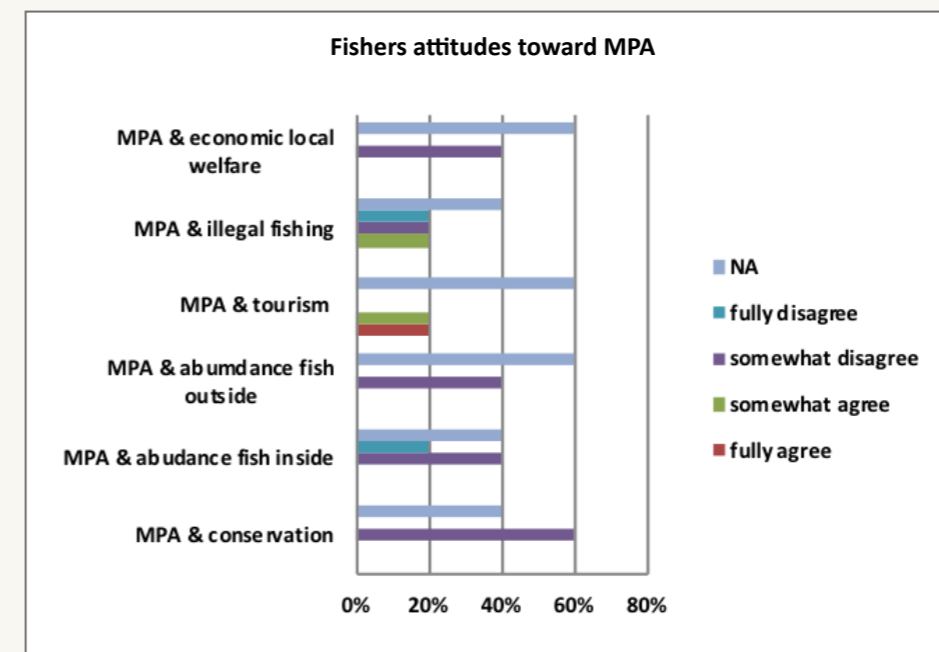
Figure 22a: Fishermen's attitudes to MPA
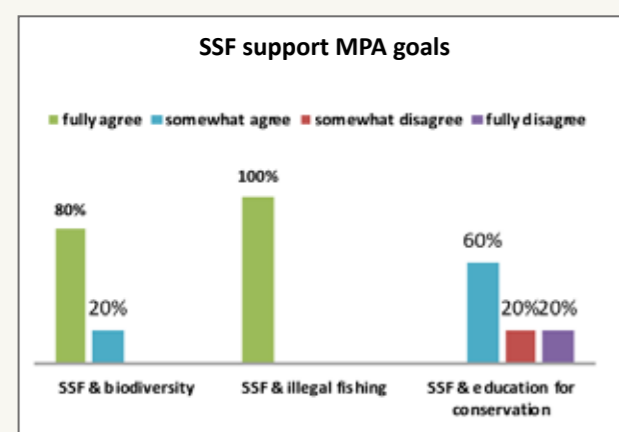
Figure 22b: Fishermen's attitudes to MPA

Although there is a conflictual relationship with the MPA, 80% of the fishermen are willing to help to protect biodiversity, while 100% of the interviewees are willing to cooperate with the MPA authority to identify and reduce illegal fishing. Among the most interesting social aspects, it is necessary to focus on the relationships between SSF and the other "users" of the coastal and natural resources. The greatest source of conflict is with the recreational fishers, who according to SSF sometimes illegally fish throughout the MPA. Some fishermen report negative experiences also with divers and diving centres, due to the crowding during the summer and the presence of too many buoys.

From the data collected in the questionnaires and consulting some databases and local informants, we made an estimation of the sector's turnover. This calculation for small-scale artisanal fishing is technically simple, but becomes a complex operation, due to both the nature of the assessment itself and the difficulty in collecting data in the field. In fact, fishermen displayed a general reticence in providing data on their economic activity. On the basis of the information collected in the field and the data analysis, it emerges that the SSF sector in Egadi Islands MPA generates an annual turnover of €586,341 if we consider only the fishermen living inside the MPA, and of €2,331,063 if we consider all the fishermen authorized to fish inside the MPA. As discussed in the methodology, studies in another North Mediterranean MPA (Niccolini et al, 2015) have shown that the additional value generated in the local economy by the fishing supply chain leads to an increase in revenue of 100% when the fish is sold to wholesalers, 200% when sold to fishmongers and 400% in the case of restaurants. Applying the same coefficients to the case study, we would arrive at a value of around €2 million generated by the fishermen living inside the MPA and €9 million considering all the SSF.

The procedure for calculating the turnover of the fishing sector is described in detail as follows. From the data, it emerged that the average daily catch volume is about 10.25kg and the average number of fishing days is 155. On the basis of this data, we calculated the average annual fishing volume that is used to estimate the average turnover.

The analysis then focused on estimating the average selling price of the catch. There are three main price ranges in the fish market that differ essentially in two factors: the species and size. Although there is a certain variability depending on the context and those involved in the transaction, the top price range comprises species whose catch is neither common nor abundant, such as sea bream, sea bass and red snapper. The price between the three categories varies considerably from a range of €5-6 euros per kilo for the third category, €7-20 for the second and €20-30 for the first. There are also other price categories, normally consisting of individual species, such as cuttlefish, octopus and lobster. To calculate the average selling price, we first estimated the percentage of the total catch for each price category (table 15).

Category	Total catch (kg)per vessel	Total catch (%)
Lobster	0.15	2
First class fish	0.72	7
Second class fish	2.74	27
Third class fish	4.48	44
Octopus/cuttlefish	2.15	21

Table 15: Volume and percentage of total catch by categor

Category	Average price € per kilo	Average volume (kg)
Lobster	34	0.15
First class fish	18	0.72
Second class fish	11	2.74
Third class fish	4	4.48
Octopus/cuttlefish	13	2.15
Average weighted price		€ 9

Table 16: Volume and price per kilo of total catch by category

Combining the price for each category with the proportion of the catch in that category gives us a weighted average price of €9/kg. This enables us to calculate the total turnover and the average per vessel turnover for the SSF sector, as shown in table 16. The table shows the figures for both the 163 authorized vessels (in brackets) and for the 41 belonging to the fishermen living in the MPA. .

Daily average catch (kg)	A	10.25
Average annual fishing days/year	B	155
Average price of catch	C	€9
Total annual catch per vessel (kg)	D=A*B	1,589
AVERAGE PER VESSEL TURNOVER	E=D*C	€14,301
Number of authorized vessels	F	41 (163)
Total annual catch SSF (kg)	G=F*D	65,149 (259,007)
GLOBAL SSF TURNOVER	H=E*F	€586,341 (€2,331,063)

Table 17: Estimated average turnover of SSF sector

I.4 REFERENCES

Area marina protetta Isole Egadi (2015). ISEA programmazione 2015.

Bio&Tec Soc. Coop. (2013). Caratterizzazione della pesca ricreativa all"interno dell"Area Marina Protetta "Isole Egadi" dall'entrata in vigore del Regolamento di Esecuzione e Organizzazione nel 2010.

Cocito, S. et al. (2015). Underwater itineraries at Egadi Islands: Marine biodiversity protection through actions for sustainable tourism. EIA Energia, Ambiente e Innovazione.

Comune di Favignana (2015). ISEA programmazione 2015.

Comune di Favignana (2016). Isole Egadi a pedali, a remi, a piedi.

Comune di Favignana (2017). Anagrafe Egadi.

Comune di Favignana (2017). Relazione delle performance 2014.

http://sicilia.indettaglio.it/ita/provincie/tp/cifretp.html

www.ampisoleegadi.it

www.aresweb.net/ricerca%5CDocumenti%5CRicerca%20Trend.pdf

www.naturaitalia.it/static/media/doc/pdf/Programmazioni_ISEA_2015/09_EGADI_ISEA_20 15.pdf

www.tuttitalia.it/sicilia/93-favignana/statistiche/indici-demografici-struttura-popolazione/

www.piazze.it/Sicilia/Trapani/Favignana

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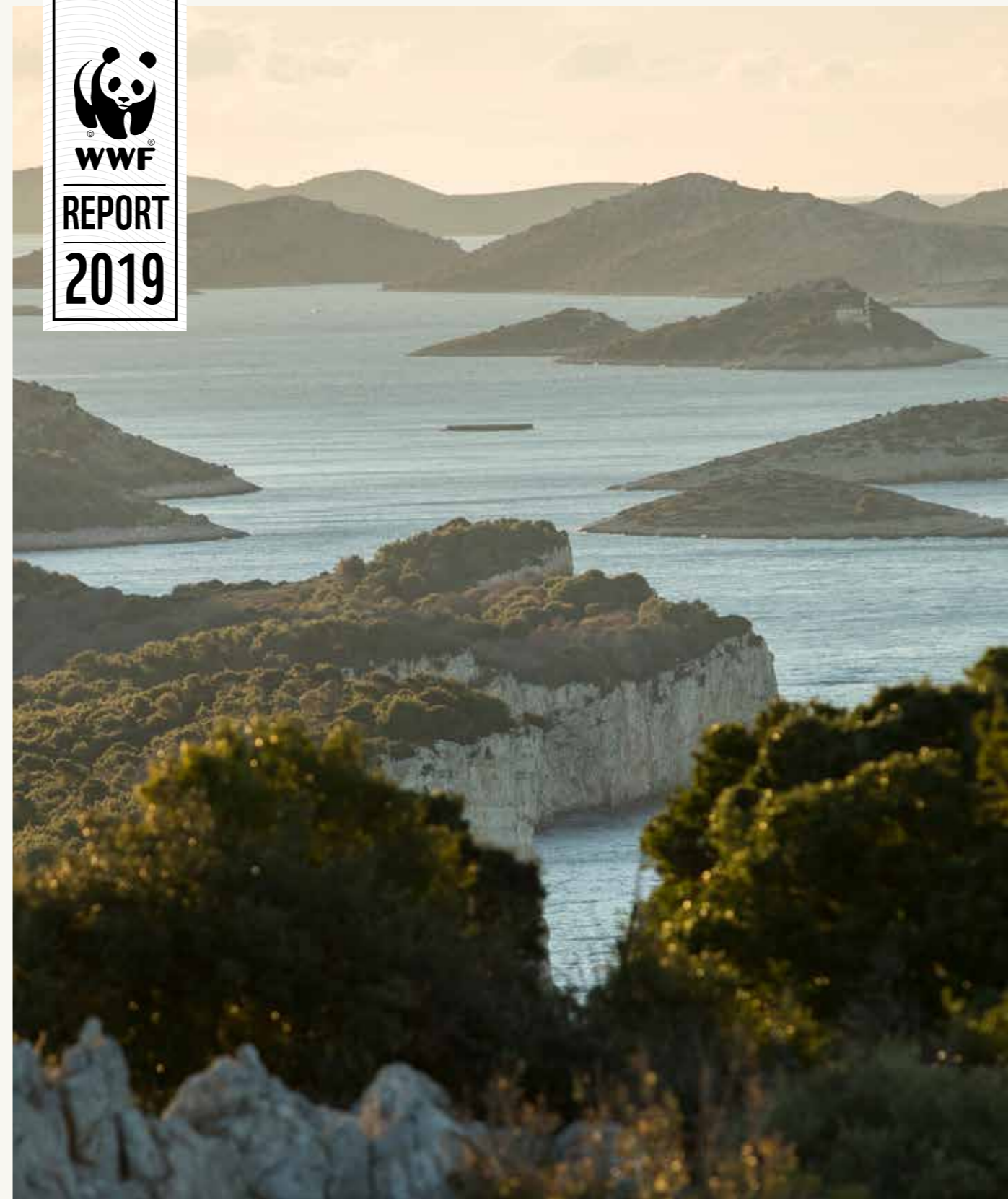
ANNEX II

TELAŠĆICA NATURE PARK: THE BALANCE BETWEEN ECOSYSTEM CONSERVATION AND TOURISTIC DEVELOPMENT

II.1. THE INSTITUTIONAL, SOCIO-ECONOMIC AND ORGANIZATIONAL CONTEXT

The Telašćica bay is situated in the middle of the Croatian Adriatic coastal zone, covering the southern part of the island of Dugi-Otok. The MPA is included in the area of the Telašćica Nature Park and was established in 1988, after being separated from Kornati National Park.

It covers an area of 70.50km2: 25.95km2 on the land (Dugi Otok and the neighbouring islets) and 44.55km2 on the sea. Inside the Park, there are 13 islands, islets and rocks and over 69km of coastline in 25 small bays. The Park is not inhabited; the administrative headquarters is located in Sali, the nearest village on the island of Dugi Otok.

Figure 1: Location of Telašćica Nature Park. Source: Karl-H. Beständig. 808 Luka I Uvala - Hrvatska, Slovenija i Crna Gora. (808 Harbours and Bays – Croatia, Slovenia and Montenegro)

The Park regulation includes special protection to important natural ecosystems like maritime cliffs on the Adriatic, the Telašćica Bay, Mir salt lake and indigenous vegetation. The cultural heritage is also important, with its Liburnian ruins and tumuli (tombs), antique remains, and small Pre-Romanesque Croatian churches.

The mission statement of the Park is "the preservation of diversity of species and habitats in their favourable condition. Protection includes the application of scientific knowledge, as well as monitoring of human influence to the environment in order to avoid or reduce unfavourable impacts on species and habitats" .[9]

Tourism represents an important sector for local economy. The MPA is located in Zadar county, an important tourist area. According to data from the Zadar County Tourist Board (Turističke zajednice Zadarske županije) in 2016 the Zadar region recorded a total of 1,624,401 tourist arrivals (6% more than in 2015) and 11,567,486 overnight stays (5% more than the previous year). International tourism dominates at both the regional and the MPA level. In 2016, international tourists made up 85% of arrivals in Zadar. Similarly, the villages nearest to the MPA (Dugi Otok island

9. http://pp-telascica.hr/protection-and-preservation/?lang=en

and Sali) registered 26,675 arrivals, of which 85% (22,741) were international. Data shows a higher concentration of tourists in the high season, which may cause overcrowding in the most popular areas.

The MPA shows a good level of organizational and institutional maturity, and it was legally established 30 years ago. The MPA has a management plan developed through a participatory planning process, in collaboration with Sibenik-Knin County, the Public Institute of Nature Protection, the Ministry of Environment, the Association Sunce and the local community (Telašćica Management Plan Extract, 2013, p .3) supported by the WWF MedPAN South Project (Gomei and Di Carlo, 2012). The plan includes a series of medium/long-term strategic objectives and is divided into five main themes, each of which indicates a macro-objective to be achieved; each theme then has a goal that the plan undertakes to pursue, sub-divided into a series of objectives with specific indicators; the plan is finally implemented concretely through a series of activities (Telašćica Management Plan Extract, p. 6).
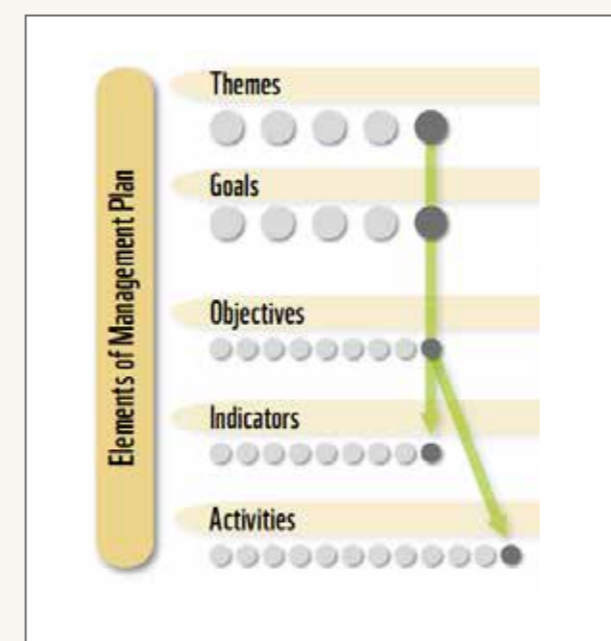
Figure 2: Methodological structure of Telašćica Management Plan

The MPA also benefit from stable sources of funding guaranteed by transfers from government and local authorities and revenues deriving from the sustainable use of natural values such as entrance tickets, permits and other sources of self-financing. For the last few years an average annual management cost of 8,607,726 Kuna (€1,159,680) was calculated, distributed in employee expenses (4,080,315 Kuna), expenditure on implementing the plan (1,491,460 Kuna) and other expenses (3,035,951 Kuna).

Category	Code	Description
Official international Recognitions	RI4	Natura 2000 Tentative List of the Unesco World Heritage Important Bird Area (IBA)
Legal date of establishment (gazetted)	I1	Decree on the Proclamation of the Act on the Proclamation of Nature Park "Telašćica", Official Gazette "Narodne novine" 14/88
Management authority	-	The Public Institution of Nature Park Telašćica (founded by a Government Decree of the Republic of Croatia)
Official headquarters	-	Municipality of Sali, nearest village to Nature Park Telašćica

Table 1: Key institutional aspects of Telašćica

Category	Typology	Code	Description
Key ecological resources	Ecosystems of international relevance	EE1	6 islets, cliffs (including Stene, rising 161m over the sea), and many sea caves
	More representative species	ES1	Peregrine falcon and Eleanor's falcon; bottlenose dolphin; yellow gorgonian (Eunicella cavolini) and the violescent sea-whip (Paramuricea clavata); protected red coral (Corallium rubrum) and bushy coral (Cladocora caespitosa)
Key cultural resources	Archaeological sites		The burial mounds in the field Čuh, the Illyrian mounds and the remains of Roman buildings from the first century.

Table 2: Key natural and cultural resources of Telašćica

Category	Indicator	Code	Measure	Source
Demographic structure	Number of resident population	KS1	None inside the MPA. 740: population of village Sali	National statistics (censuses)
	Population age structure by major age groups (0-14;15-64; 65 +)	KS2	0-14:89 (12.0%) 15-64:462 (62.5%) 65+:189 (25.5%)	National statistics (censuses)
Employment	Unemployment rate	KS1	9.0%	Zadar, Chamber of Commerce

Table 3: Key social dimensions of Telašćica

Category	Indicator	Code	Measure	Source
Composition of the economic system	Composition of local activities	KE1	Commerce & Logistics: 33.9%; Catering and Hotels: 11.5%; Agriculture: 9.6%; Administration: 5.4%; Buildings: 8.5 %; Industry: 20.5%; Other 10.7%	Zadar Chamber of Commerce
Structure and features of tourism sector	Annual tourist movement	KT1	1,624,401 (arrivals) 11,567,486 (overnights)	Regional tourism statistics
	Numbers of dives	KT2	250 or 1000-1,500 scuba divers in MPA (2016)	MPA reports Blu Finance - Final Report 2016
	International visitors	KT4	Annual arrivals for Dugi Otok island: 18,054; for Sali, 4,687 tourists	Regional tourism statistics
	National visitors	KT5	Annual arrivals for Dugi Otok island 2,938; for Sali, 996 tourists	Regional tourism statistics

Table 4: Key economic dimensions of Telašćica

Category	Indicator	Code	Measure	Source
Structure and features of tourism sector (MPA)	Annual number of overnight stays	RT1	Number of visitors in MPA: 123,327 Overnight stays in Dugi Otok island: international: 138,511, national: 19,412 Overnight stays for Sali: international: 34,449, national: 6,137	Regional tourism statistics
	Seasonality	RT2	High season (July, August): 54,790 Low (January): 2,872	Regional tourism statistics (2018)
	Tourism capacity	RT3	27 urban hotels: 1,845 beds 26 seaside hotels: 2,392 beds 19 hostels: 758 beds	Regional tourism statistics (2018)

Table 5: Key touristic dimensions of Telašćica

Category	Indicator	Code	Measure	Source
Structure and features of artisanal fisheries sector (small-scale fishery, SSF)	Number of authorized vessels		10	
	Number of fishing days	KF1	150	Fishermen's associations registers
	Daily catch:	KF2	8kg	Fishermen's associations registers
	Total annual catch	KF4	1,000kg	MPAs reports
	Total catch inside MPA	KF4	300kg	MPAs reports
	Type of catch	KF6	Common commercial species. Diplodus vulgaris, Mullus surmuletus, Trachurus trachurus, Scomber japonicus, Pagellus erythrinus, Sarda sarda, Boops boops. Sepia officinalis, Octopus vulgaris, Loligo vulgaris	Fishermen's associations registers
	Average fish price	KF7	€ 6/kg	Fishermen's associations registers

Table 6: Key dimensions of small-scale fishing sector in Telašćica

Category	Indicator	Code	Measure	Source
Organizational size and structure	MPA full-time employees	KO1	24	Organizational chart
	MPA seasonal employees	KO2	15	Organizational chart
	Management body	KO3	Public Institution of Telašćica Nature Park	Organizational chart
Financial resources	Budget capacity – Annual availability of financial resources	RF1	€ 1,159,680	MPA budget
Strategy & planning	Mission	KP1	Protection, maintenance and promotion of the Nature Park in order to protect and preserve the authenticity of nature, ensuring the smooth progress of natural processes and sustainable use of natural resources whilst supervising the implementation of nature conditions and protection measures.	Strategic Plan – Management Plan 2012, p. 11
	Implementation of the management plan	KP2	Strategic programmes to enhance conservation and local sustainable development: - Management plan - Sustainable tourism plan	Strategic Plan

Table 7: Key organizational aspects of Telašćica

Category	Indicator	Code	Measure	Source
Organizational structure	Number of volunteers	RO1	None	MPA Report
Strategy	Management Plan	RP1	Strategic Plan - Management Plan	MPA
Financial resources	Annual budget	RF1	€ 1,159,680 (average)	MPA Budget

Table 8: Relevant organizational aspects of Telašćica

II. 2 THE CHALLENGE OF NATURE-BASED TOURISM: THE POTENTIAL OF THE SCUBA DIVING SECTOR

There are numerous possibilities for enjoying the marine and coastal beauties of the park. Compared to the other MPAs, Telašćica's MPA tourism composition is unusual. The strictly NBT niches are combined with other typologies of tourists that visit the island to enjoy its amenities. For example, nautical and cruise tourism have increased in the last few years. These are important sources of income derived from people who spend some time in the bay, paying the Park entrance fee that allows for regulated trekking, swimming or snorkelling.

The water quality, beautiful underwater scenery, and abundance and diversity of plant and animal species mean the park also has great diving potential, but this has yet to be developed and is "almost non-existent as an income source" (Pascal & Milovic, 2016, p. 17). Recreational scuba diving could become a key component of marine and coastal tourism, not only for its low impact on ecosystems (compared with mass tourism), but also for the economic benefits and employment opportunities.

Field research was conducted to investigate the main features of the NBT sector and the socio-economic implications. Researchers completed 42 questionnaires during the summer period in 2017 and 2018. Most of the people interviewed was snorkelers (69%). Almost half the interviewees were between 21 and 40 years old.
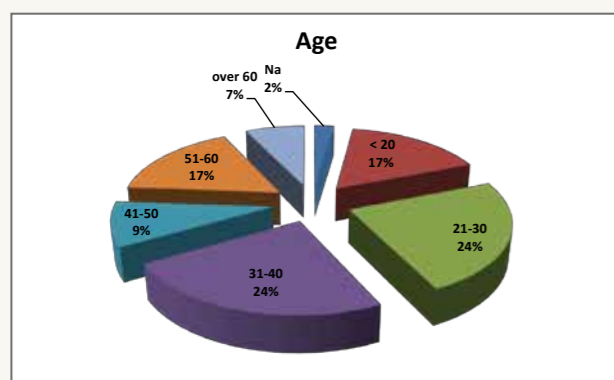
Figure 5: NBT nationality

The average education level is high, with 45% of tourists having a university degree, while the occupational analysis revealed a high percentage of employed people (38%), followed by students (24%).
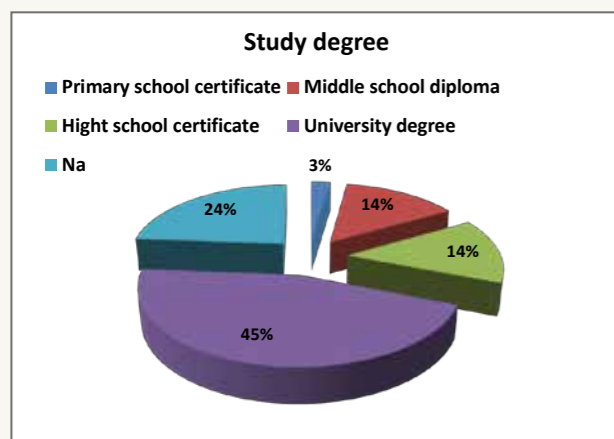
Figure 4: Educational level of interviewees
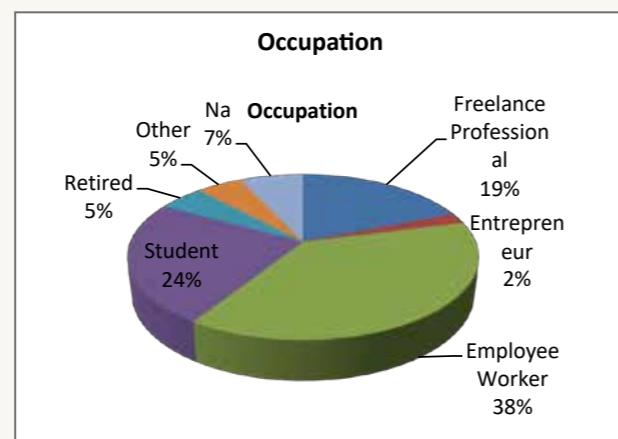
Figure 5: Interviewees' occupations

A third of those interviewed were domestic tourists, with the rest being international, with the largest proportion coming from Austria (19%). The average stay is about 11 days, with 5 days spent diving or snorkelling. Most of the tourists interviewed declared that the recreational experience in Telašćica is just a part of a longer vacation – many are on cruises.
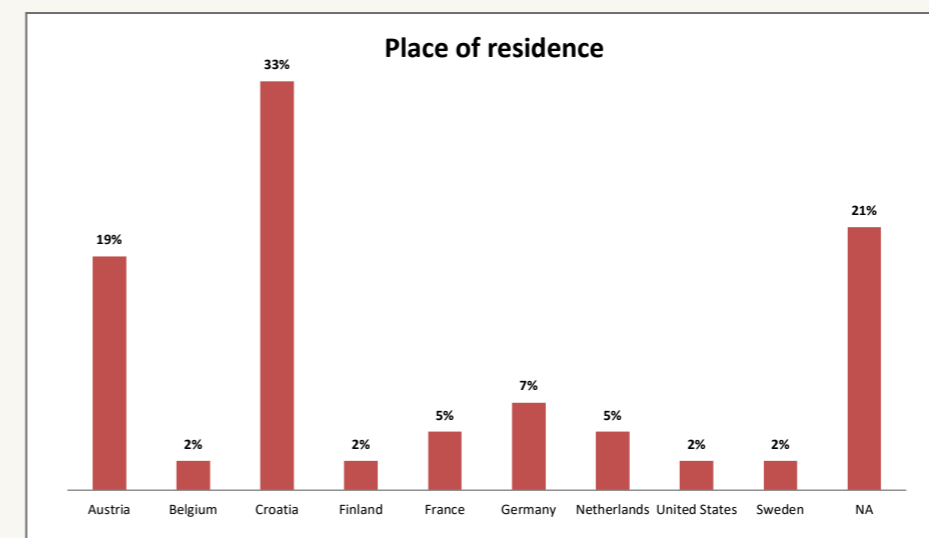
Figure 6:Interviewees' country of origin

Regarding MPA awareness, the results showed a very high level of consciousness of the presence of an MPA (95%). This result is confirmed by the fact that 43% of the respondents claimed that the presence of the MPA influenced their decision to dive or snorkel in the area.
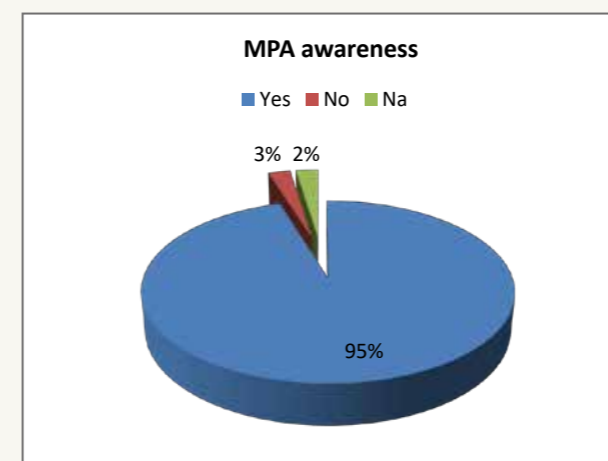
Figure 7: Awareness of MPA's existence
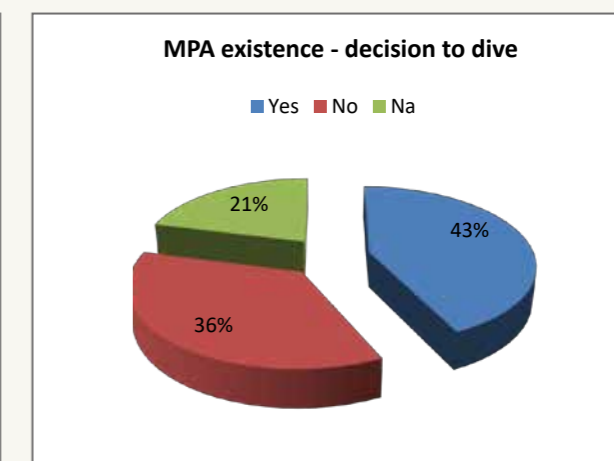
Figure 8: MPA's presence affected decision to dive

Almost a third (31%) of respondents claimed that the presence of the MPA was a factor in choosing to holiday in the area. On top of this, the most important frequently cited factors also related to features of the MPA, such as the water quality (57%), the presence of particular species (50%) and abundance and diversity of fishes (40%). Meanwhile, 82% believed that the existence of an MPA ensures ecosystem conservation.
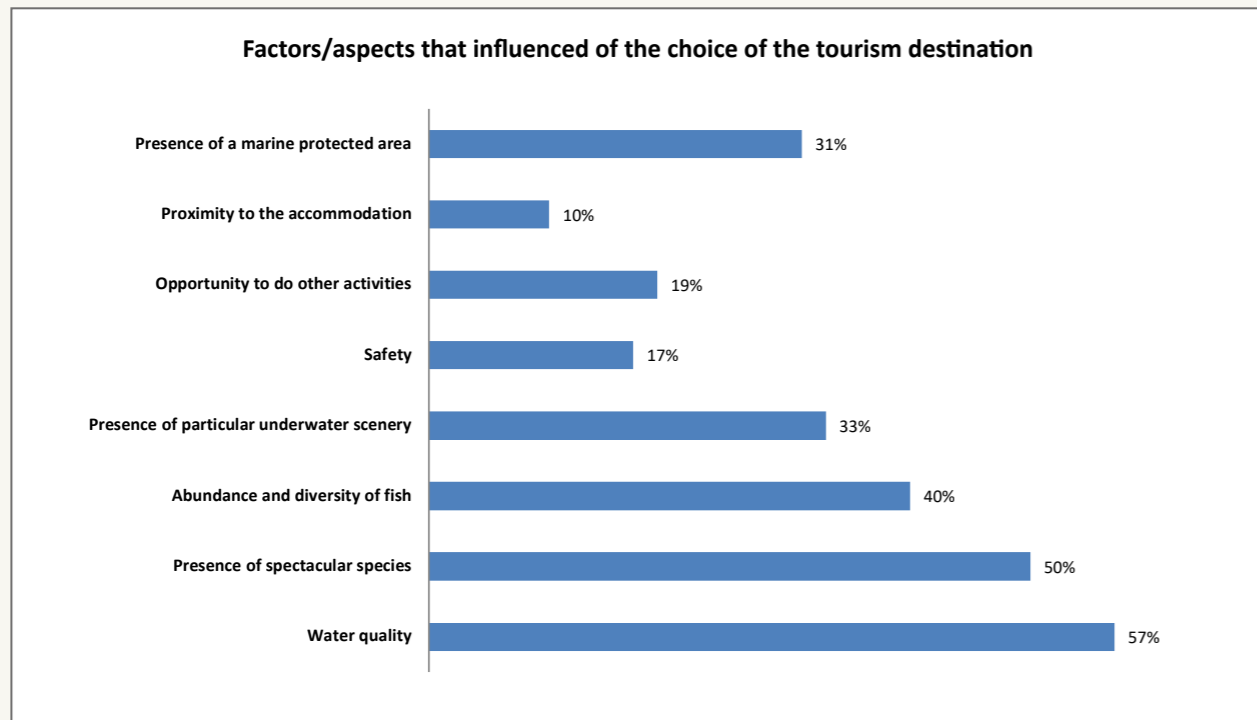
Figure 9: Key factors influencing the choice of holiday destination
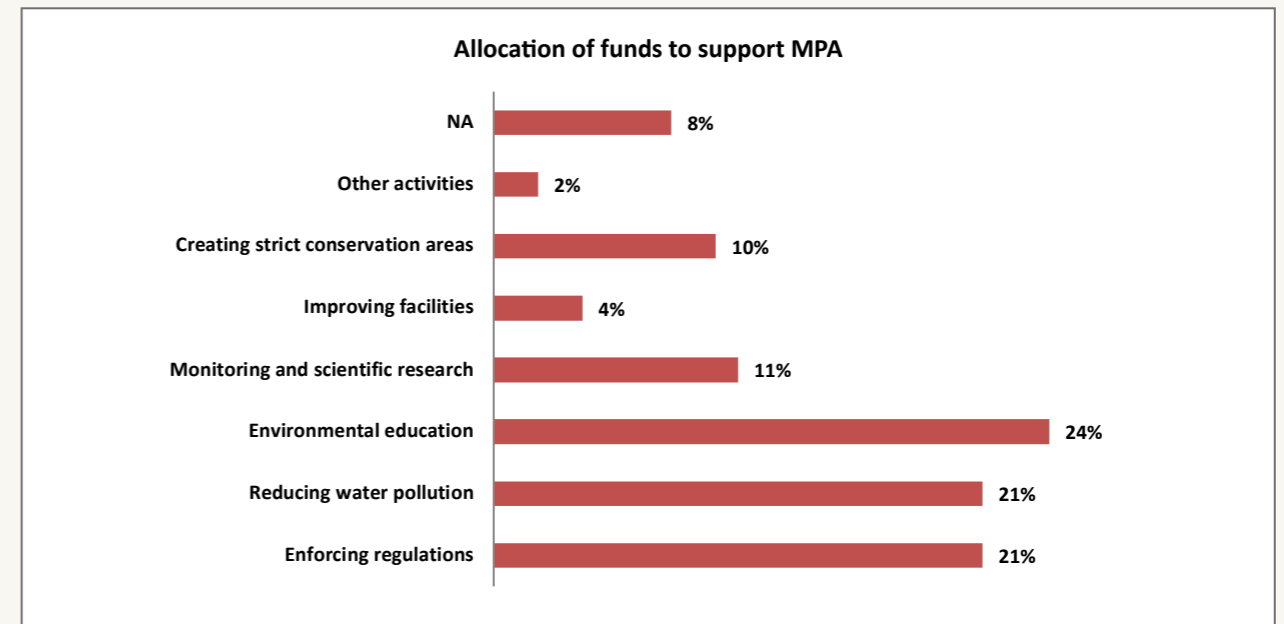
Figure 12: How NBTs would like to see extra funds allocated

To estimate the economic value of the diving sector, as one element of NBT, we applied the travel cost method (TCM). This is explained in full in the methodology, and has been adapted to the specific context, despite the low availability and/or accuracy of both external and observed data. As for the other case studies, the four components of the travel cost were identified and detailed, as described in the following table.
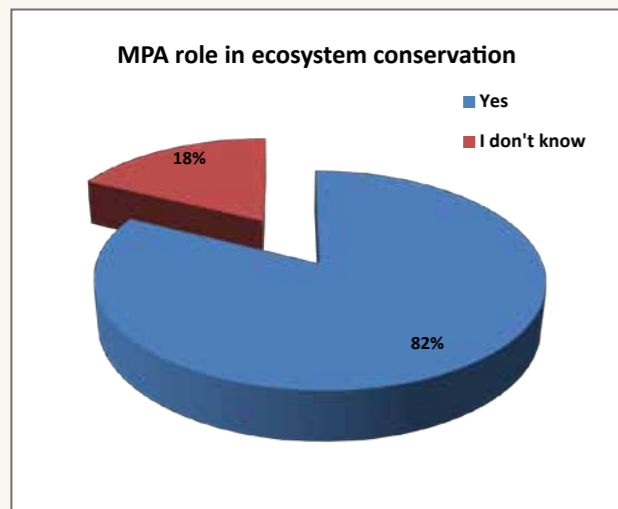
Figure 10: Does the MPA support ecosystem conservation?
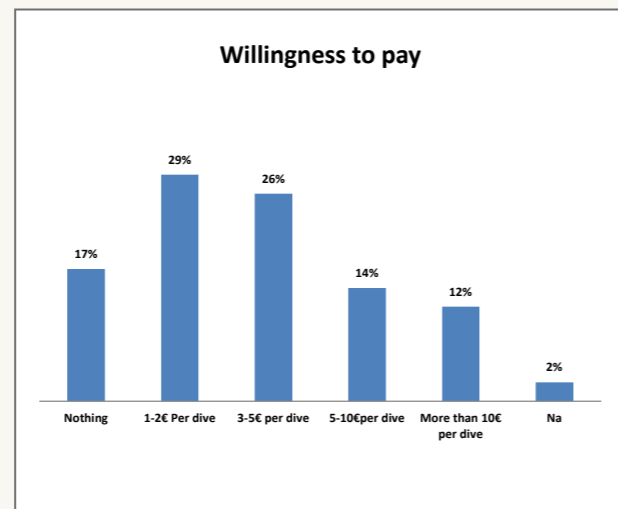
Figure 11: NBTs' willingness to pay extra to support conservation

While tourist already pay an entrance fee for visiting the park, many say they are willing to pay an additional fee for diving or snorkelling in the area to fund conservation projects. In total, 81% of respondents said they were willing to pay more, with 29% willing to pay €1-2 more per dive, 26% €3-5 per dive, and 26% more than €5 per dive. Of those who were unwilling to pay more, 86% said this was because they believe that conservation should be the merely government's responsibility.

Respondents wanted to see funds allocated to environmental education (24%), followed by reduction of water pollution (21%) and enforcing regulations (21%).

Travel cost subsection	Subsection elements	Source
TC1	Car transport cost +	Calculation of distance from place of residence and cost estimation with ViaMichelin.it
	Plane transport cost +	Estimation from hypothetical flight from respondent's place of residence to the airport of Zadar, Croatia. Average value between high-season and low-season flight, using Skyscanner.it prices.
	Ferry/fast ferry/hydrofoil transport cost +	Estimation of the ferry ticket (passengers + car) or fast ferry/hydrofoil ticket (only for passengers) from Zadar to Dugi Otok, using the official website of the ferry company jadrolinija.hr. Average value between high season and low season.
	Cruise ticket +	Estimation of the average price of the ticket of cruise, including taxes and port fees, consulting the Adriagate.com tour operator
	Ticket to dive + entrance fee to the park	Cost of a one-day diving experience, with all equipment. Average between available information obtained from two diving centres (Diving school Bozava and Kornati diver Diving Centre Eric Seselja). Addition of the entrance fee to the park = average daily price, using information from park official website
TC2	= TC1 + Overnight cost	On the basis of the type of accommodation identified by the respondent, online analysis of average price for - Second home/ resident: estimated daily cost for living in the area, considering utilities costs - Rented house: daily cost for renting, calculated from the cost of monthly rent - Camping: average daily high/low season prices using camperonline.it
TC3	= TC2 + Expenditure for other activities	Average price indicated by respondents as part of the cruise ticket
TC4	= TC3 + WTP	Weighted average amounts indicated by respondents

Table 9: Travel cost structure for Telašćica

After the definition of each cost item, it was necessary to assess the average value of each travel cost (TC1, TC2, TC3, TC4). These average values refer to the cost of both the days in which the dives were carried out, and the entire period spent in the Telašćica area, as described in the following tables.

TC1	TC2	TC3	TC4
Car transport cost + plane transport cost + ferry transport cost + cruise ticket + entrance fee & ticket to dive	TC1 + overnight cost	TC2 + expenditure for other activities/ services	TC3 + willingness to pay an additional amount of money to fund conservation projects
€ 598.33	€ 1,001.19	€ 1,068.19	€ 1,089.01

Table 10: Travel cost value for the days in which the dives were carried out

TC1	TC2	TC3	TC4
€ 798.35	€ 1,201.21	€ 1,268.21	€ 1,289.03

Table 11: Travel cost value for the entire period spent in Telašćica area

These values have been multiplied by the number of annual scuba divers (250)[10] in order to get an estimation of the recreational value, or the overall economic impact of the diving sector in the area.

Recreational value (RV) for the days on which the dives were carried out		
RVX	TCX *N° ANNUAL SCUBA DIVERS	TOTAL AMOUNT
RV1	€ 598.33 * 250	€ 149,583
RV2	€ 1001.19 * 250	€ 250,298
RV3	€ 1068.19 * 250	€ 267,048
RV4	€ 1089.01 * 250	€ 272,253

Table 12: Recreational value for the days in which the dives were carried out

Recreational value (RV) for the entire period spent in Telašćica		
VRX	TCX *N° ANNUAL SCUBA DIVERS	TOTAL AMOUNT
VR1	€ 798,35 * 250	€ 199,588
VR2	€ 1201,21* 250	€ 300,303
VR3	€ 1268,21 * 250	€ 317,053
VR4	€ 1289,03 * 250	€ 322,258

Table 13: Recreational value for the entire period spent in Telašćica

10 This information was directly provided by the MPA

The final output of the TCM is a demand curve, which shows the relation between the travel cost and the number of visitors. The areas of the rectangles in the figures represent the areas of profit for the market and of extra profit related to the scuba divers' hypothetical willingness to pay.
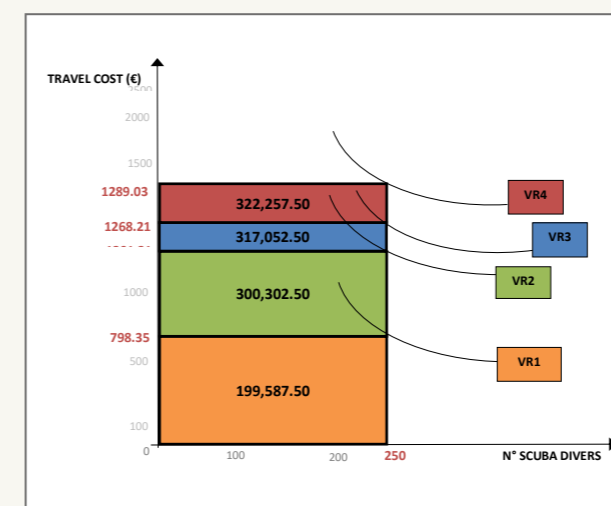
Figure 13: Recreational value associated with the entire period spent in Telašćica – Demand curve
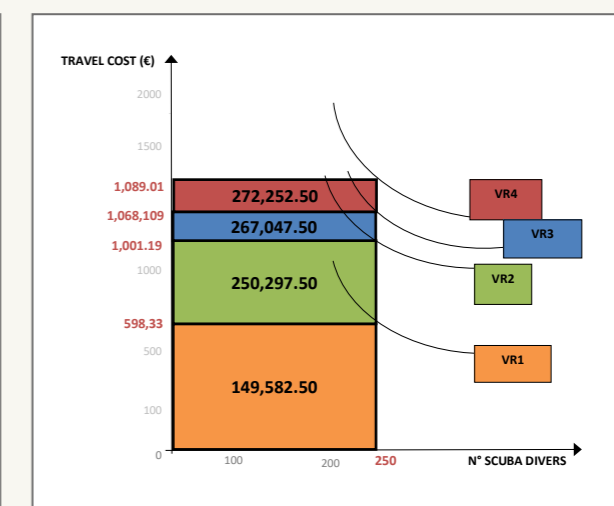
Figure 14: Recreational value associated with the days on which the dives were carried out – Demand curve

As explained in the methodological section of this report, the TCM findings are a conservative estimation of the recreational value that the scuba diving sector is able to produce. In fact, for the key indicator on the number of divers, different official sources presented two very different estimates; we used the lower of the two values.

This example shows the difficulties encountered in collecting reliable information. Despite the constraints, the study underlines the potential of this niche tourism, which can generate significant value, especially in synergy with other forms of local tourism. Future investigations could focus on understanding the role the MPA plays in terms of added value to recreational ecosystem services with respect to more impacting forms of tourism (such as nautical and cruise tourism).

II.3. THE SMALL-SCALE FISHING SECTOR: ECONOMIC STRUCTURE AND PERFORMANCE

The SSF sector in the Telašćica area is characterized by a subsistence economy. The MPA estimates that about 10 fishing vessels and 15 small-scale fishers operate inside the protected area. Their catch is mainly for local consumers and, during summer months, for restaurants. Most of the small-scale fishers have to do additional work to make a living, such as fishing tourism or boat trips for tourists during the summer.

We surveyed seven small-scale fishermen (in collaboration with the researchers of the FishMPA Blue2 Project), to better understand the main features of the sector and their attitude toward the MPA. Most of those interviewed were aged over 40 and came from Sali, the nearest town to the MPA.
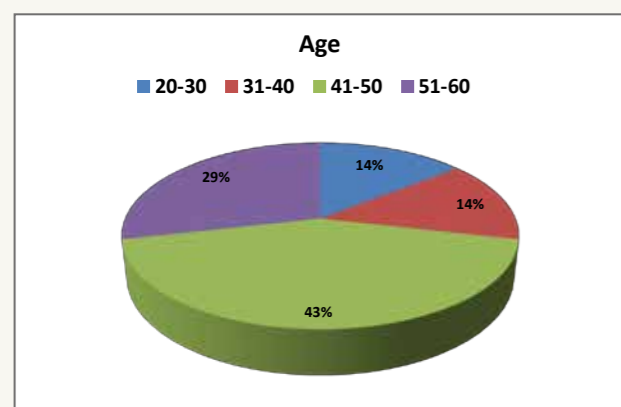
Figure 15: Age of SSFs interviewed
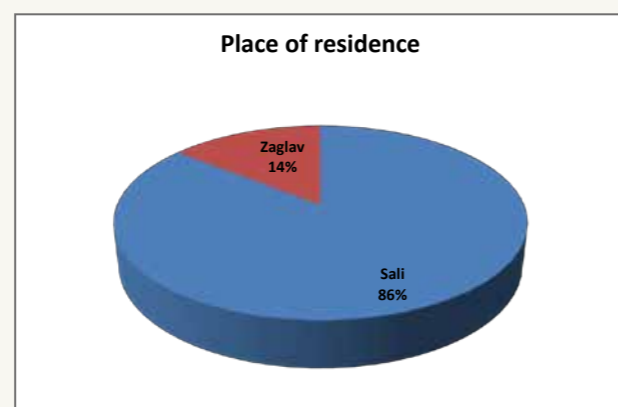
Figure 16: Place of residence

The vessels had an average length of 8m, 3GT of tonnage and 11kW of engine power. The most used fishing tool was gill net (90%), with a small percentage using longlines (5%) and fish traps (5%).
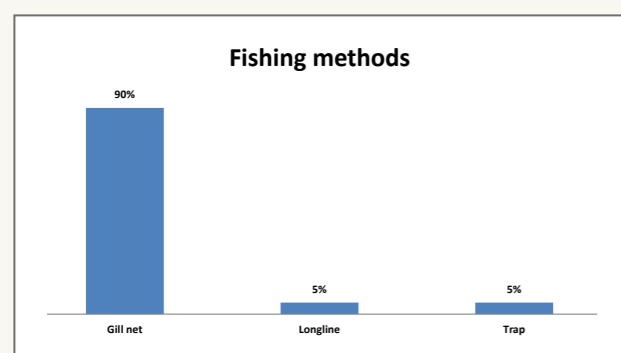
Figure 17: Fishing methods used

While 57% of the SSF thought the presence of the MPA did not affect the number of fish, 29% said it had led to an increase in the number of the fish; 43% of the respondents also claimed that the MPA is improving the habitat.
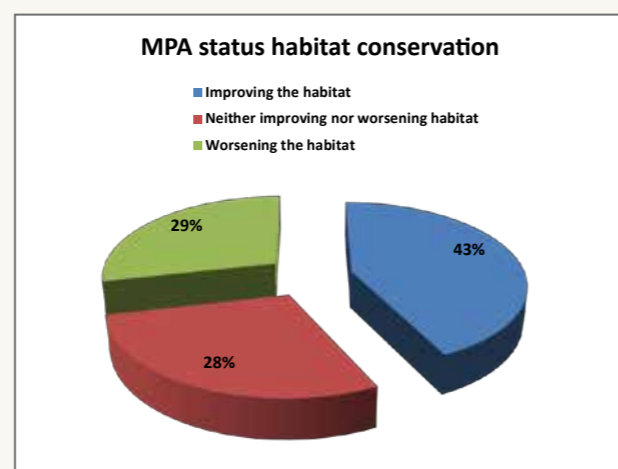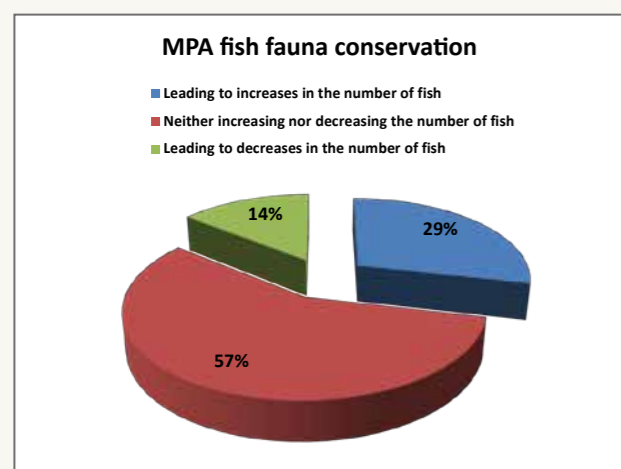
Figure 18: SSF's attitudes to MPA's impact on fish fauna conservation and habitat conservation

In general, SSF had a good relationship with other potential users of the MPA, though a small percentage (29%) complained about bad relationships with other commercial vessels.
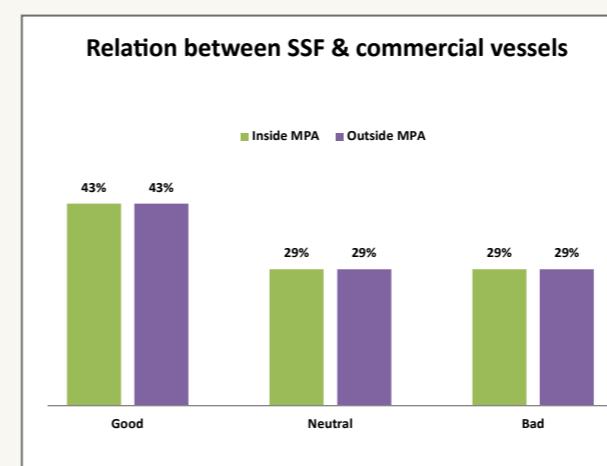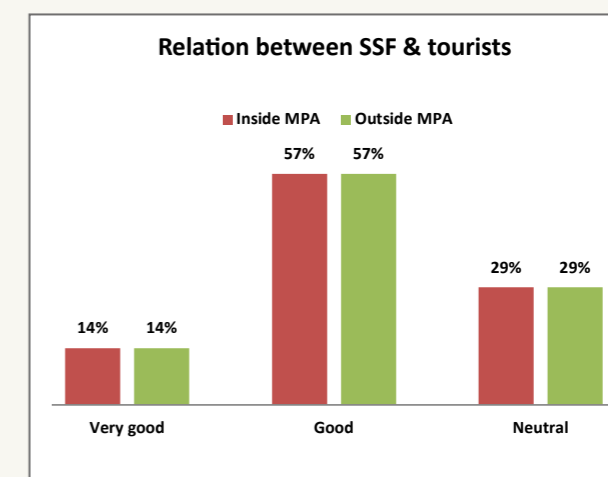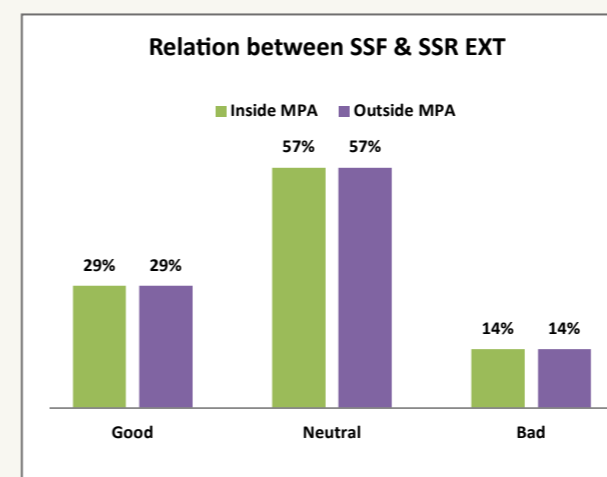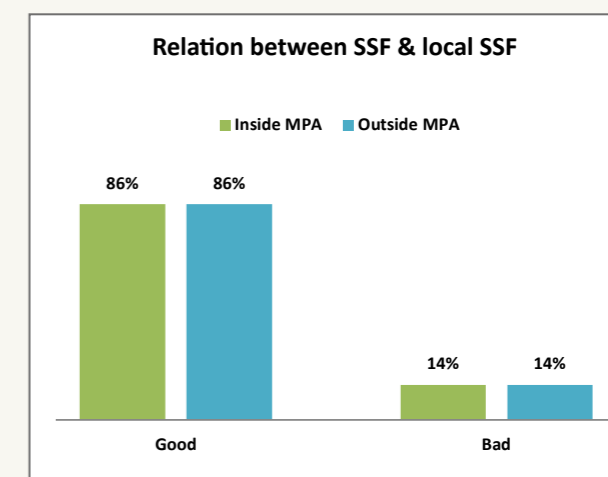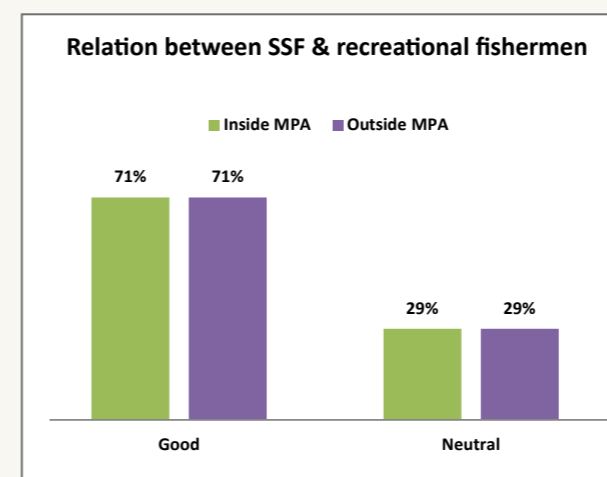
Figure 19: SSF perception of relationships with other MPA users

This positive relationship with other MPA users can be explained by the MPA management's effective stakeholder involvement process, which including involving SSF in the elaboration of the management plan and zoning. In fact, SSF show a high level of trust in the MPA overall, though there is some dissatisfaction related to its ecological outcomes and to its governance.
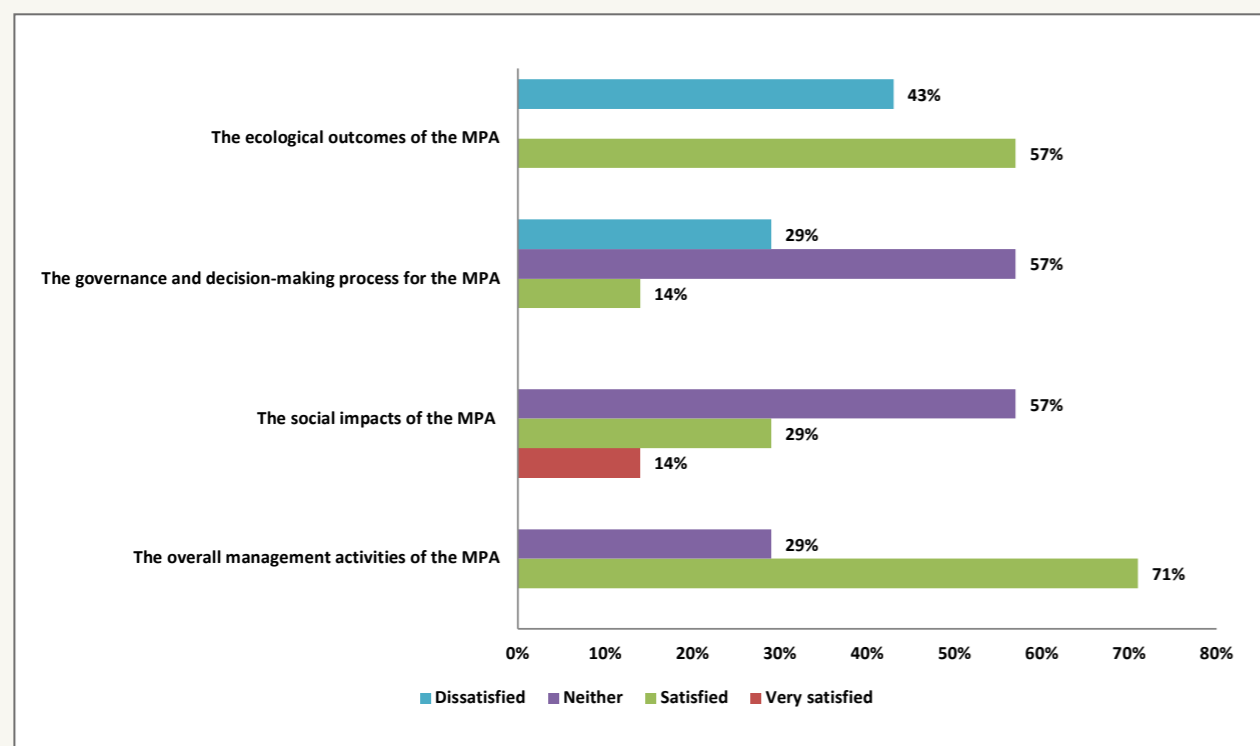
Figure 20: SSF level of satisfaction with the MPA

From an economic point of view, 71% of SSF claimed that the MPA had not affected their income, while 29% said it had increased it.
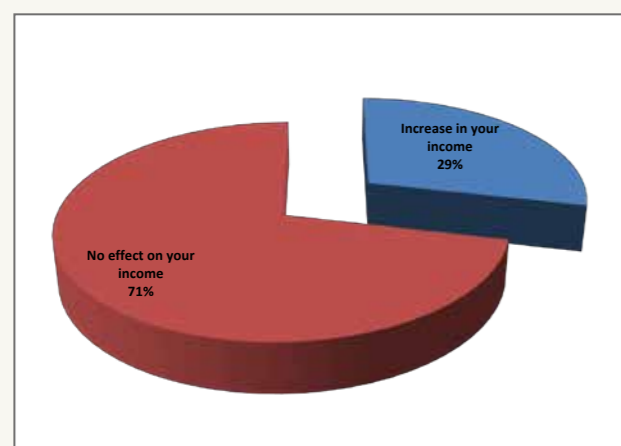
Figure 21: MPA's effect on SSF income

The interviewed fishermen claim to share the mission of the MPA, with all those interviewed claiming they supported protecting biodiversity and environmental education. Reducing illegal fishing was also seen as important by 71%, with 86% saying that poaching had a high impact on fishing.
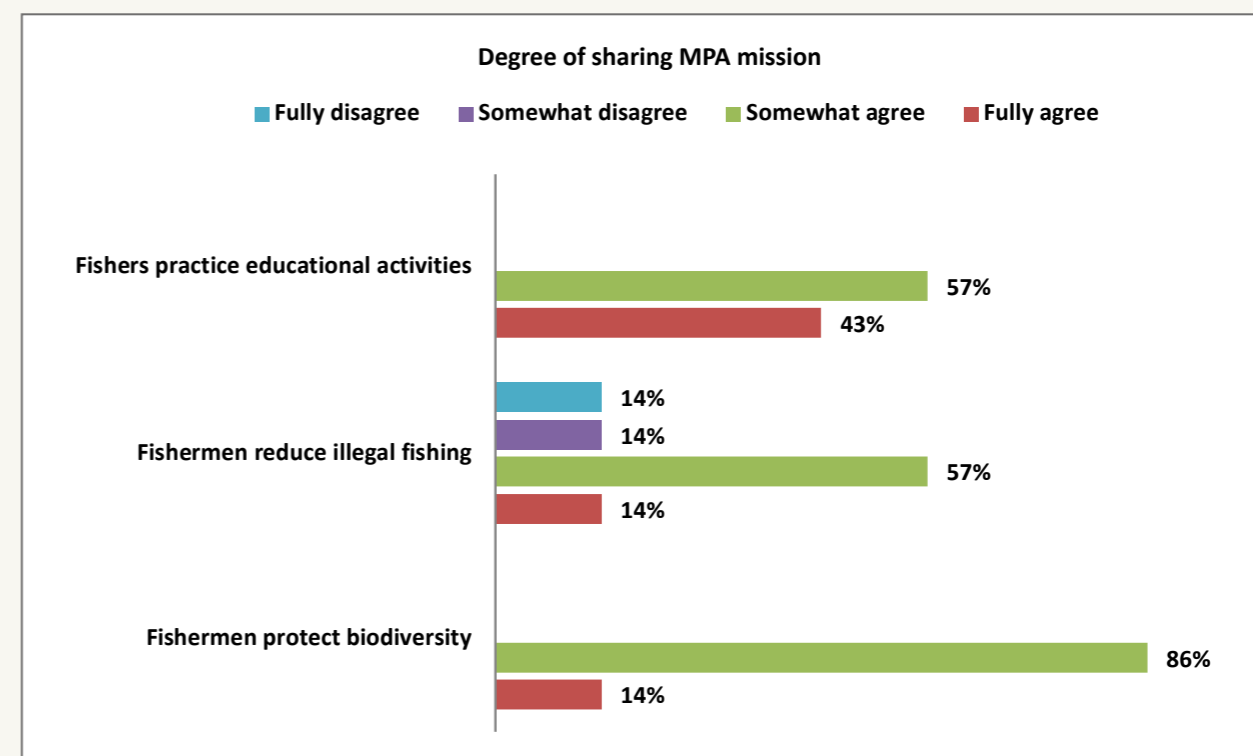
Figure 22: SSF degree of sharing MPA's mission
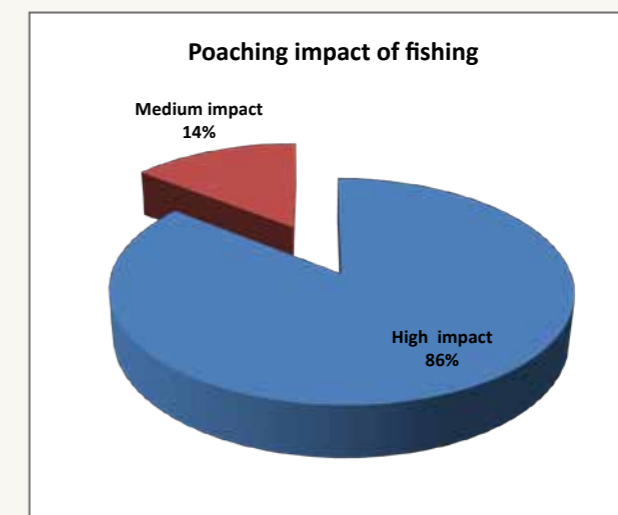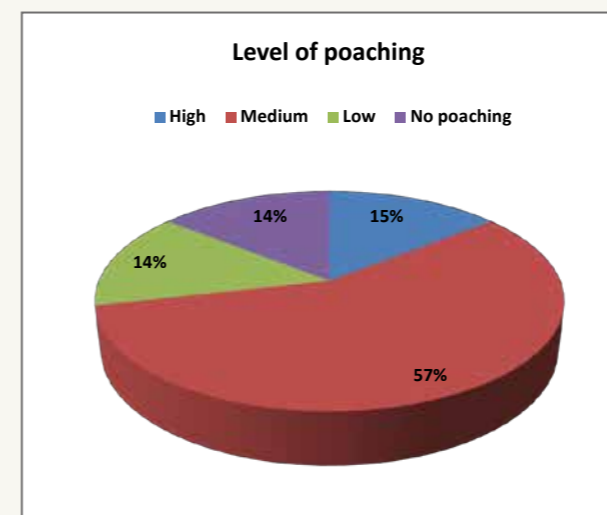
Figure 23: SSF perceptions on level and impact of poaching

Using results from the survey and other background information, we estimated the turnover of the SSF in Telašćica. According to the survey results, the average daily catch is about 8kg and the average sale price of the fish is about €6/ kg. These two measures were multiplied by the average number of fishing days, 150. This gives an estimated per vessel turnover of €7,200, and a total SSF sector turnover of €64,800.

Daily average catch (kg)	A	8
Average annual fishing days/year	B	150
Average price of catch	C	€ 6
Total annual catch per vessel (kg)	D=A*B	1,200
AVERAGE PER VESSEL TURNOVER	**E=D*C**	**€ 7,200**
Number of authorized vessels	F	10
Total annual catch SSF (kg)	G=F*D	10,800
TOTAL SSF TURNOVER	**H=E*F**	**€ 64,800**

Table 14: SSF turnover in Telašćica

II.4 REFERENCES

Gatti, P., & Carić, H. (2011) Park Prirode Telašćica Istraživanje Posjetitelja, Udruga Sunce, Zagreb.

Gomei M. and Di Carlo G. 2012. Making Marine Protected Areas Work—Lessons Learned in

the Mediterranean. WWF Mediterranean. 56 pages.

Magaš D. (1998) Nature Park "Telašćica" on Dugi Otok (Croatia) – some aspects on environmental Planning, Geodria, Vol. 3, p. 81-92

Pascal, N., Milovic, A. (2016). Marine Protected Area Telašćica Nature Park Croatia: Exploratory Study for Financing Mechanisms. Sunce, WWF and Blue Finance ECRE.

Sever, I., Carić, H., Marušić Z. (2015) Park prirode Telašćica: Istraživanje stavova i potrošnje posjetitelja, Institut za turizam, Zagreb

Srour A., Carlson A., Nastasi A., Carmignac C., Bourdenet D., Pierraccini J., Sessa M. and Ferri N. (eds.) (2018). Regional Conference on building a future for sustainable small-scale fisheries in the Mediterranean and the Black Sea. 7-9 Mach 2016, Algiers, Algeria. Food and Agriculture Organization of the United Nations, Fisheries and Aquaculture Proceedings, N° 58, Rome, Italy.

Telašćica Nature Park, Croatia, Management Plan 2012. Retrieved from pp- telascica.hr/wp-content/uploads/2016/08/Telascica-Management-plan-extract.pdf, July 2018

Zadar, Chamber of Commerce, Year XVIII, n. 33, July, 2017. (Županijska komora Zadar: FINA; Obrada: HGK – ŽK Zadar)

http://pp-telascica.hr/?lang=en

WWF REPORT 2019

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ANNEX III

TORRE GUACETO MARINE PROTECTED AREA

III.1. THE INSTITUTIONAL, SOCIO-ECONOMIC AND ORGANIZATIONAL CONTEXT

Torre Guaceto MPA is located in the Apulia region in the south of Italy. Established in 1991, since 2000 it has been managed as the Natural Reserve of the State of Torre Guaceto by a consortium with representatives from Brindisi and Carovigno municipalities, and from WWF. The MPA covers an area of 2,200 ha and 8km of coast, between Punta Penna Grossa and the Apani rocks.

Figure 1: Location of Torre Guaceto MPA. Source: www.riservaditorreguaceto.it

The Torre Guaceto MPA is an oasis rich in biodiversity. The diversity of submerged environments and the numerous species have led to the inclusion of the Torre Guaceto MPA within the List of Specially Protected Areas of the Mediterranean for the conservation of biodiversity. The prairies of Posidonia oceanica and some pre-coralligenous stretches, colonized by fascinating invertebrates, characterize the backdrops of the reserve. As for the other MPAs, tourism is a key sector for the development of the local economy. Beach tourism is the most important form of tourism, characterized by a strong seasonality from June to September. Tourist flows are significantly present along the main beaches: Penna Grossa and Apani. There are environmental education programmes for school groups, and also hiking activities, bike trekking and seawatching. The richness and the abundance of plants and fish fauna also offer the possibility to enjoy snorkelling and diving experiences.

Category	Code	Description
Official international Recognitions	RI4	Sites of Community Importance (92/43/CE) - Natura 2000 Special Protection Area Bird Directive (79/409/CE) Convention on Wetlands of International Importance European Charter for Sustainable Tourism in Protected Areas
Legal date of establishment (gazetted)	I1	Inter-ministerial Decree 4 December 1991. Establishment of the MPA Ministry of Environment Decree of 4 February 2000. Establishment of the Terrestrial Nature Reserve

Table 1: Key institutional aspects of Torre Guaceto MPA

Category	Typology	Code	Description
Key ecological resources	Ecosystems of international relevance	EE1	Coastline is characterized by a series of small coves with pocket beaches (west). In the east, the coast is sandy, with reduced rocky formations and low rocks emerging Posidonia oceanica meadows and precoralligenous formations characterized by patches of high density of gorgonians
	More representative species	ES1	Typical Mediterranean fauna, such as groupers (Epinephelus Marginatus) and other fauna (e.g. Pinna nobilis)
Key cultural resources	Ecosy		Aragonese tower

Table 2: Key natural and cultural resources of Torre Guaceto MPA

Category	Indicator	Code	Measure	Source
Demographic structure	Number of resident population	KS1	0/87,820 (Brindisi)	National Census
	Population age structure by major age groups (0-14;15-64; 65 +)	KS2	0-14: 11,862 (13.5%) 15-64=56,832 (64.7%) 65+=19,126 (21.8%)	National Census

Table 3: Key social dimensions of Torre Guaceto area

Category	Indicator	Code	Measure	Source
Composition of the economic system	Composition of local activities	KE1	Agriculture, fishing (I):26.9%; Industry, buildings ..(II): 22.9%; Commerce, services ..(III) 50.2%	Apulia Regional Statistics
Structure and features of tourism sector	Annual tourist movement	KT1	250,967 (Brindisi: 73,922; Carovigno: 78,047; Ostuni: 98,998)	Regione Puglia. Osservatorio sul turismo 2017
	Numbers of divers	KT2	2015: 52	MPA Report
	Numbers of snorkelers		2015: 225	MPA Report
	Number of beach tourists	KT3	2014: 166,892	MPA Report
	International visitors	KT4	67,081 (26.0%) (Brindisi: 24,097; Carovigno: 13,323; Ostuni: 30,381)	Regione Puglia. Osservatorio sul turismo 2017
	National visitors	KT5	183,186 (64%) (Brindisi: 49,825; Carovigno: 64,724; Ostuni: 68,617)	Regione Puglia. Osservatorio sul turismo 2017

Table 4: Key economic dimensions of Torre Guaceto area

Category	Indicator	Code	Measure	Source
Structure and features of tourism sector (MPA)	Annual number of overnight stays	RT1	166,992	Regione Puglia. Osservatorio sul turismo 2017
	Seasonality (monthly peaks)	RT2	0 (Feb) – 99,243 (Aug.)	Regione Puglia. Osservatorio sul turismo 2017

Table 5: Key touristic dimensions of Torre Guaceto MPA

Category	Indicator	Code	Measure	Source
Organizational size and structure	Full-time employees in MPA	KO1	10	MPA
	Seasonal employees in MPA	KO2	5	MPA
	Management body	KO3	Management Consortium with representatives from Brindisi and Carovigno municipalities, and from WWF	MPA
Strategy & planning	Mission	KP1	Offer a model of sustainable development of the coastal and marine areas, and a continuous improvement of its environmental governance	MPA Management Plan, p . 12
	Implementation of the management plan	KP2	Sustainable Tourism Litter management Sustainable fishery (See all projects http://www.riservaditorreguaceto.it)	MPA

Table 6: Key organizational aspects of Torre Guaceto MPA

Category	Indicator	Code	Measure	Source
Organizational structure	Number of volunteers	RO1	None	MPA Report
Strategy	Management Plan	RP1	Management plans + ISEA	MPA
Financial resources	Budget capacity – Annual availability of financial resources	RF1	€ 1,146,265	MPA Budget

Table 7: Relevant organizational aspects of Torre Guaceto MPA

III. 2 THE CHALLENGE OF NATURE-BASED TOURISM: THE SNORKELLING SECTOR

The internal tourism of Torre Guaceto MPA is different from other MPAs studied. The range of tourism activities carried out in the MPA is varied and heterogeneous. The MPA organizes cultural and educational activities during the "shoulder seasons" (especially in spring), through guided tours or educational workshops. Then there are activities with a more recreational content, such as non-professional fishing, which is regulated by a system of permits. A detailed overview of these activities is provided below.

The educational activities are well structured and developed, through school visits and educational workshops. Thanks also to the proximity of several urban centres (the MPA is about 15km both from Carovigno and Brindisi), these attract significant numbers of visitors, as shown in the tables below.

	2012	2013	2014	2015
Jan.	29	0	0	0
Feb.	0	47	0	0
Mar.	258	132	139	78
Apr.	636	1205	739	1143
May	1875	1411	1688	1473
June	226	191	253	165
July	0	215	34	0
Aug.	0	0	0	0
Sept.	0	0	0	0
Oct.	0	0	0	0
Nov.	116	50	0	68
Dec.	0	0	0	0

Table 8: Monthly flows of school trips from 2012 to 2015

	2012	2013	2014
Number of educational workshops	38	28	14
Number of participants	749	549	269

Table 9: Participants and numbers of educational workshops

Recreational fishing is also intense, as shown by the statistics on permits issued.

2010	2011	2012	2013	2014
350	92	374	479	685

Table 10: Number of recreational fishing permits released in the MPA

The typical MPA nature-based activities (e.g. diving and snorkelling) present a limited development. The number of divers was estimated at only around 50 per year, while the snorkelling sector seems to be more structured and also benefits from well-organized guided tours. Due to the limited number of divers, we decided to study snorkelling as the NBT activity for the recreational ecosystem service evaluation.C

In order to better understand the socio-economic dynamics of snorkelling in Torre Guaceto MPA, a field survey was conducted during summer 2017. In that period, Torre Guaceto MPA was involved in many projects, including an Environmental Accounting (EFrame et al., 2016). The NBT study is based on questionnaires collected from July to August 2017 focused on snorkelers, integrating the data with information collected from beach tourists. The sample of questionnaires collected with the snorkelers was too small for the travel cost method (TCM) calculation. Thus, it was decided to integrate this sample with interviews with beach tourists, whose travel costs were considered a good proxy for those of the snorkelers.

Data was processed from 80 questionnaires, of 20 snorkelers and 60 beach tourists. Surveys gathered information for the TCM calculation, and included specific questions related to each sector. For this reason, the data analysis starts by looking at the results that are common for snorkelers and beach tourists, then focuses on the specific results for the two sectors.

Overall, 44% of the respondents were aged 41-50, followed by 29% aged 31-40.

Target
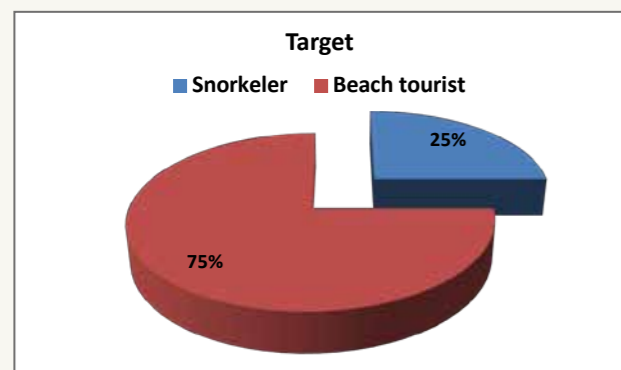
Figure 2: Proportion of tourists interviewed

Age
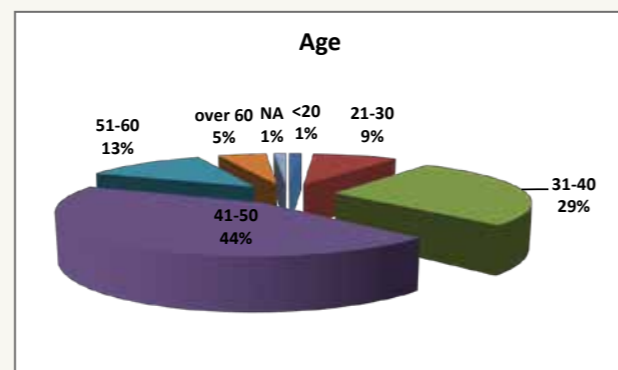
Figure 3: Age profile of tourists interviewed

The largest share of tourists came from northern Italy (40%), while the remaining 60% is divided between south (36%) and central (19%) Italy and foreign countries (5%).
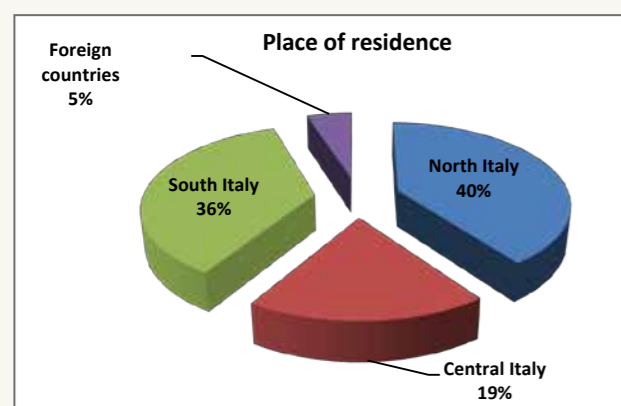
Place of residence

Figure 4: Tourists' place of origin

Most interviewed tourists were staying in Carovigno (31%), followed by Ostuni (19%) and Specchiolla (19%).

Place to stay
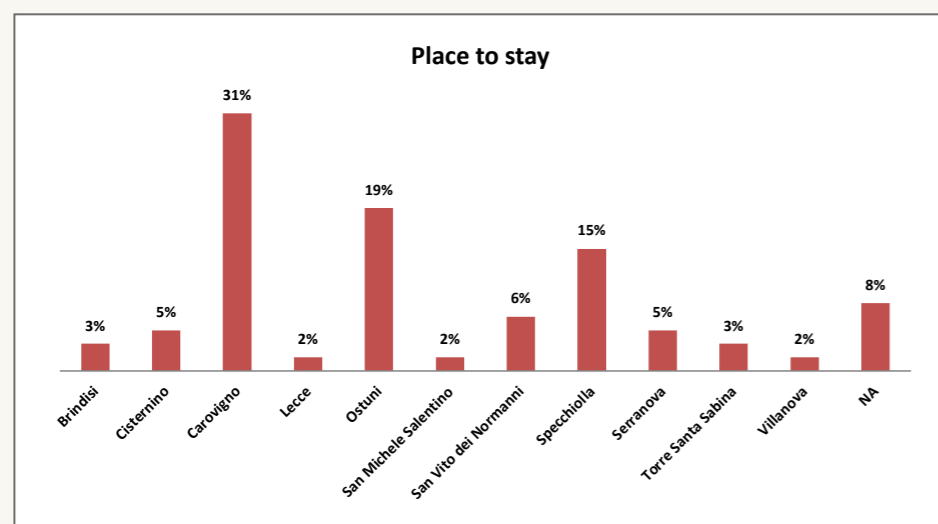
Figure 5: Tourists' place of stay

As shown below, 84% of the respondents knew about the MPA.

The graphs below focus on holiday features such as means of transport and accommodation, which are also useful for the TCM estimation.

A quarter (26%) of respondents were staying in rented houses as holiday accommodation, followed by hotels (16%) and with friends and relatives (16%). There is also a considerable percentage of second-home properties that is not easy to detect through the statistics on arrivals and overnight stays.
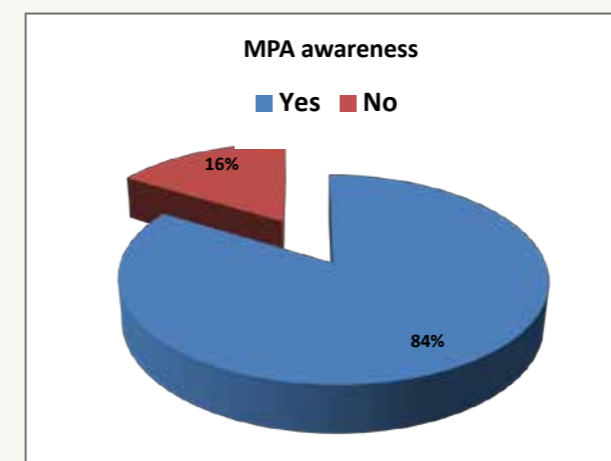
MPA awareness

Figure 6: MPA awareness
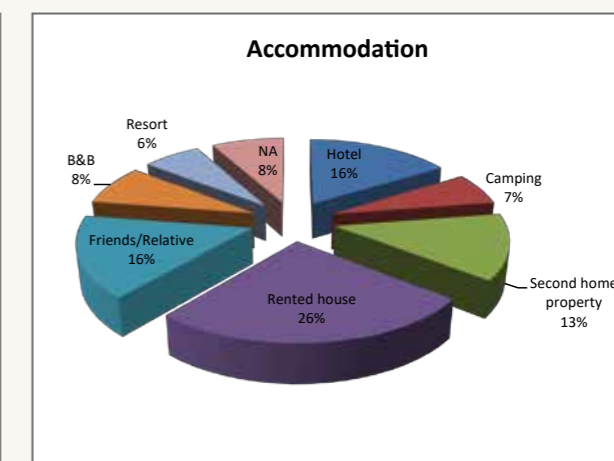
Accommodation

Figure 7: Type of accommodation

The most used means of transport for long distance (from the place of residence to the place of stay) is the car (69%). Therefore, cars are also frequently used locally for reaching the place to snorkel or the beach, with all the negative effects linked to congestion and traffic in peak season. In response, the MPA has developed an initiative called the "Trenino del Mare" (sea train) that transfers tourists from the parking to the beaches.

Means of transport - long distance
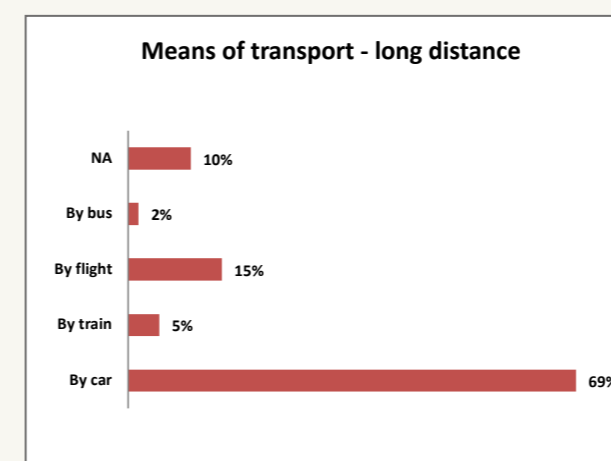
Figure 8: Means of transport – long distance

Means of transport - short distance
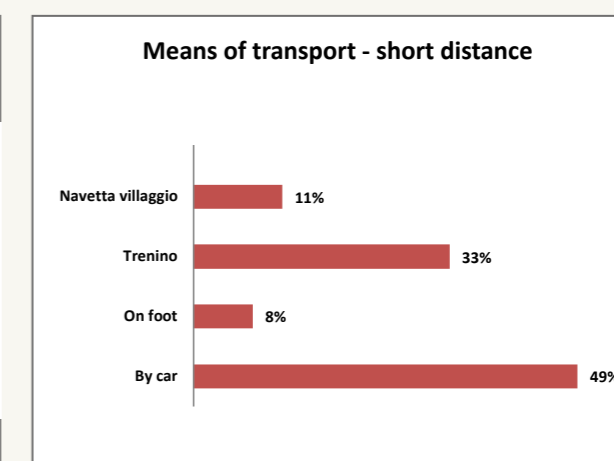
Figure 9: Means of transport – short distance

Encouragingly, 79% of tourists consider the value and the idea of the MPA to be very important. The attitude toward conservation of nature can be measured by individuals' willingness to pay for the day's parking ticket, knowing that the revenue will be used to fund conservation projects. Four out of five respondents (79%) claimed they are willing to pay €3-5, with most of the rest (18%) prepared to pay €5-10. In addition, 80% of the tourists consider the presence of the MPA as a relevant factor in deciding their vacation destination, with 65% of snorkelers also highlighting the importance of the water quality.

MPA very important tool (for conservation)	79%
Willingness to pay (Euro, % of respondents)	€ 3-5: 79%; € 5-10: 18%
MPA as factor that influences vacation choice	80%
Appreciation of natural resources (water)	65%

Table 11: Tourists' positive attitudes to MPA

To estimate the economic value of the sector, we applied the TCM, adapted to the peculiarities of the context – as shown in the table below.

Travel cost subsection	Subsection elements	Source
TC1	Car transport cost	Calculation of distance from place of residence and cost estimation with ViaMichelin.it
	Plane transport cost	Estimation from hypothetical flight from respondents' place of residence to Brindisi airport. Average value between high-season and low-season flight, using Skyscanner.it prices.
	Train ticket	Estimation of the average price of the train ticket from the place of residence to the place of stay
	Ticket to snorkel	Cost of a one-day snorkelling experience, with all equipment. Price extrapolated through consulting the official MPA website managed by Cooperativa Thalassia
	Equipped beach cost	Estimation of the average price for beach facilities (sunbed and deckchair)
	Parking cost	Average price of parking considering the survey results
TC2	TC1 + Overnight cost	On the basis of the type of accommodation identified by the respondent, online analysis of average price for: - Second home/ resident: estimated daily cost for living in the area, considering utilities cost - Rented house: daily cost for renting, calculated from the cost of monthly rent - Camping: average daily high/low season prices using Lamaforca village website - Hotel, B&B, resort: average daily high/low season prices through consulting websites of some accommodation
TC3	TC2 + expenditure for other activities/services	Average price for food, considering the average between prices of meals in both mid-range and "inexpensive" restaurants in the area
TC4	TC3 + Willingness to pay parking ticket to fund conservation projects	Weighted average amounts indicated by respondents

Table 12: Travel cost structure

After defining each cost items, we assessed the average value of each travel cost (TC1, TC2, TC3, TC4). These average values refer to the cost of both the days spent at the beach and/or snorkelling, and the entire period spent in the Torre Guaceto area, as described in the following tables.

TC1	TC2	TC3	TC4
Car transport cost + plane transport cost + train transport cost + parking + ticket to snorkel+ equipped beach cost	TC1 + overnight cost	TC2 + expenditure for other activities/ services	TC3 + willingness to pay parking ticket to fund conservation projects
€ 86.20	€ 687.01	€ 756.91	€ 779.92

Table 13: Travel cost value for the days spent at beach and/or snorkelling

TC1	TC2	TC3	TC4
€ 137.96	€ 738.77	€ 808.67	€ 829.91

Table 14: Travel cost value for the for the entire period spent in Torre Guaceto area

By multiplying the average travel costs by the total number of snorkelers we are able to estimate the overall recreational value, as shown in the following tables.

Recreational value (RV) for the days spent at beach and/or snorkelling		
RVX	TCX *N° ANNUAL SNORKELERS	TOTAL AMOUNT
RV1	€ 86.20 * 225	€ 19,395
RV2	€ 687.01 * 225	€ 154,577
RV3	€ 756.91 * 225	€ 170,304
RV4	€ 779.92 * 225	€ 175,482

Table 15: Recreational value for the days spent at the beach or snorkelling

Recreational value (RV) for the entire period spent in Torre Guaceto		
RVX	TCX *N° ANNUAL SNORKELERS	TOTAL AMOUNT
RV1	€ 137.96 * 225	€ 31,041
RV2	€ 738.77* 225	€ 166,223
RV3	€ 808.67 * 225	€ 181,950
RV4	€ 829.91 * 225	€ 186,729

Table 16: Recreational value for the entire period spent by in Torre Guaceto MPA
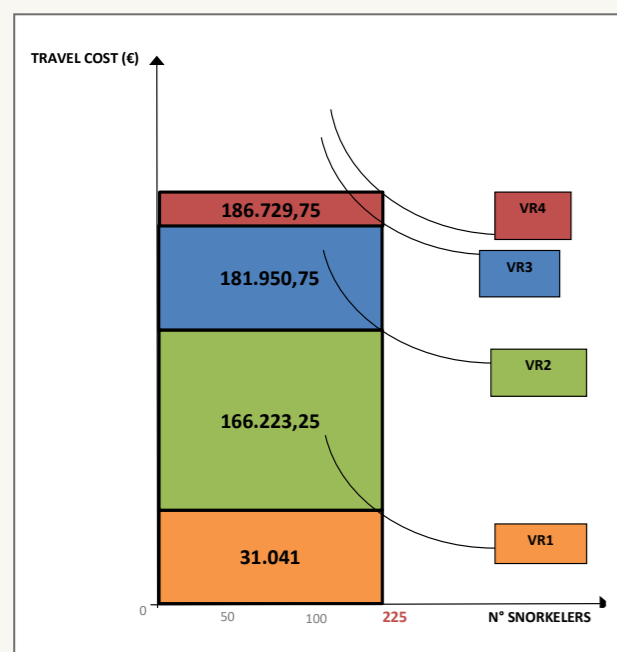
Figure 10: Recreational value associated with the entire period spent
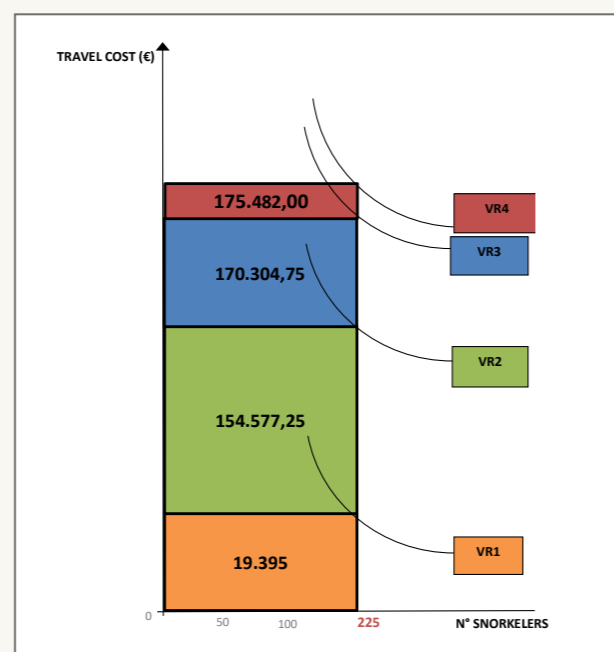in Torre Guaceto MPA – Demand curve

Figure 11: Recreational value associated with the days spent at beach
and/or doing snorkelling – Demand curve

III.3. THE SMALL-SCALE FISHING SECTOR: ECONOMIC STRUCTURE AND PERFORMANCE

The MPA management plan allows professional fishing in a large portion of the MPA. Only authorized professional fishermen resident in the municipality of Carovigno and Brindisi may fish in the area once a week using fixed nets (trammels and gillnets) or longlines for seabream and traps for octopus. In 2012 the "Cooperativa Emma" was established, which brings together six artisanal fishermen who fish inside MPA. The small fleet is composed of only five vessels.

The MPA management authority directly involved SSF in a process of co-management, through the definition of fishing policies. The fishermen's involvement limited conflict situations, and enabled the adoption of measures to protect the fish fauna and reduce the impact of fishing on marine resources.

Five SSF were interviewed in order to better understand the main features of the sector and their attitude toward the MPA. Four were aged 51-60 and one 41-50, and four had a middle school diploma All the respondents are resident in the municipality of Carovigno.
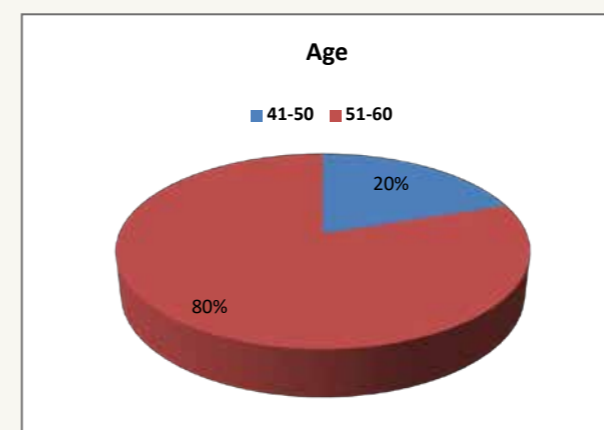
Figure 12: Age profile of SSF
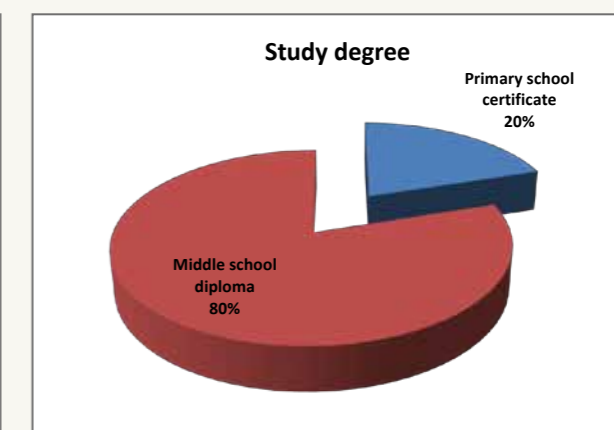
Figure 13: Educational level of SSF

As shown in the graph below, the average composition of the catch is characterized by a predominance of so-called first-class fish (42%), followed by octopus and cuttlefish (18%).
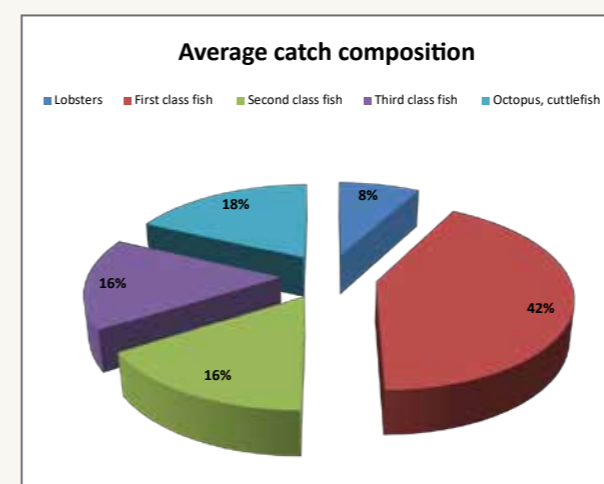
Figure 14: Average catch composition

Most of the fish is sold to local people and/or tourists (36%) and to restaurants (29%). Only 14% is sold to wholesalers, because of the added value of the fish that comes from Torre Guaceto MPA.

Fishermen have positive perceptions of the MPA. All interviewed fishermen stated that the MPA leads to both an increase in the number of fish and an improvement in the habitat. However, there are some conflicts with other users of the MPA, particularly recreational fishers.

11. Cooperativa Emma was created through a project carried out by the Torre Guaceto Consortium and the University of Lecce.

Figure 15: SSF perception of relationships with other MPA users

The successful experience of co-management and involvement of SSF in planning activities leads to a high degree of trust and satisfaction with the MPA. In particular, 80% of respondents are "very satisfied" with the overall management activities performed by the MPA and the ecological outcomes.
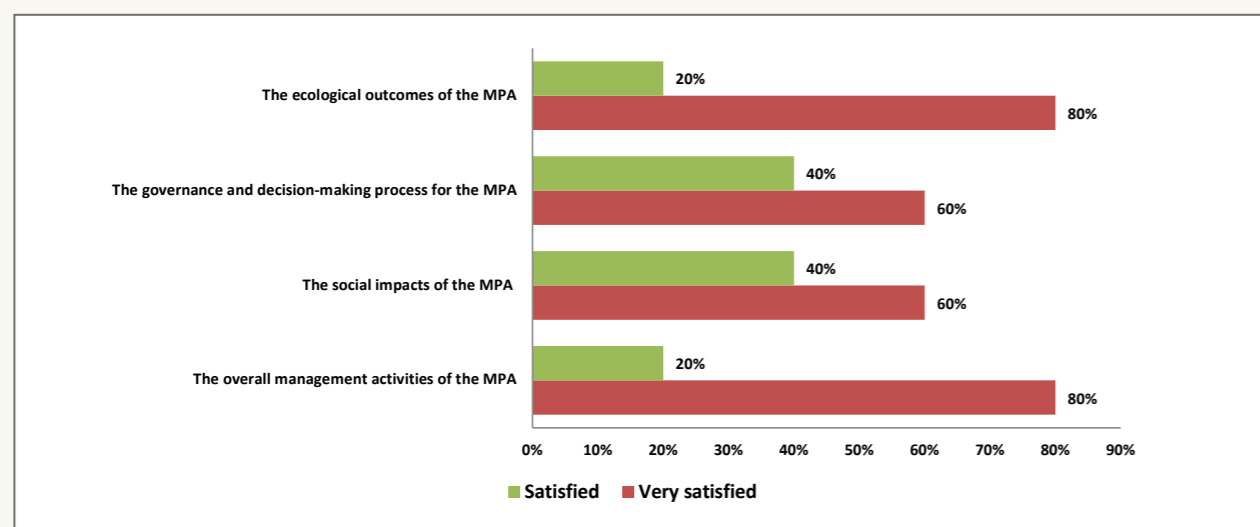
Figure 16: SSF satisfaction with MPA

The interviewed fishermen claim to share the mission of the MPA, especially in the protection of biodiversity (80%). Particularly interesting are the results related to the role of fishermen in reducing illegal fishing. Fishermen would like to play a role in stemming poaching, which they believe has an impact on their own fishing activities, but claim that they do not have the authority to do so.
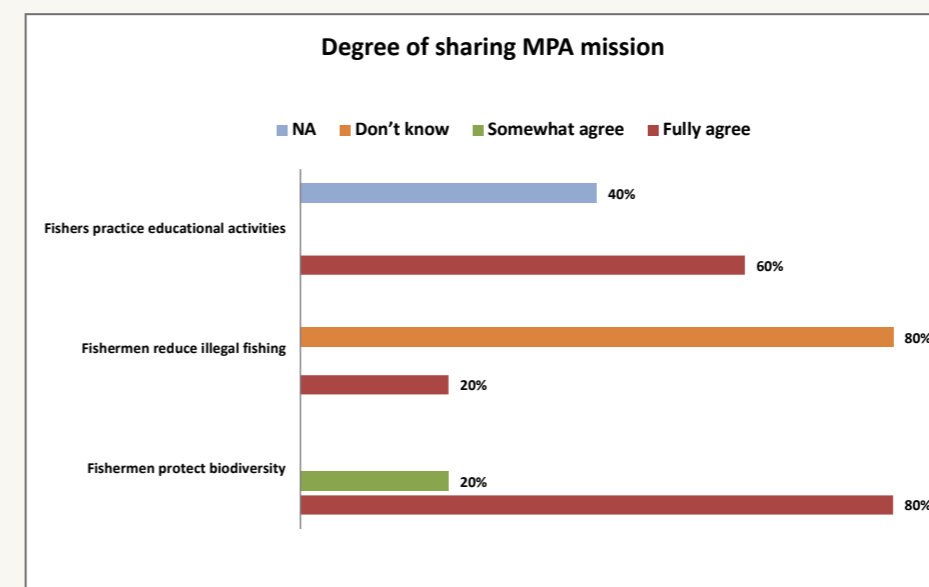
Figure 5:Tourists' place of stay
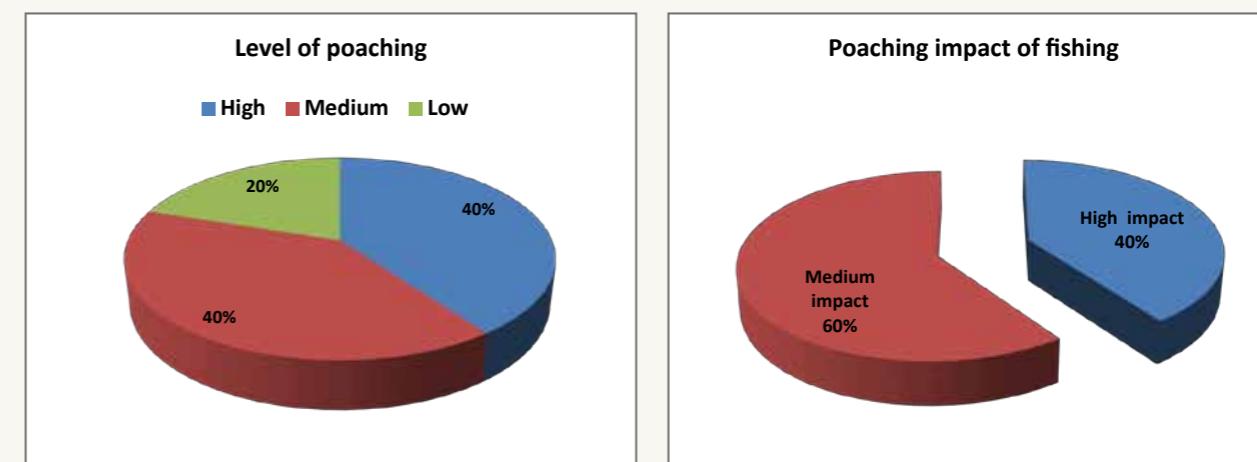
Figure 18: SSF perception of level and impact of poaching

Our analysis of the SSF sector ends with an estimation of the sector's turnover. This evaluation was carried out taking into consideration the results from the survey and the analysis of the background information.

According to the survey results, the average daily catch is about 25kg and the average sale price of the fish is about €20/kg. These two measures were multiplied by the average number of fishing days, that is about 53 days (according to the information provided by fishermen). From this, we estimate the per vessel turnover to be €26,500, giving a total SSF sector turnover of €300,000.

Daily average catch (kg)	A	25
Average annual fishing days	B	53
Average price of catch	C	€ 20
Total annual catch per vessel (kg)	D=A*B	1,325
AVERAGE PER VESSEL TURNOVER	**E=D*C**	**€ 26,500**
Number of authorized vessels	F	5
Total annual catch SSF (kg)	G=F*D	5,300
TOTAL SSF TURNOVER	**H=E*F**	**€ 132,500**

Table 17: SSF turnover in Torre Guaceto MPA

III.4 REFERENCES

Consorzio di gestione di Torre Guaceto Area Marina Protetta-Riserva Naturale Statale, Area Marina Protetta-Riserva Naturale Statale Torre Guaceto: adesione alla Carta Europea per il turismo sostenibile

Consorzio di gestione di Torre Guaceto Area Marina Protetta-Riserva Naturale Statale (2014) Dichiarazione ambientale Torre Guaceto

EFrame, University of Udine (2016), Contabilità ambientale dell'Area Marina Protetta Riserva di Stato di Torre Guaceto

Guidetti, P., Bussotti, S., Pizzolante, F., Ciccolella, A. (2010) Assessing the potential of an artisanal fishing co-management in the Marine Protected Area of Torre Guaceto (southern Adriatic Sea, SE Italy), Fisheries Research 101, 180-187

Guidetti, P. & Claudet, J. (2010). Comanagement practices enhance fisheries in marine protected areas. Conservation Biology, 24(1), 312-318

www.riservaditorreguaceto.it/ISEA/esterno/default.aspx

www.riservaditorreguaceto.it

WWF REPORT 2019

ANNEX IV

TABARKA, UNOFFICIAL MPA WITH GREAT POTENTIAL

IV.1. THE INSTITUTIONAL, SOCIO-ECONOMIC AND ORGANIZATIONAL CONTEXT

Tabarka is a coastal town inside the Governorate of Jendouba, in the north-western part of Tunisia. It is an important area for archaeological and historical features in addition to its natural aspects.

The most important economic activity is fishing, since the area is located in a productive fishing zone. Small-scale fishers (SSF) represent 80% of the whole workforce. While tourism is a relatively new activity, it is already considered as an important pillar for the local economy with great potential for development, especially towards nature-based tourism. In particular, diving attracts both locals and tourists, and Tabarka offers several diving centres with training and excursion activities.

At the moment, no official MPA has been settled in Tabarka. After the framework law "Aires Marines et Côtières Protégées (AMCP)" 49-2009 of 20 July 2009 the area has been identified as Potential MPA, but since the application decree 1844-8 of 19 May 2014 it has received no official recognition.

Category	Indicator	Code	Measure	Source
Demographic structure	Number of resident population	KS1	48,993	National Institute of Statistics 2014
	Population structure by major age groups (0-14; 15-64; 65+)	KS2	0-14: 22.75%, 15-59: 63.24%, 60+: 14.01%	National Institute of Statistics 2014
Unemployment	Unemployment rate	KS1	15-29 year-olds: 17.74% High degree holders: 29.95%	National Youth Observatory 2014

Table 1: Key social dimensions of Tabarka

Category	Indicator	Code	Measure	Source
Composition of the economic system	Size and type of local entrepreneurial activities	KE1	No data	
Structure and features of tourism sector	Annual number of scuba divers	KT2	1Boat trips and divers: 2014:13,235 2015: 8,435 2016: 10,172	Coast guards
	Annual number of snorkelers	KT3		
	International visitors	KT4	Algeria: 64,207 France: 2,821 Italy: 552 Libya: 1,242	Tabarka Regional Tourist Board 2017
	National visitors	KT5	156,713	Tabarka Regional Tourist Board 2017
Structure and features of tourism sector	Number of annual arrivals and overnight stays	RT1	Arrivals: 231,960 in 2017 (46.5% more than 2016) Overnight stays: 481,049 in 2017 (57.6% more than 2016)	Tabarka Regional Tourist Board 2017
	Hotel facilities and beds by category	RT3	1 hotel 5*: 550 beds; 4 hotels 4*: 1788 beds; 2 hotels 3*: 320 beds; 1 hotel 2*: 154 beds; 3 hotels 1*: 186 beds	Tabarka Regional Tourist Board 2017
	Number of restaurants	RT4	5 restaurants 2F 4 restaurants 1F	Tabarka Regional Tourist Board 2017

Structure and features of artisanal fisheries sector	Number of fishing days	KF1	119	District of fisheries of Tabarka 2017
	Total annual catch	KF3	52,385kg (estimated)	(district of fisheries of Tabarka 2017
	Type of fishing techniques	RF1	Trammel net, gill net, longlines, handlines, trolling.	
	Number employed	RF2	72	District of fisheries of Tabarka 2017

Table 2: Key economic and touristic dimensions of Tabarka

IV.2. NATURE-BASED TOURISM: THE SCUBA DIVING SECTOR

To analyse the economic value of nature-based tourism (NBT), we surveyed 64 divers and 18 snorkelers using a prepared questionnaire. Most were between 21 and 50 years old (81%), with 32% aged 31-40.
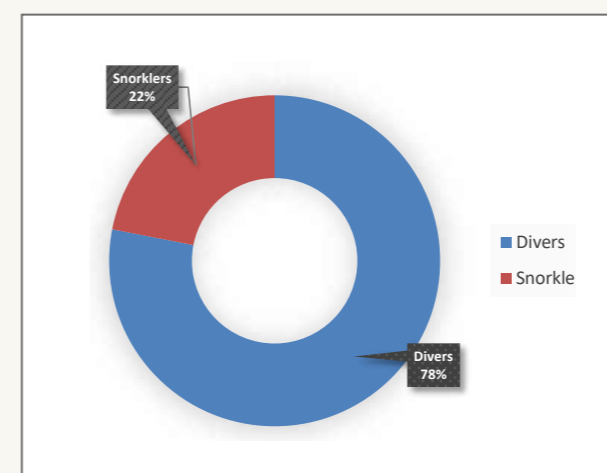
Figure 1: Interviewees profile
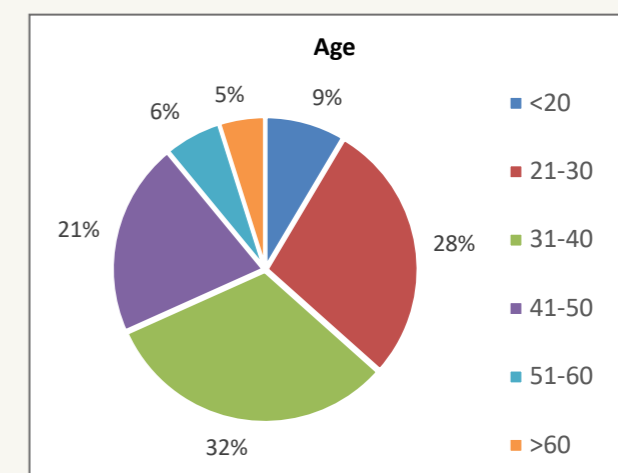
Figure 2: NBT age

Respondents came from a variety of educational backgrounds and working positions. A large proportion had received a higher education (59% graduates, 11% having a PhD diploma). The largest group were employed workers, along with a mix of freelance professionals, entrepreneurs and students.
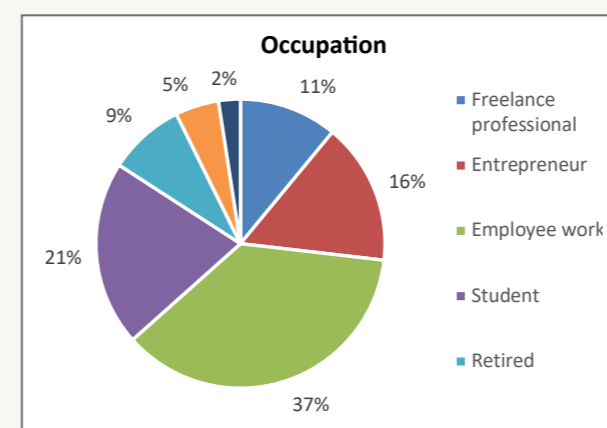
Figure 3: NBT occupation
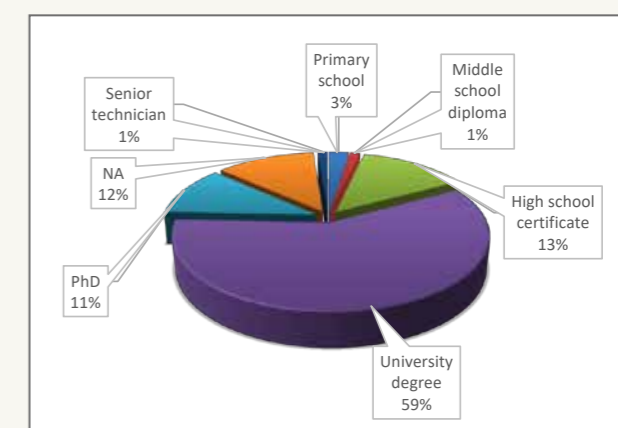
Figure 4: NBT education

Two-thirds of interviewees came from Tunisia, with 28% resident in the area of Tabarka. The largest proportion of foreign tourists came from France (17% of the total respondents), followed by minor representatives of the UK, Portugal and The Netherlands (2% each).
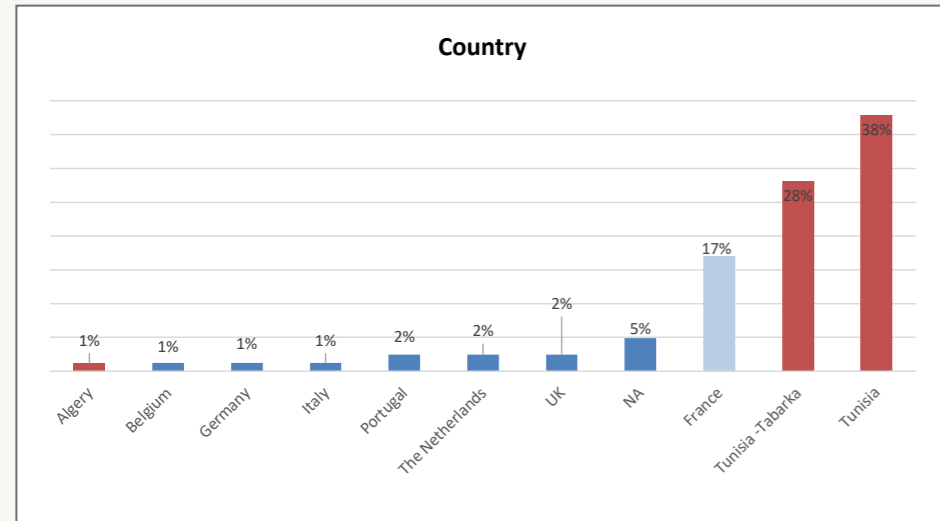

Figure 5: NBT country of origin

The reasons for choosing to dive in Tabarka varied, but there was a higher preference for the natural aspects that characterize the area, such as the underwater scenery (17%), high water quality (17%), abundance and diversity of fish (15%) and spectacular species (14%). A certain importance was given to the proximity of accommodation (12%), which may be related to the relatively high number of internal tourists.
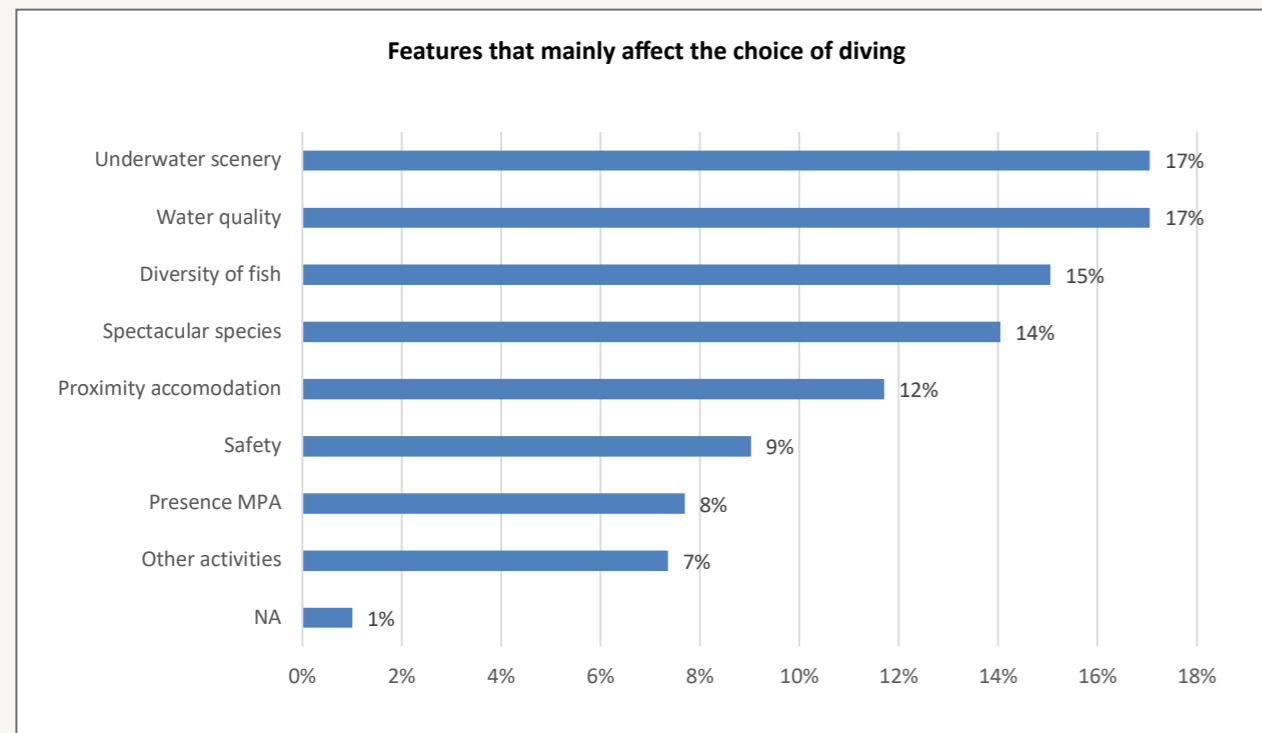
Figure 6: Features affecting NBT's choice of Tabarka as diving site

Only 8% mentioned the presence of the MPA as an influencing factor for choosing Tabarka as a diving site; this may be explained by the low awareness of the MPA's existence in general and its lack of institutional development. In relation to the overall decision to stay in the Tabarka area, 46% of respondents were aware of the existence of an MPA in the area, but only 17% said it influenced their decision, while 50% did not consider it an important factor. These responses are likely to be influenced by the lack of formal recognition or regulation of the MPA: 29% of respondents preferred not to answer and were confused by the question ("I don't know"). It is important for MPA users to understand the correlation between the concept of an MPA and the delivery of sustainable nature-based and conservation activities that they perceive as effective.
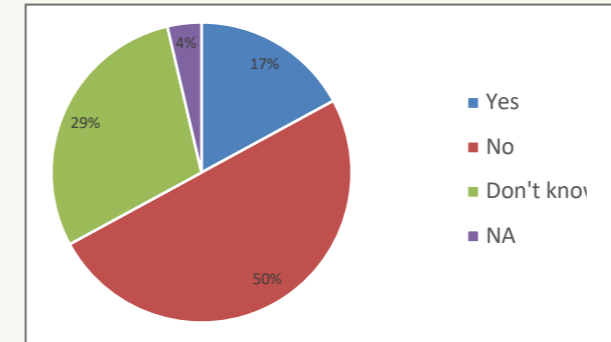
Figure 7: MPA presence as element for influencing NBT choice of staying in Tabarka
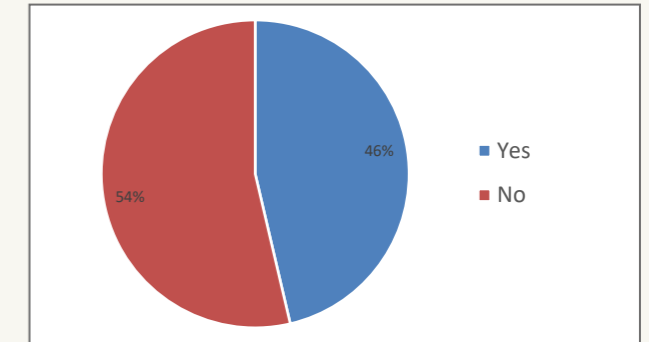
Figure 8: MPA awareness for NBT

Nearly half the respondents believed the MPA provided conservation benefits (figure 9). However, many did not know how to answer (34%) or didn't respond (15%). Again, this is likely to be connected to the MPA's lack of formalization. More than half the interviewees (57%) said they had dived inside other MPAs (figure 10), but 44% believed diving could potentially damage the ecosystem (figure 11), mainly because of divers' lack of respect towards the ecosystem, cited by 71% (figure 12).
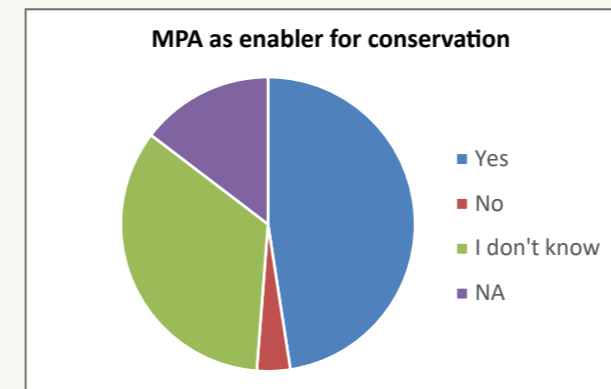
Figure 9: MPA as enabler for conservation
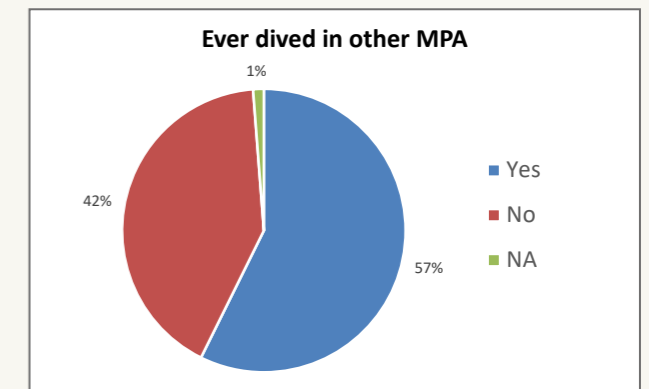
Figure 10: Other MPAs visited for diving
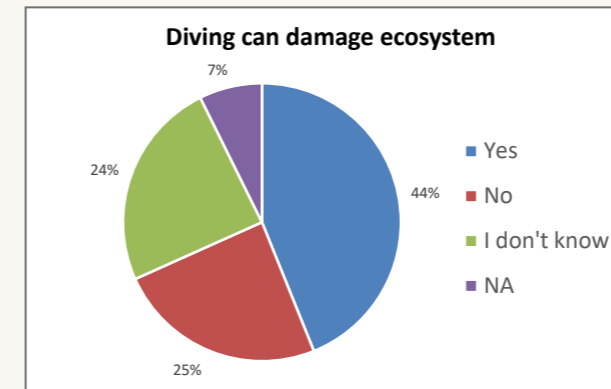
Figure 11: Perception of damage from diving activity
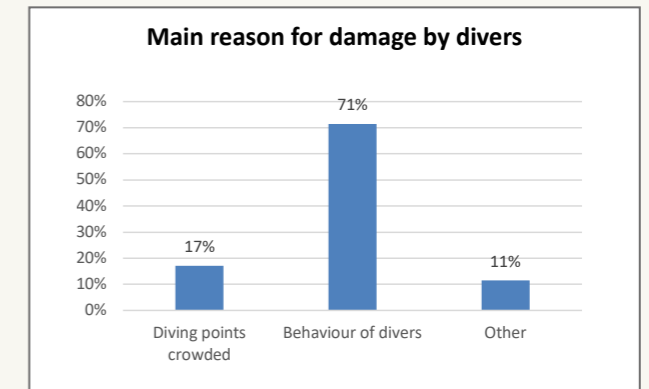
Figure 12: Perception of damage from diving activity – reasons

The positive attitude towards ecosystem conservation seems to be confirmed by respondents' willingness to pay extra amounts of money for the experience of diving inside an MPA in order to find conservation projects in the area. In fact, 84% of the interviewees said they would be willing to pay a fee ranging from €1-2 (26%) to more than €10 (10%), with the largest proportion (32%) citing €3-4 per dive. They wanted to see the extra money raised used for educating people on environmental conservation topics (23%), for enforcing regulations regarding ecosystem conservation (23%) and for reducing water pollution (18%).
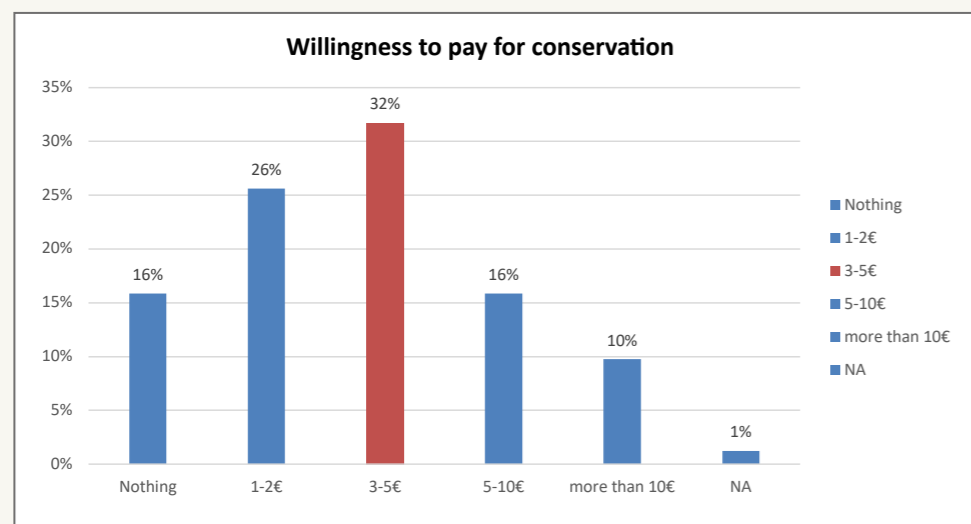
Figure 13: Willingness to pay for conservation

Among those who were not willing to pay extra money for financing conservation activities, 28% did not want any additional charges (28%) while 22% believed ecosystem conservation should be a government responsibility.
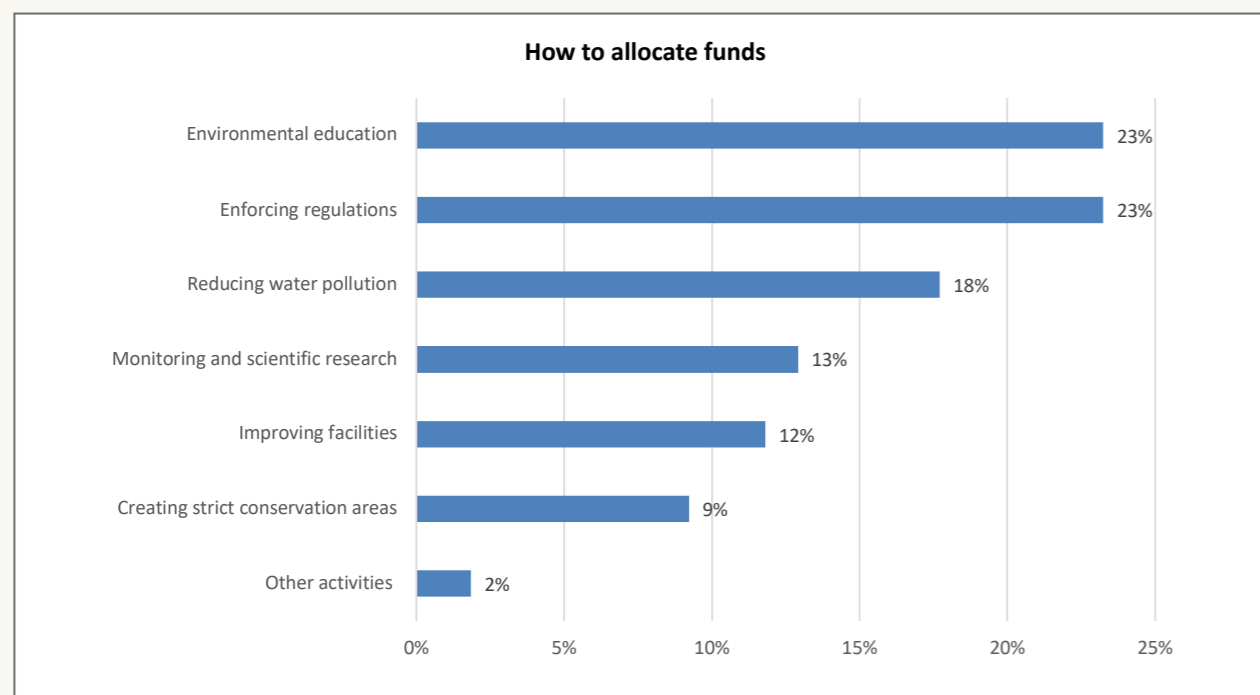
Figure 14: WTP: Activities funds should be allocated to
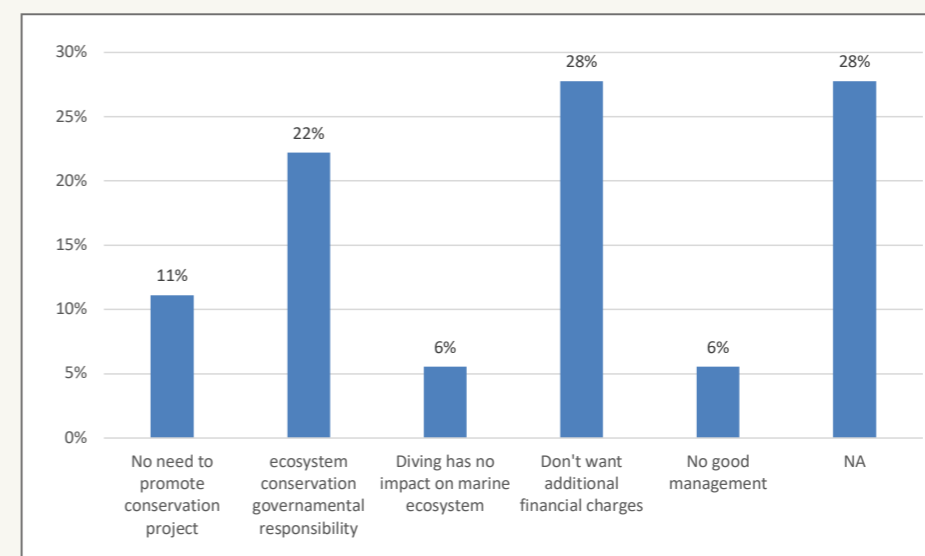
Figure 13: Willingness to pay for conservation

As for the other MPAs, the value assessment of scuba tourism in Tabarka is meant to illustrate the socio-economic benefits of NBT. We used the travel cost methodology (TCM), explained in more detail in the methodology section. Estimating the values that compose the TCM created several difficulties, related to the low availability and/or accuracy of both external and observed data, so there is a high level of approximation. In particular, the use of online data from www.numbeo.com was considered the only solution to obtain information on the cost of living in Tabarka, which was not available in any official statistics or organizations' official websites.

The following table summarizes the sources used to estimate the travel cost in Tabarka.

Travel cost subsection	Subsection elements	Source
TC1	Car transport cost	Calculation of distance from place of residence and cost estimation with ViaMichelin.it
	Ferry/plane transport cost	Plane: estimation from hypothetical flight from respondents' place of residence to the airport of Annaba, Algeria. Average value between high-season and low-season flight, using Skyscanner.it prices. Added car transfer from airport to Tabarka.
	Fast ferry transport cost	
	Ticket to dive	Cost of a one-day diving experience, with all equipment. Average between available information obtained from two diving centres (Loisirs de Tabarka and Club Nautique Tabarka) and prices estimated by survey respondents (question "Daily expenditure of diving/snorkel")
TC2	TC1 + Overnight cost	On the basis of the type of accommodation identified by the respondent, online analysis of average price for: - Hotel: average daily high/low season prices for three-star and five-star hotels - Second home/ resident: estimated daily cost for living in the area, considering utilities cost calculated with www.numbeo.com - Rented house: daily cost for renting, calculated from the cost of monthly rent available on www.numbeo.com - Camping: average daily high/low season prices for available camping ("Bni Mtir Camping") - Sailboat: average daily high/low season prices for mooring and gasoline for available port from www.noonsite.com
TC3	TC2 + Expenditure for other activities/services	Average price for food, considering the average between prices of meals in mid-range and "inexpensive" restaurants in the area, obtained from www.numbeo.com
TC4	TC3 + WTP	Weighted average amounts indicated by respondents

Table 3:Travel cost structure and sources for Tabarka analysis

To show the overall economic impact of NBT, the recreational value was calculated by multiplying the travel cost estimates with the total number of divers. This was estimated from internal reports and coast guard reports during the only available periods of 2008-2009 and 2014-2016.

The recreational value is summarized in the following tables and figures, which cover both the whole stay in Tabarka and the diving days alone.

RV	TC (average)	N°ANNUAL DIVERS (average)	TOTAL AMOUNT
RV1	€ 211.79	9304	€ 1,970,431.38
RV2	€ 427.66	9304	€ 3,978,691.56
RV3	€ 763.29	9304	€ 7,101,297.28
RV4	€ 767.35	9304	€ 7,139,078.57

Table 4: Recreational value (VR) for the whole stay in Tabarka

RV (II)	TC (II) (average)	N°ANNUAL DIVERS (average)	TOTAL AMOUNT (II)
RV1 (II)	€ 102.40	9304	€ 952,669.33
RV2 (II)	€ 318.26	9304	€ 2,960,929.51
RV3 (II)	€ 653.90	9304	€ 6,083,535.23
RV4 (II)	€ 657.96	9304	€ 6,121,316.52

Table 5: Recreational value weighted for the days on which diving was carried out
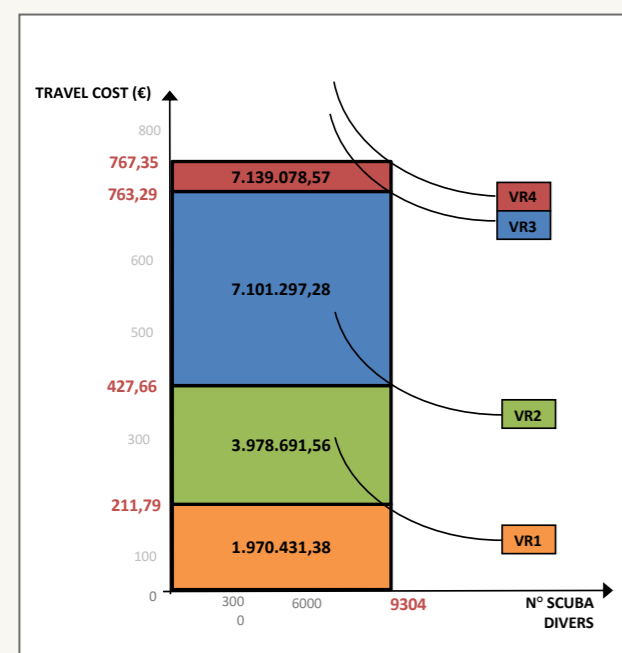
Figure 16: Recreational value for total time spent in area – demand curve
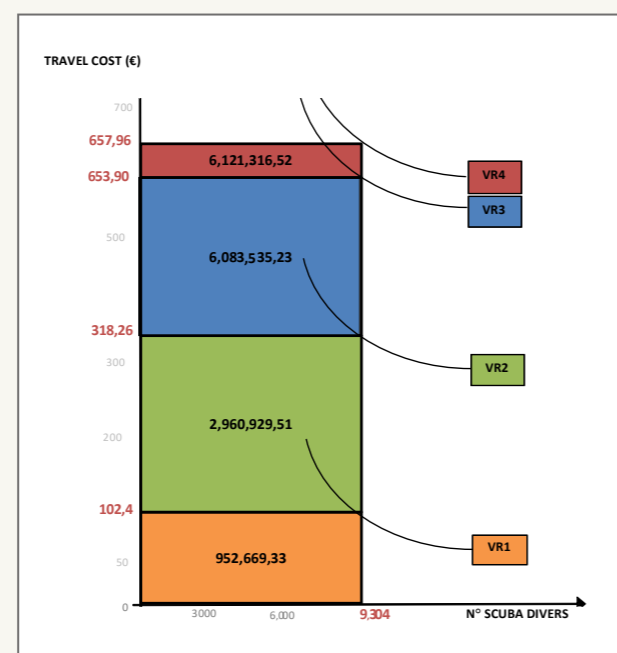
Figure 17: Recreational value for days spent diving – demand curve

IV.3. THE SMALL SCALE FISHING SECTOR: ECONOMIC STRUCTURE AND PERFORMANCE

As mentioned, the fishing sector is an important pillar of the local economy in Tabarka. Since no MPA has been established yet, in contrast with the analysis of authorized vessels done for other case studies, the analysis carried out in Tabarka focuses on the attitudes of actual users of the area – professional small-scale fishers (SSF) – towards the creation of a future marine protected area.

More specifically, 20 SSF answered a prepared survey from 26 July to 20 August 2018 in the area of Tabarka. The interviewed fishermen represent an experienced cluster, with an average of 31 years' fishing in the area, from a minimum of 8 to a maximum of 52 years. On average, each interviewed SSF owns one boat with 4.3m length and 0.9 GT of tonnage. The main fishing methods are trammel (41%), longline (29%) and gillnet (24%), though 80% of interviewees combine two or more different methods.
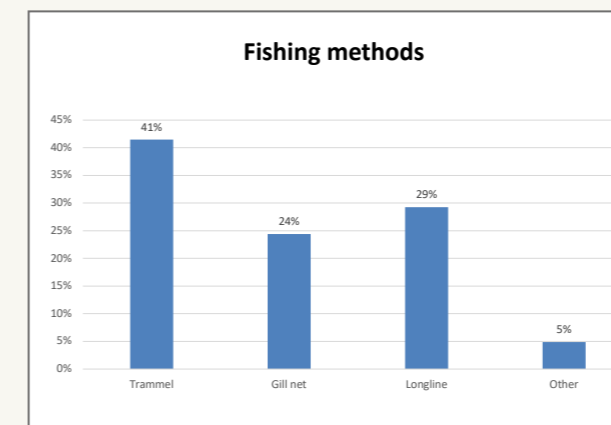
Figure 17: Fishing methods in Tabarka

Analysing the average catch composition, the largest proportion is made of lower-value third-class fish (36%), followed by second-class (31%) and the highest value first-class fish (24%). The catch composition and the unit price for each type are shown in the following graphs.
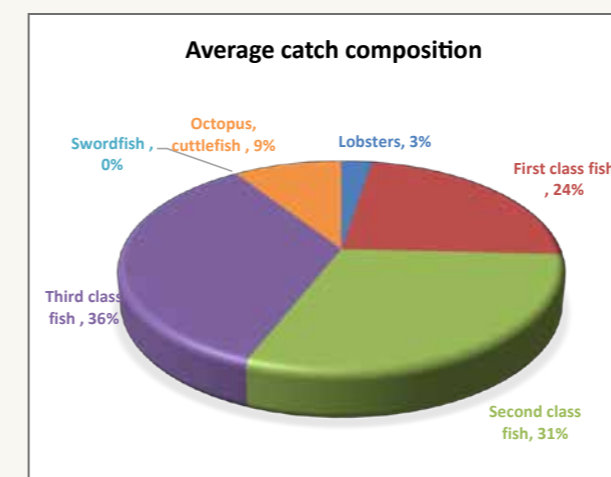
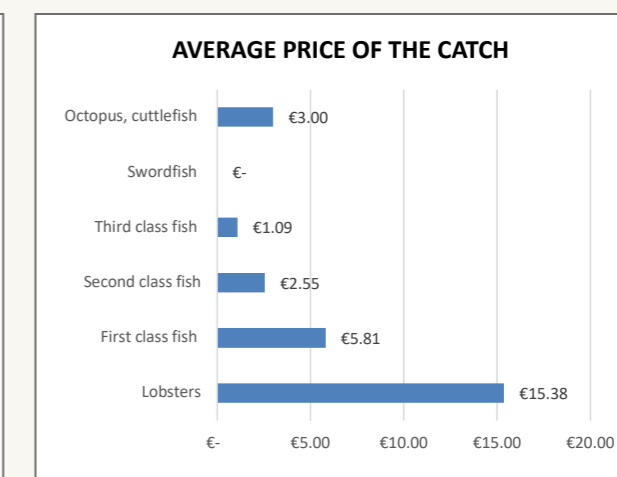*Figure 18: Average catch composition*

Figure 19: Average price of catch

While 68% of respondents claim to sell fish to more than one buyer, the largest part of the catch is sold to local fish mongers (90%), with a small quantity sold to restaurants (14%) and directly to local people and/or tourists (11%). This seems to be confirmed by the absence of close relations between SSF and beach tourists (near complete absence, with 70% of "No relation") and between SSF and divers (just "Good" relation for 60%), two-thirds of whom are locals. Another relevant point is the complete absence of wholesalers, who usually act as a connection between the fishing sector and the public but seem irrelevant for this cluster of fishers.
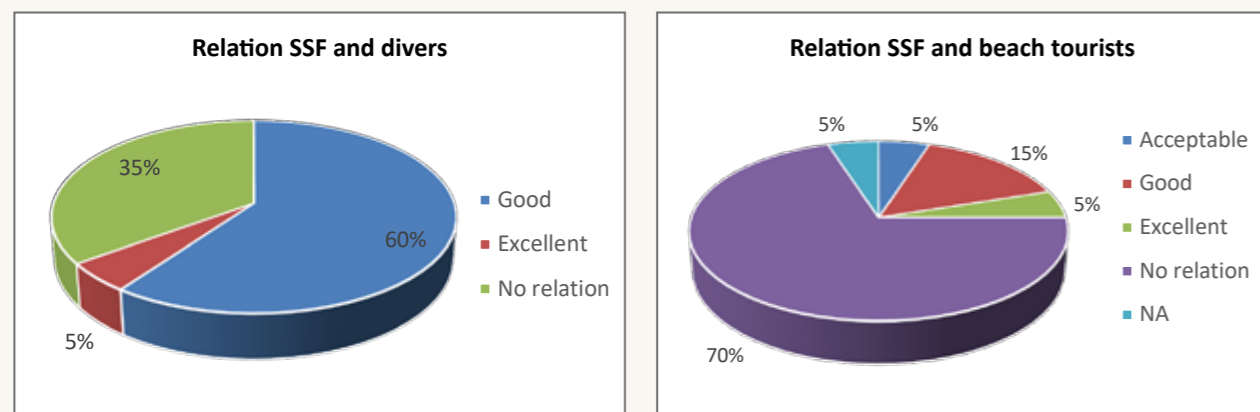
Figure 20: SSF perception of relationship with other MPA users
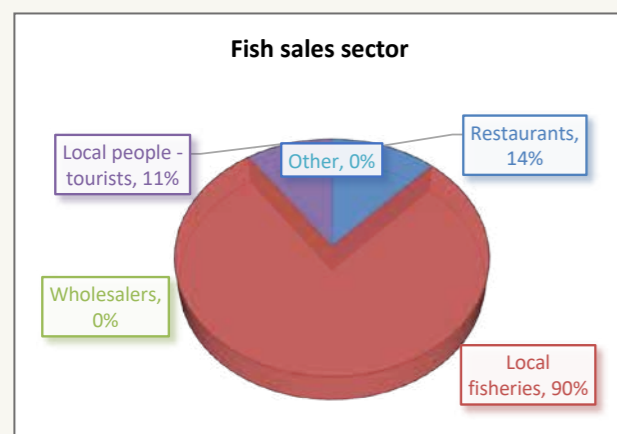
Figure 21: Who SSF sell their catch to (NB 68% claim to sell to more than one type of buyer)

Moving to the social analysis of SSF attitude towards the MPA, since there is not yet an official managed MPA the questionnaire included different questions to the ones prepared for SSF working in official MPAs. The analysis focused on SSF's perceptions of the potential benefits, concerns and features for the eventual formalization of the MPA.

Significantly, 70% of the respondents have a positive overall perception of the creation of an MPA, with 35% saying it will be "Positive" and 35% "Rather positive" for their fishing activities. This attitude seems to be confirmed from the analysis of potential benefits related to the MPA creation in Tabarka, with 45% of SSFs identifying as a major benefit the higher availability of fish inside (and around) the protected area. A significant number of respondents (25%) spontaneously commented that an additional benefit of setting up an MPA could be the reduction of the sensitive problem of spearfishing and of large fishing boats.
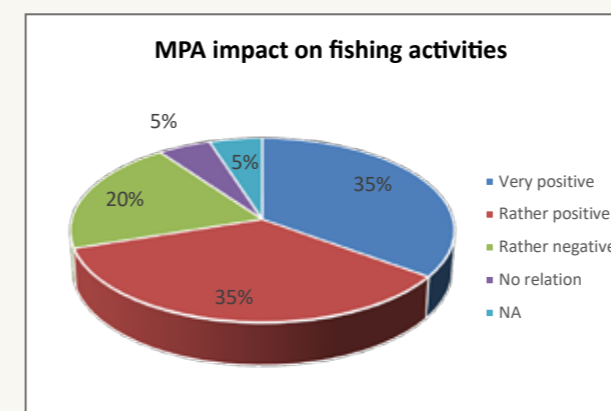
Figure 22: SSF perception of MPA's impact on fishing activities
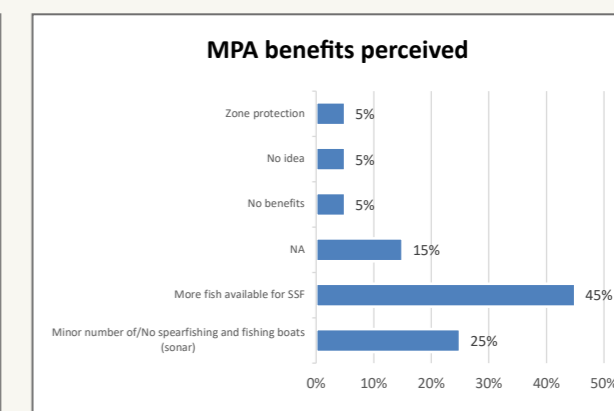
Figure 23: SSF perception of benefits of MPA

In fact, even if the relationship between SSF and both recreational and professional fishermen is generally good, there is a strong overall aversion towards spearfishing.
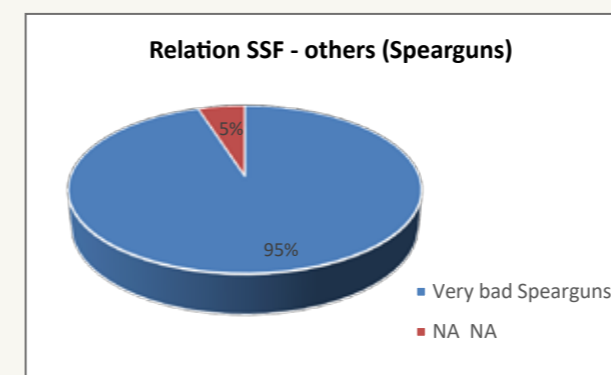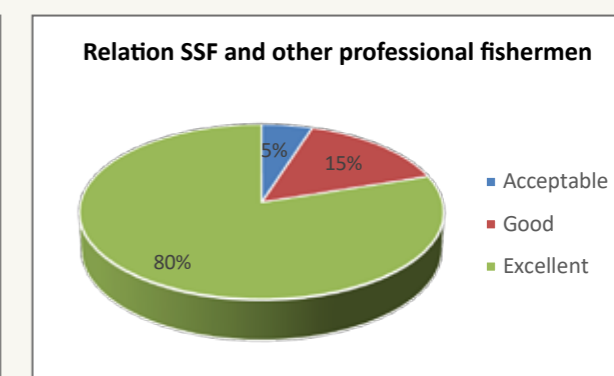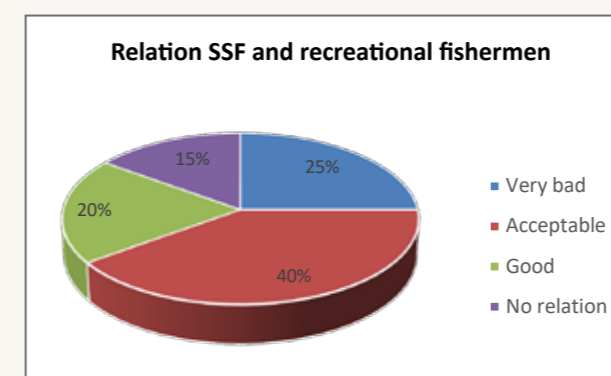

Figure 22: SSF perception of MPA's impact on fishing activities

To understand why 20% of SSF imagined the creation of an MPA would have a "rather negative" impact on fishing activities, we need to analyse these perceived constraints. While 45% of SSF did not respond, the same proportion believed that fishing might be reduced or not allowed in the area.
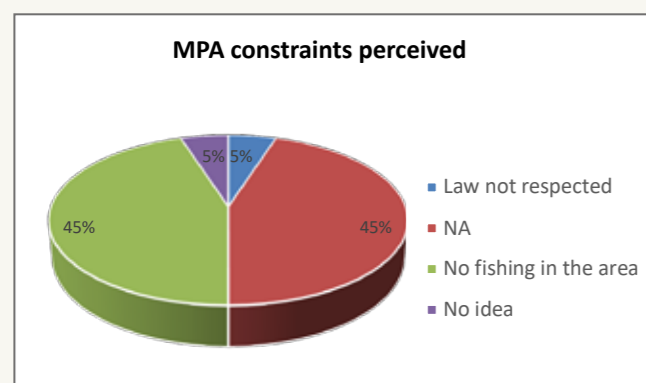
MPA constraints perceived

- Law not respected — 45%
- NA — 45%
- No fishing in the area — 5%
- No idea — 5%

Figure 25: SSF perception of MPA constraints

To look at the potential mission sharing between a future MPA and small-scale fishermen, SSF were asked to evaluate to what extent they considered specific objectives as joint activities, as shown in the following charts.
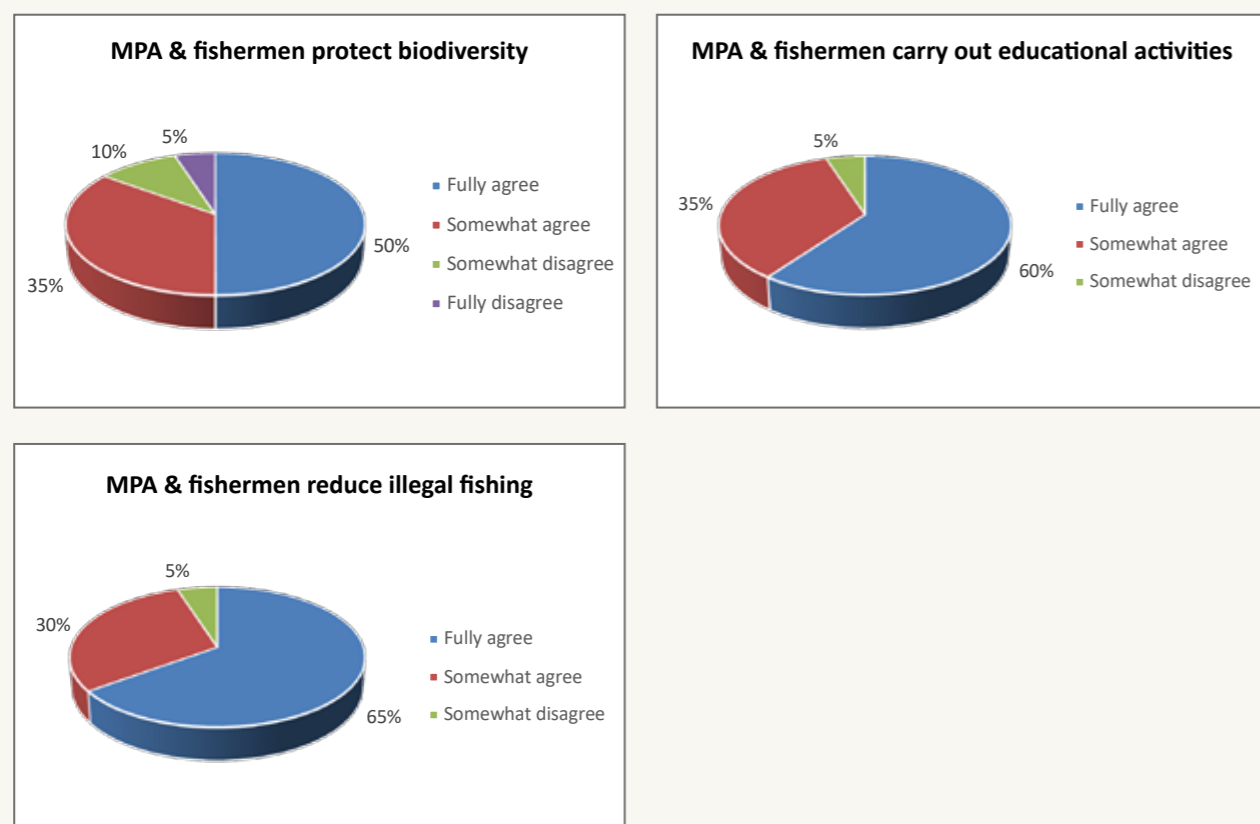
MPA & fishermen protect biodiversity

- Fully agree — 50%
- Somewhat agree — 35%
- Somewhat disagree — 10%
- Fully disagree — 5%

MPA & fishermen carry out educational activities

- Fully agree — 60%
- Somewhat agree — 35%
- Somewhat disagree — 5%

MPA & fishermen reduce illegal fishing

- Fully agree — 65%
- Somewhat agree — 30%
- Somewhat disagree — 5%

Figure 26: SSF degree of sharing MPA mission

There is a general positive attitude regarding the possibility of fruitful engagement between the MPA and fishermen for:

- biodiversity protection (50% "Fully agree", 35% "Somewhat agree")
- educational activities (60% "Fully agree", 35% "Somewhat agree")
- reducing illegal fishing (65% "Fully agree", 30% "Somewhat agree").

Reducing illegal fishing scored particularly highly. Poaching is a significant issue in Tabarka, with 70% of SSF saying there is a high level of poaching within the MPA, and all agreeing it has a high impact on their fishing activity.

Level of poaching inside MPA

- High — 70%
- Medium — 25%
- Low — 5%

Poaching impact on SSF inside MPA

- High impact — 100%
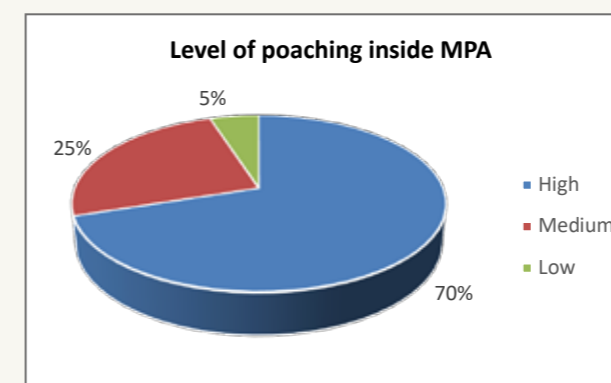
Figure 27: SSF perception of level and impact of poaching inside MPA
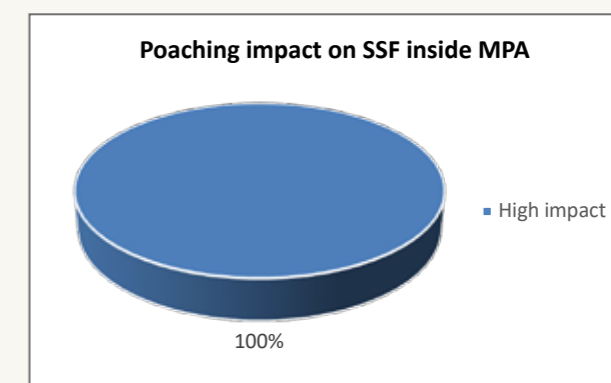
Another important result regarding SSF's attitude towards a prospective MPA is the high willingness to create a quality brand for fish living inside the protected area, supported by 60% in the survey. Analysing the open answers to this question, the major part of the respondents imagined a future MPA fish brand as a way of enhancing the quality of the catch and consequently increasing the value of the fish and their income.
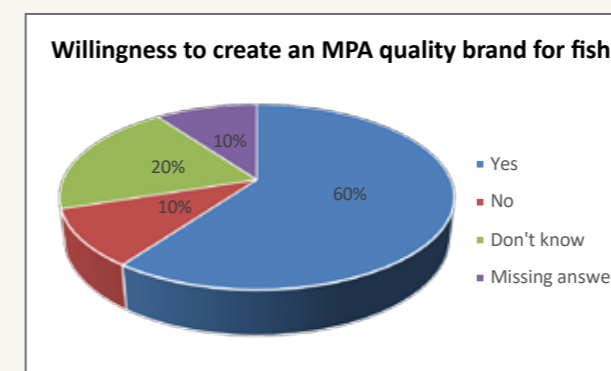
Willingness to create an MPA quality brand for fish

- Yes — 60%
- No — 10%
- Don't know — 20%
- Missing answer — 10%

Figure 28: Willingness to create an MPA quality brand for fish

Going into the economic impact of this sector, from the data analysis that the weighted average daily catch is about 6kg of fish per vessel, and the weighted average fish price is about €6. These two measures were multiplied by the average number of fishing days, which was calculated from internal reports and from the district fishery 2017 report. This gives an estimated per vessel turnover of €5,394 and a total SSF sector turnover of €690,432, based on 128 authorized vessels and 368 SSF in the area of Tabarka.

Daily average catch (kg)	A	6.20
Average annual fishing days	B	145
Average price of catch	C	€ 6.00
Total annual catch per vessel (kg)	D=A*B	899
AVERAGE PER VESSEL TURNOVER	**E=D*C**	**€ 5,394.00**
Number of authorized vessels	F	128
Total annual catch SSF (kg)	G=F*D	115,072
TOTAL SSF TURNOVER	**H=E*F**	**€ 690,432**

Table 5: SSF Turnover in Tabarka

Overall, SSF show a positive attitude towards an "institutionalized MPA", and a willingness to cooperate with the future official MPA authority in performing conservation projects and activities. Because of their mainly good (and potentially improvable) relations with other key stakeholders (divers, local fisheries, other fishers), it was important to confirm their support for some strategic future conservation activities in the area, such as biodiversity protection and educational activities. Understandably, however, their main concern is around the MPA's possible impact on fishing activities. A future institutionalized MPA may benefit SSF through the higher availability and quality of fish around the area, including through a reduction in illegal fishing. However, while 45% of those surveyed believe there will be "more fish available for SSF", a significant minority perceive the formalization of the MPA as negative, with "no fish in the area". Another worry is that regulations will not be respected.

IV.4. REFERENCES

Ministere de l'Environnement et du Developpement Durable, Loi 49-2009 du 20 juillet 2009 (Loi-cadre Aires Marines et Côtières Protégées - AMCP)

Décret d'Application 1844-8 du 19 Mai 2014

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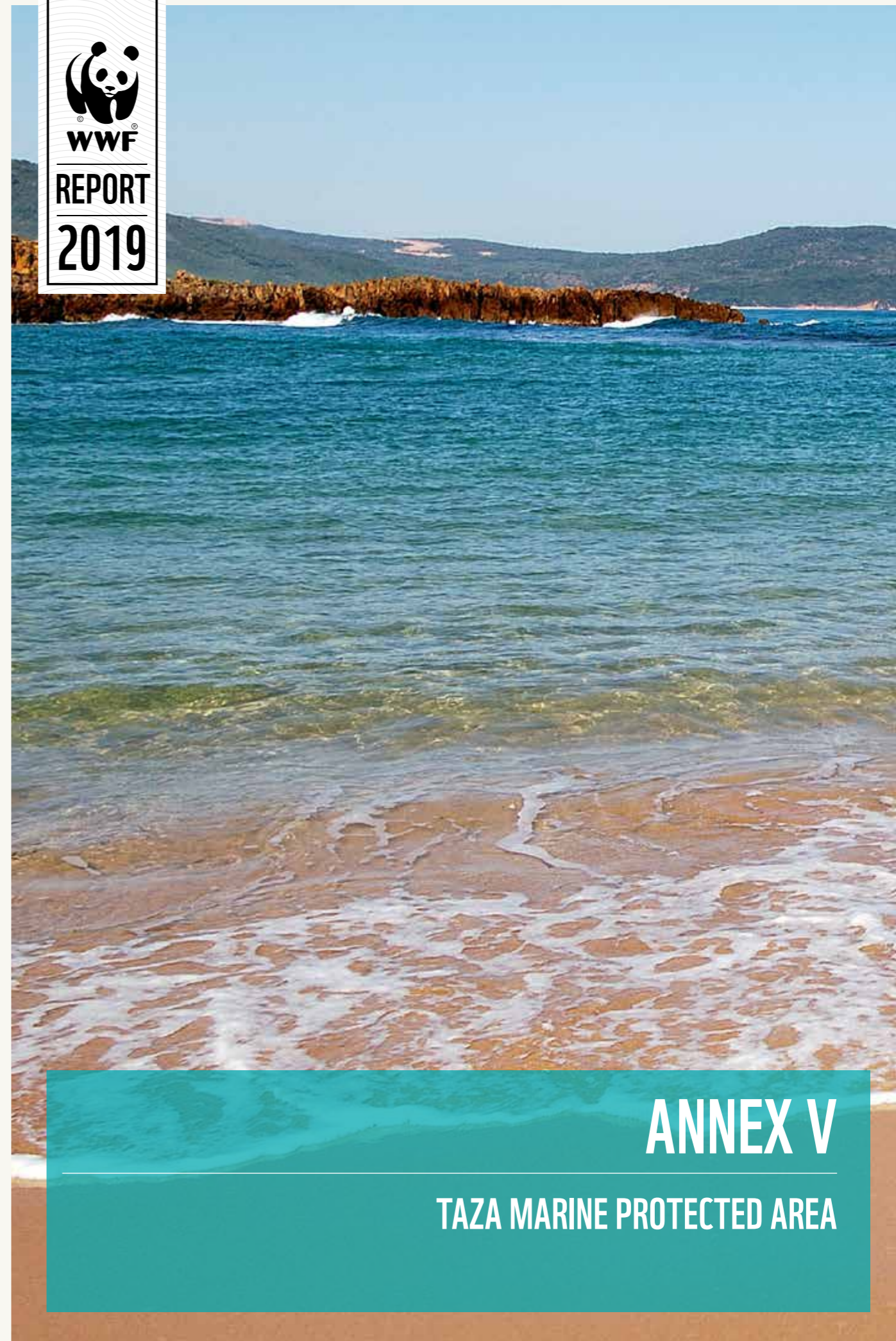
ANNEX V

TAZA MARINE PROTECTED AREA

V.1. THE INSTITUTIONAL, SOCIO-ECONOMIC AND ORGANIZATIONAL CONTEXT

As with the other non-EU cases, the analysis of the institutional and socio-economic context of the MPA of Taza is challenging due to the lack of key institutional and socio-economic data.

Figure 1: Proposed location and zoning of Taza MPA

As shown in the map, the future MPA of Taza is located on the north-east coast of Algeria adjacent to the existing Taza National Park, where the small Banc des Kabyles has already been identified as Specially Protected Areas of Mediterranean Importance . The terrestrial protected area was created to protect marine and terrestrial ecosystems, including agricultural lands, forests, rocky coasts, sandy beaches, grottos and springs (Boubekry & Djebar, 2016). While the National Park and the Banc des Kabyles MPA were formalized in 1984 (Chakour, 2012; Boubekri & Djebar, 2016), the process to establish the larger MPA of Taza formally started only in 2009 and is still not concluded. The proposed Taza MPA will cover approximately 9,603 hectares (1,299 no-take, 2,011 buffer and 6,293 peripheral) and 31.4km of coastline.

The following tables summarize the main institutional, ecological, socio-economic and organizational characteristics and key indicators. The national legal framework and the process of establishing MPAs is less mature than in for the northern Mediterranean MPAs. Algeria has established only two small MPAs (the above mentioned Banc des Kabyles, which is included in the perimeter of Taza MPA, and Habibas Islands Reserve), with six others still in the establishing process (Boubekri & Djebar, 2016, p. 281). The international recognition by UNESCO as a Man and Biosphere Reserve concerns the terrestrial area and also the "Mediterranean Seashore".

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12. http://www.rac-spa.org/spami

Category	Typology	Code	Description
Official international recognitions		RI4	UNESCO MAB (terrestrial area, including Mediterranean seashore)
Legal date of establishment		I1	3rd of November 1984 (Presidential Decree 4-328) for the National Park and the Banc des Kabyles Marine Reserve
Start of the process of establishment		E1	2009
Regulation		RE1	Basic - 17 activities regulated (fishing, tourism…)
Legal framework (National)			Law no. 11-02 2011 (PAs); Law no. 02-02 05-02-2002 (Coastal protection)
Covered protected area			El Aouana, Selma Benziada, Ziama Mansouriah[13]

Table 1: Key institutional aspects of Taza

Category	Typology	Code	Description
Key ecological resources	Ecosystems of international relevance	EE1	Marine and terrestrial ecosystems, including rocky coast, sandy beaches, grottos and springs
	More representative species	EE1	Large number of marine species with a high level of endemism such as *Epinephelus marginatus, Epinephelus costae, Pinna nobilis, Posidonia oceanica* meadow.

Table 2: Key natural and cultural resources of Taza

Category	Indicator	Code	Measure	Source
Demographic structure	Number of resident population	KS1	168,410	National census
	Population age structure by major age groups (0-14;15-64; 65+)	KS2	-	
Employment	Unemployment rate	KS1	9.6 %	National census

Table 3: Key social dimensions of Taza

Category	Indicator	Code	Measure	Source
Composition of the production system	Composition of local entrepreneurial activities	KE1	Services: 32.08%; Agriculture: 11.25%; Administration: 13.62%; Buildings and Public works: 26.12 %; Industry: 6.63%; Other 10.30%	Chakour, (2012, p. 13)
Structure and features of tourism sector (province)	Annual tourist movement	KT1	11 million (Jijelan Coast)	Tourism regional census
	Numbers of dives	KT2	3 active clubs: Raie Manta, Bousaadoun Aqua-Center and Salamandre. Total estimate: 300 divers	MPA report
	International visitors	KT4	-	
	National visitors	KT5	-	

Table 4: Key economic dimensions of Taza

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13. The planned MPA incorporates the coastline of the municipalities of Jijel, El Aouana and Ziama Mansouriah (Boubekry & Djebar, 2016).

Category	Indicator	Code	Measure	Source
Structure and features of tourism sector (MPA)	Annual number of arrivals and overnight stays	RT1	-	
	Seasonality	RT2	-	
	Tourism capacity	RT3	-	
	Number of restaurants	RT4	-	

Table 5: Key touristic dimensions of Taza

Category	Indicator	Code	Measure	Source
Structure and features of artisanal fisheries sector	Number of authorized vessels:		54	-
	Number of fishing days	KF1	135	Fishermen's associations registers
	Daily catch:	KF2	3kg - 7kg	Fishermen's associations registers
Market price	Average fish price (for main market categories)		€ 11- € 15 € 4-€6 € 0.73-€ 3 € 15; € 8	Fishermen's associations registers

Table 6: Key dimensions of small-scale fishing sector in Taza

Category	Indicator	Code	Measure	Source
Organizational size and structure	Full time (permanent and temporary)	KO1	NO	-
	Seasonal employees	KO2	NO	NO
	Governance body	KO3	Forest Department (SSF by Fishery Department) and National Commission for the Coast for the Banc des Kabyles MR	Boubekri, & Djebar (2016), p. 284
Strategy	Mission (eventually also vision)	KP1	NO	Strategic Plan - Vision Statement
	Implementation of the management plan	KP2	NO	-

Table 7: Key organizational aspects of Taza

Category	Indicator	Code	Measure	Source
Organizational size and structure	Number of volunteers	RO1	NO	-
Strategy	Tools for strategic management	RP1	Zoning (no-take, buffer and peripheral zones)	
Official collaborations	International agreements or networks	CI1	Participation in SEA-Med (Sustainable Economic Activities in Mediterranean Marine Protected Areas) project	

Table 8: Relevant organizational aspects of Taza

V.2. NATURE-BASED TOURISM: THE SCUBA DIVING SECTOR

The economic context is characterized by a scarcely developed industrial sector and by the prevalence of traditional activities such as agriculture, crafts and fishing (Chakour, 2012).

The wide coastal region (Jijelian) is receives a consistent flow of visitors (7 million) of almost exclusively national origin. As in most of the North African Mediterranean coastal areas, international tourism is currently almost absent.

The impact on the economy of nature-based tourism (NBT) is in a phase that could be defined as both embryonic and promising. The scuba diving sector began its development in 2011/2012 with the birth of the first club in the municipality of Jijel (Ligue de Sauvetage de Secourisme et des Activites Subaquatiques, 2016), and has seen a growth of both clubs (9 units) and diplomas (from 32 to 144 per year) in the following five years.

We conducted our survey during summer 2018, giving a questionnaire to a sample of 51 nature-based tourists at the end of their diving/snorkelling experience. Of the 51 tourists interviewed, 10% were snorkelers and 78% divers. Most of them were between 31 and 40 years old (57%), with a high average education level (78% had a university degree). Half (49%) were employed workers.
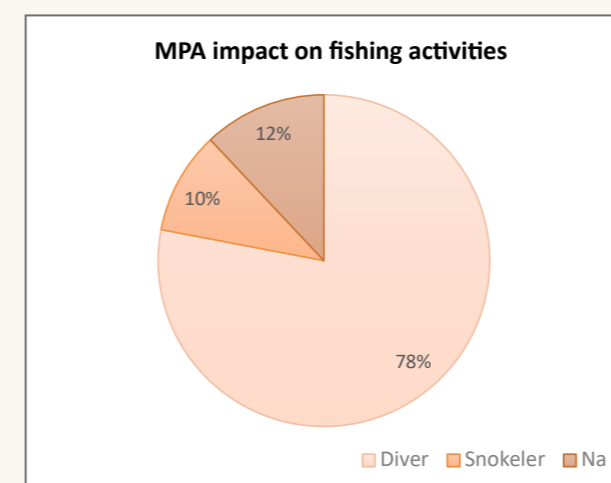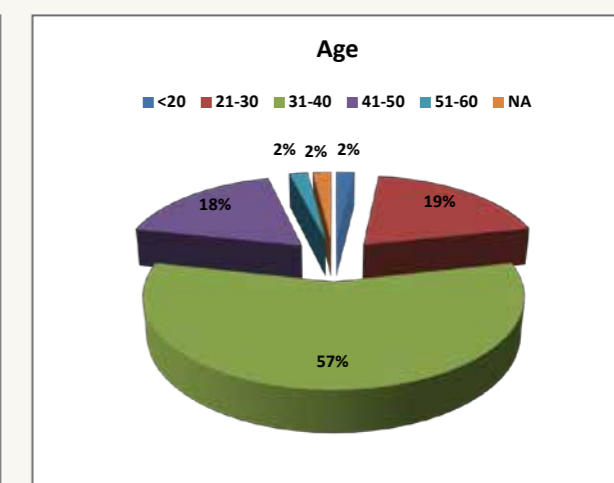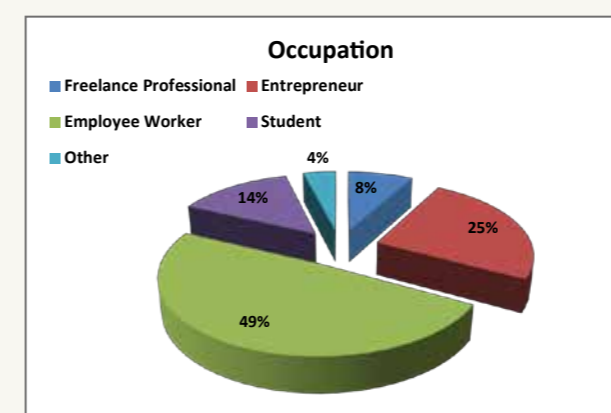

Figure 2: NBT profile

Figure 3: NBT age profile
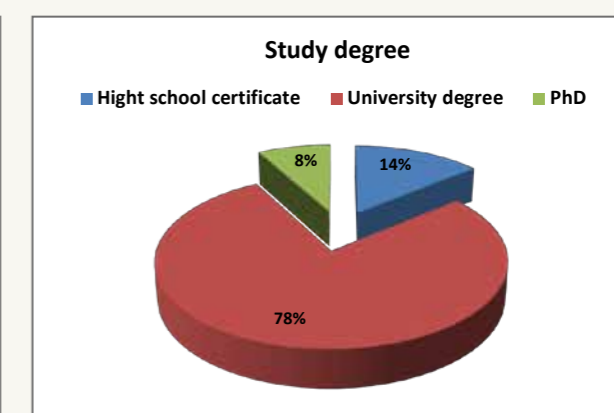

Figure 4: Occupation of NBTs interviewed

Figure 5: Educational level of NBTs interviewed

As underlined above, the survey results show a prevalence of a domestic tourism, with a flow of tourists coming from the main Algerian cities (Algiers) or from the inner towns (Setif). As for the entire region, there is a very low presence of international visitors among the NBTs (4%). The average stay is low, with less than seven days of holiday and about three days spent diving/snorkelling.
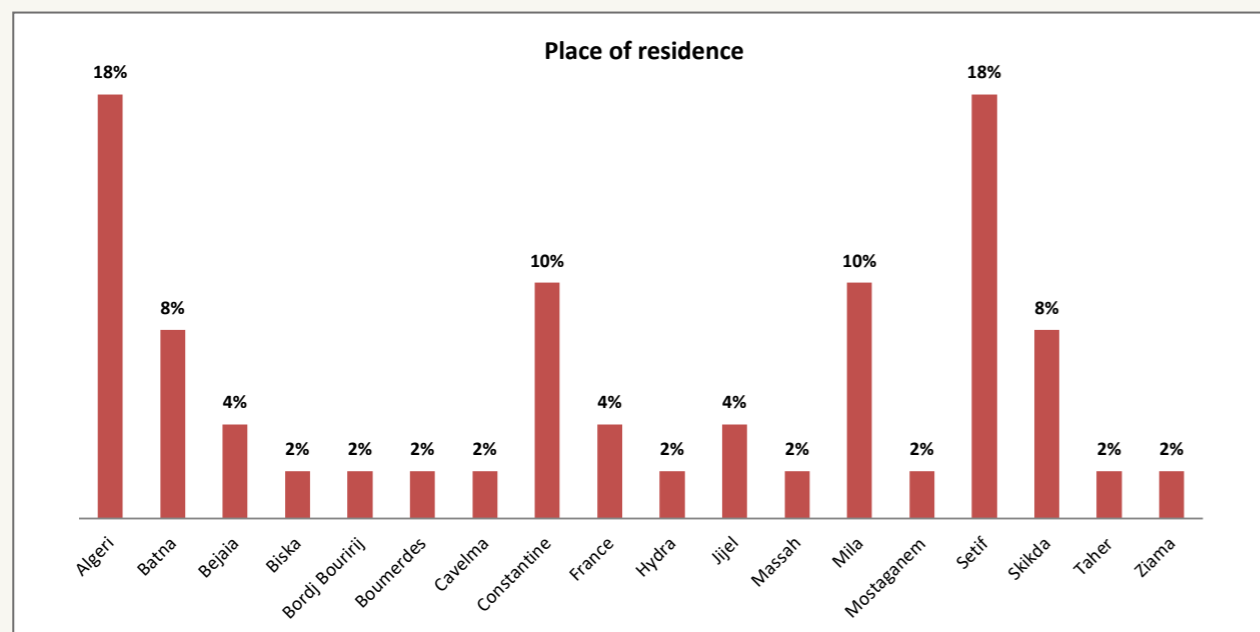

Figure 6: NBTs' place of residence

The factors that affect the choice of the diving site are dominated by natural aspects, such as the water quality (67%) and the presence of particular underwater scenery (67%). Another factor that affects the choice of the diving site is safety (55%). Only 2% mentioned the presence of an MPA as a choice factor.
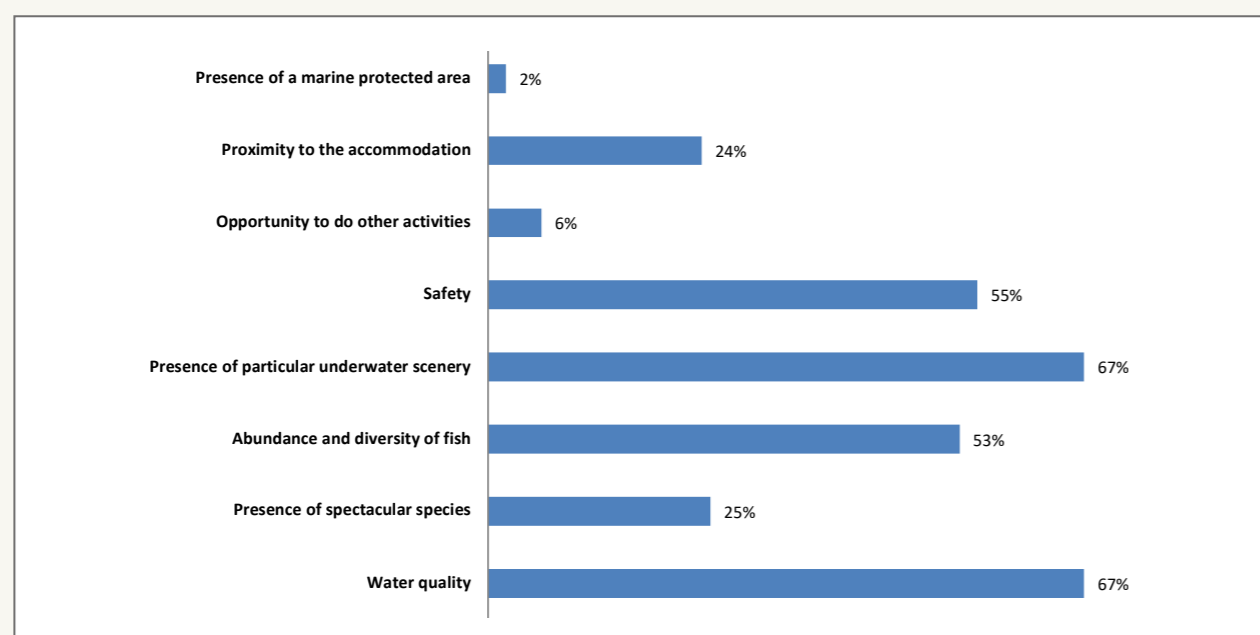
Figure 6: NBTs' place of residence

On the other hand, those surveyed showed a high willingness to pay (WTP) compared with the other cases. The results show that 55% of people interviewed are willing to pay an extra €5-10 fee per dive to fund biodiversity conservation and environmental protection projects.
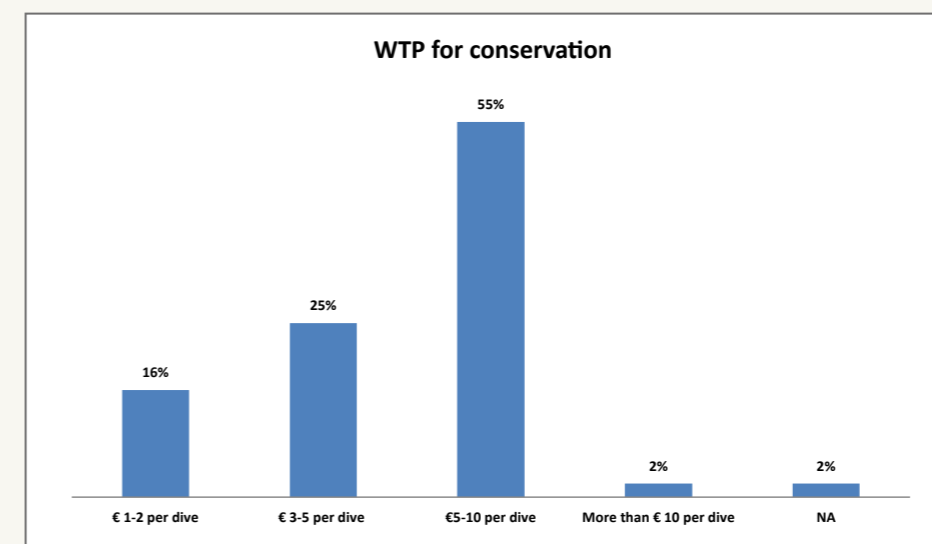
Figure 8: Willingness to pay (WTP) extra to support conservation

The activities considered most suitable to allocate funds to support MPA management projects are enforcing regulations (24%), environmental education (19%), and improving the quality of services to enhance the diving experience (18%).
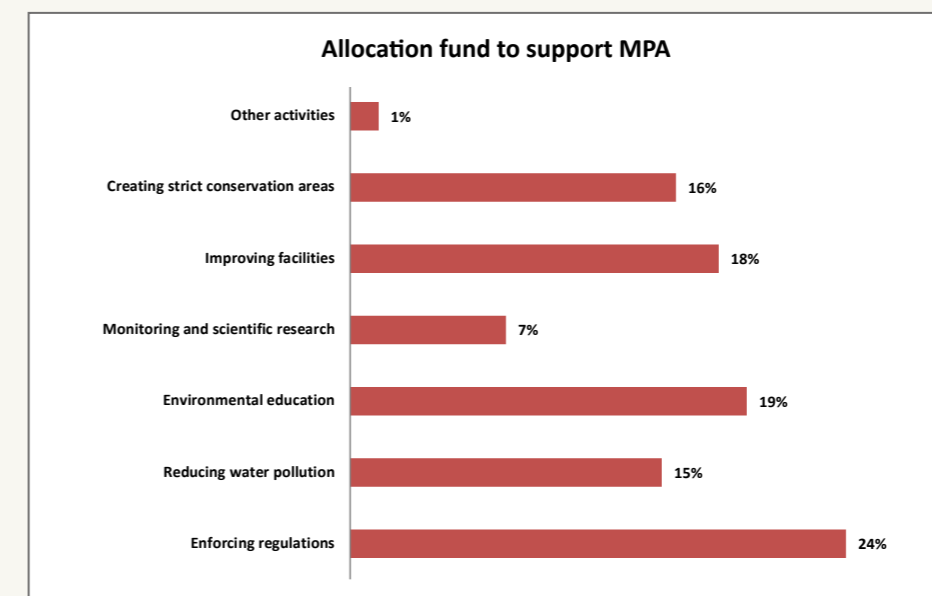
Figure 9: How NBTs would like to see extra funds allocated

The final section of the analysis of NBT in Taza area is dedicated to the evaluation of its potential economic value, through the application of the Travel Cost Method (TCM), divided – as in the other cases – in four components.

Travel cost subsection	Subsection elements	Source
TC1	Car transport cost	Calculation of distance from place of residence and cost estimation with ViaMichelin.it
	Plane transport cost	Estimation from hypothetical flight from respondents' place of residence to the airport of Jijel, Algeria. Average value between high-season and low-season flight, using Skyscanner.it prices.
	Bus ticket	Estimation of the average price of the bus ticket for the route Algiers-Jijel (Sogral transport company)
	Ticket to dive	Cost of a one-day diving experience, with all equipment. Average prices estimated by survey respondents (question "Daily expenditure on diving/snorkel")
TC2	TC1 + Overnight cost	On the basis of the type of accommodation identified by the respondent, online analysis of average price for: - Hotel: average daily high/low season prices for three-star and five-star hotels - Second home/resident: estimated daily cost of living in the area, considering utilities cost calculated with www.numbeo.com - Rented house: daily cost for renting, calculated from the cost of monthly rent available on www.numbeo.com - Camping: average daily high/low season prices for available camping
TC3	TC2 + expenditure for other activities/services	Average price for food, considering the average between prices of meal in both mid-range and inexpensive restaurants available in the area, obtained with www.numbeo.com
TC4	TC3 + WTP	Weighted average amounts indicated by respondents

Table 9: Travel cost structure and sources for Taza analysis

The following table reports the average value of each travel cost component. The estimation took into account first the cost of the days in which the dives were carried out, and then the cost of the entire period spent in the Taza area.

TC1	TC2	TC3	TC4
Car transport cost + plane transport cost + bus transport cost + ticket to dive	TC1 + overnight cost	TC2 + expenditure for other activities/services	TC3 + willingness to pay an additional amount of money to fund conservation projects
€ 29.43	€ 153.12	€ 184.49	€ 201.95

Table 10: Travel cost value for the days in which the dives were carried out

TC1	TC2	TC3	TC4
€ 49.04	€ 172.73	€ 204.11	€ 221.56

Table 11: Travel cost value for the days in which the dives were carried out

These values were multiplied by the number of annual scuba divers (300) in order to get an estimation of the overall economic impact of the diving sector in the area. The following tables summarize the recreational value for each TCM subsection. Again, the tables give the recreational value for both the days on which the dives were carried out, and the entire period spent in the Taza area.

Recreational value (RV) for the days in which the dives were carried out		
RVX	TCX *N° ANNUAL SCUBA DIVERS	TOTAL AMOUNT
RV1	€ 29.43 * 300	€ 8,829
RV2	€ 153.12 * 300	€ 45,936
RV3	€ 184.49 * 300	€ 55,347
RV4	€ 201.95 * 300	€ 60,585

Table 12: Recreational value for the days on which the dives were carried out

Recreational value (RV) for the entire period spent in Taza		
RVX	TCX *N° ANNUAL SCUBA DIVERS	TOTAL AMOUNT
RV1	€ 49.04 * 300	€ 14,712
RV2	€ 172.73* 300	€ 51,819
RV3	€ 204.11 * 300	€ 61,233
RV4	€ 221.56* 300	€ 66,468

Table 13: Recreational value for the entire period spent in Taza

The final TCM outputs are the following demand curves, which show the relation between the travel cost and the number of visitors. The areas identified by the rectangles in the figures represent the areas of profit for the market and of extra profit related to the divers' hypothetical willingness to pay to support conservation.
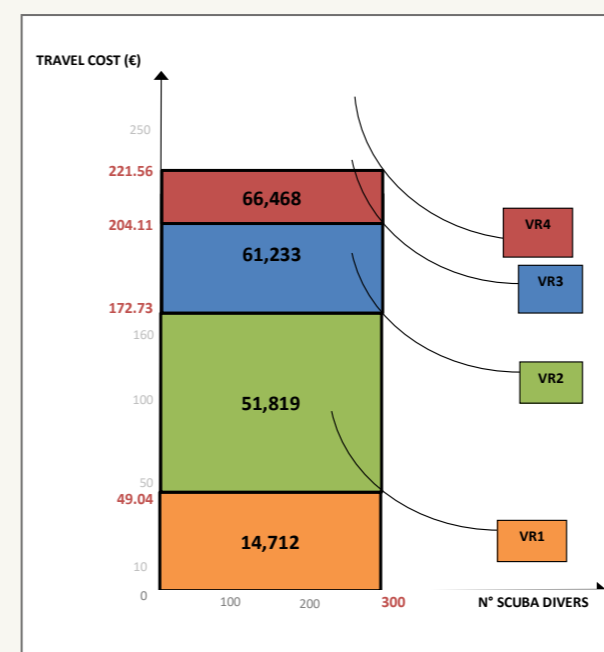

Figure 10: Recreational value associated with the entire period spent in Taza – Demand curve
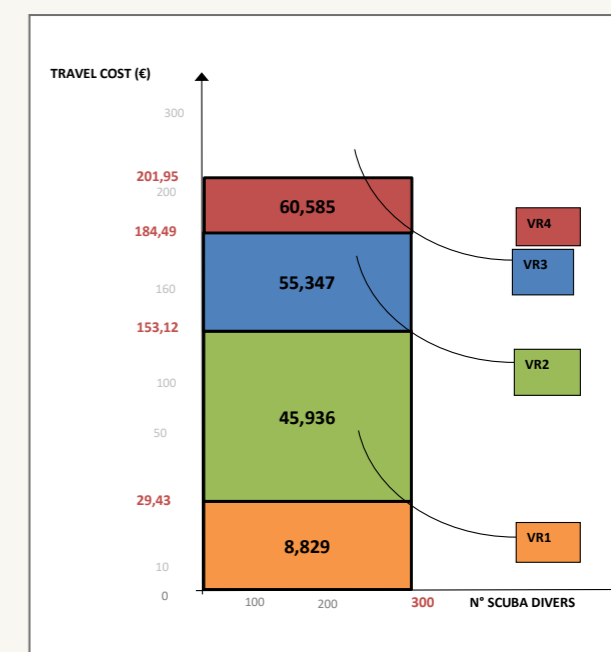

Figure 11: Recreational value associated with the days on which the dives were carried out – Demand curve

V.3. THE SMALL-SCALE FISHING SECTOR: ECONOMIC STRUCTURE AND PERFORMANCE

As Boubekri and Djebar (2016) underlined, the fisheries sector "does not have a strong relevance to the national economy in Algeria, but at the local level, fishing is a traditional practice that generates income, and provides food and a source of employment for the inhabitants of coastal villages" (p.282). While fishing does not seem to be a major economic activity in the wider area, artisanal fishing remains the main socio-economic activity around the area of the future Taza MPA (Boubekri et al., 2018).

Artisanal fishing is experiencing many challenges, including the increasing trend in recreational fishing (Boubekri & Djebar, 2016). Fishermen report that incomes have been decreasing in the last 10 years as the total catch has fallen. Some target species and vulnerable species, such as brown meagre (Sciaena umbra), brown grouper (Epinephelus marginatus), and swordfish (Xiphias gladius), have seen a collapse in catches after 2010 due to very intensive fishing in previous years. Other challenges include poaching and other illegal activities. The establishment of an MPA and the consequent sustainable management of marine resources seems necessary to bring order, rationality and long-term economic sustainability to this precious but vulnerable sector.

A survey of 34 small-scale fishermen was conducted from March to October 2018. The average age of respondents was between 41 and 50 years old (44%), followed by 29% older than 50. Only 6% were aged 20-30. This data seems to suggest that the young generation prefers other kinds of jobs.
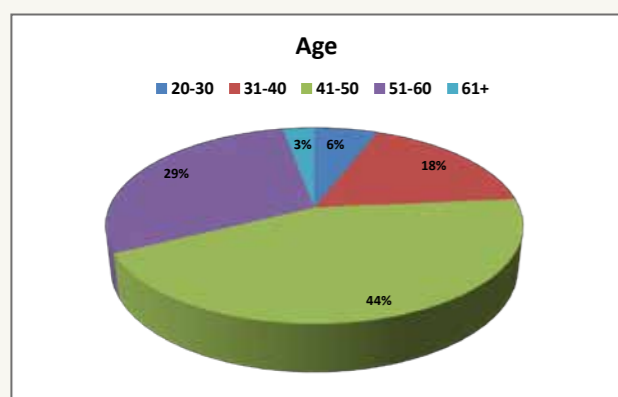
Figure 12: Age profile of SSF

The fleet appears to consist of 54 authorized vessels with 5.7m average length, 1.8 GT average tonnage and 53kW average engine power. The most used fishing methods are trammel net (35%) and gillnet (35%).
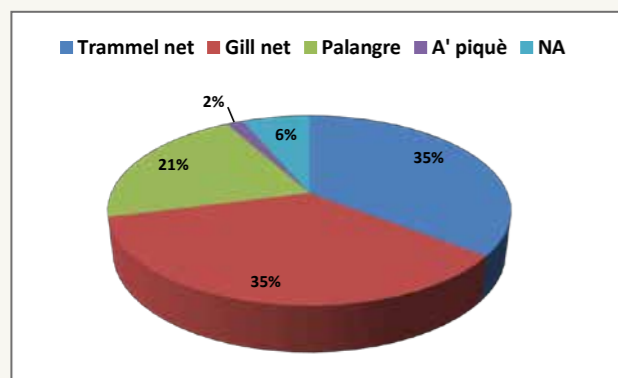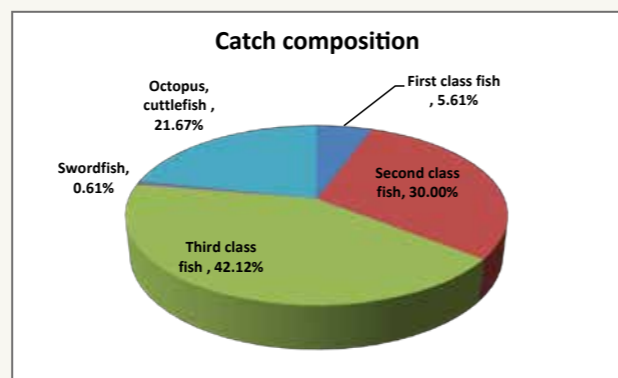

Figure 13: Fishing method

Figure 14: Catch composition

The average catch composition shows a predominance of low-value "third-class fish" (42.12%), followed by second-class fish (30%), then octopus and cuttlefish (21.67%). According to the respondents, the largest part of the catch is sold to wholesalers (52%), 30% to restaurants and a small quantity to local fishmongers (12%), with just 2% sold directly to local people and/or tourists. Only 4% of the fishermen interviewed claimed to sell to foreign markets without the brokerage of wholesalers.
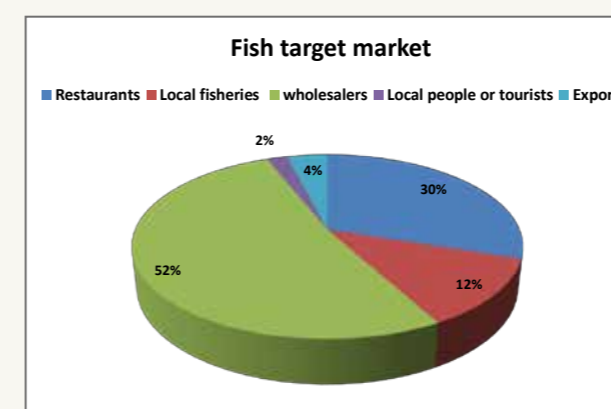

Figure 15: SSF target market

The relationship between SSF and the other users of marine resources is in an interesting area of focus. This information could be useful for MPA managers to better understand the main conflictual situations in order to seek solutions that meet the needs of different users. The most complex relationship seems to be with the other professional fishermen, where there is competition over territory and resources.
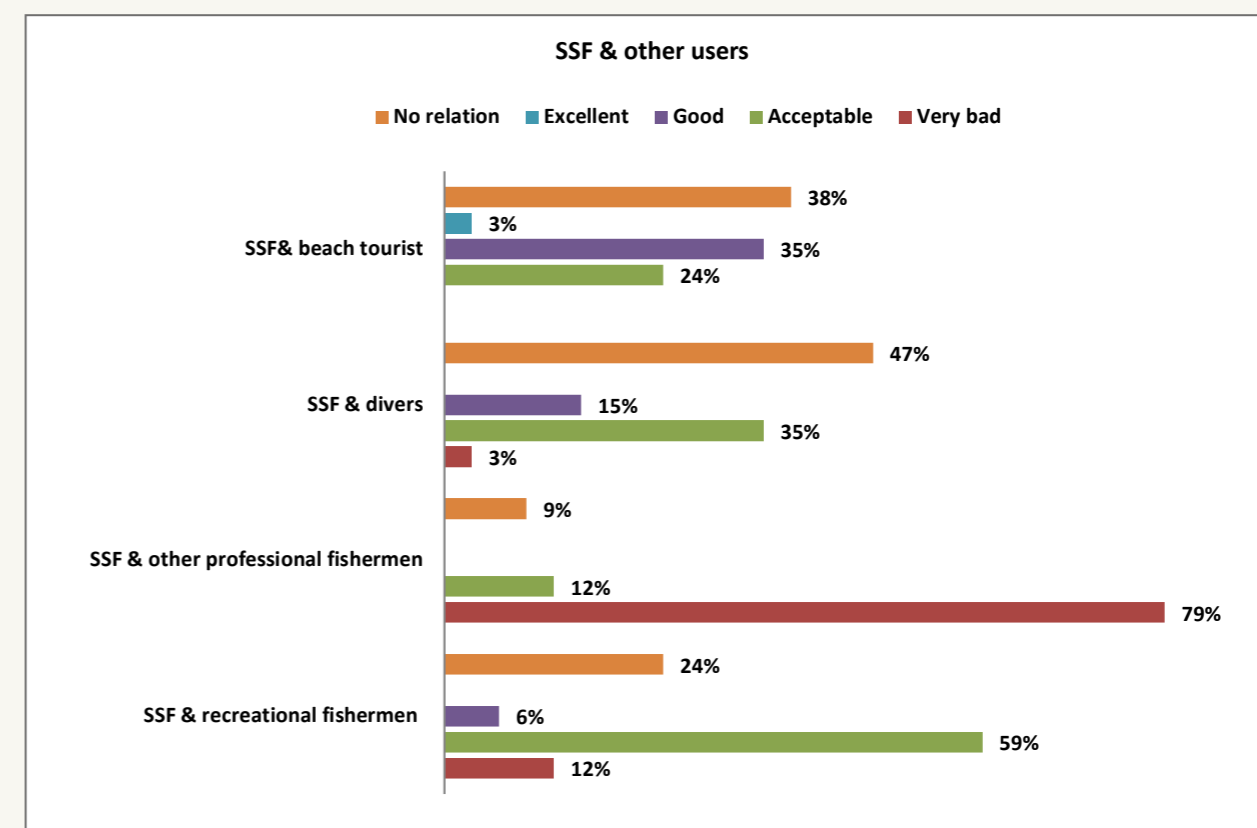

Figure 16: SSF perception of relationships with other MPA users

Respondents were asked to express an opinion about the activities and impact of the MPA. Although the MPA has not yet been officially created, it is interesting to investigate the expectations that fishermen have towards its establishment. The results show a low level of trust in the abilities of the MPA to positively affect the well-being of the local community, their income and their fishing activities.
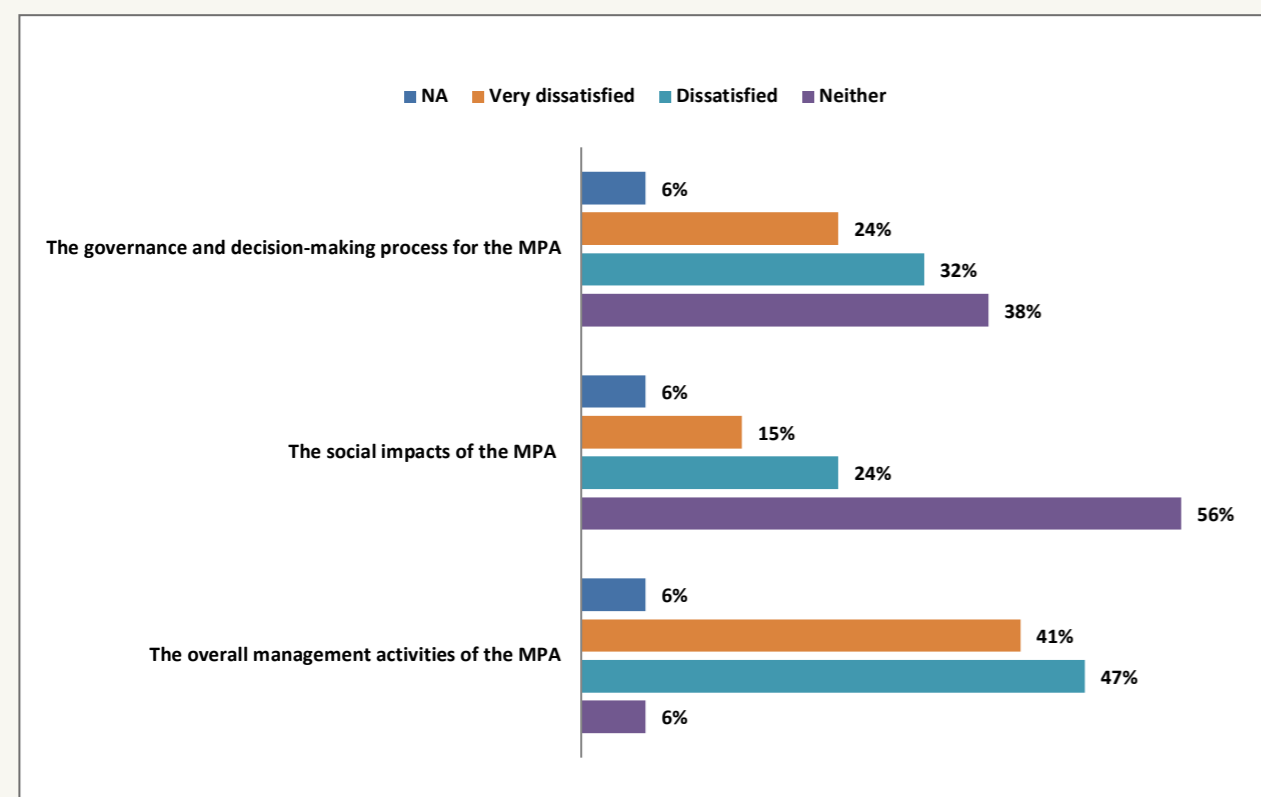

Figure 17: SSF degree of satisfaction with MPA

In addition to the conservation of marine and coastal biodiversity, the establishment of the future MPA aims "to improve the economic situation of the local community by creating new work opportunity in diverse environment-friendly schemes and implementation of strategies and methods to protect and integrally manage coastal areas" (Boubekry, Djebar, 2016).

Despite their scepticism, fishermen appear to share the MPA's goals and mission. As shown by the following table, most of the fishermen in fact declare that they feel potential allies in carrying out activities directly linked to the mission of an MPA, such as the reduction of illegal fishing, the conservation of biodiversity and also environmental education. This suggests a high potential for involving these key stakeholders in future MPA activities.

Daily average catch (kg)	A	8
Average annual fishing days	B	135
Average price of catch	C	€ 5.00
Total annual catch per vessel (kg)	D=A*B	1080
AVERAGE PER VESSEL TURNOVER	**E=D*C**	**€ 5,400**
Number of authorized vessels	F	54
Total annual catch SSF (kg)	G=F*D	58,320
TOTAL SSF TURNOVER	**H=E*F**	**€ 291,600**

Table 15: SSF turnover in Taza

The last section of our analysis focuses on estimated the turnover of the SSF sector. On the basis of the information collected in the field and the data analysis, we estimated a weighted average daily catch of about 8kg of fish per vessel, and a weighted average fish price of about €5. This gives a per vessel turnover of about €5,400 and a consequent SSF sector turnover of about €291,600.

	Fishermen protect biodiversity	Fishermen reduce illegal fishing	Fishers practice educational activities
Fully agree	50%	65%	18%
Somewhat agree	24%	24%	32%
Somewhat disagree	3%	0%	0%
Fully disagree	3%	0%	0%
Don't know	21%	12%	50%

Table 14: SSF degree of sharing of MPA institutional goals

V.4 REFERENCES

Boubekri, I., Amara, R., & Mazurek, H. (2019). Characterization of purse seine fishery of Ziama Bay (Gulf of Béjaia, SW Mediterranean): Implications for sustainability management. Ocean & Coastal Management, 175, 79-89.

Boubekri, I., Caveen, A. J., Djebar, A. B., Amara, R., & Mazurek, H. (2018). Structure and spatio-temporal dynamics of the artisanal small-scale fisheries at the future MPA of "Taza"(Algerian coast, SW Mediterranean). Mediterranean Marine Science.

Boubekri, I., & Djebar, A. B. (2016). Marine protected areas in Algeria: future marine protected area of "Taza" (SW Mediterranean), continuing challenges and new opportunities facing an integrated coastal management. Ocean & Coastal Management, 130, 277-289.

Chakour, S. C. (2012). Étude socio-économique pour la future aire marine du Parc National de Taza. Commandée par WWF MedPO

Ligue de Sauvetage de Secourisme et des Activites Subaquatiques – Jijel (2016), Statistiques (2010-2016)

Sfaksi, N. (2012). Suivi de la dynamique paysagère au sein d'un espace naturel protégé: Cas du Parc National de Taza (Wilaya de Jijel, Algérie). Université Ferhat ABBAS – Sétif, Département Biologie et Ecologie Vegetale

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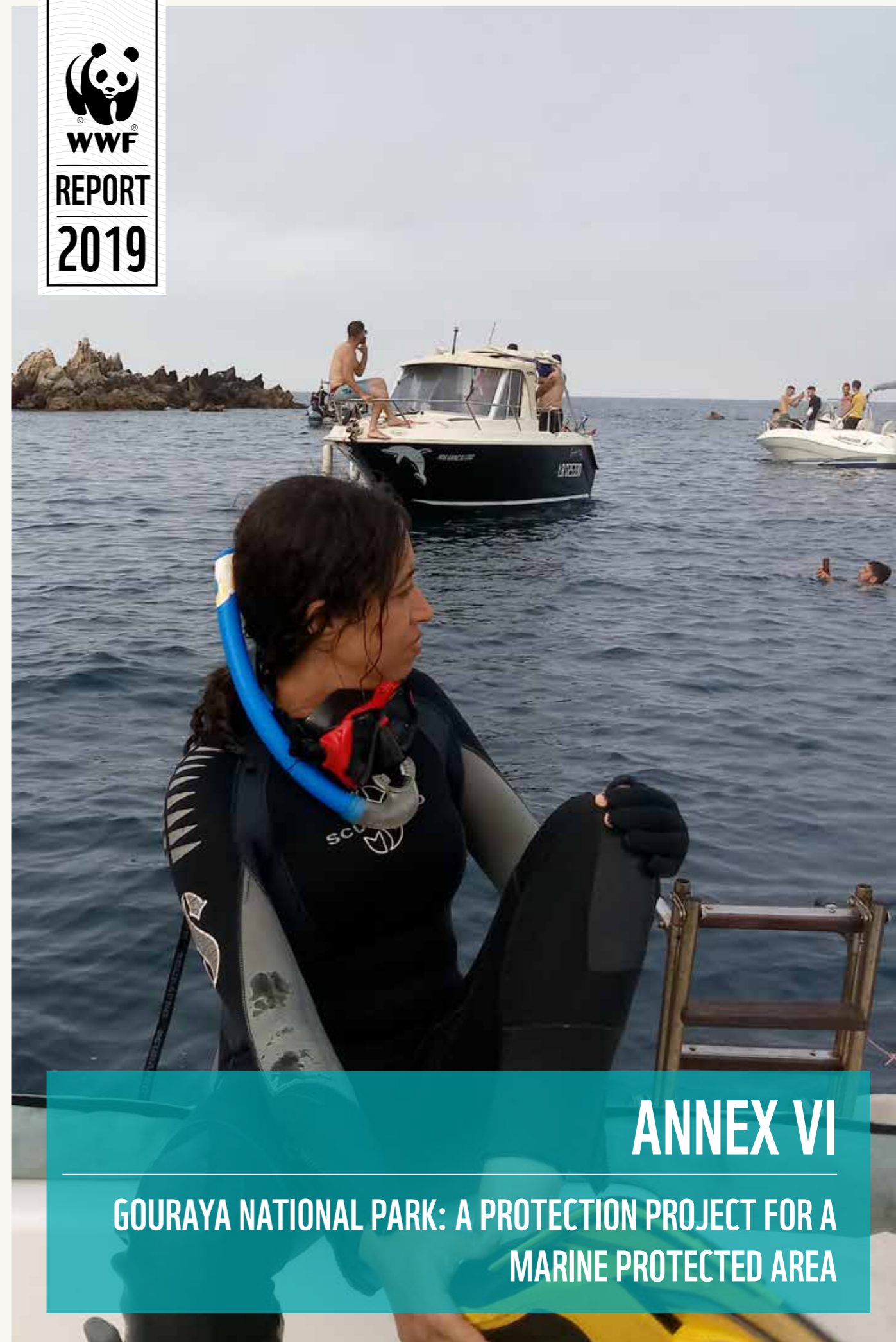
ANNEX VI

GOURAYA NATIONAL PARK: A PROTECTION PROJECT FOR A MARINE PROTECTED AREA

VI. 1. THE INSTITUTIONAL, SOCIO-ECONOMIC AND ORGANIZATIONAL CONTEXT

The bay of Bejaia, located on the Algerian coastline, is a key area for the Algerian industrial economy. Moreover, the presence of important historical sites as well as of a variety of landscapes (rocky shore, beaches, wetlands) has enhanced the development of the tourist sector.

Gouraya National Park was established in 1994 and, in 2004, UNESCO recognized it as biosphere reserve. It has been proposed to extend the national park into the marine area. As shown on the map below, the future Gouraya MPA will extend from Cape Bouak in the east to the island of Pisans in the west.

Figure 1: Location of future Gouraya MPA

Currently, the marine part of Gouraya National Park has no special status. This site is an area of 7,842 hectares under no legal protection.

The area is characterized by a high biodiversity and a natural heritage representative of the Mediterranean Sea. It has undergone significant anthropogenic changes that risk progressively destroying the marine and costal ecosystem. The main goals of the future Gouraya MPA "consist in maintaining the remarkable biodiversity, preserving artisanal activities such as fishing, ensuring the sustainable development of activities related to the marine area and promoting environmental education" (Boumaoura et al., 2018).

Category	Code	Descriptio
Official international recognitions	RI4	UNESCO – Biosphere Reserve (2004)
Legal date of establishment (terrestrial area)	I1	Décret n° 84-327 du 3 novembre 1984 portant création du parc national de Gouraya (wilaya de Bejaia)
Start of the process of establishment (MPA)	E1	2013
Legal framework (national)		Law nr 11-02 2011 (PAs); Law nr 02-02 05-02-2002 (Coastal protection)

Table 1: Key institutional aspects of Gouraya

Category	Typology	Code	Description
Key ecological resources	Ecosystems of international relevance	EE1	Mediterranean Sea shore ecosystem, cliffs and beaches
	Ecosystems of inter	ES1	Sperm whales, short-beaked common dolphin, bottlenose dolphin, harbour porpoise

Table 2: Key natural and cultural resources of Gouraya

Category	Indicator	Code	Measure	Source
Demographic structure	Number of resident population	KS1	959,100	Directorate of Budget Programming and Monitoring (2015)
	Population age structure by major age groups (0-14;15-64; 65+)	KS2	0-14 : 215,560 (22.5%) 15-64 : 680,175 (70.9%) 65+: 63,365 (6.6%)	Directorate of Budget Programming and Monitoring (2015)
Employment	Unemployment rate	KS1	12%	Directorate of Budget Programming and Monitoring (2015)

Table 3: Key social dimensions of Gouraya

Category	Indicator	Code	Measure	Source
Composition of the economic system	Composition of local employment activities	KE1	Agriculture: 20.57% Construction : 23.26% Public Industry : 7.31% Administration: 12.30% Services : 21.43% Tourism : 0.4% Trade : 12%; Other : 0.9%	Chakour, (2012, p. 13)
Structure and features of tourism sector	Annual tourist movement	KT1	Beach tourists : 9,843,370 Hotel stays : 19,698 (2018 data)	Directorate of Tourism (2017)
	International visitors	KT4	10,956 (2018 data)	Regional tourism statistics
	National visitors	KT5	8,842	Tourism regional census

Table 4: Key economic dimensions of Gouraya

Category	Indicator	Code	Measure	Source
Structure and features of tourism sector (MPA)	Annual number of arrivals and overnight stays	RT1	Arrivals : 98,798 Overnight stays : 239,242	Regional tourism statistics (till September 2018)
	Seasonality	RT2	High season (July, August) : 54,790; Low (January) : 2,872	Regional tourism statistics (2018)
	Tourism capacity	RT3	27 urban hotels: 1,845 beds 26 seaside hotels: 2,392 beds 19 hostels : 758 beds	Regional tourism statistics
	National visitors	KT5	350 to 450	MPA report

Table 5: Key touristic dimensions of Gouraya

Category	Indicator	Code	Measure	Source
Structure and features of artisanal fisheries sector	Number of authorized vessels		73	Regional tourism statistics (Till September 2018)
	Number of fishing days	KF1	365	Fishermen's associations registers
	Daily catch	KF2	4kg - 7kg	Fishermen's associations registers

Table 6: Key dimensions of small-scale fishing sector in Gouraya

Category	Description	Source
Management authority	Ministere de l'Agriculture et du développement rural, Direction générale des Forẹt (Official headquarters: Municipality of Bejaia)	-

Table 7: Key organizational aspects of Gouraya

VI. 2 THE CHALLENGE OF NATURE-BASED TOURISM: THE SCUBA DIVING SECTOR

As in other coastal areas of the Southern Mediterranean, the nature-based tourism (NBT) is still underdeveloped. Although the area is characterized by consistent mass tourism concentrated in the summer months, there is a growing interest in kinds of tourism more respectful of marine and coastal resources, such as scuba diving.

Through field research, we tried to understand the potential of the scuba diving sector for the local economy and for the future Gouraya MPA. We issued 34 questionnaires during summer 2018. Most of the people interviewed was divers (56%), but there was a small percentage of kayakers (12%). Most respondents were between 21 and 50 years old, with 50% aged 31-40.
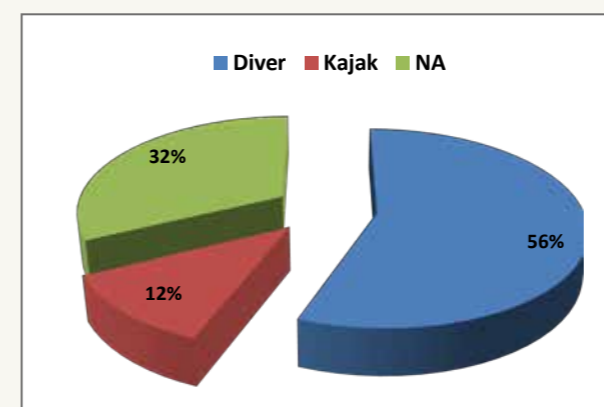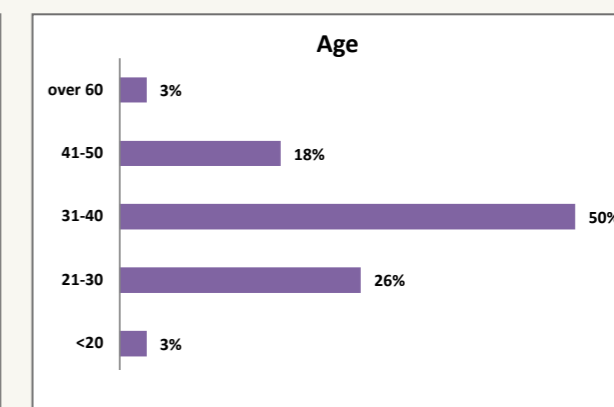

Figure 2: Profile of interviewees

Figure 3: Age profile of interviewees

The average education level is high, with 82% of tourists having university degree, while the occupational analysis revealed an high percentage of employed workers (62%).
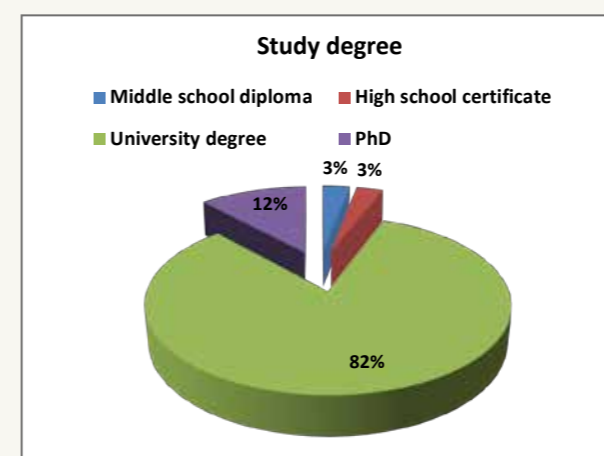

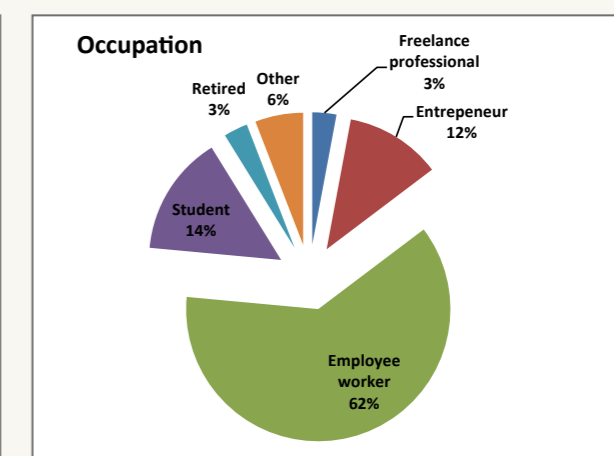*Figure 4: Educational level of NBTs*

Figure 5: Occupation of NBTs

The analysis showed a purely domestic tourism, with a flow of tourists coming from the main Algerian cities (Algiers) or from the inner towns (Setif). There is a very low presence of international visitors (3%). Also the average stay is low, with five days of holiday and about one day spent diving.
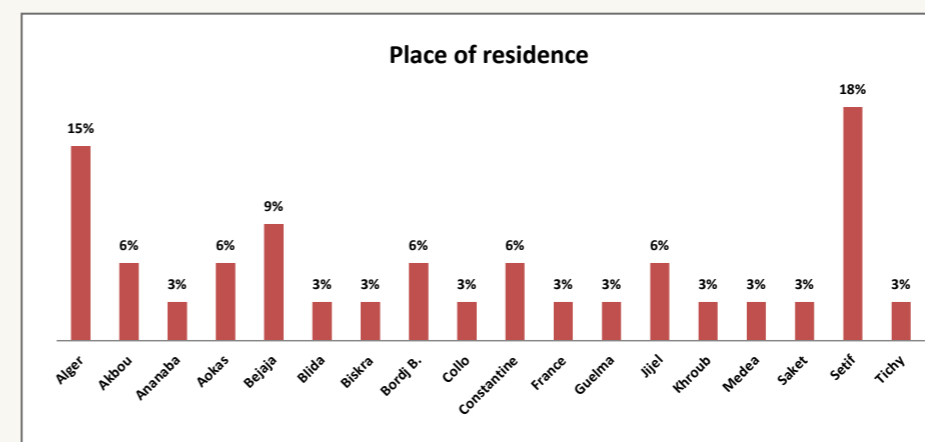

Figure 6: Place of residence of NBTs

As shown in the graph below, the choice of diving site was most frequently influenced by the MPA's specific features, such as the water quality (23%) and the presence of particular underwater scenery (23%). Safety was the most important factor for 24% of respondents.
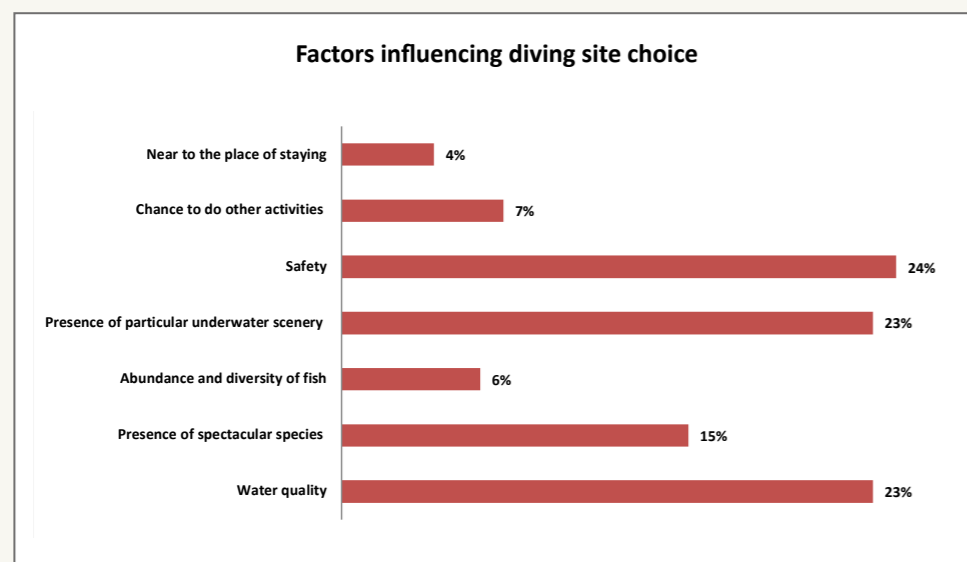

Figure 7: Factors influencing choice of diving site

Although it has not yet been officially designated as a protected area, the respondents showed a positive attitude toward conservation of the natural resources and, consequently, a kind of nature-based tourism. Of those interviewed, 82% think that the presence of an MPA ensures ecosystem conservation.
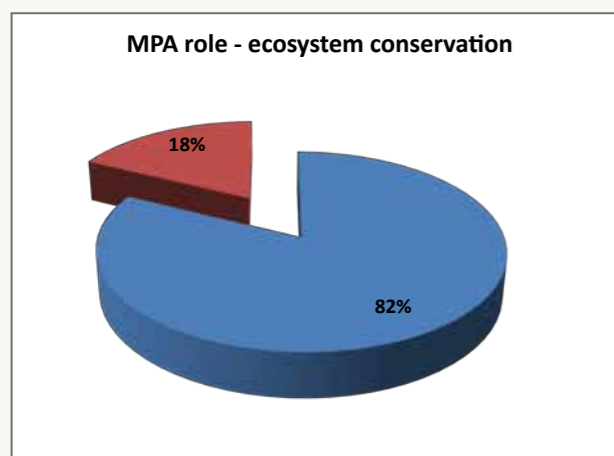
Figure 8: Does the MPA support ecosystem conservation?

This general positive conservation awareness is confirmed by the data on willingness to pay extra amounts of money for the experience of diving inside an MPA. Over half (53%) of the respondents said that they are willing to pay €5-10 more per dive, while one in four (24%) are willing to pay more than €10. Management activities that people wanted to see funds allocated to include enforcing regulations (27%), creating strict conservation areas (19%) and improving facilities (18%).
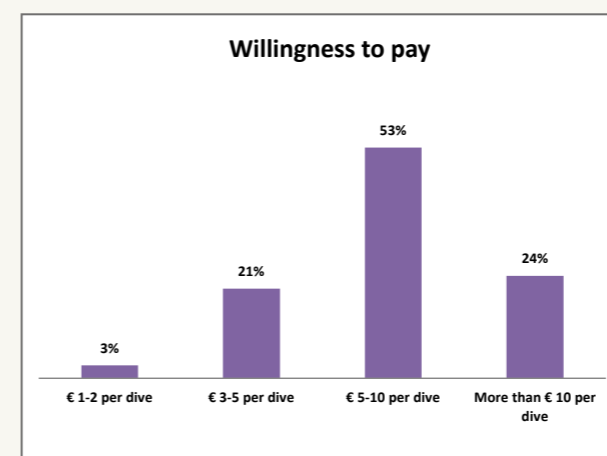
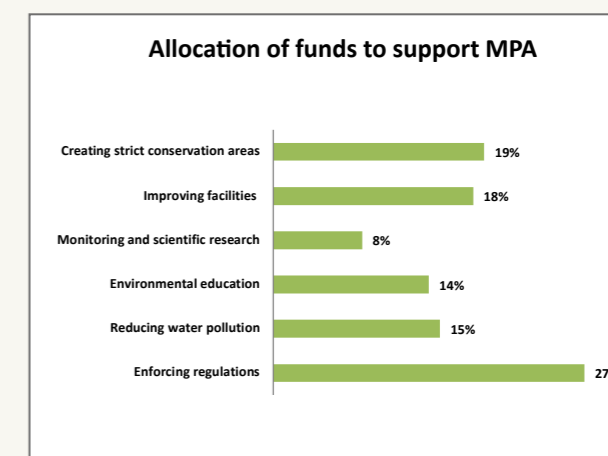*Figure 9: NBTs' willingness to pay extra to support conservation*

Figure 10: How extra funds for MPA should be allocated

To estimate the economic value of diving, as an example of NBT, we applied the travel cost method (TCM), adapted to the peculiarities of the site. The table below identifies and details the structure and the sources used to calculate the travel cost.

Travel cost subsection	Subsection elements	Source
TC1	Car transport cost	Calculation of distance from place of residence and cost estimation with ViaMichelin.it
	Plane transport cost	Estimation from hypothetical flight from respondents' place of residence to the airport of Bejaial, Algeria. Average value between high-season and low-season flight, using Skyscanner.it prices.
	Bus ticket	Estimation of the average price of the bus ticket related to the routes Algiers/Blida or Algiers/Bordj B. (Sogral transport company)
	Ticket to dive	Cost of a one-day diving experience, with all equipment. Average prices estimated by survey respondents (question "Daily expenditure of diving/snorkel")
TC2	TC1 + Overnight cost	On the basis of the type of accommodation identified by the respondent, online analysis of average price for - Hotel: average daily high/low season prices for three-star and five-star hotels - Second home/resident: estimated daily cost for living in the area, considering utilities cost calculated with www.numbeo.com - Rented house: daily cost for renting, calculated from the cost of monthly rent available on www.numbeo.com - Camping: average daily high/low season prices for available camping
TC3	TC2 + expenditure for other activities/services	Average price for food, considering the average between prices of meals in mid-range and inexpensive restaurants available in the area, obtained with www.numbeo.com
TC4	TC3 + WTP	Weighted average amounts indicated by respondents

Figure 11: Travel cost structure and sources for Gouraya analysis

After the definition of each cost items, it was necessary to assess the average value of each travel cost (TC1, TC2, TC3, TC4). These average values refer to the cost of both the days in which the dives were carried out, and the entire period spent in the Gouraya area, as described in the following tables.

TC1	TC2	TC3	TC4
Car transport cost + plane transport cost + bus transport cost + ticket to dive	TC1 + overnight cost	TC2 + expenditure for other activities/ services	TC3 + willingness to pay an additional amount of money to fund conservation projects
€ 17.86	€ 156.56	€ 184.79	€ 197.35

Table 8: Travel cost value for the days in which the dives were carried out

TC1	TC2	TC3	TC4
€ 32.72	€ 171.41	€ 199.65	€ 212.20

Table 9: Travel cost value for the for the entire period spent in Gouraya area

These values have been multiplied by the number of annual scuba divers (400) in order to estimate the overall economic impact of the diving sector in the area, summarized in the following tables.

Recreational value (RV) for the days in which the dives were carried out		
RVX	TCX *N° ANNUAL SCUBA DIVERS	TOTAL AMOUNT
RV1	€ 17.86 * 400	€ 8,829
RV2	€ 156.56 * 400	€ 45,936
RV3	€ 184.79 * 400	€ 55,347
RV4	€ 197.35 * 400	€ 60,585

Table 10: Recreational value for the for the days in which the dives were carried out

Recreational value (RV) for the entire period spent in Gouraya		
RVX	TCX *N° ANNUAL SCUBA DIVERS	TOTAL AMOUNT
RV1	€ 32.72 * 400	€ 13,088
RV2	€ 171.41* 400	€ 68,564
RV3	€ 199.65 * 400	€ 79,860
RV4	€ 212.20 * 400	€ 84,880

Table 11: Recreational value for the entire period spent in Gouraya

The recreational value is useful to build the demand curve, the final TCM output, which shows the relation between the travel cost and the number of visitors. The areas of the rectangles in the figures represent the areas of profit for the market and of extra profit related to the divers' hypothetical willingness to pay for conservation.
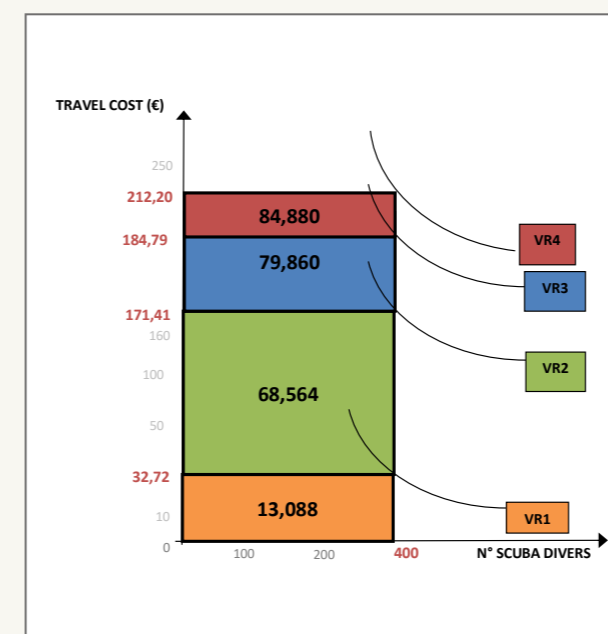

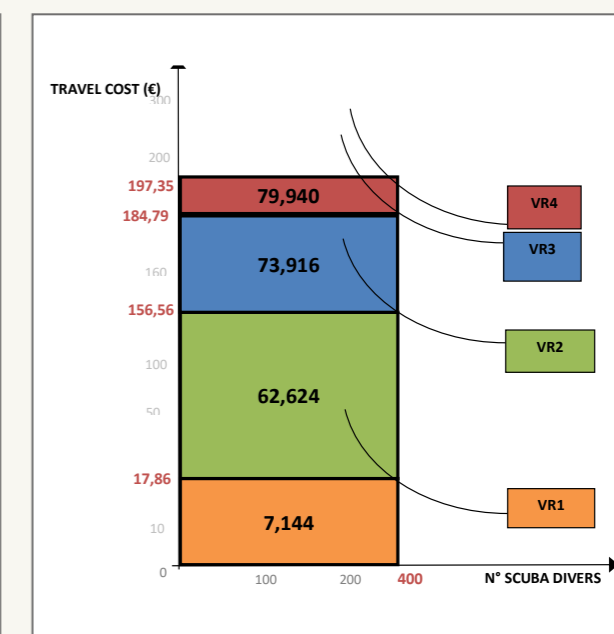*Figure 12: Recreational value associated with the entire period spent in Gouraya – Demand curve*

Figure 13: Recreational value associated with the days in which the dives were carried out – Demand curve

As explained in the methodological section of this report, the TCM findings are a conservative estimate of the recreational value that the scuba diving sector is able to produce, due to the difficulties in collecting reliable information. Despite these constraints, the study underlines the potential of this tourism niche and its ability to support the entire local tourism sector.

VI.3. THE SMALL-SCALE FISHING SECTOR: ECONOMIC STRUCTURE AND PERFORMANCE

The marine area of Gouraya National Park faces often conflicting developments. In this narrow coastal area a fragile ecosystem coexists with strong anthropogenic pressure, and a balance is needed between the conservation of natural heritage and economic development (urbanization, tourism, fishing, etc.).

The local small-scale fishing (SSF) is a key sector for the local economy in Gouraya. As in the other marine contexts in the Mediterranean and globally, in the Gouraya area there has been a decline of fish resources. For this reason, "the establishment of marine protected areas is beginning to be considered as an effective alternative for the management of coastal fisheries" (Robert & Polunin, 1991). Coupled with this, developing a system of knowledge of the small-scale fishery at Gouraya and of the fishing zones of Bejaia will enable better regulation of fishing activities. This is the main challenge for the future Gouraya MPA.

In Gouraya area there are 73 authorized vessels that practise artisanal fishing. We conducted a survey on a sample of 37 fishermen, in order to better understand the socio-economic dynamic of the small-scale fishery sector and the fishermen's attitude toward the establishment of the future MPA. The average age of those interviewed was from 41 to 50 years old (43%), followed by 51-60 (35%). Two-thirds (65%) of the respondents come from the town of Bejaia.
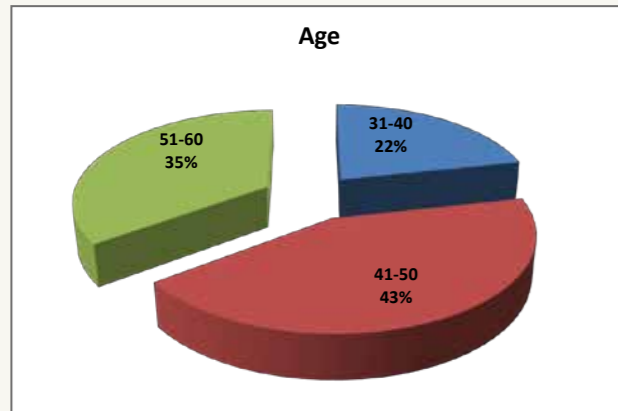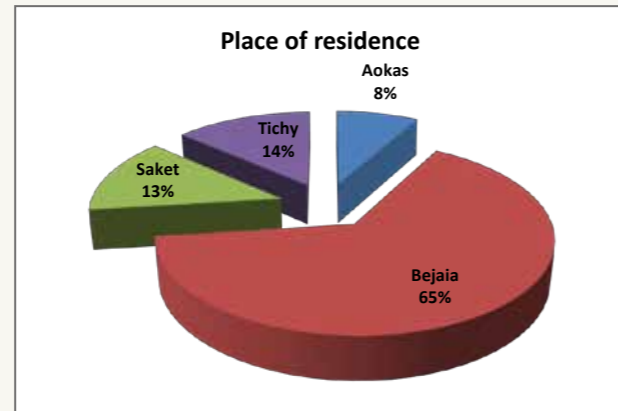
Figure 14: Age profile of SSF

Figure 15: Place of residence of SSF

The vessels had an average of 6m length, 2.52GT of tonnage and 48kW of engine power. The most used fishing methods are gillnet (45%) and palange (26%).
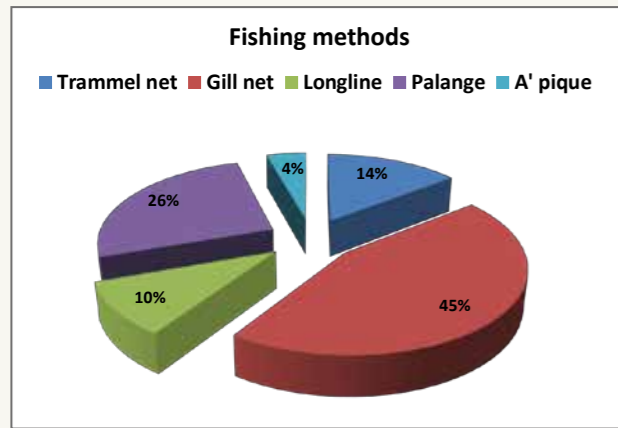

Figure 16: Fishing methods

As shown in the graph below, the average composition shows a predominance of so-called second-class fish (36%), followed by third-class fish (30%) and octopus and cuttlefish (21%).
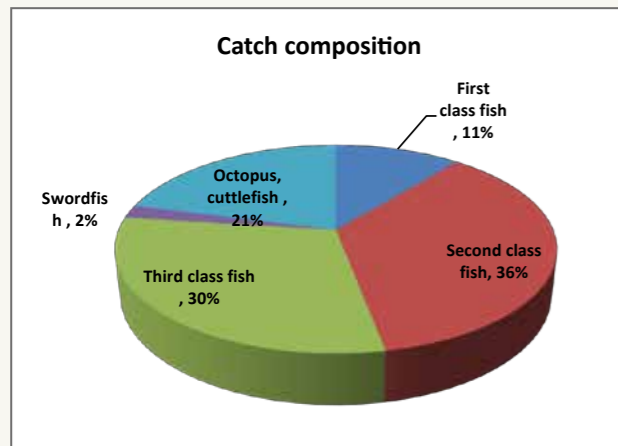
Respondents sold most of their fish to restaurants (35%) and wholesalers (30%).

Figure 17: Catch composition
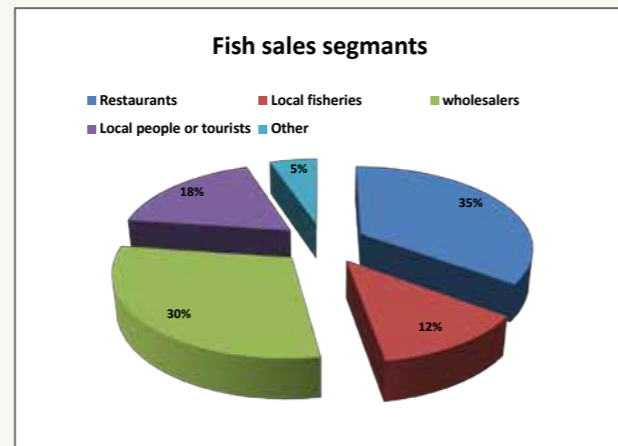
Figure 18: Who SSF sell their fish to

The relationships between SSF and other users of the future MPA showed a high percentage of conflict in relation with other professional fishermen (89%). This is related to the use of fishing techniques that damage natural resources and above all because they compete for the same fish resources.
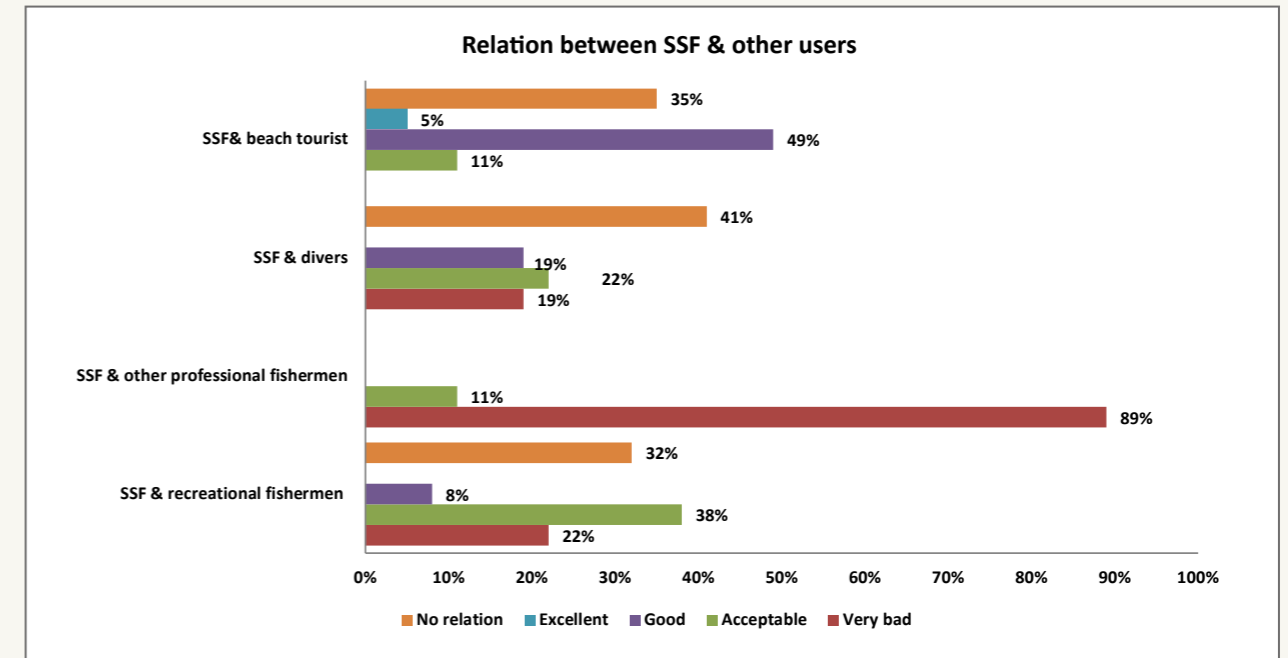

Figure 19: SSF perception of relationships with other MPA users

One of the issues on which the management of the future Gouraya MPA should focus is working on raising awareness around the activities and impact of the MPA. Fishermen have a low level of trust in the MPA and its role in enhancing the improvement of the well-being of the local community. Most of the fishermen interviewed claim that the presence of a MPA won't significantly affect their income or their fishing activities.
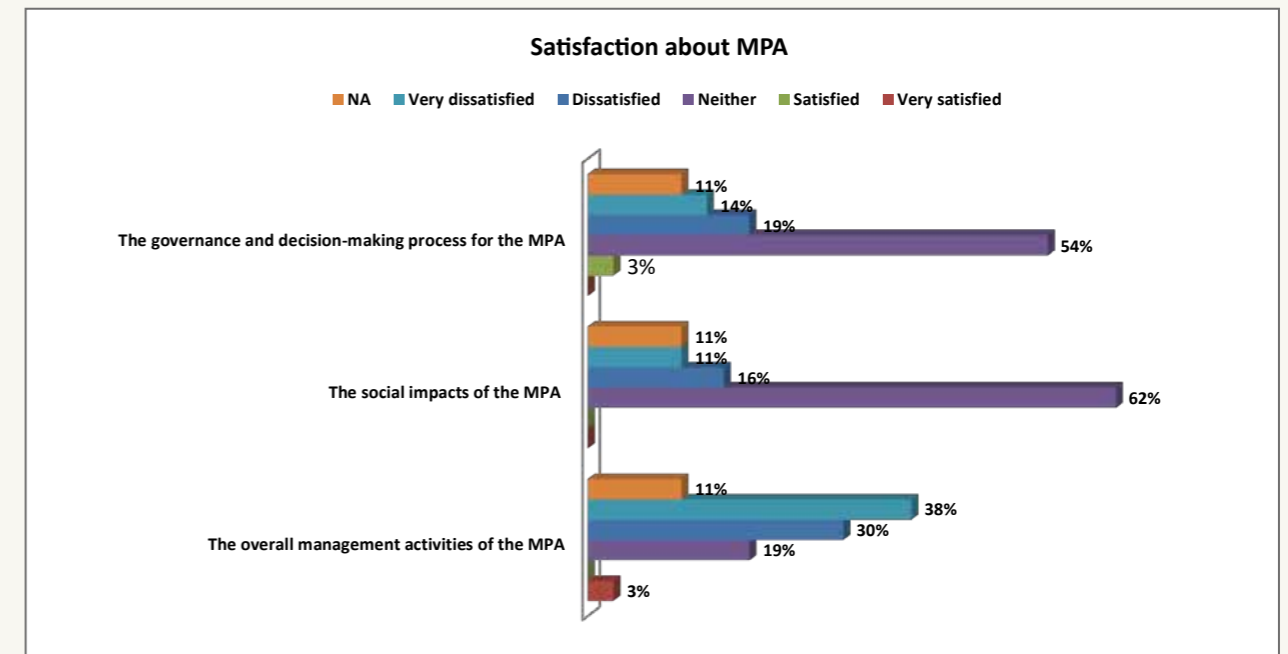

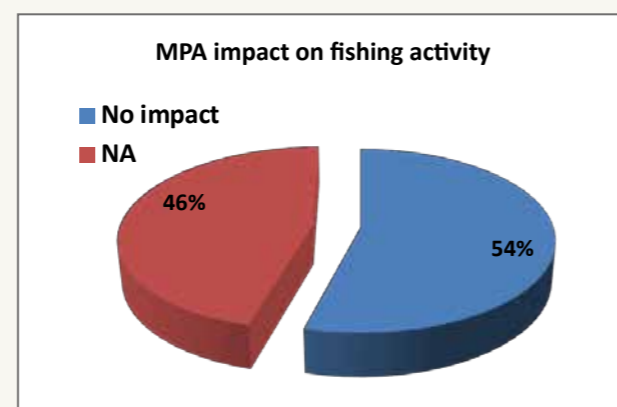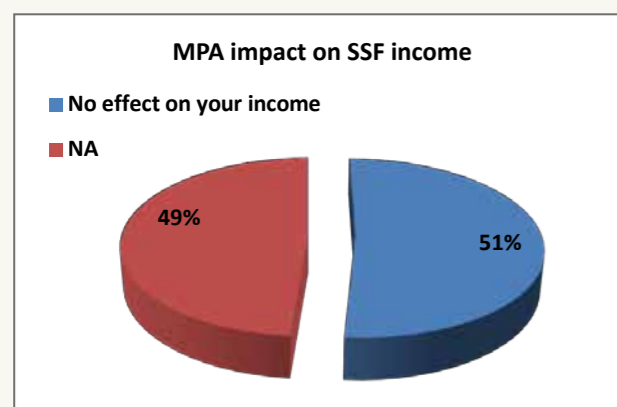*Figure 20: SSF degree of satisfaction with MPA*

Figure 21: MPA impact on SSF income

Figure 22: MPA impact on fishing activity

Our analysis of the small-scale fishing sector in Gouraya ends with an estimation of the sector's turnover, taking into consideration the results from the survey and the analysis of the background information. According to the survey results, the average daily catch is about 7kg and the weighted average sale price is about €7/kg. These two measures were multiplied by the average number of fishing days, that is about 365 days (according to the fishermen's associations registers). From this calculation the per vessel turnover was estimated at €17,885, giving a consequent SSF sector turnover of €1,305,605.

Daily average catch (kg)	A	7
Average annual fishing days	B	365
Average price of catch	C	€ 7
Total annual catch per vessel (kg)	D=A*B	2555
AVERAGE PER VESSEL TURNOVER	**E=D*C**	**€ 17,885**
Number of authorized vessels	F	73
Total annual catch SSF (kg)	G=F*D	186,515
TOTAL SSF TURNOVER	**H=E*F**	**€ 1,305,605**

Table 12: SSF Turnover in Gouraya

While these results indicate the need to create a stakeholder involvement processes, the interviewed fishermen appear to share the mission of the MPA especially in the protection of biodiversity (51%) and in the reduction of illegal fishing (59%). The latter is a critical issue to tackle, due to the high impact it has on fishing activity.
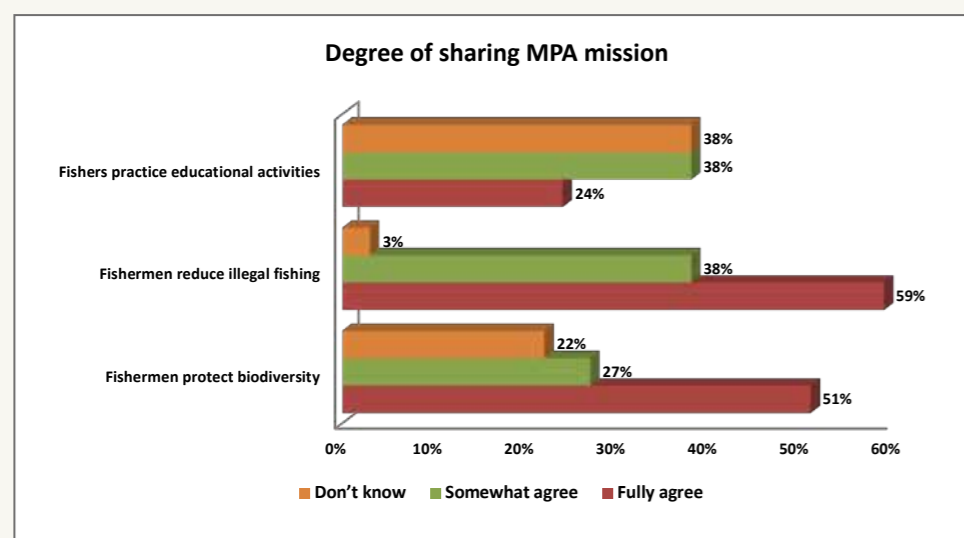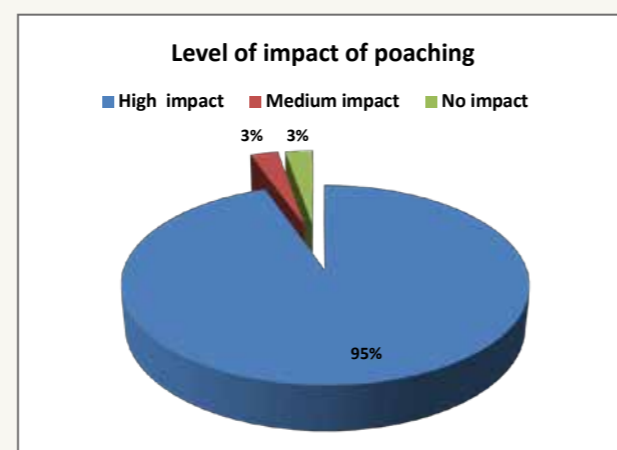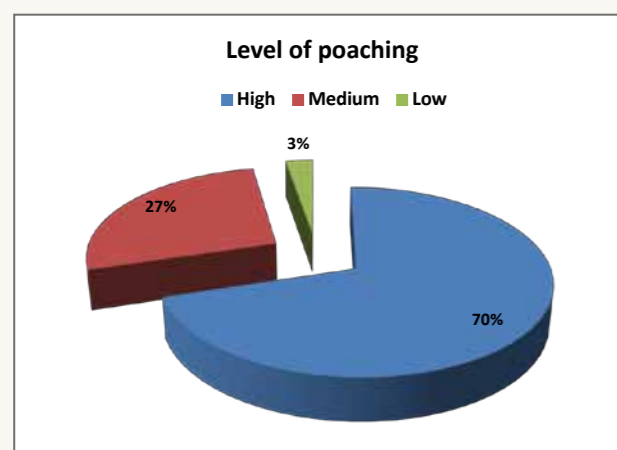

Figure 23: SSF degree of sharing MPA mission

VI.4. REFERENCES

Belbacha, S. (2016) Parc National de Gouraya. Rapport d'enquête sur la situation dela pêche artisanale dans la future aire marine protégé du Parc National Gouraya. Micro project Med Pan/Parc National de Gouraya, pp. 1-45

Boumaour, A., Grimes, S., Brigand, L., & Larid, M. (2018). Integration process and stakeholders' interactions analysis around a protection project: Case of the National park of Gouraya, Algeria (South-western Mediterranean). Ocean & Coastal Management, 153, 215-230.

Figure 24: SSF perception of level and impact of poaching in MPA

MEDITERRANEAN MPAs IN NUMBERS

1%

Though it covers less than 1% of the global water surface, the Mediterranean is one of the richest seas in terms of biological diversity

9.68%

Approximately 9.68% of the Mediterranean Sea has been designated as MPA, mainly only in the northern part of the basin or with small paper parks

2.48%

Only 2.48% of the Mediterranean is covered by MPAs with a management plan, only 1.27% by MPAs that effectively implement their management plans

US$5.6 TRILLION

The economic assets generated by the Mediterranean Sea are valued at around US$5.6 trillion.

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