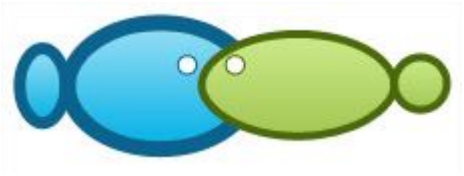

Proportions of social acceptance in the designation of a marine protected area: Cap de Garde in Annaba, Algeria (SW Mediterranean)

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Abstract. The main mandate of Marine Protected Areas (MPA), defined by the conservation of biodiversity, marine resources and habitats, their creations must also have a positive impact on social conditions. The achievement of such objectives depends on the initial design process, hence the need to consult with the local community and stakeholders during all phases of the design of the MPA. In the Mediterranean the MPA have shown their capabilities to provide a variety of benefits, hence the perpetual growth of their numbers which reached 677 in 2012. However, their distribution is uneven between the two shores, 93.39% of them are located in the North against 6.61% in the South. Although Algeria has only two MPA, it attaches great importance to the protection of the environment with the ratification of several conventions, treaties and protocols, the most important of which is the commitment under the CBD. It is in this context of the establishment of MPAs that our study is aimed at analyzing the influence of users' knowledge, beliefs, attitudes and occupational factors on social acceptance to the proposal to create an MPA in the Cap de Garde region of Annaba on the Northeast Algerian coast (SW Mediterranean). This study examines the nature of the reactions of all users of the site, designated since 2005 by the United Nations Environment Program as Specially Protected Areas of Mediterranean Importance (SPAMI). For this, 600 questionnaires were submitted to the public between June and August 2014, with a 73.3% response rate. While the results from a frequency analysis show that 81.6% of respondents are in favor of the project. The Pearson Chi-square test (χ^2) and a classification analysis (direct marketing) allowed us to distinguish 3 socioprofessional profiles. The first profile is represented at 58.2% by male of university level, state officials, not practicing any extractive activity in the study area. The 2nd profile includes 100% of tourists, mostly university male from various professions. While the 3rd profile accounts for 13.2% of the respondents and is 100% of male practicing a profession related to the direct use of the marine environment, with a very low level of education. Public participation at such an early stage has allowed us to identify and quantify the degree of acceptance, as well as the interest of the community and users in protecting the marine area of the Cap de Garde in Annaba.

Key Words: marine environment conservation, sociologic survey, social assessment, conservation in Mediterranean Sea, socio-professional factors.

Introduction. The number of marine protected areas (MPA) established and/or planned in the world has increased dramatically in recent years (Guidetti 2006; Revenga & Badalamenti 2008). This pace continues to accelerate in order to achieve the international targets on protected areas set at the World Summit on Sustainable Development (Johannesburg 2002 in ONU 2002) and the United Nations Convention on Biological Diversity (CBD). At the COP10 held in Nagoya, Japan (De Santo 2013), the aim was to increase the global aerial coverage of MPA from 2.3% according to Boubekri & Djebar (2016) and Spalding et al (2013) to 10% in 2020 of protected seas and oceans (Bennett & Dearden 2014b).

The Mediterranean Sea a natural and cultural heritage, a hot spot of global biodiversity, is subject to strong human pressure (Blondel & Aronson 2005; Lotze et al 2011), it has seen a massive increase in the number of MPA that supply of benefits (Garcia-Charton et al 2008). All the countries bordering this sea are signatories to the CBD and the Barcelona Convention (amended in 1995), which oblige them to reduce the loss of biodiversity (Abdulla et al 2008). This has led to a collective approach and the

adoption of a new Protocol on Specially Protected Areas and Biological Diversity SPA/DB (UNEP-MAP-RAC/SPA 1995) as the main instruments for designation and management of MPA at the regional level. For example, the Mediterranean has increased from 40 MPA in the 1990s (Badalamenti et al 2000, 2002) to around 100 in 2008 (Abdulla et al 2008; Revenga & Badalamenti 2008) and is protected in 2012 by a network of 677 effective MPA (Gabrié et al 2012). The Algeria represents only 1.89% of total MPA around the Mediterranean (Boubekri & Djebar 2016). In 2005, the United Nations Environment Program (UNEP) designated 4 sites: le Banc des Kabyles, les Îles Habibas, l'île Rachgoun et le Cap de Garde in Annaba as potential MPA (UNEP 2005). To date, only two sites have been designated as Specially Protected Areas of Mediterranean Importance (SPAMI), namely le Banc des Kabyles in Jijel and les Îles Habibas in Oran, and 6 other sites are still being planned and are currently in project.

Growing interest in MPA by governments and ecologists around the world, lies in the role they play as an effective management tool for addressing the observed dysfunctions between different ecological, social and economic systems in marine and coastal areas.

The ecological system is affected by the socio-economic system through anthropogenic pressures. The many human activities and their pollutants cause serious effects on marine ecosystems, such as the diminution of biodiversity, declining fish stocks, degradation and destruction of natural habitats, as well as changes in the chemistry of the water and temperature (Islam & Tanaka 2004; Batista et al 2014). The development of adequate and effective conservation measures to address the impacts that generally affect marine ecosystems is imperative.

For this purpose, MPA are proposed as an effective bulwark protecting and conserving biodiversity, critical habitats and species, MPA help restore overfished stocks and degraded areas and solve conflicts of use and to address other issues related to protection (Kelleher 1999; Boubekri & Djebar 2016). Their objectives are not only oriented towards ecology but also focus on sociological aspects (Thomassin et al 2010). In general, studies on the establishment and evaluation of future MPA tend to focus on the collection of biological data, whereas if one refers to the literature (Davis 2002; WWF 2005; Charles & Wilson 2009), societal, economic, cultural and institutional issues are equally essential to the success of these and must be integrated in the process of establishment and management. Succeeding this dual mandate is more complex in practice than in theory, in fact, studies show the ineffectiveness of MPA to achieve goals at the same time social and ecological (Lowry et al 2009; Bennett & Dearden 2014a), to the point of being criticized for negative impacts social, economic, cultural and political on local populations and communities (Bennett & Dearden 2014b). Coastal areas are usually subject to a variety of resource use, resulting in conflicts of interest between users (Thomassin et al 2010). The conflicts generated can be both internal conflicts between users, and basic between conservation and exploitation (Crosby et al 2000), making the creation and management of MPA even more complex, mostly in socio-politico-economic context of densely populated areas (Spalding et al 2010). The need for a reassessment of how social and economic considerations are incorporated into MPA projects is essential (Voyer et al 2012).

Thus, addressing the problem of effective MPA management requires an assessment of people's beliefs, customs, practices and attitudes towards their environment (Gray et al 2010). The social assessment plays an important role in building an understanding of the social factors that influence the planning and management of MPA, hence the need to collect information on the social field.

The MPA mainly regulate human behavior (Blaustien 2007; Blount & Pitchon 2007; Northcote & Mcbeth 2008), it is certain that they affect the wellbeing of individuals and groups who appreciate use of the marine environment as part of their lifestyle and their social identity (Momtaz & Gladstone 2008; Voyer et al 2012). This is the case in the region of Cap de Garde in Annaba which is under strong pressure uncontrolled that threatens biodiversity. Tourism and demographic pressures due to the significant increase in attendance at neighboring sites and the saturation of available space, erode land space already heavily degraded (Grimes 2012). As for the marine environment, it is

contaminated by a growing organic pollution which would quickly condemn any manifestation of life, especially in the eastern part of the Cape (UNEP 2005). Despite its description as bio-strategic and priority for United Nations Development Programme (UNDP) protection method in the context of the Mediterranean action plan (MAP), Cap de Gadre enjoys no status of national or international protection. Nevertheless, a classification procedure launched by the Ministry of Water Resources and Environment, which is a prerequisite for any protection measures, has been under way for several years.

In this context is located our study on the assessment of social acceptance, a preliminary step in the process of setting up an MPA. This is the first sociologic survey in the region of Annaba which combines the local population, key stakeholders and users of the marine environment in the process of creating decision-making of MPA of Cap de Garde in Annaba- Algeria (SW Mediterranean).

Material and Method

Description of the study zone. The study area is located between E7° 39'51 '' and N37° 00'15 '', at the extreme east of Algeria in the commune of Seraidi, Daïra of Annaba, Wilaya of Annaba (Figure 1) which counts 700,000 inhabitants and 3 tourist extension zones: the Annaba coast road (Cap de Garde) spreading over 375 ha, the West Bay in Chetaibi with 382 ha and Djenane El-Bey in Oued Begrat in Seraïdi which covers 137 ha (Annuaire monographie 2014). This site spreads over a 9.5 km coastal line going from the Cap de Garde, known as Ras El Hamra, to the Pain de Sucre promontory with the Mediterranean Sea at the north and Djebel Edough at the south (Figure 1). It has 2 sides: the 1st to the west of the Cap de Garde is still virgin with 600 m of sandy beach, 2,400 m of rocky and inaccessible coastal relief resulting from massifs which plunge directly into the sea; the 2nd, to the east is partially urbanized with the presence of a naval forces observatory, a lighthouse and a few dwellings, secondary properties of city dwellers, but seasoned fishermen. This sector is served by the only road of approximately 8 km which leads to the chief-place of the Wilaya of Annaba, one of the biggest agglomerations of Algeria and one of the most polluted due to massive industrialization.

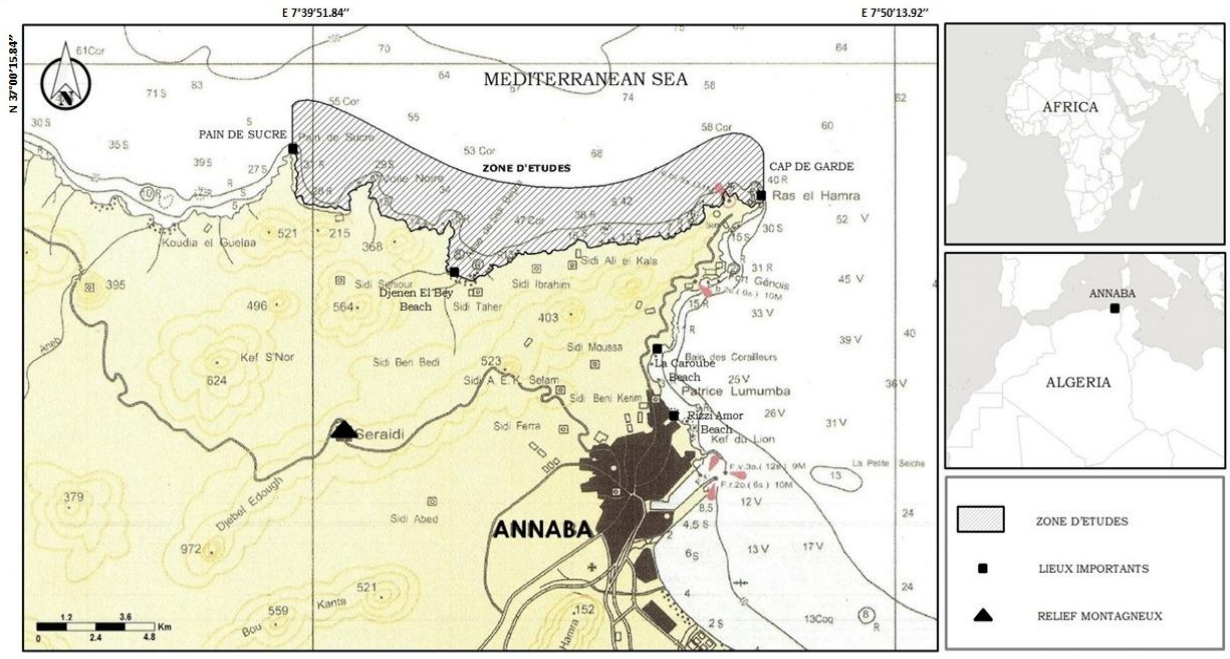

Figure 1. Map showing the location of the study area selected for the establishment of the MPA of Cap de Garde in Annaba, Algeria.

The rocky dominance of the site makes its access difficult for the fishing gear, which has allowed this area to retain a great fauna and flora richness. The census realize by Grimes (2012), indicates the presence of 331 species, some of which already enjoy an international protection status. This is the case of seagrass *Posidonia oceanica*, gorgonians *Eunicella* sp., the noble pen shell *Pinna nobilis*, the dusky grouper *Epinephelus marginatus* or marine mammals such as the dolphin *Delphinus delphis* (Grimes 2012). This site is also a privileged observatory for scientific research in the fields of marine biology, tourism, history and culture.

Development of the questionnaire. The data obtained were collected by means of a survey which necessitated the establishment of a questionnaire consisting essentially of closed-ended questions limiting the choice of response. This tabular questionnaire consists of 17 sections with 90 questions, of which 88 are closed and 2 are open.

The first section concerns the marine activity practiced since a year with a choice of answer limited to 8 suggestions: professional fishing, recreational fishing, swimming, snorkeling, boat-sailing (personal or rental boat), and sailing with a personal or rental motor boat.

The second section consisted of defining the respondents' general knowledge of biology and marine reserves.

The third section has been divided into 3 subheadings concerning questions related to the perception of the environment health status in general, freshwater, sea, coral reefs, fish and sea grass beds.

The fourth section was exploited under 2 aspects, the first concerned threats to the marine environment related to the practice of anthropogenic activities and the second was directed towards the knowledge of animal or plant species threatened with extinction in the Mediterranean.

The fifth heading comprises 3 subheadings:

- The evaluation of communication about the project and the means used (television, radio, newspapers, public authorities, verbal communication or through the internet);
- The user group to be included in the decision-making process for the implementation of such a project (local population, professionals, scientists, environmental protection associations, administrations and authorities).
- The involvement of user groups in socio-professional organizations or associations of environmental nature.

The following section is devoted to solutions that may help reduce the threats to the marine environment through 7 suggestions: integral marine reserve, multi-use marine reserve, preservation of the current cantonment, a bay contract creation, control reinforcement on environment use, awareness-raising of marine environment and tourist sensitization about it.

In the 12th section, we indirectly interpreted the social acceptance of the project by asking the question: 'Are you in favor of creating an MPA at the Cap de Garde?' While in the 13th, we sought to evaluate the beneficial impact of creating an MPA.

We then sought the respondents' opinion on the establishment of an environmental tax financing the management of the marine reserve before estimating the environment non-use value.

The last section was devoted to the description of the respondent's socio-professional situation: gender, resident or tourist, profession and level of education.

Method of data collection and sampling strategy. The method of data collection and the sampling strategy required a preliminary step.

The test study carried out between April and May 2014 enabled us to make the necessary appointments to talk with public authorities and stakeholders of the sectors concerned. The study was launched after having been tested on 3 groups of users, pre-selected as having a common interest in protecting the study area.

- The fishermen group represented by 10 of them, contacted by telephone for an interview in the Fisheries Chamber in presence of the Director and their representatives.

- The second group consisted of the public authorities: the Environment Director, the Fisheries and Fishing Resources Director, the National Coastal Commission (CNL) and the Deputy Mayor in charge of the environment and coastal management within the municipality of Annaba.

- The third group consisted of scientists regrouping students and researchers from the Sciences Faculty of Annaba University.

The results obtained enabled us to adjust the initial questionnaire in accordance with all their recommendations.

As for the final study carried out between June and September 2014, it enabled us to retain 4 groups of users to whom 600 questionnaires were submitted.

- The first group includes the public authorities represented by the officials of the Directorates of Environment, Fisheries and Fishing Resources, Tourism, the National Coastal Commissioner and Annaba Municipality.

- The second group represents scientists, namely students and researchers from the Department of Nature and Life Sciences and the Department of Marine Sciences.

- The third group concerns fishermen working in the port of Annaba. Along with 5 to 10 minutes interviews, 120 questionnaires were distributed to this category of users, known to be difficult to approach, in order to explain to them in a simplified way the objectives and expected results of this project.

- The fourth group corresponds to holidaymakers and summer residents. A geographically stratified sampling was used in the tourist and holiday resorts of Annaba; 120 questionnaires were distributed at 3 busy places in the city: the Cours de la Révolution Avenue, the seafront promenade and the Cap de Garde frontline. 120 others were submitted in August 2014 to holidaymakers encountered on the Oued Bagrate beach which was included in our study area (the only sandy beach, accessible by road, where swimming is not prohibited).

All questionnaires were retrieved after one week. Thus, after the questionnaire finalization and before undertaking data collection, we sought to know the relevant size of the sample.

Calculation of sample size. The method used in administering the questionnaires required motorized travel because of the distance between the sampling points. Of the 600 questionnaires distributed, 500 were returned with a response rate of 83.4% and after verification we removed the incomplete questionnaires to validate only 440.

According to equation: $n = N / 1 + N \times e^2$ (Guide Méthodologique: Enquête de terrain 2011), where N = population size, e = precision level, a number of 400 questionnaires are obtained, to which 10% is added to absorb the losses due to the field constraints, obtaining thus a final size of 440 samples.

The sample size is valid for a statistical study with a 95% confidence level and a of 5% variability degree.

Data from the survey were captured and analyzed using SPSS v20 Inc. Software, Chicago, IL, USA. Three types of analysis were exploited:

- Univariate analyses including frequency, mode and median,
- Bivariate analyses through the establishment of Pearson Chi-square test.
- Multivariate analyses based on the multi-response test to group several variables into one together with the classification test (direct marketing). This latter allows the profile characterization of the persons who have responded to the various hypotheses related to the social acceptance of the MPA project.

Assumptions test. We have focused our investigation on 13 hypotheses where we have grouped together all the questioning related to the creation of the Cap de Garde MPA.

1. The use of resources by determining: the type of marine environment use, the activity most practiced, the socioprofessional category concerned and the assumption that the people who mostly practice these activities tend to reject the establishment of the MPA.

2. The determination of general knowledge about biology, environment and reserves: we suggested classifying socio-occupational categories according to their

knowledge of biology and the environment, assuming that the better they know an ecosystem, the easier its protection acceptance will be.

3. The perception of the environment state of health in general and that of the marine environment in particular because logically, the more people feel concerned by the environment state of health, the more they are predisposed to accept its preservation through among other things, the establishment of an MPA. What is the socioprofessional category which thinks that the environment is of poor quality, that it has been continuously deteriorating during the last decade and in that case what is the most threatened resource.

4. The perception of environmental threats where it is felt that the more aware a society is of the threats to its environment, the more receptive it is to the creation of MPA. For this reason we have submitted two questions: do the people who participated in the survey know of animal or plant species threatened with extinction in the Mediterranean before establishing their socioprofessional profiles, are the threats to our environment taken seriously and which profiles characterize this segment of the population.

5. Communication around the project to create the Cap de Garde MPA. We wanted to know if people have heard about the Cap de Garde MPA project in Annaba, if so, through which means of communication; and finally which socioprofessional category is best informed because the better society is enlightened the higher the social acceptance will be.

6. The perception by the population of the most important professional categories' influence towards the MPA project realization.

7. Involvement in socioprofessional organizations and environmental protection associations. We believe that people who belong to environmental associations can readily accept the implementation of an MPA.

8. The indirect evaluation of the degree of social acceptance was materialized by the enquiry whether the population was in favor or not of the creation of an MPA in Cap de Garde. We also sought to determine the socioprofessional category that beforehand accepts the MPA.

9. The perception of the proposed solutions to mitigate the threats impact on the chosen area, which socio-occupational category supports the inclusion of these solutions in the management plan, and how it would influence acceptance of the project.

10. The general perception of the positive effects towards the creation of an MPA in Cap de Garde.

11. The perception of the introduction of an environmental tax for all users of the environment who do not respect the regulations related to the protection of the MPA and which socioprofessional category thinks that this fee will allow better management.

12. The perception of the non-use value of the environment and its importance in determining social acceptance. If society understands and accepts non-use values, values that are not associated with actual use, or even the ability to use a good or service from the marine environment, to protect it so that future generations benefit.

13. Determination of socioprofessional parameters influence for social acceptance. Level of education, occupation, place of residence and gender are determining factors. The more educated the respondents are, the more they have general knowledge about the threats to the marine environment, which makes them more conducive to restricting their uses.

Results. Our results show that the implication of the local population is a necessary and a sufficient condition for MPA creation. To reach this notice we have elaborated an axed investigation about the social acceptance estimate, factors that influence on it and its socio-professional characterization.

Estimation of social acceptance. The variant analysis regarding the social acceptance estimate show that 67.5% of the interviewees are males, 64.5% leave in Annaba, 33.9% are state officials and 50.66% have a university level (Table 1).

Table 1

Socio-professional organization of respondents based on gender, education, employment and origin

Socio-professional indicators	*Sample*	*%*
	Gender	
Male	297	67.5
Female	143	32.5
Total	440	100
	Education level	
University	223	50.5
Senior technician	42	9.5
Secondary level	104	23.6
College level	67	15.2
Elementary level	4	0.9
Total	440	100
	Employment	
Students	50	11.4
Fishers	85	19.3
Officials	149	33.9
Without function	23	5.2
Retired	27	6.1
Other	106	23.9
Total	440	100
	Origin	
Residents of Annaba	282	64.1
Tourists	158	35.9
Total	440	100

The application of a multiple answer test has provided us with a set of frequencies which, after effecting analysis show that for the most part of the interviewees had practiced at least a practice related to the marine environment in the 2014 with a tendency to the non-extractive activities. These last are the most popular; they deal among others with the swimming which represents 89.6% or even with scuba diving or free diving with 33.5%. The greatly prized extractive activities are sport or professional fishing that regards respectively 29.6% and 20.5% of the sample (Figure 2).

Regarding general knowledge in biology, the environment and the reserves, the rate of answers has reached 88.2%. 388 out of 440 subdued questionnaires were valid and 52 or 11.8% non-compliant or non-standard. The interviewees who affirmed having knowledge in natural reserves represent 78.4% and those in MPA 78.1%.

As for the protection of the environment, 65.1% of the sample presents this case and 41.5% of them think that the ecologic quality of the natural elements such as: the environment, fresh water, the sea, coral reef, herbaria and the fish is of a bad or a very bad quality. On the other hand for the protection of the marine environment 70% of the interviewees feel concerned and 21% find that its quality is bad or very bad (Table 2).

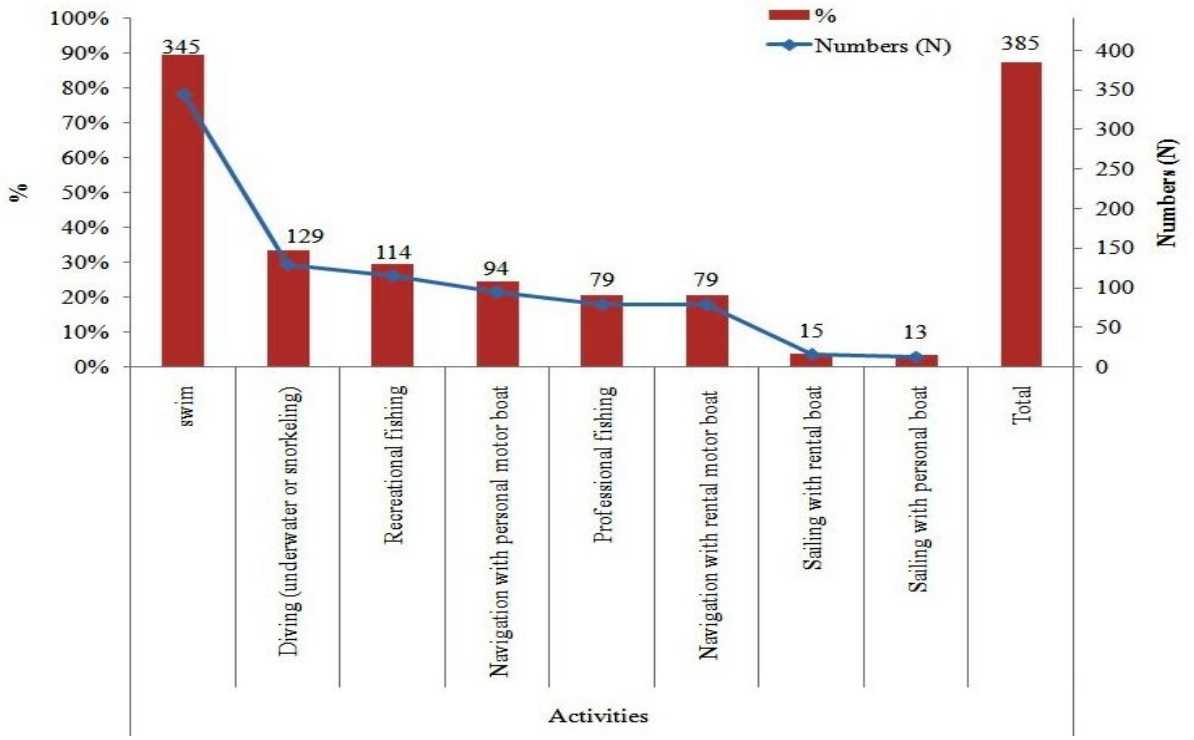

Figure 2. Representation of the frequencies of the activities most practiced in 2014 the marine zone of the Cap de Garde (N = 385 valid observations and 55 missing).

Table 2

Results from univariate frequency analysis of respondents' perceptions on the quality of the environment

Perception of the quality of the environment								
Environmental Protection		*Ecological degradation of the sea*			*Threats of anthropogenic activities*			*Com.*
In general	*Marine environment*	*Coral reef*	*Seagrass*	*Fish*	*Industrial discharge*	*Waste water treatment*	*Overfishing*	
65.1%	70%	73.1%	69.7%	73.2%	83.7%	80.8%	80.4%	68.4%

Com. - communication.

In a general way 74.7% of the interviewees admit having noticed the degradation of the ecologic quality of the sea during the last decade, 73.1% notice this alteration on the coral reef, 69.7% on the herbaria and 73.2% in the reduction of the fish abundance (Table 2).

Regarding threats due to human activities in marine area (zone) of Cap de Garde, 33% of our sample considers that they have a highly significant negative impact. In order to further develop this observation and in order to identify the responsible we have formulated 3 suggestions and the results obtained show that 83.79% of the interviewees associated this fact to the industrial discharges, 80.82% to the bad waste water treatment and 80.37% to the overfishing (Table 2).

In terms of the communication about the creation of the MPA and its repercussions on the social acceptance, 68.4% of interviewees had heard about the project which 34.1% by verbal communication (Table 2).

The whole of respondents propose to involve all groups of users of the community as stakeholders and to integrate them imperatively into the decision-making process. In this context, we notice that only 11.6% of the sample adheres to environmental

associations and 19.3% to socio-professional organizations related to the usage of marine environment (Figure 3).

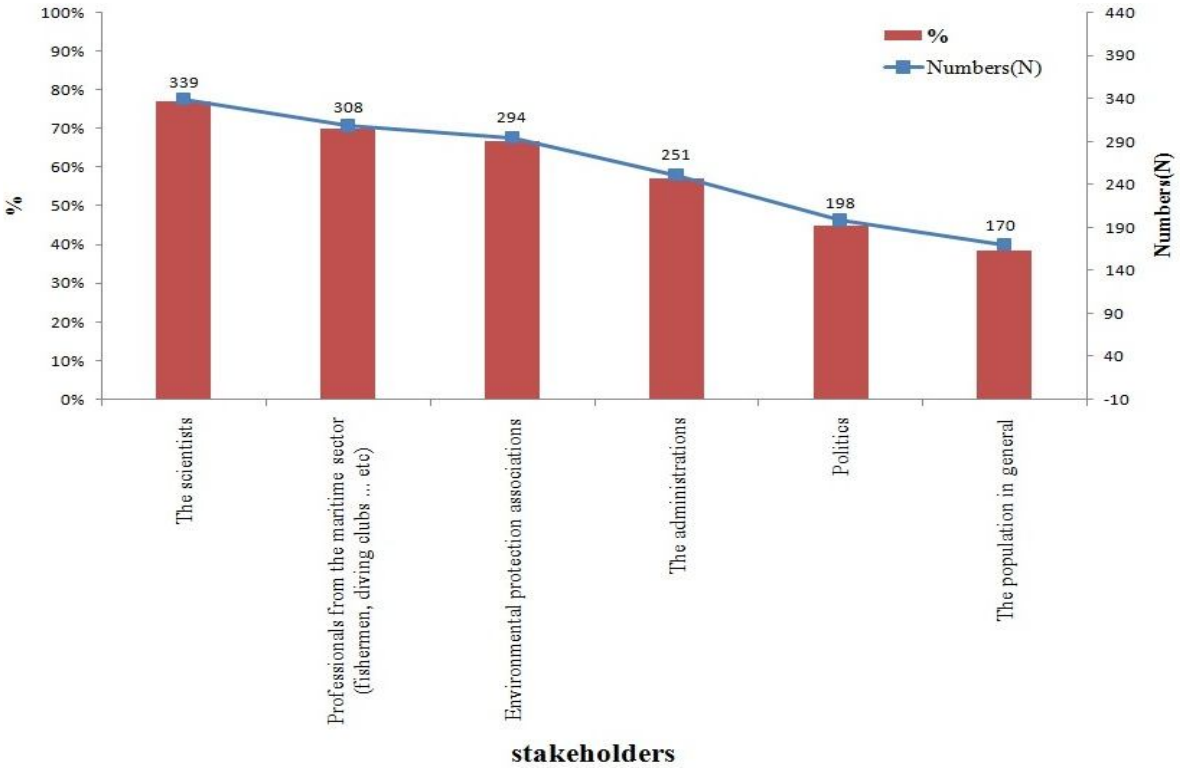

Figure 3. Representation of the respondents opinions on the categories of environmental users to be implied in the decision-making process (N = 440 observations).

Regarding the suggested solutions in order to decrease the damages that influence on the marine environment 49.5% of the sample think that they are very good. For a better conservation of the 7th medium it has been held:

- Public awareness with 73.6%,
- Awareness of visitors with 65.8%,
- The creation of a multipurpose marine supply,
- A reinforcement of controls near to the users 58.3% (Figure 4).

The indirect evaluation of the social acceptance degree has been materialized by the request if the population is in favor or not to the creation of MPA in the Cap de Garde. The results obtained show that 81.6% are in favor the rest of 18.4% are against. For a better comprehension of this report, we have sought for the impact of possible consequences of the creation of this MPA in the region of Annaba. Thus 4 suggestions have been submitted:

- Improving the quality of the sea bed which received the approval of 96.1% of the interviewees.
- The increase of the numbers of the ichthyologic biodiversity with 92.9%. finally the positive consequences on:
- Touristic activities with 87% and

Commercial activities related to marine environment with 79.8% (Figure 5).

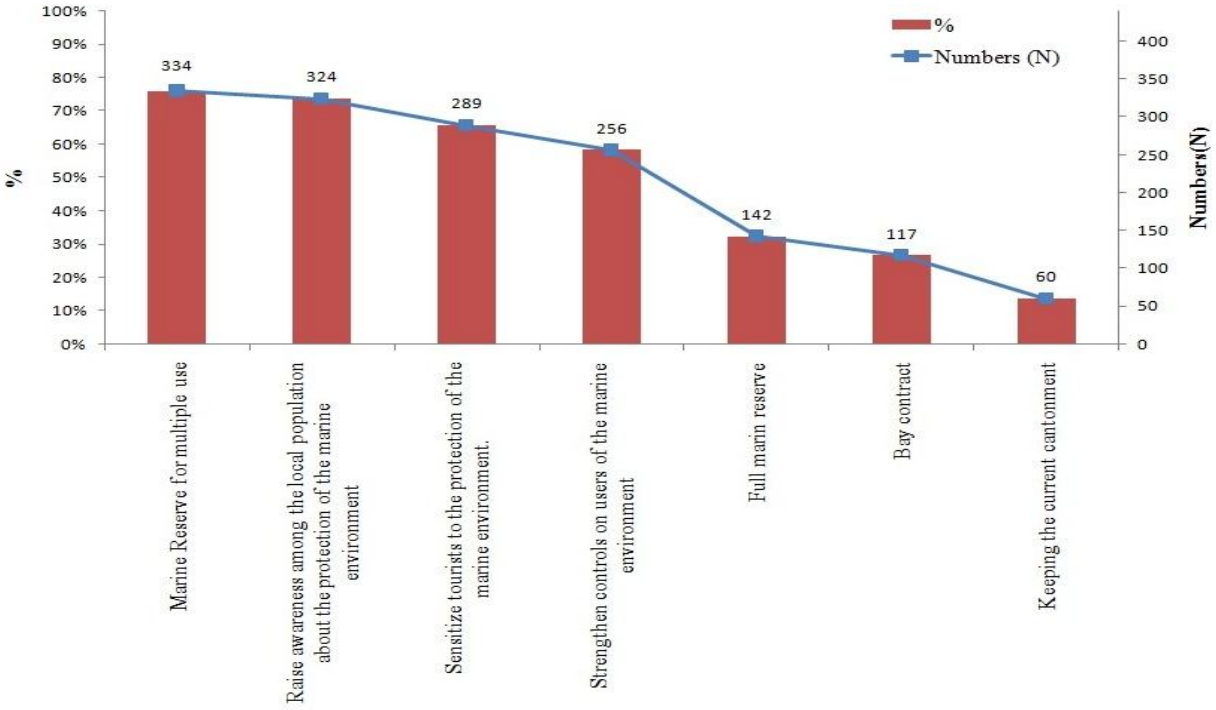

Figure 4. Representation of sample perception on appropriate solutions to reduce threats to the marine environment (439 valid and 1 invalid observations).

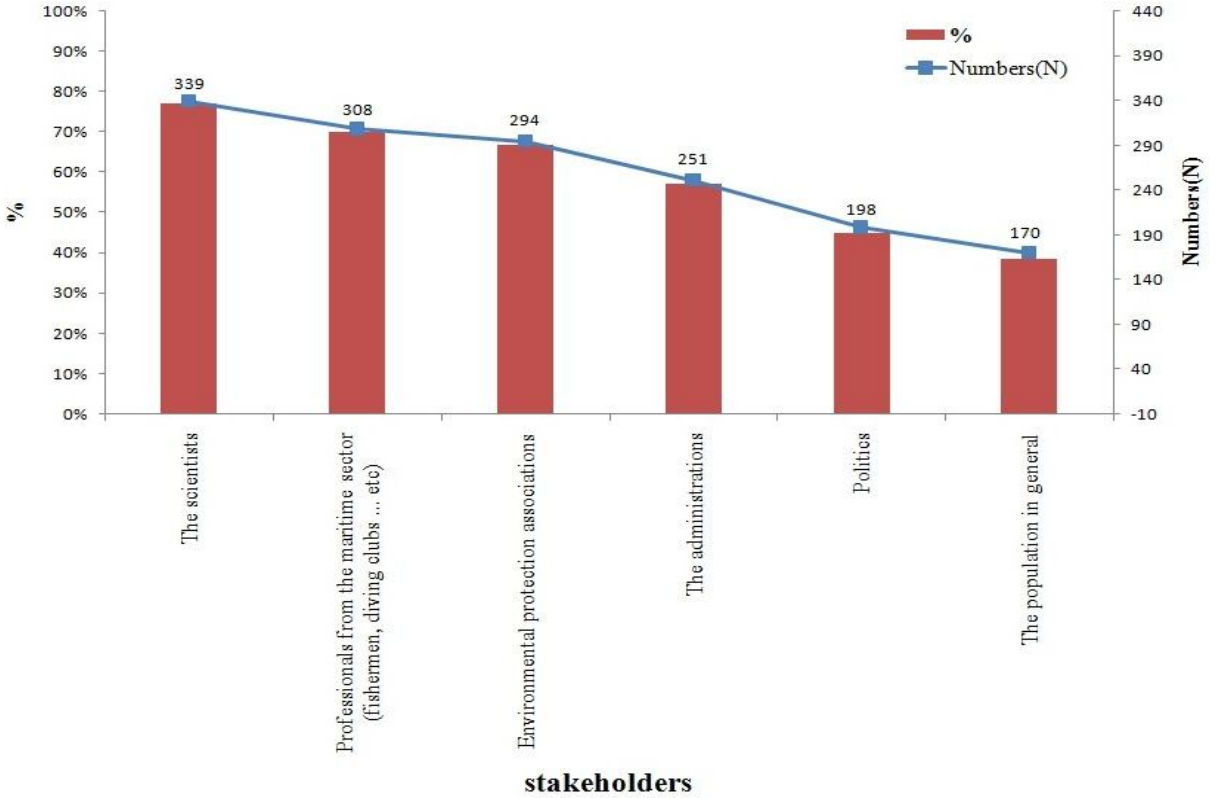

Figure 5. Distribution of the respondents views on the potential benefits of creating the MPA in the Cap de Garde marine area (440 observations).

As for as the environmental tax, is concerned 70% of interviewees 308/440 are ready to pay a contribution, when using the space of the MPA.

As a last hypothesis we have estimated the value of the non-usage of the medium by submitting 4 questionings which main for theses answers

- 99.1% hope that these future generations can know and benefit from marine habitats.

- 97.5% want to limit the fishing in certain zones in order to improve the ichthyologic growth.

-86.4% wish the slowdown of the improvement in certain costal zones in order to conserve a natural environment.

-only 18.6% admit that marine habitats don't have any value for people (Figure 6).

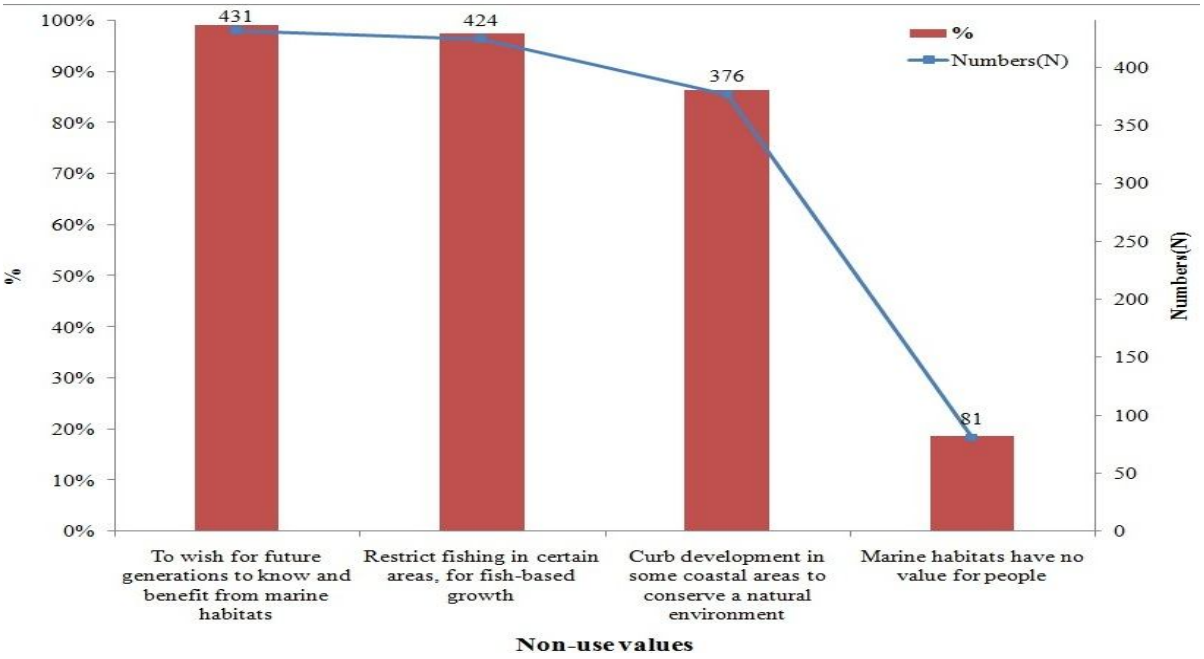

Figure 6. Representation of sample perception with respect to the non-use value of the marine environment.

Factors influencing the social acceptance. Only 8 out of the 13 tested hypotheses are significant. They have been exploited through some analysis in order to determine the factors that influence the social acceptance or the refusal to create the MPA Cap de Garde. The test Chi-square (χ^2) of Pearson allowed us to determine their degrees of influence.

The first hypothesis according to which persons that practice activities related to the marine medium are not in favor of the establishment of a MPA has been accepted for extractive activities such as professional and sport fishing however rejected by recreational like swimming and diving consequently, the social acceptance varies according to the type of practiced activity (Table 3).

Regarding the second hypothesis in which we looked for proving the influence of the interest granted to the protection of environment in general and of marine environment about the social acceptance has been accepted (Table 3).

As for as the third hypothesis which deals with the perception of the quality of the present health state of the marine environment, of its habitats and about the one ten years ago. Compared with 5 suggestions which go from a very bad to very good, the very bad one is amply rejected by the population with thresholds of 0.524 about the present marine environment and 0.266 about the one ten years ago (Table 3).

As for the fourth hypothesis, advocating that the communication about the project influences significantly the social acceptance of the MPA, the opinions are highly correlated with no signification threshold pressing the social acceptance (Table 3).

Table 3

Results from the chi-square test of Pearson between social acceptance and the significant variables of the survey (χ2 = chi-square result, df = degree of freedom, p = to confirm or refute the research hypothesis)

Social acceptance								
Marine activities practiced				*Interests of environmental protection*		*Perception of the health of the sea and its habitats*		*Communication*
Extractive activities		*Recreational activities*		*Environ. in general*	*Marine environ.*	*Current ecol. state*	*Ecol. status during the decade*	
Prof. fishing.	*Recr fishing*	*Swimming*	*Scuba diving*					
X^2=31.302 ddl=1 p=0.000	X^2=3.847 ddl=1 p=0.050	X^2=3.689 ddl=1 p=0.055	X^2=0.222 ddl=1 p=0.637	X^2=7.773 ddl=4 p=0.05	X^2=12.375 ddl=4 p=0.015	X^2=3.208 ddl=4 p=0.524	X^2=5.215 ddl=4 p=0.266	X^2=35.16 ddl=1 p=0.000

Prof. - professional, Recr. - recreational, Environ. - environment, Ecol. - ecological.

The solutions proposed in order to decrease the threat that hang over the marine medium represent the 5th hypothesis of our survey. It proposes 4 solutions: the creations of a multipurpose MPA, the reinforcement of the control of the users, raise local population awareness and raising the visitors awareness. Only the two first suggestions have been significantly correlated with a threshold ($p<0.05$) and the last two ones have been rejected (Table 4).

Table 4

Results of the Pearson chi-square test (χ2) correlating social acceptance with proposed solutions to reduce threats to the area

	The proposed solutions to reduce threats			
S.A.	*Reserve multiple use*	*Strengthen environmental control*	*Raise public awareness*	*Raising visitors' awareness*
	χ2 =16.095 Df = 4 P = 0.041	χ2 =10.249 Df = 4 P = 0.036	χ2 =5.491 Df = 4 P = 0.241	χ2 =2.500 df=4 p = 0.64

S.A. - social acceptance, Df - degree of freedom, p - confirm or reverse the hypothesis.

The 6th hypothesis stipulating that the interviewees in favor of the establishment of an environmental tax accept the MPA, has been admitted (Table 5).

As for as the 7th hypothesis according to which the socio-professional parameters have an influence on the social acceptance, apart from gender, our results prove this acceptation with a significant threshold <0.05 (Table 5).

Table 5

Results of the Pearson chi-square test (χ^2) relating the influence of socioprofessional parameters on social acceptance (S.A.) (df: degree of freedom, p: measure the risk to reject the null hypothesis).

	Environmental tax	*Socio-professional parameters*				
S.A.		*Resident*	*Visitors*	*Gender*	*Education level*	*Employment*
	χ^2 = 0.006 df = 1 p = 0.936	χ^2 = 5.428 df = 1 p = 0.020	χ^2 = 5.815 df = 1 p = 0.016	χ^2 = 0.373 df = 1 p = 0.541	χ^2 = 14.242 df = 4 p = 0.007	χ^2 = 0.846 df = 5 p = 0.000

S.A. - social acceptance, Df - degree of freedom, p - confirm or reverse the hypothesis.

As for as the 8th hypothesis according to which we have indirectly evaluated the social acceptance of the MPA. This last has been considered as a dependent variable with regard to which the influence of the other significant variables has been tested.

Characterization of the social acceptance taking into account the influence of the socioprofessional factors. The social acceptance for the creation of a MPA at the Cap de Garde has been indirectly evaluated with 81.6% of interviewees in favor of this project.

This result made us characterize this population and evaluate the different socio-professional factors which influence on it. For that purpose or this is why we resorted to a multivariate analysis classification type (direct Marketing) in which there was included the socioprofessional parameters we have divided into 3 profiles:

- The first profile corresponding to 58.2% of the supporters of the MPA in the Cap de Garde, male represent 62%, 87.5% live in Annaba, 46.3% are state employees and 61.2% have education on university level (Table 6).

- The second profile includes 28.5% of the interviewees, 100% are tourists, 64% male of different professions and 52% are students (Table 6).

- The third profile presents 13.2 % of the interviewees, 100% are male living in Annaba and practicing a professional activity which has a direct relationship with the extractive usage of the marine environment that is to say professional fishing, 58.6% of them have a low educational level (Table 6).

Table 6

Representation of respondents profiles having a favorable opinion with regard to the creation of an MPA in Cap de Garde in Annaba, according to their socio-professional characteristics

Categories	*Profile 1*	*Profile 2*	*Profile 3*
Supports the establishment of MPA to the Cap de Garde in Annaba	84.3% favorable	90.4% favorable	51.7% favorable
Size of each class	58.2%	28.5%	13.2%
Socio-professional characteristics	62% males	64% males	100% males
		Employment	
	46.3% officials	100% various occupation	100% fishers
		Residency	
	87.5% resident to Annaba	100%	100% resident to Annaba
		Education level	
	61.2% university	52% university	58.6% college

Discussion. The evaluation of the social acceptance plays a great role in understanding features which impact on the process of planning and on the management of MPA whose number is in a perpetual increase. This partially stems from climatic events as well as from the consequences of the exploration of natural resources by humans. In 2016, the "Protected Planet Report" shows that the number of MPAs reached 14,688 and correspond to 4.12% of the world's oceans and 10.2% of coastal areas (UNEP-WCMC, IUCN, 2016); however, the goal to achieve is that of Aichi 11 that targets 10% in 2020. The Mediterranean Sea follows this tendency in fact, on October 2016, there were 7.4% of its surface under official designation – national or international against 4.50% in 2012

(MedPAN 2016). This obstruction is due to the capacity of MPA to attain the objectives of conservation and to save nature (Agardy 1994) by dint of species protection of the threatened environment (Garcia–Rubies & Zabala 1990) and of the biodiversity (Badalamati et al 2000).

The MPA can temporarily have negative social impacts on local communities who accept or reject the idea of an MPA establishment in their territory, impeding the initiative success of protection. Hence, the success of an MPA is narrowly tied to the degree of implication of the local community in the initial process of its creation. Several studies including the ones of Pollnac et al (2001); Christie & White (2007), show the fact of imposing an MPA in a region without a wide community consensus systematically entails to its failure. A great public participation in the process of evaluation of the social acceptance is consequently a key factor to take into account in all the stages of the MPA conception. The setting of an MPA is less likely of being crowned by success when conflicts between the local community, different users of the environment and the commission of the MPA steering are multiple (Hargreaves–Allen et al 2011). In order to relieve the impacts of these socio-economic antagonisms, plenty of treated international conventions have seen the light because of the CBD signature concluded in Rio de Janiero within Earth Summit that took place in 1992. Among others, we can cite:

- The protocol of Cartegena on the prevention of biotechnological risks relative to the CDB signed on January 29th 2000 in which it was proposed to state subscribers a judicial frame for the use of biotechnologies and/or of their products, by setting a principle of precaution.
- The protocol of Nagoya came into force (of laws) on October 2014 on the access to genetic resources and the suitable and equal share of advantages flowing of their use.

Since February 2011, Algeria has had a specific legislation for the implementation of MPA and for the management of coastal zones under the Law no. 11-02 (FAO 2011), emphasizing the involvement of the stakeholders and the integration of the various sectors from the early stages of planning of these spaces.

In Annaba, the third coastal town in Algeria, we have evaluated throughout a sounding about the levels of support of the local collectivity that influences the acceptance or the refusal of the creation of the first MPA in this region. For this reason, we focused on four groups of users of the environment according to their socio-professional criteria. During this inquiry, we have distributed a face to face questionnaire and meetings with a specific group the fishermen. This method involving random sampling of the population has enabled us to collect valuable data and to analyze the views of the community in its broad dimension.

Our results show a very high level of social acceptance, they are close to those obtained by many authors, and we will cite Thomassin et al (2010) in its project to create the AMP in the Reunion islands or those of Wolfenden et al (1994) on 4 protected areas in New Zealand.

A minority group that does not exceed 18% of the population remains septic at the idea of establishing an MPA at the Cap de Garde in Annaba. This rate is similar to that encountered by Sant (1996) in the marine reserve of Jervis Bay in Australia. We have also shown that this community minority could, when supported by the main user groups become significant and long-term play a crucial role in the success or failure of future MPA. This was the case during investigation of Australian attitudes following the creation of marine parks 2 (Voyer et al 2012), where 25% of the community is against or undecided. This study also indicates that disregarding the views of opponents of the MPA can, in the long term, harm future relationships with local communities and hinder the success of the project.

The professional category that does not support the establishment of an MPA in Cap de Garde is that of persons with activity directly related to the extractive use of marine resources namely professional fishers of Annaba. This finding was predictable, mixed results were obtained in closed talks with representatives of this group of users; the discussions were stormy between those for and those against. The first groups saw the long-term benefits of a rebuilding of stocks and an increase in catch sizes, believing

that the implementation of an MPA would restrict their activities and reduce their stocks and consequently their incomes, considered already very insufficient in relation to the effort deployed. This type of resistance was also noted by Minnegal et al (2003) in their work on the evaluation of the acceptance of recreational and commercial fishermen on the establishment of several small marine reserves in the state of Victoria in Australia.

The fact that some sections of the community remain opposed ideologically to restrictions on access to resources seems to us inevitable. Despite this disagreement, supporters of the MPA remain a majority within this group of users of the environment. In this context Pelletier et al (2005); Burke (2001) or Thomassin et al (2010), make 2 observations:

- The 1st concerns the strong influence of people's perceptions and opinions on health of the environment in general and of the marine environment especially and of these coastal resources,
- The 2nd is linked to the current management mode and that proposed through the creation of the MPA to minimize threats to the coastal zone.

We explain the perceptions that are accepting MPA levels are influenced by socioeconomic factors such as education level, gender, occupation, wealth or culture, which is inspired, individuals in their visions and understandings. Rao (2003), found the same result in an assessment of knowledge, skills and perceptions of local people on the issues of planning and management in the biosphere reserve at Nanda Devi in India. This hypothesis was confirmed by Cinner & Pollnac (2004) at Mahahual in Mexico after the analysis of socio-economic factors which influence on the community's perception concerning the coastal resources.

The identification of socio-professional factors that influence the general opinion of the community and their analysis by the method of classification have enabled us to characterize the favorable respondents to the establishment of the MPA Cap de Garde by regrouping them into 3 socio-professional profiles of different size. The largest class is mainly formed by men possessing university education, working and living in Annaba. The second class exclusively includes tourists who are highly educated, and having different jobs. They are related to Cap de Garde and wish preserving it. Finally, the third class which is the smallest one involves two categories: favorable fishers and unfavorable minority to the establishment of the MPA.

The social acceptance is characterized by three factors determining the influence of perceptions of people on the resources and their preservations. We have, from the importance order: the educational level, followed by the job and ending with living place. In Annaba, the social acceptance is strongly correlated with the protection of the environment, the conservation of the marine environment and the degree of consciousness of interviewees about the disastrous repercussions of human activities.

These results are partially comparable to those of Cinner & Pollanc (2004). Indeed, these authors put richness as a new determining criterion and classify it to the height of 75% before the educational level with 16%, and lastly the living place which represents 8%.

The users of the environment have mitigated opinions according to practiced activities while they are extractive, the opinions are against the establishment of the AMP and favorable to the project when they are re-creative. This divergence is observed when requiring knowing what these users think to know concerning the proposed solutions of management in order to decrease the threats which weigh on the selected zone for putting in place the MPA. Nevertheless, they are pertaining to a majority to accept the establishment of multiple use storage and for the reinforcement of controls. They reject the idea of creating integral storages. It is in this ultimate stage that we have noted the role of education, the importance of communication around the project and the small influence of the perception of sea health state and its resources upon the social acceptance. This set of observation is partially mentioned in the work of Thomassin et al (2010) which justifies it with the eventuality that a large proportion of interviewees do not have direct contact with marine environment and consequently it remains few of sensitivity to its account. This behavior reverberates on the way people perceive the degradation of the environment. McClanahan et al (2005), associates to this the public

unconcern and the modern society, in general, to the nature leading thus, to the feeling that the individuals and the local actions have few influences upon the state and the function of the ecosystem which they belong to.

Conclusions. The social acceptance involves determining the variables that play a role in the level of approval of all the stakeholders involved and therefore the success of the Cap de Garde MPA. While this study allowed us to take into account 4 essential modalities, namely:

- The perceptions, the attitudes and the values which represent the different marine environment between the environment users as fishers and the large public.
- The socio-economic and cultural differences between the groups of users are crucial because of the effects of their activities upon the resources and the degree of implication of each of them for its conservation.
- An equal exam of all insights, involving those of minority groups and the opponents of project is essential in order to ensure an approach socially equal and well-fitting before the declaration of the MPA.
- The introduction of an anthropocentric approach in the planning of the marine reserve must not be diluted in critical stages of the project starting of MPA in order to achieve success of marine savings which depend on the public reactivity.

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