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# THE USE OF Q-METHODOLOGY TO OBTAIN STAKEHOLDER DISCOURSES ON THE FUTURE DEVELOPMENT OF RIA FORMOSA COASTAL ZONE, SOUTH OF PORTUGAL\*

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## Resumo:

Uma estratégia eficiente de conservação da natureza implica a análise de interesses dos intervenientes envolvidos. O presente artigo apresenta a metodologia Q como ferramenta no desenvolvimento dessa análise. O objectivo é a análise de intervenientes locais através dos seus próprios termos e categorias, não apresentando ideias pré formadas de quais as suas necessidades e ou problemas. O estudo revela a existência de 4 perspectivas sobre o desenvolvimento futuro da Ria Formosa: pró educação ambiental e capacitação; desenvolvimento turístico e pesqueiro; burocracia, condições do sector pesqueiro e ordenamento do território; qualidade ambiental, integração e organização. Finalmente, estas perspectivas foram comparadas com as acções do plano POLIS 2008. Verificou-se que o plano responde transversalmente à maioria das preocupações identificadas. O ponto de maior conflito é a questão da demolição das casas existentes nas ilhas barreira.

**Palavras-chave:** Análise de intervenientes interessados, metodologia Q, Gestão Costeira Integrada.

**Códigos JEL:** Q24 ; Q28

## Abstract:

Any effective strategy for nature conservation necessarily involves stakeholder analysis. This article focuses on Q-methodology for this analysis. The objective is to understand both the identities and desires of local stakeholders in their own terms and categories, instead of making assumptions about their problems and needs. The study revealed 4 discourses on the future development of the Ria Formosa: Environmental education and information exchange; economic development supported and taking advantages of the environmental values; land planning and decrease of bureaucracy; and environmental quality, integration and organization. Finally, these discourses are compared with the Ria Formosa action plan - POLIS 2008 - that includes investment to improve and develop this coastal system. In conclusion, the action planned in POLIS 2008 covers most of the concerns that stakeholders identified. The major conflict area identified is related to the demolition of houses existing on the barrier island of the lagoon system.

**Keywords:** Stakeholder Analysis, Q sort, Integrated Coastal Management.

**JEL Codes:** Q24 ; Q28

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## I. Introduction

Ria Formosa (fig.1) is a unique area in Portugal and Europe due to its exceptional environmental and landscape quality with high ecological, cultural, social and economic value (POPNERF, 2009). It is a mesotidal coastal system with a surface area of 84 km<sup>2</sup>, two peninsulas, five islands and an exposed intertidal area of about 80% (Andrade, 1990). The lagoon system is connected to the ocean by six tidal inlets. Environmental variation across the lagoon is the reason for a wide variety of habitats: salt marshes, sand banks, mud flats, seagrass beds, channels, dunes, inlet deltas, barrier islands and sandy shores (POPNERF, 2009). This variety of habitats is also the reason for the existence of high biodiversity including several endemic and rare species. The identified species include: 693 plant species, 18 mammals, 15 reptiles, 11 amphibians, 79 fishes, 184 mollusks and 214 birds. All these characteristics led to the Ria Formosa's protection under national law since 1979, its inclusion in the Habitat Directive and in international conventions such as Ramsar.

The Natural Park of Ria Formosa (PNRF), of approximately 18000 hectares, covers the whole area of the lagoon system and its municipalities: Loulé (partially), Faro, Olhão, Tavira and Vila Real de Santo António. Traditional activities dating back to ancient times are still important: fisheries (90000 tonnes caught in 2001), shellfish exploitation (80-95% of national production) and salt farming (98% of national production in 2001) (POPNERF, 2009).

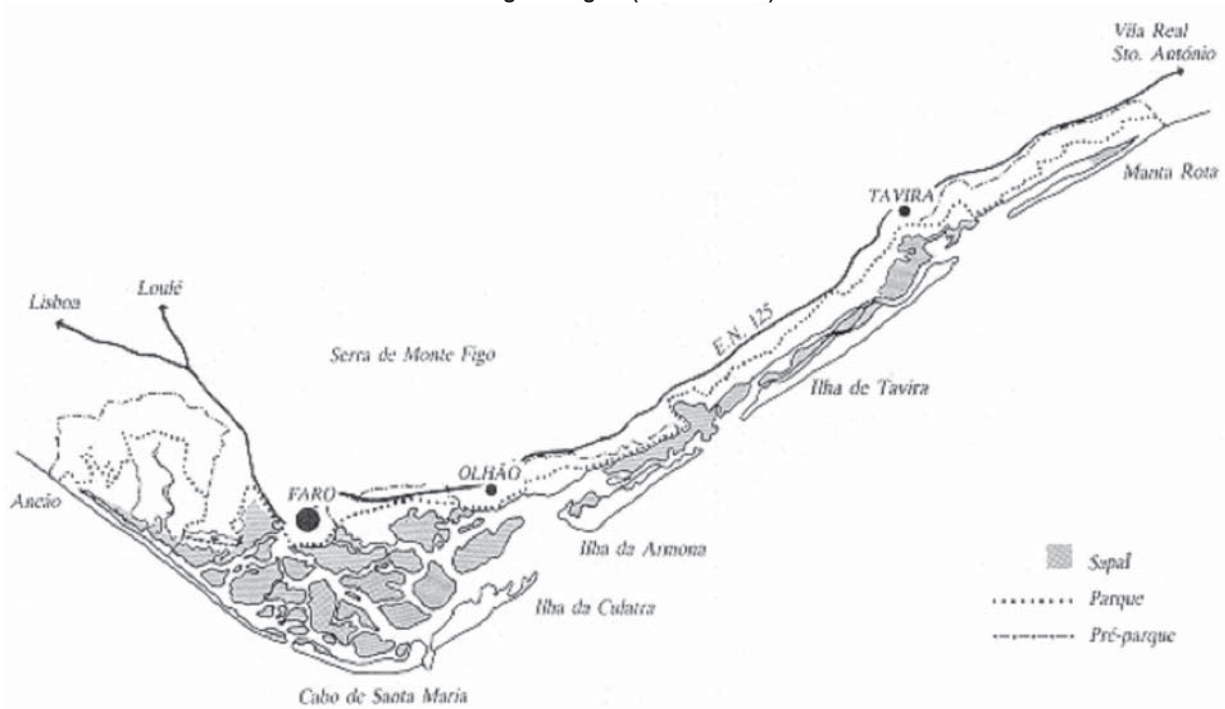
In the past few decades, increasing threats to the area have appeared (POLIS, 2008). Urban pressure due to tourism development, inappropriate urban occupation on the barrier island, replacement of fishery communities in tourism areas, increase in toxic substances from domestic and industrial waste water, disorganized recreational activities, increase of boats and motor craft, invasion of exotic species, dredging activities, lack of environmental infrastructure (fences, elevated walkway, delimitation of beach access), lack of control and inspection of illegal activities, declining fish and shellfish stocks, and coastal erosion. In socio-economic terms the problems identified include an exodus of young people linked to a decrease in work opportunities, insufficient professional qualification and degradation of cultural heritage. These threats are identified in the different management plans that

include this area (e.g. Coastal Zone Management Plan, Ria Formosa Natural Park Management Plan and POLIS 2008 – Action Plan for Ria Formosa requalification), however, institutional complexity has delayed the development of effective and direct solutions.

Ria Formosa, due to its individuality, geographic conditions and dimension, is managed by several institutions: Biodiversity and Nature Conservation Institute (ICNB), Water Institute (INAG), Regional Development and Coordinating Commission of the Algarve (CCDR), Ports and Maritime transportation Institute (IPTM), Municipalities, etc. (POLIS, 2008). The existence of several institutions with management responsibilities makes decision-making a complex, bureaucratic and slow process. In 2006, a working group was created with the aim of defining a future strategy for the Ria Formosa Coastal Zone capable of solving identified problems. An Action Plan was developed, *Polis Litoral Ria Formosa (2008-2012)*, and a new entity - Sociedade de Requalificação e Valorização da Ria Formosa SA - was formed to implement the plan and provide financial support. This Action Plan aims to present an intervention that is consensual among defined stakeholders and that makes Ria Formosa a reference in terms of sustainable development. As explained in POLIS 2008, this document combines the work performed by several institutions, management plans and follows the guidelines of the National Strategic Plans for Integrated Coastal Management, Biodiversity and Nature Conservation, Sea issues, Fisheries and Ports.

Any effective strategy needs to take into account the socio-cultural needs of the society that it influences. For the plan to work, we need a stakeholder analysis. Stakeholder analysis describes possible conflicts over any intended measures, who the local stakeholders involved in the conflicts are, what they believe and want, and the trade-offs they are willing to make (Addams and Proops, 2000). Such knowledge is critical if the participatory decision strategies and action plans are to respond meaningfully to the political and social realities in which decision-making takes place. Without these steps, policies and measures may fail to gain sufficient political support to be made into rules, and even if they are, they will often lack enough support among local people to be effective. Many implementation attempts have failed because

FIGURE 1  
 Map of the study area: the lagoon system of the Ria Formosa, located on the south coast of Portugal, the Algarve region (source: ICNB).



local people saw measures as being imposed on them, making the enforcement of the rules much too expensive to be effectively implemented. The answer to this dilemma is a facilitated process in which all local stakeholders – i.e. the people who are in the best position to undermine the effort if they choose to do so – are involved. Such processes may not lead to everyone agreeing, and will often involve compromise, but they do lead to instruments that have a much better chance of actually working in the long run.

The methodological challenge in the design of an effective negotiation process is to create a realistic picture of the political landscape. Q-methodology (Stephenson, 1953) has been used for a long time in psychology and increasingly in other disciplines, such as political science (Brown, 1980). The most important advantage of this method is the possibility of understanding both the identities and desires of the local stakeholders in the terms and categories they themselves are using, and not making preliminary assumptions about whether groups have a legitimate stake in any related conflicts (Smith, 2001). This type of analysis is called discourse analysis; it takes the statements of the stakeholders about the conflict and expresses them in their own terms as

an interactive process. In particular, it is interested in the intersection of facts, values and interests in the things that people say about the conflict (Watts and Stenner, 2005). Understanding how people link these three makes a number of contributions. Concerning the facts, discourse analysis helps to uncover where the presentation of validated scientific information may aid in reconciliation. It also may identify real disagreements that may benefit from, or even require, further research that will lead to potential solutions. Concerning values, discourse analysis helps to uncover those areas where compromise is possible and where it is impossible based on strongly held beliefs. Concerning interests, it gives information about where possible compromises and/or win-win outcomes are possible. The structural approach sees society as made up of groups that form the attitudes of their members through world views or ideologies. These world views take the form of and are expressed as values. Hence, values are bound up in group identities, which is what makes them such a barrier to compromise. Group solidarity is the most important source of social power beyond the control of economic interests, so compromising on values becomes a betrayal. The product of the discourse

analysis is a description of discursive themes (Brown, 1993, 2002). Themes are repeated patterns in which facts, values and interests are linked in the same way by participants in the discourse.

This article applies Q-methodology in order to understand the discourse of stakeholders on the future development of Ria Formosa Coastal Zone. The results of this analysis are compared with the actions that will be developed by POLIS Litoral Ria Formosa in order to understand how stakeholders react to its implementation and suggest improvements.

## II. Methods

This study is based on Q-methodology and the main aim is to understand what stakeholders perceive as important actions towards the future use and development of the Ria Formosa coastal zone. In order to apply this method, 30 interviews were given to 10 different groups of stakeholders: tourism companies, fishermen, researchers, NGOs,

government, residents, tourist, real estate agencies and local authorities. From these interviews, 31 statements (table 1) were taken as being the most common discourse among the interviews.

Using these statements, a questionnaire was given to 22 individuals related to the groups of stakeholders mentioned above. Participants were asked to sort the 31 statements according to their importance to them. A seven-point scale was used: -3 -2 -1 0 +1 +2 +3. Here -3 corresponded to the two statements participants considered as least important and +3 the two most important statements. The ranking of the statements by an individual is known as that individual's Q sort, and reflects how much individuals value each statement. Participants are forced to make choices because the number of statements in each of the seven-point scale was defined previously. The number of statements that had to correspond to each element of the scale is described in table 2.

TABLE 1  
Statements use in Q sort questionnaire.

1	We should work towards a tourism industry dedicated to nature and respecting its limits.
2	We should preserve cultural heritage and improve the conservation of historical buildings.
3	We should develop tourism with content. Knowledge increases respect by the area.
4	Traditional economic activities should be connected with tourism.
5	Overfishing is making species disappear.
6	Protection is important so that fish stocks do not diminish.
7	The number of fishermen is decreasing.
8	Circumstances are not created so that fishermen have better working conditions.
9	Marine resources are decreasing.
10	The lack of control is threatening marine biodiversity.
11	Most of the times things fail when law is being applied.
12	People must be better informed to preserve biodiversity.
13	Society is increasingly aware of political measurements for environmental protection.
14	We should invest in environmental education for adults.
15	There is a lack of infrastructure so people can enjoy nature in a balanced way.
16	There are too many ugly buildings, with no regard for scenery.
17	The houses on the barrier island are a landscape and environmental attack.
18	The Natural Park institution does not correctly carry out its nature conservation responsibilities.
19	The management institutions are too prohibitive, which does not allow the development of economic activities.
20	The supply is disorganized; economic activities are not integrated with the others that occur in the same space.
21	It is necessary to increase communication between the scientific community and the population.
22	Tourism needs to be organized. At the moment people use everything as they want, they pass everywhere with boats and the police do not go after them.
23	We should do environmental education for tourists and local people, based on coexistence with nature.
24	There is too much bureaucracy, which discourages investors.
25	We are starting to develop nature tourism but with no rules.
26	There are too many management institutions, there's a lack of integration and common aim.
27	The municipalities are too dependent on the financial support of the building lobbies.
28	We need to improve the Wastewater Treatment Plants.
29	Black markets are limiting the development of economic activities.
30	Dredging inside the lagoon system is important to maintain its current use.
31	We should have an environmental tax for the users of this area that could be used for nature conservation.

TABLE 2  
Number of statements that had to be allocated in each scale score.

Scale score	-3	-2	-1	0	1	2	3
No. Statements	2	4	6	7	6	4	2

Twenty-two Q sorts were performed. Delineating the various discourses within the survey was accomplished by factor analysis of the Q-sorts.

The analysis was done using PQ method version 2.11, a freeware program devoted to Q analysis (<http://www.rz.unibw-muenchen.de/~p41bsmk/qmethod/pqmanual.htm>). One enters each Q sort in the study as data and the package then correlates each Q sort with every other sort. This intercorrelation matrix is then factor analyzed using a Principal Components Factors Analysis.

In this study, 22 variables were ultimately reduced to four factors, or idealized social discourses. During the factor interpretation process, each factor was examined individually and compared with other factors for the purpose of illustrating the characteristics of the various discourses, as well as the points of agreement and disagreement.

### III. Results and Discussion

The purpose of this study was to reveal distinct perspectives concerning the future development of the Ria Formosa coastal zone. A specific perspective is obtained by the interpretation of a specific factor obtained using the statistical procedure. In this study, four factors were extracted. All these factors had at least two participants giving them significant loading. Consensus and disagreement were identified among all the factors, and some statements were identified as distinguishing elements. Below is a description of each discourse based on various elements of the analysis. Some statements gained positive and negative extreme scores in more than one discourse; this fact decreases statements' importance when we try to analyze each perspective by itself. Other statements with rather neutral scoring, e.g. 0, can provide valuable information if all the other factors ranked them extremely high or low, respectively (Watts and Stenner, 2005). For this reason, the discourses are also interpreted by using statements that distinguished factors statistically significant at the

99% confidence level ( $P < 0.01$ ), followed by those statistically significant at the 95% confidence level ( $P < 0.05$ ). A careful and rigorous selection of the Q statements was made. Finally, interpretation also depends on in-depth interviews conducted in the first stage of the methodology, so that research bias could be minimized as much as possible.

#### A. The four discourses on regime effectiveness

##### A.1) Discourse A

Discourse A explains 17% of the total variance (table 3). This discourse (table 5 and 5.1) is most concerned with the need for information and education to better preserve the environmental quality of the Ria Formosa coastal zone (stat. 21, 12, 23). There is much concern about the environmental situation of this area (stat. 10, 9, 6, 17, 22). This perspective understands value through contingency, giving high importance to the potential threat that lack of control represents for marine biodiversity (stat. 10) and the Q-methodology heavy human pressure on the barrier islands (stat. 17). The focus on contingent valuation is also demonstrated by the emphasis given to preservation of natural areas and the need to constrain human activities along the lagoon system (stat. 22). In this perspective, the value of Ria Formosa is not recognized for all users and therefore it emphasises the need to increase investment in information and environmental education. During most of the interviews this issue was identified and linked with the lack of wastewater treatment facilities, that cause bad odors, mainly in the Ria Formosa area closest to urban centers, which contributed to a negative view of this ecosystem.

Administrative and economic issues are not regarded as important. Investors are not considered to be affected negatively by an excess of bureaucracy (stat. 24), implying that economic development is allowed with a positive or negative impact on environmental quality of the area.

Environmental education through coexistence with nature is perceived as important to achieve societal awareness of environmental issues and values (stat. 23). The current form of ecotourism is considered well organized (stat. 25). However, other forms of tourism are perceived as unorganized and threatening to environmental quality (stat. 22). Economic issues related to market and fisheries are minor concerns for this discourse, as well as the possible relationship between municipalities and construction lobbies (stat. 29, 24, 8). Land planning is also a minor concern (stat. 26, 27, 25).

Information and education seem to be the main vehicle of change in the Ria Formosa coastal zone. Concerns about environmental quality are identified but not about economic development. Considering the contingent nature of this perspective's valuation of the environment, one could surmise that a focus on environmental education would be a logical investment, as education is a form of current investment in future behavior modification; in other words, a present investment that pays off into the future. Discourse A focuses to a certain extent on participatory processes and dissemination of information on the process of governance in general. From this analysis we can call discourse A *Pro Environmental education and information exchange*.

### **A.2) Discourse B**

Discourse B explains 12% of the total variance (table 3). This discourse is very concerned with the exploitation of marine resources in a sustainable way (table 6 and 6.1). In contrast to the previous discourse, it is believed that people are increasingly aware of environmental issues (stat. 13). In addition, discourse B shows a strong belief that conservation of natural resources will improve human welfare and economic development. By the rank given to statement 6 and 9, nature protection is an important issue. On the other hand, fishery activities and tourism development are also highly ranked. Fishermen's work conditions (stat. 8), as well as market dynamics, including the existence of parallel markets (stat. 29), are relevant issues. Discourse B considers that parallel markets diminish the importance of the fishing sector in official economic data. The true economic importance of same fishing activities, such as clam gathering and farming, is not reflected in official data and this

has negative effects when it comes to distributing economic incentives. Other research projects have identified this issue (e.g. Praça, 2004; Van Den Belt, 2000; Michler, 2003), as well as the lack of a current strategy to overcome this difficulty.

Spatial organization of tourism is not considered an important topic in contrast with the previous discourse (stat. 22 and 25). However both perspectives present a common perception of the Ria Formosa's contingency value, although discourse B is more related to the value of direct use and discourse A presents concerns related to indirect value and existence values (Boyle and Bishop, 1985). Following the same line of thought, it is not surprising that discourse B considers the ecotourism sector as an important area for development (stat. 3, 1).

The minor concerns of this discourse relate to administration and land-use planning (stat. 26, 11, 31, 27, 26). This result suppresses the great importance of economic development. Development occurs slowly due to financial constraints and lack of incentives, rather than due to administrative problems. Discourse B strongly agrees that the Ria Formosa coastal zone should be managed taking into account environmental benefits, rather than political interests and, on the other hand, it considers that economic development should be a primary concern. For this reason discourse B is called *Pro economical development supporting environmental values*.

### **A.3) Discourse C**

Discourse C explains 11% of the total variance (table 3). It focuses primarily on institutional performance and secondly on the environmental results obtained (table 7 and 7.1). This discourse gives greater importance to issues related to administration and city planning. Bureaucracy is identified as the main issue (stat. 24), which might be related to the rank attributed to land-use planning. From this discourse's point of view, issues related with law enforcement and management institutions are two of the main obstacles in nature conservation and future development (stat 6, 8, 2, and 15). Environmental awareness of society was ranked low (stat.13) and education towards sustainable development is not a topic of concern, which reinforce the importance given to short-term actions rather than long term. Institutional issues were a common topic discussed in the interviews and,

although the institutional functionality of Natural Park of Ria Formosa is not a major concern for discourse C (stat. 18), the same issues are identified for this institution (Guimarães et al, 2010).

This is the only discourse that gives a high value to cultural heritage (stat. 2) and the need to preserve it. In addition, discourse C considers that there is not sufficient infrastructure for people to enjoy nature without damaging it (stat. 15). Also, waste water treatment facilities are an important topic (stat. 28). All these concerns are strongly linked with administration, distribution of investment and the priorities of local governance.

The fishing industry (stat. 6, 7, 8, 9, 5), as in discourse B, is one of the main issues for the future development of the area. In terms of tourism development, this discourse does not show a clear concern (stat. 1, 25, 3). Environmental tax is not considered an important action towards nature conservation (stat. 31). Economic issues related to lobbies (stat. 27) and black markets are not a concern (stat. 29). From these results it is clear that discourse C focuses attention on administrative issues being one of the main points for improvement in the future development of Ria Formosa. For these reasons discourse C is called *Pro land planning and anti red tape*.

#### **A.4) Discourse D**

Discourse D (table 8 and 8.1) explains 9% of the total variance (table 3). In this discourse, primary concern is with administrative organization and the lack of integration among institutions (stat. 26, 19, 11). Cooperation between and coordination among institutions is perceived as a necessity for effective growth. It is the only discourse that considers municipalities as dependent on construction lobbies (stat. 27). One hand management institutions are not considered too prohibitive (stat. 19) and on the other hand laws are respected (stat. 11), which means that regulation is adequate and development can occur. This is the only discourse that does not negatively rank the use of an environmental tax (stat. 31) demonstrating that environment quality is an important topic. In addition, lack of control (stat. 10), water quality (stat. 28) and eco-tourism (stat. 1) demonstrate this concern. Economic development is not perceived as a major issue. Tourism organization

is a concern (stat. 22) although not much attention is given to this sector. In the same vein, the fishery sector is not highly ranked (stat. 8, 5, 9).

In relation to nature conservation, the houses in the barrier island (stat. 17) and the effectiveness of the Natural Park (stat. 18) are considered minor concerns. This viewpoint believes that problems affecting growth and development of the Ria Formosa exist at the level of regulations and coordination, and therefore as potentialities. These issues can be related to the discursive and pragmatic tension between the institutionalized regulations and their actual implementation, as well as problems related to institutional organization and coordination. The same issues are identified by previous works as a common problem on a national scale (Garcia, 2004). Taking this into account, discourse B is defined as *Pro-environmental quality, integration and organization*.

#### **B. Stakeholder group loadings on each factor or discourse**

The number of stakeholder group loadings on each factor is summarized in Table 3. It is important to note that all stakeholder groups loaded on one of the factors and none loaded on two or more factors.

The *Pro Environmental education and information exchange* discourse is defined by a total of 8 stakeholders: four of them are related to environmental sciences and education, one is an employee of Ria Formosa Natural Park Institution, one is related to ecotourism activities and fisheries, one is a recreational diver and one works in real estate.

The *Pro economic development supported and taking advantages of environmental values* discourse combines the opinions of a real estate worker, the vice-chief of the Maritime Police, an environmental NGO worker, a fishermen and a foreigner who owns a house in the area.

The *Pro land planning and decrease of bureaucracy* discourse is supported by a former canned fish industry worker, a resident, a municipal worker related to water treatment, and a staff member of the Regional Tourism Authority for the Algarve.

The *Pro-environmental quality, integration and organization* discourse was defined by a researcher at the government fishery research institute, a Port Authority worker, a tourist, a member of the Natural Park Institute and a construction industry worker.

From the loadings described we can see that there are clear patterns in the relationships of subgroups to each discourse. However, discourses are loaded with individuals that can easily be recognized or linked with the defined discourse. Discourse A is loaded with participants linked with education, discourse B participants included business and environmental protection participants, discourse C includes government workers, as does discourse D.

### C. Areas of Consensus and Disagreement

The purpose of this study was to reveal the existence of any distinct discourses on the future development of the Ria Formosa coastal zone. It is significant that, even though the participants were drawn from very specific groups, all of whom were involved in some way in the issue, the application of Q-methodology has revealed four distinct discourses. Interestingly, all four discourses were broadly represented by the

**TABLE 3**  
Reordered factor matrix with grey shading indicating the Defining Sorts.

Participant Code	Discourses			
	A	B	C	D
Q4	0,5671X	-0,1626	0,0278	-0,0217
Q51	0,4842X	0,2391	0,0483	0,2104
Q39	0,6784X	0,198	-0,0725	0,091
Q23	0,6363X	-0,0773	-0,1638	0,1305
Q37	0,6615X	0,1705	-0,0556	0,0603
Q1	0,7831X	0,2224	0,1384	-0,2036
Q16	0,5630X	-0,091	0,2244	-0,294
Q60	0,7089X	-0,1664	0,031	0,2639
Q12	0,2609	-0,7064X	0,3388	-0,0447
Q13	0,1658	0,5591X	0,2051	-0,1723
Q56	0,1235	-0,5888X	-0,0402	0,1228
Q58	0,2903	0,5329X	0,311	-0,0111
Q42	0,1839	0,6469X	0,0256	0,1578
Q17	-0,2927	0,268	0,6038X	-0,1129
Q9	0,0247	-0,0362	-0,7679X	-0,1727
Q46	0,2022	0,142	0,7226X	0,1097
Q59	0,064	-0,2173	0,4732X	0,3873
Q28	-0,1324	-0,0142	0,2974	0,4427X
Q11	0,1226	-0,2675	0,2145	0,6200X
Q25	0,0628	0,464	0,1934	0,5182X
Q21	0,1861	-0,0074	-0,4261	0,6975X
Q41	0,0428	0,0418	0,0394	0,4482X
% Expl. Var.	17	12	11	9
Total q sorts	8	5	4	5

**TABLE 4**  
Correlation between factors.

	A	B	C	D
A	1	0.096	0.059	0.174
B	0.096	1	0.07	0.028
C	0.059	0.07	1	0.123
D	0.174	0.028	0.123	1



TABLE 5

Discourse A - major concerns about the present and future of the Ria Formosa coastal zone.

Statements defining Discourse A major concerns	Factor score			
	A	B	C	D
<b>Information and education</b>				
21- It is necessary to increase communication between the scientific community and the population.	3*	1	1	1
12- People must be better informed to preserve biodiversity.	2*	-1	0	-1
23- We should conduct environmental education for tourists and local people, based on coexistence with nature.	2	0	1	1
<b>Environment</b>				
10- The lack of control is threatening the marine biodiversity.	3	0	0	3
9- Marine resources are decreasing.	2*	1	-1	-2
6- Protection is important so that fish stocks diminish.	2	2	2	2
17- The houses on the barrier island are a landscape and environmental affront.	1*	-1	0	-2
22- Tourism needs to be organized. At the moment people use everything as they want, they pass everywhere with boats and the police do not go after them.	1*	-2	-1	1

**Note:** Values in place 1 or 0 are only shown when statistically significant (P<0.05; asterisk (\*) indicate significance at P<0.1).

TABLE 5.1

Discourse A - minor concerns about the present and future of the Ria Formosa coastal zone.

Statements defining Discourse A minor concerns	Factor score			
	A	B	C	D
<b>Administration and economy</b>				
29- Black markets are limiting the development of economic activities.	-3	3	-2	0
24- There is too much bureaucracy, which discourages investors.	-3*	1	3	0
31- We should have an environmental tax for the users of this area that could be used in nature conservation.	-2	-2	-3	0
8- There are no circumstances for fishermen to have better working conditions.	-1*	2	2	-3
<b>Land use planning</b>				
26- There are too many ugly buildings, with no correlation to scenery.	-2	-2	0	0
27- The municipalities are too dependent on the financial support of the building lobbies.	-2	-3	-1	2
25- We are starting to develop nature tourism, but with no rules.	-2	0	-2	-1

**Note:** Values in place 1 or 0 are only shown when statistical significant (P<0.05; asterisk (\*) indicate significance at P<0.1).

TABLE 6

Discourse B - major concerns about the actual and future of Ria Formosa coastal zone.

Statements defining Discourse B major concerns	Factor score			
	B	A	C	D
<b>Economy</b>				
29- Black markets are limiting the development of economic activities.	3*	-3	-2	0
6- Protection is important so that fish stocks do not diminish.	2	2	2	2
8- Circumstances are not created so that fishermen have better working conditions.	2	-1	2	-3
9- Marine resources are decreasing.	1*	2	-1	-2
<b>Tourism developments (direction to go)</b>				
3- We should develop tourism with content. Knowledge increases respect by the area.	3	1	-1	1
1- We should work towards a tourism industry dedicated to nature and respecting its limits.	2	1	0	2
13- Society is increasingly aware of political measurements for environmental protection.	2	-1	-2	1
25- We are starting to develop nature tourism but with no rules.	0*	-2	-2	-1

**Note:** Values in place 1 or 0 are only shown when statistical significant (P<0.05; asterisk (\*) indicate significance at P<0.1).

**TABLE 6.1**  
**Discourse B minor concerns about the actual and future of Ria Formosa coastal zone.**

Statements defining Discourse B minor concerns	Factor score			
	B	A	C	D
<b>Administration and economy</b>				
11- Most of the times things fail when law is being applied.	-3*	0	1	-2
26- There are too many management institutions, there's a lack of integration and common aim.	-2*	0	1	3
31- We should have an environmental tax for the users of this area that could be used for nature conservation.	-2	-2	-3	0
<b>Land use planning</b>				
27- The municipalities are too dependent on the financial support of the building lobbies.	-3*	-2	-1	2
26- There are too many management institutions, there's a lack of integration and common aim.	-2	-2	0	0
22- Tourism needs to be organized. At the moment people use everything as they want, they pass everywhere with boats and the police do not go after them.	-2	1	-1	1

**Note:** Values in place 1 or 0 are only shown when statistical significant  
(P<0.05; asterisk (\*) indicate significance at P<0.1).

**TABLE 7**  
**Discourse C major concerns about the actual and future of Ria Formosa coastal zone.**

Statements defining Discourse C concerns	Factor score			
	C	A	B	D
<b>Administration and economy</b>				
24- There is too much bureaucracy, which discourages investors.	3*	-3	1	0
6- Protection is important so that fish stocks do not diminish.	2	2	2	2
7- The number of fishermen is decreasing.	2	-1	0	-1
8- Circumstances are not created so that fishermen have better working conditions.	2	1	2	-3
<b>Land use planning</b>				
2- We should preserve cultural heritage and improve the conservation of historical buildings.	3*	0	1	0
15- There is a lack of infrastructure so people can enjoy nature in a balanced way.	1*	-1	-1	0
<b>Environment</b>				
28- We need to improve the Wastewater Treatment Plants.	2	0	0	2
1- We should work towards a tourism industry dedicated to nature and respecting its limits.	0	1	2	2

**Note:** Values in place 1 or 0 are only shown when statistical significant  
(P<0.05; asterisk (\*) indicate significance at P<0.1).

**TABLE 7.1**  
**Discourse C minor concerns about the actual and future of Ria Formosa coastal zone.**

Statements defining Discourse C minor concerns	Factor score			
	C	A	B	D
<b>Environment</b>				
18- The Natural Park institution does not correctly carry out its nature conservation responsibilities.	-3*	1	1	-1
13- Society is increasingly aware of political measurements for environmental protection.	-2	-1	2	1
5- Overfishing is making species disappear.	-2	0	-1	1
25- We are starting to develop nature tourism but with no rules.	-2	-2	0	-1
9- Marine resources are decreasing.	-1	2	1	-2
3- We should develop tourism with content. Knowledge increases respect by the area.	-1*	1	3	1
<b>Economy</b>				
31- We should have an environmental tax for the users of this area that could be used for nature conservation.	-3	-2	-2	0
29- Black markets are limiting the development of economic activities.	-2	-3	3	0
27- The municipalities are too dependent on the financial support of the building lobbies.	-1	-2	-3	2

**Note:** Values in place 1 or 0 are only shown when statistical significant  
(P<0.05; asterisk (\*) indicate significance at P<0.1).

TABLE 8

Discourse D major concerns about the actual and future of Ria Formosa coastal zone.

Statements defining Discourse D concerns	Factor score			
	D	A	B	C
<b>Administration and economy</b>				
26- There are too many management institutions, there's a lack of integration and common aim.	3*	0	-2	1
27- The municipalities are too dependent on the financial support of the building lobbies.	2*	-2	-3	-1
6- Protection is important so that fish stocks do not diminish.	2	2	2	2
22- Tourism needs to be organized. At the moment people use everything as they want, they pass everywhere with boats and the police do not go after them.	1	1	-2	-1
31- We should have an environmental tax for the users of this area that could be used for nature conservation.	0*	-2	-2	-3
29- Black markets are limiting the development of economic activities.	0*	-2	-3	3
<b>Environment</b>				
10- The lack of control is threatening marine biodiversity.	3	3	0	0
28- We need to improve the Wastewater Treatment Plants.	2	0	0	2
1- We should work towards a tourism industry dedicated to nature and respecting its limits.	2	1	2	0

**Note:** Values in place 1 or 0 are only shown when statistical significant (P<0.05; asterisk (\*) indicate significance at P<0.1).

TABLE 8.1

Discourse D minor concerns and disagreements about the actual and future of Ria Formosa coastal zone.

Statements defining Discourse D minor concerns	Factor score			
	D	A	B	C
<b>Fisheries</b>				
8- Circumstances are not created so that fishermen have better working conditions.	-3*	1	2	2
5- Overfishing is making species disappear.	-3	0	-1	-2
9- Marine resources are decreasing.	-2	2	1	-1
<b>Administration</b>				
19- The management institutions are too prohibitive, which does not allow the development of economic activities.	-2	-1	-1	-1
11- Most of the times things fail when law is being applied.	-2*	0	-3	1
18- The Natural Park institution does not correctly carry out its nature conservation responsibilities.	-1*	1	1	-3
<b>Environment</b>				
17- The houses on the barrier island are a landscape and environmental attack.	-2	1	-1	0

**Note:** Values in place 1 or 0 are only shown when statistical significant (P<0.05; asterisk (\*) indicate significance at P<0.1).

various groups of stakeholders, thus confirming the capacity of Q-methodology to reveal the patterns shared across individuals. This makes the method suitable for the study of contentious and widely debated social phenomena such as the environment (Addams and Proops, 1999).

Discourse A (*Pro Environmental education and information exchange*) is the only one that put education and information as priority (fig.2). Although other discourses put environmental education on the positive side, they do not consider better and increased information concerning biodiversity a priority. In addition, the environmental conscience of local people varies among discourses (fig.3). Discourse A considers society as having a lack of environmental conscience, as in discourse C (*pro-*

*environmental quality, integration and organization*). Discourse B (*Pro economical development supporting environmental values*) and D (*pro land planning and anti red tape*) present a more positive view and consider that environmental conscience is important and present in local society.

Both discourse A and B are concerned with the decline of marine resources (fig.2); discourse C and D are not - their view is more directed at administrative and *red tape* economic issues, while the others present a clear concern about environmental issues. However, discourse A and D present a shared concern with the lack of control in terms of depletion of marine resources.

Houses on the Ria Formosa's barrier islands are an important topic that has been discussed for many years. It represents an important area of conflict between local people and governance. Earlier actions have failed to eliminate or decrease urban occupation on the island. The present work shows that this might continue to be an area of conflict because only discourse A (fig. 2) positioned the related statement (17) in a positive position; all other discourses considered it a minor concern.

The possible lack of organization of tourism activities (fig. 2), in terms of areas used is a concern for discourses A and D and a minor concern for discourses B and C. The existence of black markets seems a concern only for discourse B, while fisheries are a concern for discourses B and C, connected with the importance of economic development.

Discourse C was the only discourse that considers ecotourism (fig. 3) a minor concern. However all discourses agree that nature tourism is, at the moment, well regulated and that limiting tourist development is important.

Bureaucratic issues (fig.4) are the main concern for discourse C and a minor concern for discourse A. Concern with cultural heritage is also a major concern for discourse C and, to a lesser degree, Discourse B; the remaining discourses consider it of intermediate concern.

Waste water Treatment Plants are a major concern for discourses C and D. The lack of integration (fig. 5) is a major concern only to discourse D. Figure 5 shows statements that are agreed upon by all discourses. The development of tourism activities linked with traditional activities is not considered an important issue, and environmental tax is not well accepted.

All discourses consider protection of marine resources important and environmental education for adults is considered an intermediate concern.

#### D. POLIS action plan 2008-2012: comparison

The existence of too many institutions managing the Ria Formosa is considered an important issue for most of the discourses identified. Discourse C and D are very concerned with integration and organization. These discourses are defined mostly by government workers. The POLIS action plan is managed by a new institution created solely for this purpose: Sociedade de Requalificação e Valorização da Ria Formosa SA. This strategy might not be well accepted, mainly by stakeholders connected with governmental institutions that might consider this as yet another institution. In order to overcome this possible barrier, a well organized and sensible interface should be defined by the Sociedade de Requalificação e Valorização da Ria Formosa SA and all other institutions involved.

FIGURE 2  
Agreement and disagreements using discourse A as reference.

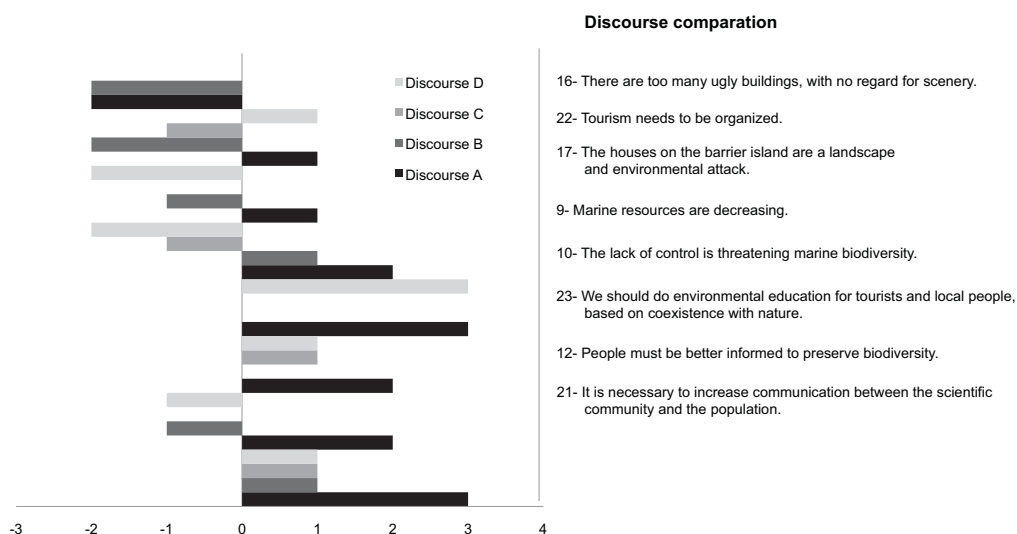




FIGURE 3

Agreement and disagreements using discourse B as reference.

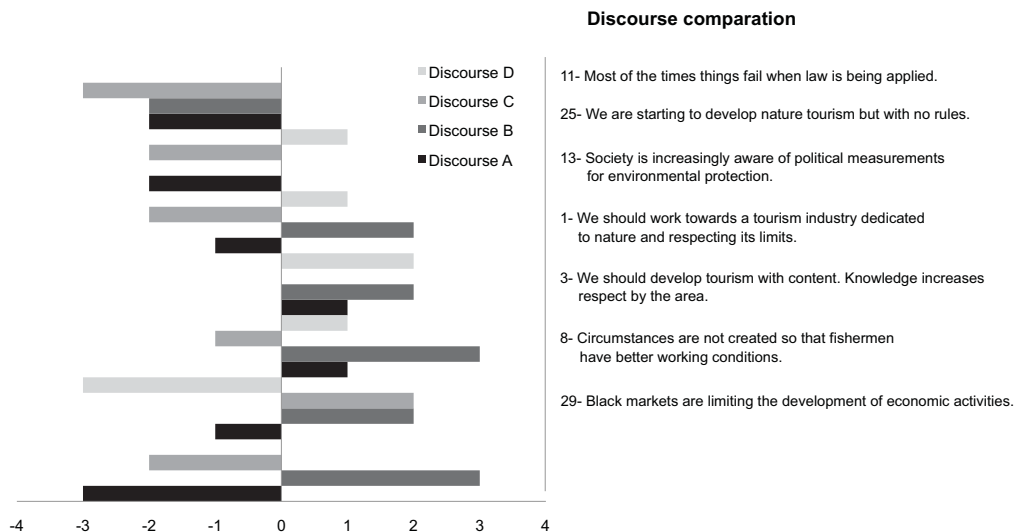


FIGURE 4

Agreement and disagreements using discourse C as reference.

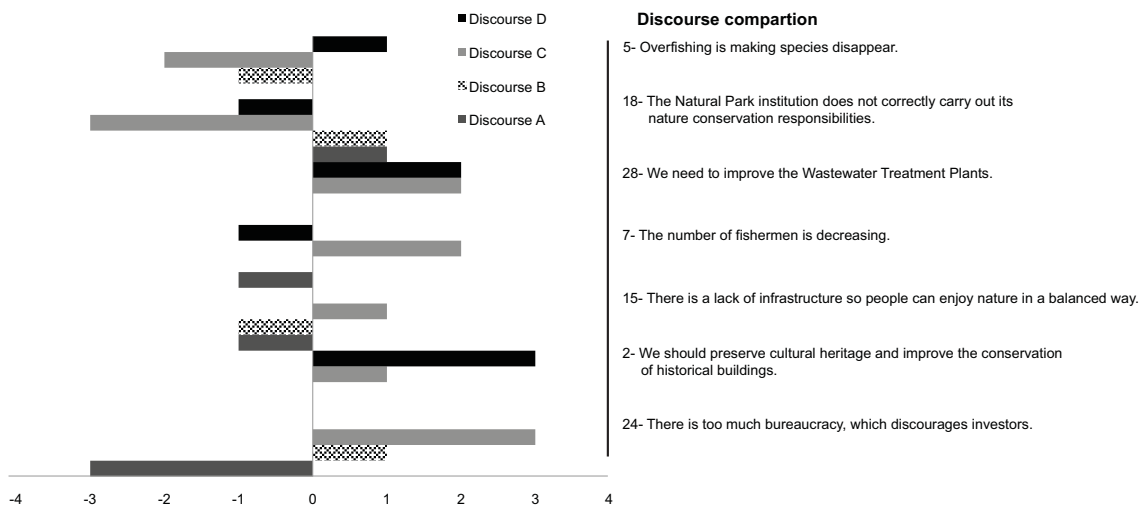


FIGURE 5

Agreement and disagreements using discourse D as reference.

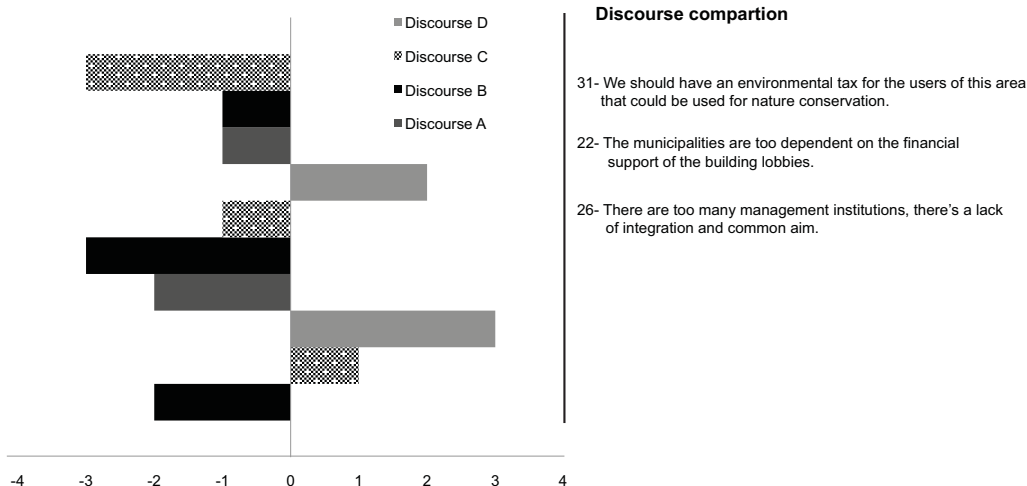
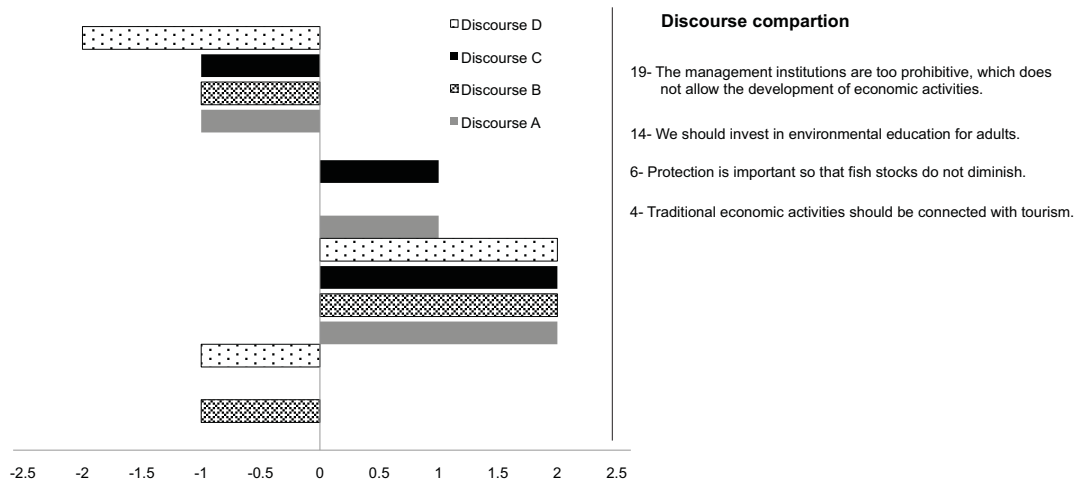


FIGURE 6

Statements that are consensual to all discourses. All listed statements are non-significant at  $P > 0,1$ .



Natural and cultural heritage have been identified by stakeholders and their importance highlighted by discourses B and C. POLIS-2008 defines several communication and dissemination strategies for the Ria Formosa's natural and cultural values. In addition, marketing strategies are going to be developed to increase tourist activities connected with goods and services from the Ria Formosa, which Q sort analysis also revealed as a positive move.

POLIS also includes investment in the demolition of built areas on the barrier island. The aim of this project is to combat erosion problems and risk situations and need to reestablish the dune system. However, as mentioned previously, houses on the barrier island are considered a minor issue for most of the discourses and can be a major area of tension between local society and management institutions, as it has been for many years. Bearing this in mind, residents who will be affected by these measures should be identified and an advance period of communication and negotiation should be established.

Investment in waste water treatment plants has also been pointed out in the analysis and is also included in POLIS-2008.

Protection of marine resources is commonly considered important and POLIS-2008 includes several investments that can promote it: coastal monitoring activities linked to geographic information systems and environmental quality control, among other strategies.

Various actions are planned to improve working conditions in the fisheries sector, which has also been an identified concern.

In addition, several investments are planned to increase infrastructure for enhancing contact with nature, a concern also identified by Q analysis.

POLIS appears to respond to several concerns identified by this stakeholder analysis, which bodes well for its acceptance within the Ria Formosa community. However, communication and information strategies should be developed in order to guarantee the success of the overall project, especially the parts that involve demolition actions.

## IV. Conclusions

This study clearly shows the diverse perspectives for the future development of the Ria Formosa coastal zone. This leads to the conclusion that there is no one 'right' way of defining a future strategy for coastal management. The identification of four distinct discourses underlines the complexity of the concept.

Use of Q-methodology allowed the generation of statistically significant results with the use of only a small sample of participants and its participant-driven nature minimized research bias. Despite the distinct advantages of Q methodology, the initial stages of research design (carrying out interviews, generating and carefully selecting the statements) are very

intensive and time-consuming for the researcher. Consequently, the study suggests that it might not be possible to agree on one definitive method for stakeholder analysis. Instead, those needing to use such an assessment should not restrict themselves to following one of the identified views, but rather they should use a combination of criteria. We should recognize that different methods need to be used and that any measurements will only ever provide partial evaluations of the overall system. Perhaps it is more important to open political and participatory avenues to achieve effective strategies, coupled with legal and scientific measures for promoting a cleaner environment.

## V. Acknowledgements

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