The use of Q-methodology to obtain stakeholder Discourses on the future development of Ria Formosa Coastal zone, south of Portugal

Nome	Maria Helena Marques Enes Guimarães
Instituição	Gabinete de Gestão e Conservação da Natureza, Universidade dos Açores
Morada para correspondência	Rua do Bocage, 130 8000 Faro
País	Portugal
E-mail	helenaguimaraes@uac.pt
Telemóvel	00351968829544

A B S T R A C T

The lagoon system of Ria Formosa is important for both nature conservation and economic development. Its important ecological characteristics have been reemphasized by its protection by national law since and its inclusion in international conservation instruments. In the last decades, increasing threats to the area have appeared. These threats are identified in the different management plans which include this area; however institutional complexity has delayed the development of effective solutions. Effectiveness cannot be easily measured, since different stakeholders use different criteria as the basis of their opinion.

An effective strategy for nature conservation necessarily involves using stakeholder analysis. Without these steps, policies may fail to gain sufficient political and local support to be made into rules, and even if they are, they will often lack enough support among local people to be effective.

The purpose of this study is to investigate discourses concerning future management of Ria Formosa coastal zone. This article focuses on stakeholder analysis with Q methodology. 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. In February 2007, we did thirty interviews among 10 different groups of stakeholders. From these interviews, 31 statements were taken as

being the most common discourse. Using these statements a questionnaire was performed to 22 new individuals. Participants were asked to sort the 31 statements according to how important or not they were to them. These results were then analyzed using factor analysis.

This study revealed four distinct discourses on the future development of this area: environmental education and capacity building; fisheries and ecotourism development; bureaucracy, land planning and fisherman conditions; environmental quality, integration and organization. Theses Discourses are analyzed in detail and compared with the new action program in Ria Formosa, POLIS 2008. It concludes that the action planned in POLIS 2008 covers most of the concerns that stakeholders identified. The major conflict area identified concerns demolition actions of part of the houses existing in some of the barrier island of the lagoon system. In order to prevent conflict situation, communication and information strategies should be developed.

1 . I n t r o d u c t i o n

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 (POPNRF, 2004). This is a mesotidal coastal system with a surface of 84 Km^2, an exposed intertidal area of about 80% and with two peninsulas and five islands (Andrade, 1990). The lagoon system is connected to the ocean by six tidal inlets. Environmental changes along the lagoon are 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 (POPNRF, 2004). These same varied habitats are also the reason for the area's high biodiversity, including endemic and rare species. The area is home to 693 plant species, 18 mammals, 15 reptiles, 11 amphibians, 79 fishes, 184 mollusks and 214 birds. Due to these important ecological characteristics, the Ria Formosa is protected by national law (since 1979), the Habitat Directive and is included in international conventions such as the Ramsar Convention. The Natural Park of Ria Formosa (PNRF) with proximally 18000 hectares covers the whole area of the lagoon system and it´s municipalities; Loulé (partially), Faro, Olhão, Tavira and Vila Real de Santo António,. Traditional activities dating back to ancient times are still important; fisheries (90000 ton registered in 2001), shellfish exploitation (80-95% of national production) and salt farming (98% of national production in 2001) (POPNRF, 2004).

In the last decades, increasing threats to the area have appeared (POLIS 2008). Urban pressure due tourism development, inappropriate urban occupation on the barrier island, replacement of fisheries communities in tourism habitations areas, increase of toxic substance from domestic and industrial waste water, unorganized recreational activities, increase of boats and water motors inside the lagoon, invasion of exotic species, dredging activities, lack of environmental infrastructures (fences, elevated walkway, delimitation of beach accesses), lack of control and inspection of illegal activities, decrease of fish and selfish stocks and coastal erosion. In socio-economic terms the identified problems include a decrease of young people linked to a decrease of work opportunities and insufficient professional qualification and degradation of cultural heritage. These threats are identified in the different management plans which include this area (e.g. Coastal Zone Management Plan and Ria Formosa Natural Park Management Plan), 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 organized with the aim of defining a future strategy for Ria Formosa Coastal Zone capable of solving the identified problems. An Action Plan was developed, Polis Litotal 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 the consider 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 the 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.

An 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 in the conflicts are, what they believe and want, and the trade-offs

they're willing to make (Addams & Proops, 2000). Such knowledge is critical if the participatory decision strategies and action plans are to respond meaningful 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 local people saw measures as 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 of the 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 to designing 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 groups having or not having a legitimate stake and 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. Understanding how people link these three makes a number of contributions. Concerning the facts, the 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 the values, the discourse analysis helps to uncover those areas where compromise is possible and where it is impossible based on strongly held beliefs. Concerning the 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 word 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

1° CONGRESSO DE DESENVOLVIMENTO
REGIONAL DE CABO VERDE
15° Congresso da APDR

2° CONGRESSO LUSÓFONO
DE CIÊNCIA REGIONAL
3° Congresso de Gestão e Conservação
da Natureza

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 the 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 Litotal Ria Formosa in order to understand how stakeholders reaction to its implementations and suggest improvements.
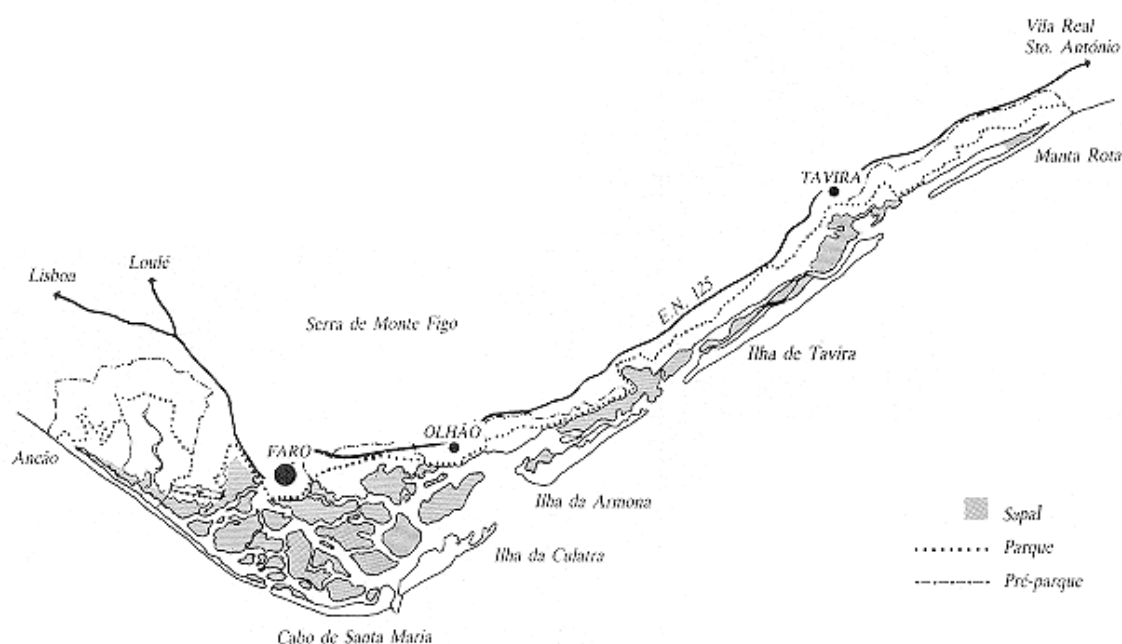

Figure 1. Map of the study area. The lagoon system of Ria Formosa located in the south coast of Portugal, the Algarve.

2. METHODS

This study is based on Q- methodology and the main aim is to understand what stakeholders perceive as important actions towards the futures use and development of Ria Formosa Coastal zone. In order to apply this method 30 interviews where performed to 10 different groups of stakeholders; tourism companies, fishermen, researchers, ONG (NGO's?), government, residents, tourist, real estate agencies and authority institutions. From this interviews, 31 statements (table 1) were taken as being the most common discourse among the interviews.

Using these statements a questionnaire was performed to 22 individuals related to the group 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 "*less 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 the individual´s valorization of 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.

Twenty-two Q sorts were performed. Delineating the various Discourses within the concourse 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 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 factor interpretation process, each factor was examined individually and in comparison with other factors for the purpose of illustrating the characteristics of the various Discourses, as well as the points of agreement and disagreement.

1° CONGRESSO DE DESENVOLVIMENTO
REGIONAL DE CABO VERDE
15° Congresso da APDR

2° CONGRESSO LUSÓFONO
DE CIÊNCIA REGIONAL
3° Congresso de Gestão e Conservação
da Natureza

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 the cultural heritage and improve the conservation of historical buildings.
3	We should develop tourism with background. 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 don't diminish.
7	The number of fishermen is decreasing.
8	Circumstances are not created so that fishermen have better working condition.
9	Marine resources are decreasing.
10	The lack of control is threatening the 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 infrastructures so people can enjoy nature in a balance way.
16	There are too many ugly buildings, with no scenery correlation.
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 to prohibitive which does not allow the development of economic activities.
20	The offer is unorganized, economic activities are not integrated with the other that occurs in the same space.
21	It's 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 don't go after them.
23	We should do environmental education for tourist and local people, based on the 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 the common aim.
27	The municipalities are too dependant 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 actual utilization.
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

3. RESULTS and DISCUSSION

The purpose of this Q study was to reveal distinct discourses on future development of Ria Formosa coastal zone. A specific discourse is the interpretation of a specific factor extracted by the statistical procedure. In this study four distinct factors

1º CONGRESSO DE DESENVOLVIMENTO
REGIONAL DE CABO VERDE
15º Congresso da APDR

2º CONGRESSO LUSÓFONO
DE CIÊNCIA REGIONAL
3º Congresso de Gestão e Conservação
da Natureza

were extracted. All these factors had at least two participants loading significantly on them. Some areas of 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 both positive and negative extreme scores in more than one discourse in which case their relative importance is low. 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 the statements which distinguished the factors by being statistically significant at the 99% confidence level (P < 0.01), followed by those statistically significant at the 95% confidence level (P < 0.05). Finally, the interpretation also depends on the in-depth interviews that were conducted with the participants of the Q study beforehand in order to generate the Q statements, so as to minimize research bias as much as possible. However, bias can never be totally eliminated but is reduced by careful and rigorous selection of the Q statements and the very large number of possible statement combinations.

3.1. The four discourses on regime effectiveness

3.1.1. Discourse A: Pro Environmental education and information exchange

Discourse A explains 17% of the total variance (table 3). This discourse (table 5 and 5.1) is more concerned with information and education needs in order to better preserve the environmental quality of the coastal zone of Ria Formosa (statements 21, 12, 23). There is a high level of concern for the environmental situation of this area (statements 10, 9, 6, 17, 22). It is felt that there is lack of control which threatens marine biodiversity. Administration and economy are not regarded as important issues. Investors are not considered to be affected negatively by excess of bureaucracy (statement 24) which implies that economical development is allowed in positive or negative way for the environmental quality of the area.

Environmental education through coexistence with nature is perceived as important to achieve society awareness of environmental issues (statement 23). The current form of ecotourism is considered well organized (statement 25). However other forms of tourism are perceived as unorganized and threatening the quality of the environment (statement 22).

CABOVERDE
Redes e Desenvolvimento Regional

1º CONGRESSO DE DESENVOLVIMENTO
REGIONAL DE CABO VERDE
15º Congresso da APDR

2º CONGRESSO LUSÓFONO
DE CIÊNCIA REGIONAL
3º Congresso de Gestão e Conservação
da Natureza

Economical issues related to market and fisheries are minor concerns for this Discourse, as well as the possible relationship between municipalities and construction lobbies (statements 29, 24, 8). Land planning is also a minor concern (statements 26, 27, 25).

In this discourse, information and education seem to be the main vehicle of change in Ria Formosa Coastal zone. Concerns with the environment are identified but not with economic development. It is perceived that only through information exchange and education, sustainable development might occur. Discourse A focuses to a certain extent on participatory processes and dissemination of information on the process of governance in general.

3.1.2. Discourse B: Pro sustainable development; economical concerns maintaining environmental quality (table 6 and 6.1)

Discourse B explains 12% of the total variance (table 3). This discourse is very concerned with the exploration of marine resources in a sustainable way. It gives importance to the need of protection and the increase of working conditions for fishermen (statements 6, 8, 9). Also gives large importance to the existence of parallel markets that have a negative effect on the economic development (statements 29).

The second main concern is tourism development and its direction. It considers the development of more ecotourism activities to be important (statements 3, 1). In contrast to the previous Discourse it believes that people are more sensitive to environmental issues (statement 13). Tourism is not seen as unorganized or with no rules (statement 25).

The minor concerns of this Discourse are connected to administration and land use planning. Environmental tax is not deemed an important measure (statement 31) in any of the Discourses. On one hand, it agrees strongly that Ria Formosa Coastal zone should create a regime based on environmental, rather than political, benefits, but on the other it admits economic development should be a primary concern.

3.1.3. Discourse C: Pro land planning and decrease of bureaucracy (table 7 and 7.1)

Discourse C explains 11% of the total variance (table 3). It focuses primarily on the institutional performance and secondly on the environmental results obtained. This

CABOVERDE
Redes e Desenvolvimento Regional

1º CONGRESSO DE DESENVOLVIMENTO
REGIONAL DE CABO VERDE
15º Congresso da APDR

2º CONGRESSO LUSÓFONO
DE CIÊNCIA REGIONAL
3º Congresso de Gestão e Conservação
da Natureza

discourse gives a higher importance to issues related to administration and city planning. Bureaucracy is pointed out as the main issue (statement 24), which might be related to the rank attributed to land use planning. The fisheries industry (statement 6, 7, 8), as in Discourse B, is one of the main issues for the future development of the area. It is the only Discourse that gives a high value to cultural heritage (statement 2) and the necessity to preserve it. In addition Discourse C considers that there are not sufficient infrastructures for people to enjoy nature without damaging it (statement 15). In terms of tourism development this Discourse is in favor of limitation and rules in order of preserving the environment (statement 1). It also considers that water treatment needs to be increased (statement 28).

It is considered that the natural park carries its functions (statement 18), the environmental awareness of population is considered low and ecotourism is a minor concern. Environmental tax is also not considered a concern (statement 31) and economic issues related to lobbies existence (statement 27) and black markets are not a concern (statement 29).

3.1.4. Discourse D: Pro-environmental quality, integration and organization (table 8 and 8.1)

Discourse C explains 9% of the total variance (table 3). In this discourse, the primary concern is related to administrative organization and the lack of integration among institution (statement 26). Effectiveness is viewed as the achievement of cooperation among institutions.   It is the only Discourse that considers municipality's dependent of construction lobbies (statement 27). Management institutions are not considers too prohibitive and so development can occurs in a positive or negative direction (statement 19), however it is considered that laws are applied in a correct manner. It is the only Discourse that does not rank negatively the use of environmental tax (statement 31). Tourism organization is also a concern (statement 22) as well as the existence of black markets (statement 29).

The second major concern is related to environmental quality; the need of control and improve wastewater treatment (statement 28). In relation to nature conservation, the houses in the barrier island (statement 17) and the effectiveness of the Natural Park (statement 18) are considered minor concerns. The Fisheries is not an important issue (statements 8, 5, 9).

3.2. Stakeholder group loadings on each factor or discourse

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

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 element of Ria Formosa Natural Park, one is related to ecotourism activities and fisheries, one is a diving partisan and one works in real estate.

Pro sustainable development discourse is define by a real estate worker, the vice-chief of maritime police , a worker of an ONG of environmental issues, a fishermen and one tourist that has a house in the area.

Pro land planning and decrease of bureaucracy is supported by a former worker in the canned fish industry, a resident, an element of a municipality related to water treatment, and an element of the Regional Tourism authority for the Algarve.

Pro-environmental quality, integration and organization discourse was defined by a research on fisheries of the government fishery research institute, a functionary of the port authority, a tourist, an element of the Natural Park institute and a work in the construction industry.

From the described loadings we can see that there are clear patterns in the loadings of subgroups to each discourse.

1° CONGRESSO DE DESENVOLVIMENTO
REGIONAL DE CABO VERDE
15° Congresso da APDR

2° CONGRESSO LUSÓFONO
DE CIÊNCIA REGIONAL
3° Congresso de Gestão e Conservação
da Natureza

Table 3. Reordered factor Matrix with grey underline 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	0,070	0,028
C	0,059	0,070	1	0,123
D	0,174	0,028	0,123	1

Table 5. Discourse A major concerns about the actual and future situation of Ria Formosa coastal zone.

Statements defining Discourse A concerns	Factor score			
	A	**B**	**C**	**D**
Information and education				
21- It's 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 do environmental education for tourist and local people, based on the coexistence with nature.	2	0	1	1
Environment				
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 fishes don't diminish.	2	2	2	2
17- The houses on the barrier island are a landscape and environmental attack.	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 don't go after them.	1*	-2	-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 5.1. Discourse A minor concerns about the actual and future situation of Ria Formosa coastal zone.

Statements defining Discourse A minor concerns	Factor score			
	A	**B**	**C**	**D**
Administration and economy				
29- Black markets are limiting the development of economic activities.	-3	3	-2	0
24- There is too much bureaucracy which discourage investors	-3*	1	3	0
31- We should have an environmental tax for the users of this area that could be use in nature conservation.	-2	-2	-3	0
8- Circumstances are not created so that fishermen have better working condition	-1*	2	2	-3
Land use planning				
26- There are too many ugly buildings, with no scenery correlation.	-2	-2	0	0
27- The municipalities are too depended 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 situation of Ria Formosa coastal zone.

Statements defining Discourse B concerns	Factor score			
	B	**A**	**C**	**D**
Economy				
29- Black markets are limiting the development of economic activities.	3*	-3	-2	0
6- Protection is important so that fishes don't diminish.	2	2	2	2
8- Circumstances are not created so that fishermen have better working condition	2	-1	2	-3
9- Marine resources are decreasing.	1*	2	-1	-2
Tourism developments (direction to go)				
3- We should develop tourism with background. When people know a space they respected better.	3	1	-1	1
1- We should work towards a tourism dedicated to nature, 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 situation of Ria Formosa coastal zone.

Statements defining Discourse B minor concerns	Factor score			
	B	**A**	**C**	**D**
Administration and economy				
26- There are too many management institutions, there's a lack of integration and the common aim.	-2*	0	1	3
11- Most of the times things fail when law is being applied.	-3*	0	1	-2
31- We should have an environmental tax for the users of this area that could be use in nature conservation.	-2	-2	-3	0
Land use planning				
27- The municipalities are too depended on the financial support of the construction lobbies.	-3*	-2	-1	2
26- There are too many ugly buildings, with no scenery correlation	-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 don't 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 situation of Ria Formosa coastal zone.

Statements defining Discourse C concerns	Factor score			
	C	**A**	**B**	**D**
Administration and economy				
24- There is too much bureaucracy which discourages investors.	3*	-3	1	0
6- Protection is important so that fishes don't 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 condition.	2	1	2	-3
Land use planning				
2- We should preserve the cultural heritage and better preserve the historical buildings.	3*	0	1	0
15- There is a lack of infrastructures so people can enjoy nature in a balance way.	1*	-1	-1	0
Environment				
1- We should work towards a tourism dedicated to nature, respecting its limits	0	1	2	2
28- We need to improve the Wastewater Treatment Plants.	2	0	0	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 and disagreements about the actual and future situation of Ria Formosa coastal zone.

Statements defining Discourse C minor concerns	Factor score			
	C	A	B	D
Environment				
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
9- Marine resources are decreasing.	-1	2	1	-2
3- We should develop tourism with background. When people know a space they respected better.	-1*	1	3	1
5- The over fishing is making species disappear.	-2	0	-1	1
25- We are starting to develop nature tourism but with no rules.	-2	-2	0	-1
Economy				
31- We should have an environmental tax for the users of this area that could be use in nature conservation.	-3	-2	-2	0
27- The municipalities are too depended on the financial support of the building lobbies.	-1	-2	-3	2
29- Black markets are limiting the development of economic activities	-2	-3	3	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: Discourse D major concerns about the actual and future situation of Ria Formosa coastal zone.

Statements defining Discourse D concerns	Factor score			
	D	A	B	C
Administration and economy				
26- There are too many management institutions, there's a lack of integration and the common aim.	3*	0	-2	1
27- The municipalities are too depended on the financial support of the building lobbies.	2*	-2	-3	-1
6- Protection is important so that fishes don't 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 don't go after them.	1	1	-2	-1
31- We should have an environmental tax for the users of this area that could be use in nature conservation.	0*	-2	-2	-3
29- Black markets are limiting the development of economic activities	0*	-2	-3	3
Environment				
10- The lack of control is threatening the 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 dedicated to nature, 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 situation of Ria Formosa coastal zone.

Statements defining Discourse D minor concerns	Factor score			
	D	A	B	C
Fisheries				
8- Circumstances are not created so that fisherman have better working condition	-3*	1	2	2
5- The over fishing is making species disappear.	-3	0	-1	-2
9- Marine resources are decreasing.	-2	2	1	-1
Administration				
19- The management institutions are to 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
Environment				
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).

3.4. Areas of Consensus and Disagreement

The purpose of this study was to reveal the existence of any distinct discourses on the future development of 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 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 (Barry and Proops, 1999).

Discourse A is the only that put education and information as priority (fig.2). Although other discourse put environmental education in the positive side, they don´t consider the need for better and increased information concerning biodiversity a priority. In addition, the position about environmental conscience of local people varies among discourses (fig.3). Discourse A (pro education and information) considers society with lack of environmental conscience as in discourse C (pro-environmental quality, integration and organization). Discourse B (pro sustainable development) and D (pro land planning and decrease bureaucracy) present a more positive view and considers environmental conscience important and existing in local society.

Both discourse A (pro education and information) and B (pro sustainable development) are concerned with the decrease of marine resources (fig.2). Discourse C

1° CONGRESSO DE DESENVOLVIMENTO
REGIONAL DE CABO VERDE
15° Congresso da APDR

2° CONGRESSO LUSÓFONO
DE CIÊNCIA REGIONAL
3° Congresso de Gestão e Conservação
da Natureza

(pro-environmental quality, integration and organization) and D (pro land planning and decrease bureaucracy) are not; their view is more directed to administration and economy issues. However, discourse A and D present the same major concern that is the lack of control in terms of depletion of marine resources.

Houses in the barrier Islands are an important topic in Ria Formosa 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 discourse considered it a minor concern.

The possible disorganization of tourism (fig. 2) in terms of areas of use is a concern for discourse A and D and a minor concern for the discourse B and C.

A black markets seems a concern only for discourse B while fisheries is a concern for discourses B and C more connected with the importance of economical development.

Ecotourism (fig. 3) seems an important economic activity for discourse B that also shows concern about environmental quality. Discourse C was the only discourse that considers it a minor concern. All discourses agree that nature tourism is, at the moment, well regulated and that limiting tourism development is important.

Bureaucratic issues (fig.4) are the main concern for discourse C and the minor concern for discourse A. Concern with cultural heritage is also a major concern for Discourse C and in a lower level to Discourse B, the remaining discourse considers it an intermediate concern.

Waste water Treatment Plans is a major concern for discourse C and D. The lack of integration (fig. 5) is a major concern to discourse D and not to all the others. It is interesting to observe that these Discourses have been defined mainly by element working in governmental institutions.

Figure 5 shows statements that are agreements among 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 on marine resources important and environmental education for adults is considered an intermediate concern.
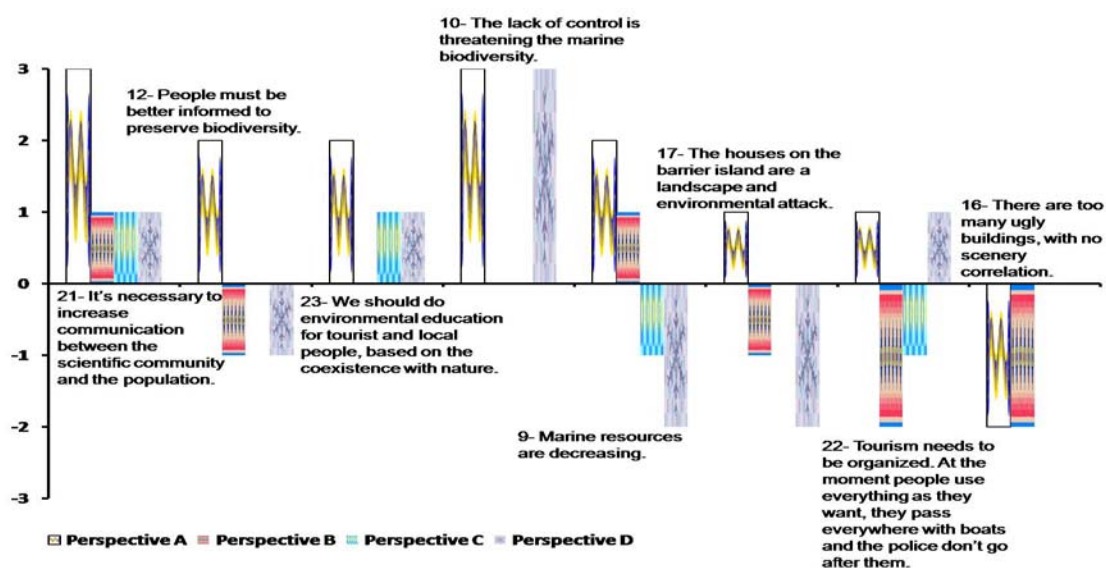
CABO VERDE
Redes e Desenvolvimento Regional

1º CONGRESSO DE DESENVOLVIMENTO
REGIONAL DE CABO VERDE
15º Congresso da APDR

2º CONGRESSO LUSÓFONO
DE CIÊNCIA REGIONAL
3º Congresso de Gestão e Conservação
da Natureza

Figure 2. Agreement and disagreements with Discourse A.
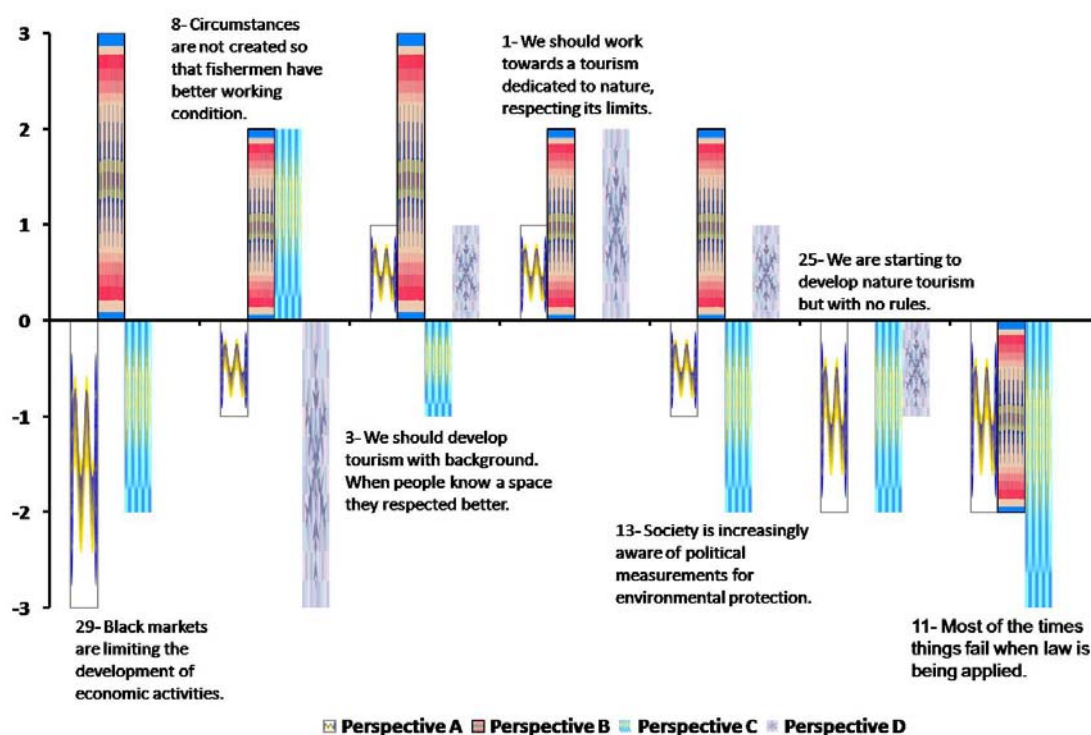

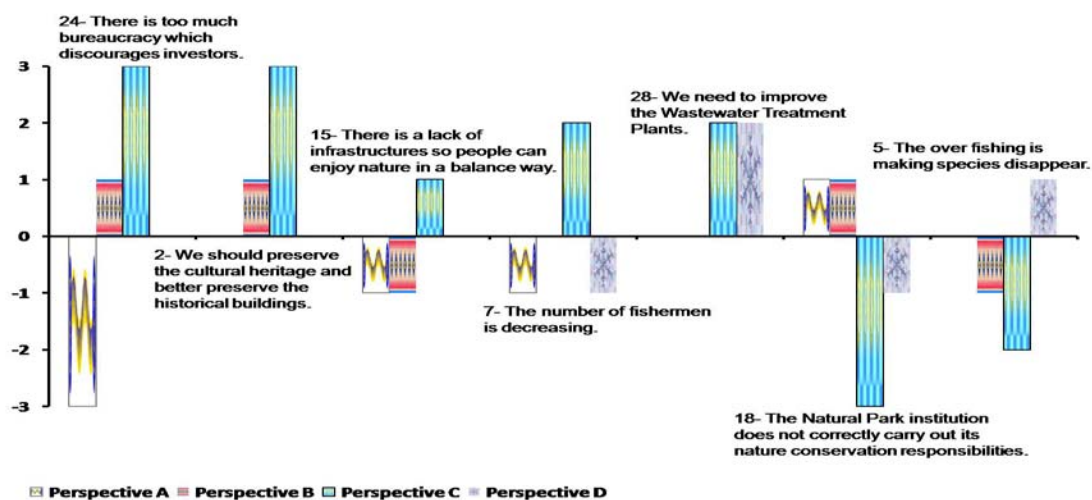**Figure 3**. Agreement and disagreements with Discourse B.

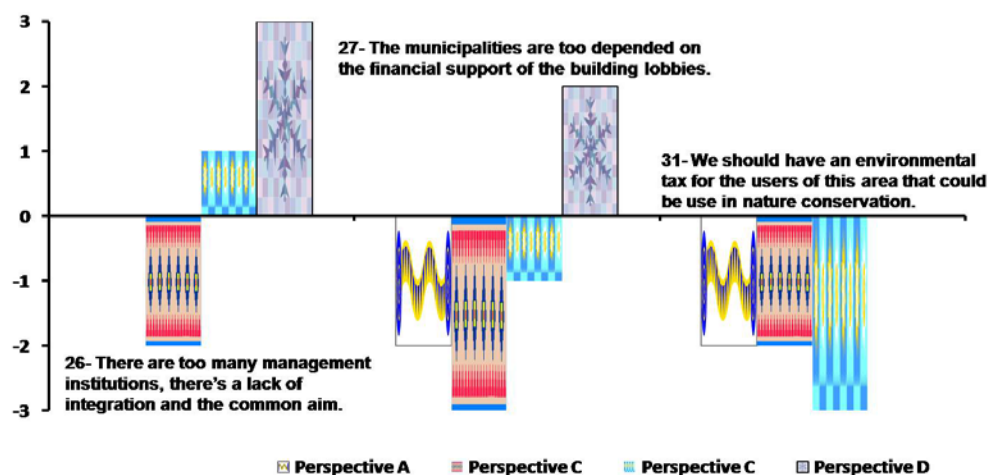**Figure 4**.Defining agreement and disagreements of Discourse C.
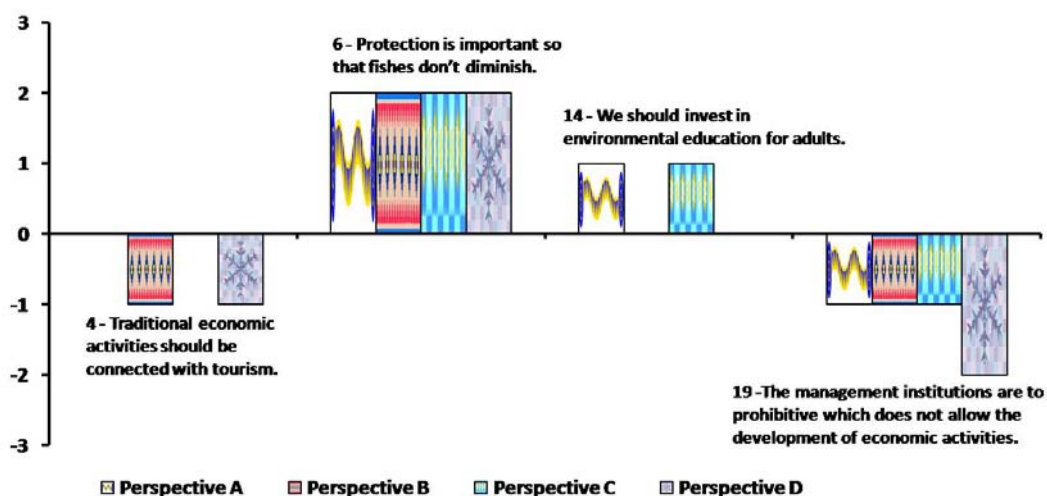

Figure 5. Agreement and disagreements with Discourse D.

Figure 6. Statements of consensus that do not distinguish any pair of factors. All listed statements are non-significant at P > 0,1.

3.6 POLIS action plan 2008-2012: comparison

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

Nature and cultural heritage has been identified by stakeholders and their importance has been highlighted by Discourse B and C. POLIS 2008 defines several communication and diffusion strategies of Ria Formosa nature and cultural values. In addition marketing strategies are going to be developed in order to increase tourist activities connected with good and services from Ria Formosa, that has also been highlighted in Q sort analysis as the direction to go.

POLIS also includes investment for demolition of built areas within the barrier island. The aim of this project is related to erosion problems, risk situation 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 the management institution 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 performed.

Investments in waste water treatment plans have also been pointed out in the analysis and are 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, environmental quality control, among other strategies.

Different action are planned in order to increase working condition for fisheries sector. Fisherman condition has also been an identified concerned in Q sort analysis.

There are several investments planned to increase infrastructures that will enhance contact with nature which has also been pointed as an important need.

POLIS appears to respond to several concerns identified by this stakeholder's analysis which is a positive aspect of its acceptance within Ria Formosa society, however communication and information strategies should be developed in order to guarantee the success of the overall project mainly to issues that involve demolition actions.

3. CONCLUSIONS

This study clearly shows that different people view future development in Ria Formosa coastal zone in very different ways. In other words, there is no one 'right' way of defining direction to go in terms of coastal management and the identification of four discourses underlines the complexity of the concept.

The use of Q methodology allowed the generation of a statistically significant results with the use of only a small sample of participants and its participant driven nature minimizing research bias. Despite the distinct advantages of Q methodology the initial stages of the 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 way of 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 more important is the opening of political and participatory avenues as a means of achieving effectiveness coupled with the legal and scientific measures of a cleaner environment.

4. REFERENCES

Addams, H., Proops, J., 2000. Social Discourse and Environmental Policy: an Application of Q Methodology. Edward Elgar, Cheltenham.

Andrade C., 1990 – O Ambiente de Barreira da Ria Formosa. Ed. Departamento de Geologia da Universidade de Lisboa. PhD thesis. Universidade de Lisboa.

Brown, S.R., 1980. Political Subjectivity: Applications of Q-methodology in Political Science. Yale University Press, New Haven and London.

Brown SR., 1993. A primer on Q methodology. Operant Subjectivity: Journal of the International Society for the Scientific Study of Subjectivity 16(3/4)..

Brown SR., 2002. Q technique and questionnaires. Operant Subjectivity: Journal of the International Society for the Scientific Study of Subjectivity 26(2)..

ICN/Natural Park of Ria Formosa, 2004. Management Plan of the Natural Park of Ria Formosa.

POLIS, 2008. Sociedade para a Requalificação e Valorização da Ria Formosa SA.

Smith N.W., 2001. Current systems in psychology: history, theory, research, and applications. Wadsworth.

Stephenson, W., 1953. The Study of Behavior: Q-technique and its methodology. University of Chicago Press, Chicago.

Watts, S., Stenner, P., 2005. Doing Q methodology: theory, method and interpretation. Qualitative Research in Psychology 2 (1), 67-91.