

## Water-related citizens' complaints on a coastal wet land area: exploring the influence of local administrative boundaries

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### ABSTRACT

This paper explores the water-related citizens' complaints submitted to the municipalities surrounding 'Ria de Aveiro', a natural lagoon located in the center of Portugal close to the Atlantic coast, and is aimed at analyzing how local administrative boundaries might influence the frequency, typologies and territorial pattern of complaints. It also analyzes the frequency of water-related complaints in relation to other environmental problems raised by local population. The proposed analysis assesses how the existence of such a large water territory that 'Ria de Aveiro' is, influences the typologies of water-related complaints and the propensity of the population to complain about problems specifically related to the quality of this area. It also analyzes the relationship between the extent of the water body of 'Ria de Aveiro' within each municipality and the frequency of water-related complaints. The paper is organized into four sections. The first presents a brief literature review about citizen environmental complaints and their relevance for environmental and water resources governance, highlighting the role played by different sorts of stakeholders involved. The second section describes the case study and the methodology adopted. The results of the empirical study are presented in the third section with emphases given on the actors involved, the typologies of water-related problems referred to in the complaints, as well as, their territorial pattern. The final section critically analyses these results and questions the actual relevance of local administrative boundaries in the perception of water-resources related values as interpreted and communicated by citizens' complaints.

**KEY WORDS:** *Citizen complaints, water resources, local boundaries, Portugal.*

### INTRODUCTION

The demand for high levels of environmental quality is responsible for the increasing of public involvement and a greater accountability by several authorities, especially at the local level, in order to attend citizens' expectations. In this regard, complaints submitted by citizens to local authorities have the potential to reveal environmental problems as seen by population, the actors involved and associated territorial pattern, being an important source of information for planning, prevention and management of local environmental problems (see, for example, Carvalho and Fidélis, 2009; Carvalho and Fidélis, 2011).

Amongst the environmental problems that have mobilized public attention around the world, pollution of water resources and sanitation are the most frequently referred to (see, for example, Cantrell, 1980; Jiménez, 1999; Dasgupta and Wheeler, 1997; Kosecik and Sagbas, 2004; Carvalho, 2007; Fidélis and Carvalho, 2009; Dimitrov, 2009; Carvalho and Fidélis, 2011). Water-related complaints submitted to local authorities also reflect, to some extent, public expectations regarding the quality of water resources and the improvement of related services.

This paper explores the water-related complaints submitted by citizens to the municipalities surrounding 'Ria de Aveiro', a natural lagoon located in the central section of Portugal's Atlantic coast, and is aimed at analyzing how local administrative boundaries might influence the frequency, typologies and territorial pattern of complaints. It also analyzes the frequency of water-related complaints in relation to other environmental problems raised by local population. The proposed analysis assesses how the existence of such a large water territory that 'Ria de Aveiro' is, influences the typologies of water-related complaints and the tendency of the population to complain about problems

specifically related to the quality of this area. It also analyzes the relationship between the extent of the water body within each municipality and the frequency of water-related complaints.

### PUBLIC COMPLAINTS, WATER GOVERNANCE AND THE ROLE PLAYED BY DIFFERENT STAKEHOLDERS

Although environmental protests have been well explored by the literature, there are few studies specifically related to the characterization of citizens environmental complaints. In this study, environmental complaints submitted by citizens to governmental authorities are considered formal and non-organized comments and demands regarding dissatisfaction with certain environmental quality parameters that directly or indirectly affect the population's quality of life (Carvalho and Fidélis, 2009; 2011).

The main contributions identified in the literature address the complaints submitted to local authorities as indicators of environmental problems from the standpoint of citizens. These also allow the identification of the actors involved, the territorial pattern and the performance of local governments in managing and resolving these problems (Kosecik and Sagbas, 2004; Carvalho and Fidélis, 2009; Carvalho and Fidélis, 2011). Other studies address citizens' complaints as relevant tools for the improvement of environmental quality parameters, environmental regulation, compliance with environmental standards and pollution control (Dasgupta and Wheeler, 1997; Huang and Miller, 2006; Warwick and Ortolano, 2007; Montenegro et al, 2009).

Despite the strictly localized nature seen in the studies about environmental complaints, some common characteristics are to be highlighted. Among these are

citizens as predominant complainants, local governments as key actors in the resolution of complaints, the incidence of problems common to urban areas, such as noise, solid waste, water-related problems, air pollution and also failures in the provision of urban services (Cantrell, 1980; Dasgupta and Wheeler, 1997; Jiménez, 1999; Kosecik and Sagbas, 2004; Carvalho and Fidélis, 2009; Dimitrov, 2009; Carvalho and Fidélis, 2011). In addition to the information provided by environmental complaints, as described above, Carvalho and Fidélis (2011) found that complaints are relevant tools to a self-assessment on the part of local governments, besides representing a channel for public participation.

The growing demands in the water sector have stimulated new forms of managing water resources and related services. As suggested by Tropp (2007), *'the governance transformation is intrinsically linked to the increasing focus on the complexity of water management and the multifunctional character of water and the search for alternative forms of organisation'* (p. 19). Inclusive decision-making processes, with involvement and dialogue of different stakeholders, knowledge sharing and public participation reflect, to some extent, the transformations evinced in the field of water governance.

Characterization of water-related complaints and their importance for water governance has not been widely described in the literature, nor the way related institutions respond to them. The role of institutions has been widely discussed in the light of resolution of conflicts over natural resources, the development and implementation of policies or decision-making processes with impact on the environment (for example, Ostrom, 1990; O'Riordan and Jordan, 1999; Young, 2002, cited in Adger *et al.*, 2003; Bromley, 1991; Harpham and Boateng, 1997, cited in Brunckhorst, 1998; Young, 2003; Adger *et al.*, 2003; Paavola, 2006; Thomas, 2010), but has not been sufficiently reported regarding environmental concerns raised by local population (see, for example, Carvalho and Fidélis, 2009; Fidélis and Carvalho, 2011). Institutions are considered as being the institutional framework in which environmental decisions are made and the set of rules by which these decisions are implemented. At a more pragmatic level, they play a role in both the cause and mitigation of environmental problems (Bromley, 1991; O'Riordan and Jordan, 1999; Young, 2002, cited in Adger, 2003). From a local perspective, it is widely accepted that local government units play an important role in the implementation of environmental sustainability (Thomas, 2010; Fidélis and Pires, 2009; Pires 2011, cited in Carvalho and Fidélis, 2011). One reason for this is the fact that these entities are considered closest to the people, besides being responsible for the management of environmental issues in the local context (Wild River, 2006, cited in Thomas, 2010). Local governments are, in fact, a component of the administrative system of modern societies that, in addition of being responsible for the provision of public services, seek to guarantee the realization of democratic values at the local level (Kosecik Sagbas, 2004). Local governments are particularly important in the citizens' daily lives since they are responsible for managing the infrastructure and services that directly affect their quality of life (Davila, 2009, cited in Satterthwaite, 2009), in which water-related issues are of great relevance. In this sense, attending to public expectations meets the realization of democratic principles

at the local level besides increasing public confidence in local governance entities.

## CASE STUDY AND METHODOLOGY

The study that we briefly present in this article, involves the eleven municipalities surrounding 'Ria de Aveiro', namely Águeda, Albergaria-A-Velha, Aveiro, Estarreja, Ílhavo, Mira, Murto, Oliveira do Bairro, Ovar, Sever do Vouga and Vagos. The municipalities correspond to an area of approximately 1600 km<sup>2</sup>. The empirical research methodology consisted of the identification and broad analysis of complaints regarding environmental problems and a detailed analysis of those related to water-related issues<sup>1</sup> submitted to the City Councils between 2000 and 2007<sup>2</sup>. Once selected, the complaints were categorized according to typologies of actors involved, sorts of water-related problems and territorial distribution by municipality. Comparison of water-related complaints with complaints resulting from other environmental problems raised by local population and the relationship between the extent of the usually flooded area, within each municipality and the frequency of water-related complaints were also analyzed. The study found that a total of 2140 complaints presented between 2000 and 2007. Complaints locations were georeferenced on the 1:25,000 scale cartographic base using AutoCAD 2012. The thematic maps were drawn to show the distribution of water-related complaints by municipalities (total distribution and *per capita* distribution) as well as the distribution of all environmental complaints.

## RESULTS

### Actors involved

The analysis of actors involved reveals the sorts of complainants, sources of environmental problems and actors requested to solve the problems. The results shows that *citizens* are those who submitted the majority of complaints to the municipalities (see fig. 1).

The blamed for being responsible for the environmental problems included especially *citizens* and *City Councils* (see fig. 2).

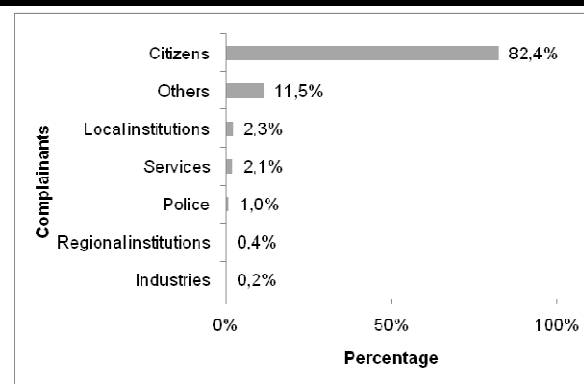


Figure 1 – Types of complainants.

<sup>1</sup> Including problems related to sanitation.

<sup>2</sup> The municipalities of Albergaria-A-Velha and Mira did not provide complaints for consultation. The municipality of Vagos has only a single complaint that is not associated with water.

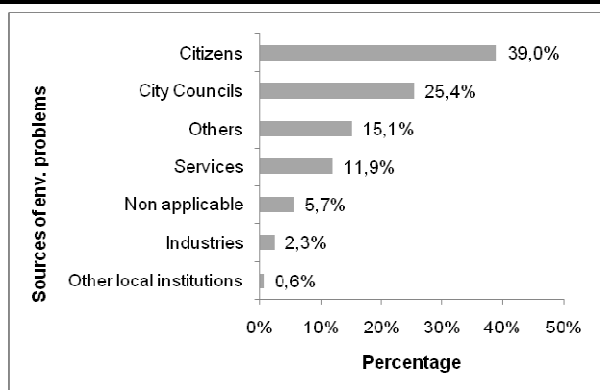


Figure 2 – Sources of environmental problems.

City Councils represent the main requested institutions to solve environmental problems object of complaint, followed by public health centers, especially on the situations related to insalubrity.

### Water-related complaints

The environmental problems referred to in the complaints were classified according to the following categories. The problems related to *abandoned residences and lots*, especially brambles, represent the main factor of environmental dissatisfaction as seen by local population. *Water-related problems* proved to be the second largest group and *solid waste*, with emphasis to open dumps, represents the third most common type of environmental problem that has been object of complaints (see fig. 4).

Water-related complaints were classified into the following subcategories (see fig. 5).

Sewer represent the main type of water-related problem, referring to the dumping in water courses, streets or lots and also the absence of connection to public sewerage system. Next categories are *water flow*, especially land drainage and flooding, *sanitation infrastructure*, which are mostly associated to leaking water meters, obstruction of water collectors and water supply, and *water pollution* from weed species, oil, gas, chemicals, amongst others. Finally, *erosion* represents the less frequent type of water-related problem.

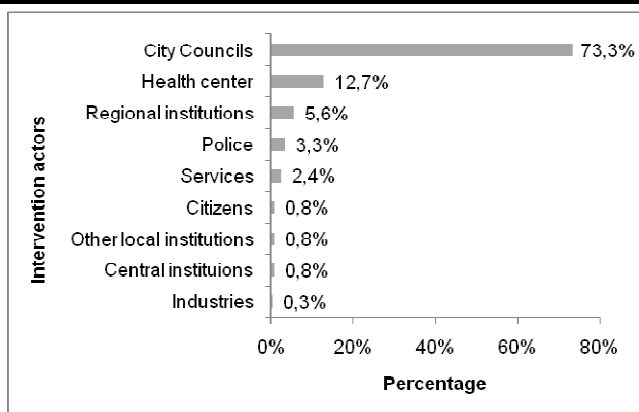


Figure 3 – Intervention actors.

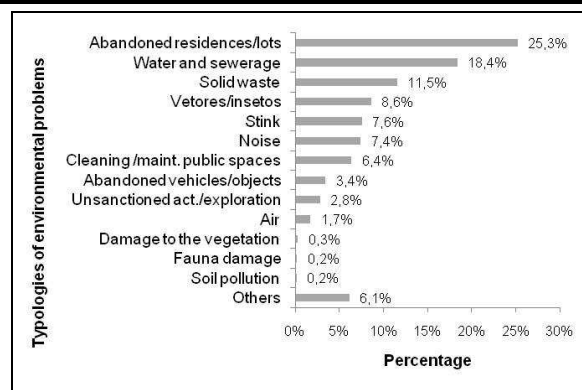


Figure 4 – Typologies of environmental problems referred to in the complaints.

### Territorial analysis

Territorial distribution of all complaints reveals a greater concentration in Águeda, which is one of the most populous municipalities. In the overall picture provided by this analysis, concentration of complaints is not associated to the territorial expression of 'Ria de Aveiro' nor the levels of urbanization (see fig. 6). The territorial analysis of water-related complaints reveals that most of them are concentrated in Ovar, Águeda and Aveiro, the most populated municipalities with higher levels of urbanization (see fig. 7).

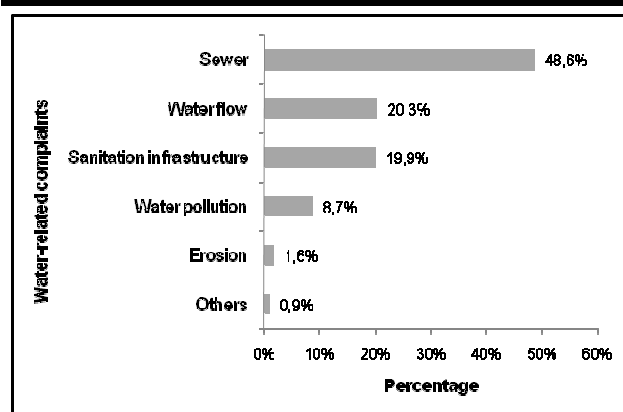


Figure 5 – Subcategories of water-related problems.



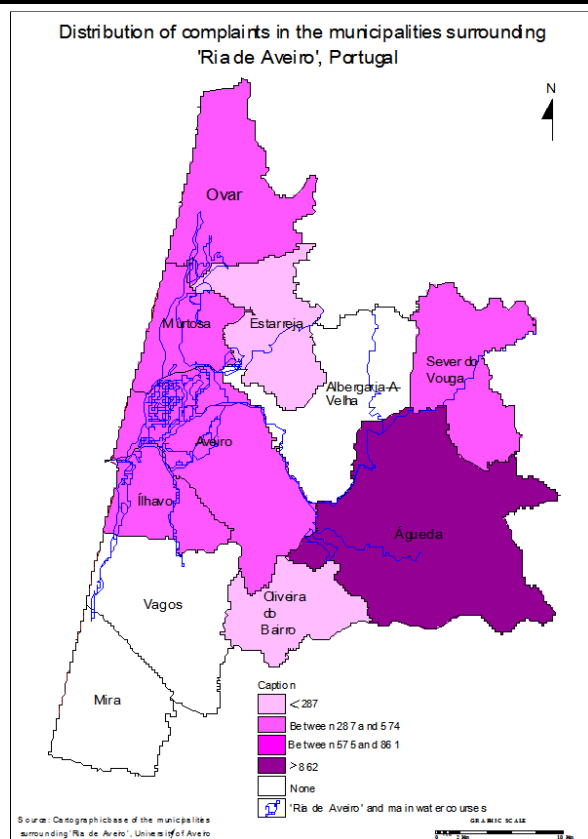


Figure 6 – Territorial distribution of complaints.

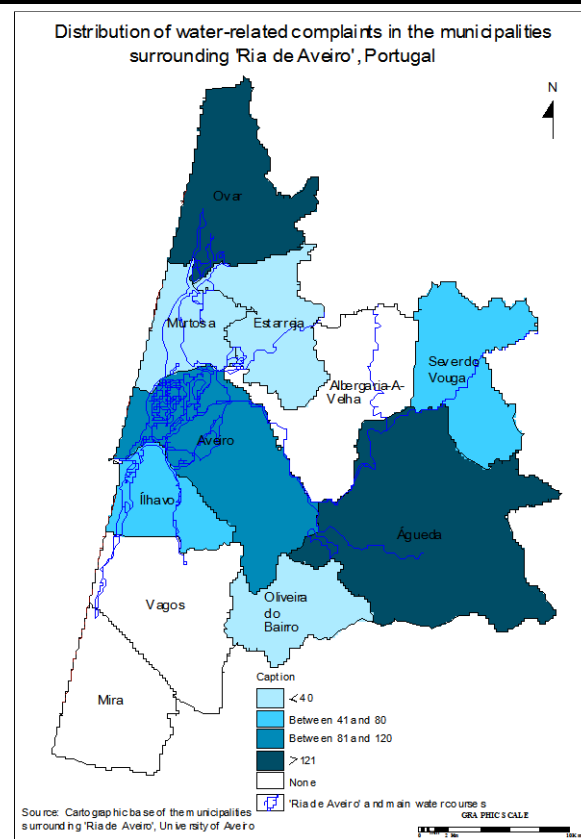


Figure 7 – Territorial distribution of water-related complaints.

Having in mind the distribution of *per capita* water-related complaints, the results do not show a similar spatial pattern of complaints. Citizens of Sever Vouga, Ovar and Águeda are those who seem more active in submitting complaints to local authorities (see fig. 8). As evinced before, *per capita* values of water-related complaints do not reveal the same

results (see fig. 9). Finally, analysis of the relationship between the percentage of flood area and frequency of complaints by municipalities appear to reveal, with the exception of Aveiro, that the area covered by water and the proximity of water bodies is not necessarily determinant of higher numbers of complaints (see table 1).

Table 1. Percentage of flood area and frequency of complaints by municipalities<sup>3</sup>.

Municipalities	Flood area (hectares) <sup>4</sup>	Frequency of water-related complaints <sup>5</sup>	Ratio between frequency of water-related complaints and flood area
Estarreja	2479	1.3%	0.02
Aveiro	2371	20.3%	0.3
Águeda	1717	21.9%	0.67
Ovar	1349	28.9%	0.33
Murtosa	797	1.6%	0.07
Ílhavo	392	10.8%	0.2
Oliveira do Bairro	291	2.9%	0.05
Sever do Vouga	86	12.3%	0.11

<sup>3</sup> With the exception of Vagos which has a single complaint.

<sup>4</sup> Based on the territorial area of each municipality in hectares.

<sup>5</sup> Based on the total number of complaints.

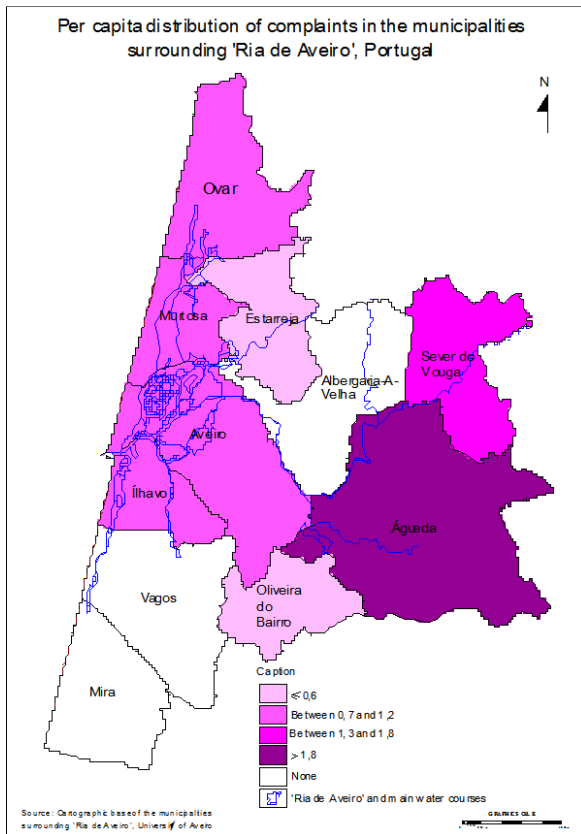


Figure 8 – Per capita distribution of complaints.

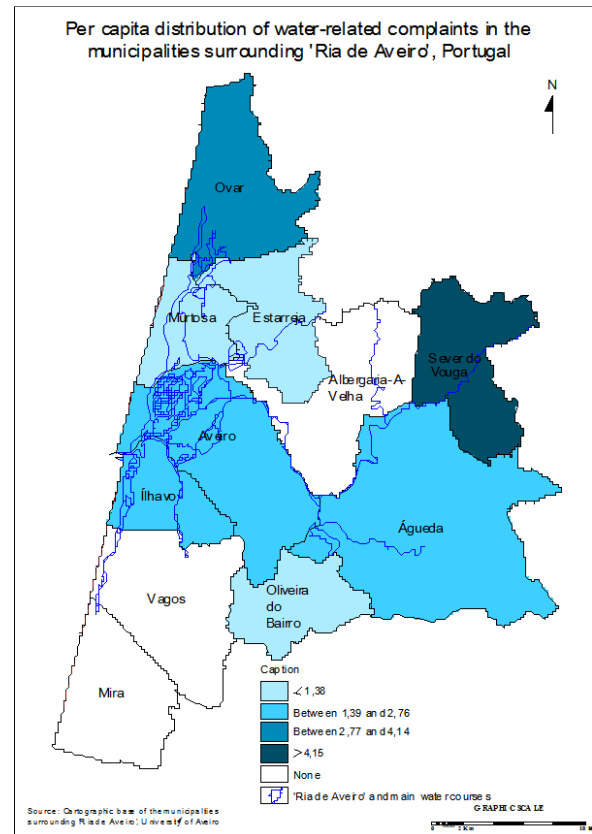


Figure 9 – Per capita distribution of water-related complaints.

## A GENERAL OVERVIEW OF WATER-RELATED COMPLAINTS

The study of water-related complaints identified three main types of local actors: complainants, those seen as sources of environmental problems and those required to intervene in resolution of complaints. The results reveal the predominance of citizens as complainants and sources of environmental problems, which means that the local actors who complain more frequently belong to the same class as those who cause the environmental problems. City Councils, the authority closer to citizens, are seen as key actors for the resolution of the environmental problems and related conflicts.

This study also reveals that local populations are mostly concerned about the problems related to environmental infrastructure deficiencies, namely sanitation and flood. These results call for local governments to evaluate existing water-related services in order to improve their performance.

In the overall panel, complaints are concentrated in the most populous municipalities with great levels of urbanization. On the other hand, *per capita* analysis does not show a good correlation between population and urbanization levels in relation to the frequency of complaints. Territorial extent of this water resource in each municipality has no significant influence in the frequency of water-related complaints. On the other hand, local

administrative boundaries proved to exert greater influence on the frequency of these complaints than the territorial extent of this ecosystem in the municipalities under study. This can be confirmed from the heterogeneous frequency of complaints by municipalities which does not reflect the contiguity of the ecosystem.

Although the municipalities under study have similar characteristics, with dispersed patterns of urbanization and potentially similar problems, the pattern of complaints is most related to the administrative boundaries than regional characteristics. This may reveal different governance contexts, levels of public satisfaction and civic participation, closeness and trust between the public and local governments, amongst others.

Surprisingly, the problems affecting Ria de Aveiro are not reflected in complaints submitted to local authorities. In the surrounding area of such an important ecosystem, it would be expected a stronger mobilization and a greater sensitivity about the problems that affect 'Ria de Aveiro'. The fact that citizens do not recognize local authorities as having a particular role for the protection and management of Ria de Aveiro may also be a relevant rationale for these results.

## CONCLUSION

The study of water-related complaints has the potential to reveal the most critical problems as seen by local actors, the actors involved and the territorial pattern, the latter being



relevant information to identify critical zones. The study reveals a poor perception about the problems affecting 'Ria de Aveiro'. On the other hand, the study shows a greater sensitivity of local populations about the problems which directly affect their quality of life, especially those related to sanitation. Territorial distribution of the total number of complaints and the water-related complaints reveals that, in general terms, levels of urbanization and population number are determining factors in the frequency of complaints. Otherwise, *per capita* values show a poor correlation between concentration of complaints and population number. Furthermore, the territorial extent of 'Ria de Aveiro' has no significant impact in the frequency of water-related complaints. As the territorial expression of this water body does not determine the greater or lesser number of complaints by municipalities, administrative boundaries seems to be the most decisive factors in the perception of water-related problems.

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