

Stakeholder engagement to enhance integrated water management in the context of a river basin in Portugal

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In memory of my parents

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Abbreviations

BDA	Basin District Administration
CS	Case Study
EU	European Union
INAG	Instituto Nacional da Água (National Water Institute)
NGOs	Non-Governmental Organisations
NWA	National Water Authority
RB	River Basin
RBM	River Basin Management
SSM	Soft Systems Methodology
IWRM	Integrated Water Resources Management
WFD	Water Framework Directive

Abstract

The purpose of this research is to define a framework for the enhancement and commitment of public participation in the context of river basin management (RBM) in Portugal based on the implementation of the Water Framework Directive (WFD) to achieve good water governance.

In Portugal, public participation is often scarce, in spite of stakeholders being invited to participate by water management companies, as later referred to in this research. The WFD also maintains that stakeholders should be involved in RBM decisions.

Based on an interpretivist research philosophy the research adopted case studies and expert interviews to provide multiple sources of evidence on the nature and complexity of River Basin Management and Public Participation

The main case study interviews were carried with the case study managers. Additional expert interviews were carried with other case study stakeholders and general stakeholders (from industry and agriculture sectors).

Data was analysed using content analysis. Soft Systems Methodology (SSM) application produced “rich pictures” to identify the level of engagement and commitment by stakeholders to participation in national water resources management. Cross case analysis was performed using the outcomes of case studies and interviews. Following this, the final framework was developed to meet the aim and objectives of the research.

This research provided the identification of gaps in stakeholders’ participation in RBM. A final conceptual model is presented aiming to guide decision makers to solve this problem. It is proposed that two types of partnering groups are created to fulfil the aim and objectives which were pursued.

The importance of this research relies on RBM improvement and the enhancement of the body of knowledge in Public Participation, to minimize the

gaps on good water governance in Portugal. This research provides a framework which may guide some of the policy makers in RBM on how to optimise the participation of the stakeholders, assessing multi-stakeholder viewpoints in parallel. It aims to support the achievement of a major societal goal which is to gain trust among all groups of stakeholders and the community served by the river basin, which can lead to improved contribution and commitment to reach good water governance.

Key words: stakeholder participation, basin, integrated water resources management, partnering

Chapter 1. Introduction

The purpose of this research is to define a framework for the improvement of stakeholder engagement and participation, in order to enhance integrated water management in the context of a river basin in Portugal.

The enhancement and commitment of stakeholders to participation in the context of river basin management (RBM) based on the implementation of the Water Framework Directive (WFD), is said to be highly important to achieve good water governance (Allen & Rieu-Clarke, 2010; Jaspers, 2003).

The next sections define the background to this study, some key concepts which will be further explored in this thesis (river basin management RBM, integrated water resources management IWRM, etc.), the rationale for this research and the aims and objectives which were pursued.

1.1. Background to the study

During the 1960's, economic development in some countries was impacted by significant increases in their population. This meant that the use of large volumes of water and huge wastewater discharges lead to some serious water pollution problems and/or depletions in the natural water resources available. This proved to be a difficult problem to handle and solve and led to an imbalance between the water supply needs and water availability (Hipólito and Vaz, 2011). A new paradigm arose when, in an attempt to reach a balance, the UNESCO International Conference on Water, in Mar de la Plata (1977), defended the need for a holistic approach to water management (Hipólito and Vaz, 2011). This new paradigm argued the need for considering water management from a holistic perspective, in an integrated way, due to the assumption that though the different uses of available water resources are inter-dependent they should be considered together, in order to ensure their equitable and sustainable use and to promote coordination and collaboration among the individual sectors (farming, industries, etc.) and stakeholders; thus emerged the concept of Integrated Water Resources Management (IWRM)

(United Nations, 1992; UNESCO - WWAP 2006; Antunes et al, 2008; Global Water Partnership, 2000 and 2009; Allen and Rieu-Clarke, 2010; Hipólito and Vaz, 2011).

UNESCO and the United Nations (UN) supported the paradigm of IWRM in order to achieve a balance between the availability of natural water and users' demands, limiting their use in an equitable way among the different users (farmers, industrialists and citizens) in order to prevent scarcity due to overuse by a single sector and to prevent water pollution due to wastewater discharges. However, UNESCO contradicts this by saying that the relationship between water availability and its exploitation by humans is complex, uncertain and vulnerable, which raises doubts about the capability of IWRM to coordinate resources management in an equitable way, to meet all stakeholders' demands. Hydraulic resources, being finite, should be used carefully because overuse by a sector (i.e. agriculture) means the amount remaining may not be adequate to fulfil the demands from other users (Global Water Partnership, GWP, 2009).

For the successful application of this new concept of integrated water management (IWRM), a basin was found to be the appropriate geographic unit. The basin of a river can be defined as the surface area around a river, whose boundary line links the higher points of the mountains around it and inside which all rainfall reaching the soil will partially contribute to the river by flowing towards it; although some of the rain will infiltrate the soil and other parts evaporate into the atmosphere or be retained by vegetation (Buchholz, 1998; Corbitt, 1989; Lencastre, 1984; Hipólito and Vaz, 2011).

The concept of integrated water management (IWRM), applied to river basin management (RBM), considers management at a basin level to be an appropriate geographic scale to deal with water usage in a sustainable way. This will, hopefully, bring together all the local water resource demands and constraints, to coordinate and control, at local level (the basin), water usage, pollution prevention and protection of water for use by future generations whilst at the same time considering local social and development issues, local stakeholders' needs and interests and conflicts as a whole in an integrated approach for the benefit of all (Hipólito and Vaz, 2011; Global Water Partnership, 2009). The ancient water resource management systems practiced

by sectors dependent on water operated in such a way that each sector acted separately without due consideration to possible conflicts with other users and this led to poor management, uncontrolled water pollution and water depletion, and unsustainable water usage. The new philosophy of bringing together all of the sectors who use water and examining their interests, using an holistic approach, and applying this system in each river basin, was seen as a very promising start to reaching good governance of water resources. Allen and Rieu-Clarke (2010:244) also support this view by stating that “*IWRM seeks to manage watersheds so that economic, social and environmental concerns are balanced appropriately*”, thus bringing together the different dimensions of the IWRM process in RBM which rely on social aspects, political and economic issues, environmental aims and supportive legislation, as will be explained further in this report (in *chapter 2*).

Since 2000, the philosophy of integrated water management processes to be considered in river basin management (RBM) has been directed by the Water Framework Directive (WFD or Directive 2000/60/CE); which is a piece of legislation aimed at guiding and helping UE Member States to achieve good water governance and the sustainable use of water resources, which means preventing or solving any pollution problems and preserving water resources to allow them to be available for use by future generations. The WFD defined the basin as the most appropriate geographic unit for water management, defending integrated approaches and setting a timetable for the implementation of all related issues namely; the establishment of river basin plans for the identification of local constraints and problems, and definition of measures to solve them.

In order to clearly identify the local issues of river basin management (RBM), an integrated approach is essential (integrated water resources management, IWRM). Local stakeholders (farmers, industrialists, technicians and citizens) should be responsible for their actions in the use of hydraulic resources (such as the supply of huge amounts of water and wastewater discharges into rivers); their actions should be based on clear information and they should be encouraged to actively participate in decision-making processes, providing their own views and any local concerns, helping to identify any areas of conflict

existing in water resource use which could be solved collectively to provide more accurate tools to attain an effective integrated management system for the available resources (*Singh, 2006; Antunes et. al., 2008 citing Allan, 2003 and Currie-Alder et al., 2006; Allan and Rieu-Clarke, 2010; Hipólito and Vaz, 2011; Global Water Partnership, 2009; international conferences on water and environment, since the Dublin Conference on Water and Environment in 1992*).

The Water Framework Directive (WFD) also encourages the active involvement of all interested parties for its successful implementation through the production, review and updating of river basin management plans to ensure that all relevant issues and possible problems are identified inside each basin. All this leads to the conclusion that the enhancement of public participation appears to be highly importance for the effective and successful implementation of integrated water resources management approaches to better achieve good water governance at a basin level.

Based on the parameters of a river basin, this study aims to define a framework for the enhancement of public participation in IWRM approaches on a basin geographic scale, hereafter called “river basin management (RBM)” through the identification and classification of local stakeholders, the clarification of RBM drivers, the participation features and definition of methods for the successful commitment and engagement of all stakeholders so that good water governance is better achieved. The background of the study provides the context for exploring some of these concepts, thereby fulfilling the aim of the study, which will be defined in section 1.3, and which will focus on providing a framework for the improvement of stakeholder engagement and higher participation in RBM.

The following paragraphs summarise the key concepts related to the domain of this research as; river basin management (RBM), integrated water resources management (IWRM), stakeholder engagement, participation, good water governance and their relationships.

RBM is the management, by a water authority, of all waters inside a river basin, according with the principles established in the Water Framework Directive (WFD) and other Directives (Jaspers, 2003; Hipólito & Vaz, 2011).

WFD, the EU Water Framework Directive (2000), is a piece of legislation providing a framework for water governance to ensure protection and sustainable use of water in river basins.

The *IWRM* philosophical approach for river basin management (RBM) is a part of RBM. It relies on hydraulic resources evaluation, multidisciplinary knowledge, environmental objectives, water usage in the basin, decision policy levels and measures, legal and institutional scenarios and the engagement of all stakeholders to actively participate and contribute to the definition of solutions and decision-making processes (*Hipólito and Vaz, 2011*).

Water governance is said to be the “*political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society*” (*GWP, 2002*).

Participation can be defined as ensuring that all relevant groups are actively involved in decision-making processes so that their views and interests are considered in the solutions (*Allan and Rieu-Clarke 2010*).

Water governance is said to benefit from the engagement and participation of stakeholders, at a local level (the basin), by bringing together their different views in cases of conflict and achieving a solution (*Allen and Rieu-Clarke, 2010* and *Antunes et al., 2008*, citing *Currie-Alder et al., 2006* and *Allan, 2003*).

Hipólito and Vaz, 2011 state the need for *IWRM* is explained by the complex interrelations amidst the several water uses. For the engagement of stakeholder to effective participation, relevant information needs to be provided (*GWP, 2000*).

Some interviewees stated that stakeholders are often not engaged because they consider their participation is not important their participation due their lack of knowledge of RBM issues and the gaps in the implementation of measures which were defined in the Basin Plans (as it will be explained in chapter 4).

1.2. Rationale for this research

The scope of river basin management (RBM) includes river water upstream and downstream, groundwater, surface water, control of water supply, other water usage and also water availability, pollution and monitoring. The management of the river basin is impacted by related policies and regulatory frameworks. RBM is said to be difficult due to the complexity and uncertainty of the river's behaviour over time and also due to human actions (Antunes et al., 2008 citing UNESCO – WWAP 2006). In fact, the variation in the availability of water over the years is related to rainfall, or lack of it during dry periods, to the demand for water by people and other industrial and agricultural sectors (manufacturing industries, agriculture for crop irrigation and animal rearing), and sometimes by the uncontrolled discharges which pollute rivers, implying the need for a careful integrated management system.

The need to consider together all these complex, uncertain and vulnerable drivers, that interfere with RBM, in order to provide not only stakeholders' equitable access to water resources but also information and approaches to the decision-making processes (Global Water Partnership, GWP-TAC, 2000 and 2009) led to the conclusion that river basin management (RBM) should be pursued through a philosophy relying on an integrated approach to water resources management (Integrated Water Resources Management, IWRM). (UNESCO – WWAP, 2006, cited by Antunes et al., 2008; Hipólito and Vaz, 2011).

The decision-making processes of RBM, that deals with the complexity and vulnerability of available water resources and their use by humans, will benefit from the contribution of all parties who have a stake in water usage, by considering each stakeholder's interests and demands and also understanding their specific knowledge of local issues. In order to engage and enhance stakeholders' contribution to RBM, in an integrated way, a public participation approach appears to be highly important in order to consider their views and interests, solve existing conflicts and provide a more transparent decision-making process to serve the community living in the basin thereby bringing the community into a partnership for pursuing good water governance (Heiland,

2005; Antunes et al., 2008; McDonnell, 2008; Videira et al., 2008; Lauber et al., 2008).

1.3. Aim and objectives

The aim of this research is to provide a framework for the improvement of stakeholder engagement and their greater participation in RBM, in order to enhance integrated water management in the context of a river basin in Portugal.

The enhancement and commitment of stakeholders in participation in the context of river basin management (RBM) based on the implementation of the Water Framework Directive (WFD) is said to be highly important to achieve good water governance (*Antunes, 2008*).

The objectives of this research are:

- a) Identify key stakeholders and their behaviour within the context of RBM;
- b) Examine stakeholder dynamics (level of engagement, commitment and participation) in identified case studies;
- c) Critically evaluate ways for the solution of gaps in stakeholder dynamics amidst various drivers of RBM;
- d) Propose a framework for improved stakeholders' participation in RBM in Portugal.

The aim and objectives were pursued in the analysis which is detailed in chapter 4 and in the conclusions (chapter 5).

At the end of this research a framework to engage a broad range of stakeholders in river basin management (RBM) will be presented. A strategy for changing the attitudes of a community to their possible and useful contribution by creating awareness of the importance of their participation and engagement will be derived from the final conceptual model and the proposed creation of partnering groups. The main purpose is to make the authorities in river basin management, and the whole community within a basin, aware of how important their participation and trust relationships could be (*Allan & Rieu-Clarke, 2010; Dyer, 2008; Jaspers, 2003*). This comprehension is said by those authors to be

extremely important to manage and preserve waters which are a common resource for the community served by the basin.

At this point, the first stage of Soft Systems Methodology (SSM, later explained in sections 3.6.3 to 3.6.5) is started. The problem to be addressed is identified, which is the aim and objectives of this research. For a deeper identification of the problem a literature review was undertaken on RBM and on stakeholder theory (for stakeholders' later identification and classification).

Chapter 2. Detailed literature review

A focussed literature review was pursued on river basin management (RBM), official documents, applicable legislation and stakeholders' participation.

The literature review of RBM focused on the scope (*Blackstock 2012; Hipólito & Vaz, 2011; WFD 2000*), RBM components (*Hipólito & Vaz, 2011; Antunes, 2008*), identification of who are stakeholders (*Allen 2010; Mitchell 1997; Freeman 1984*), the nature of RBM drivers (*Lebel 2010; Videira 2008; WFD 2000; Buchholz 1998*) and chronology of RBM (*Allen 2010; GWP 2009*).

Official documents analysed, related to the focus of this thesis, were national RBM Plans (*Ave RBM Plan, etc.*) and Portuguese Reports (for agriculture, industry and other sectors as *ENEAPAI 2007-2013, etc.*).

Legislation analysed were the WFD (*WFD 2000*), EU legislation (*IPPC, Integrated Pollution Prevention Directive; etc.*) and Portuguese legislation (*PNA 2000; IPPC Law; National Water Law*).

Literature on stakeholders' participation was focused on stakeholder theory (*Parmar 2010; Mitchell 1997; Freeman 1994*), best integration of stakeholders (*PNA 2000*) and partnering (*Dyer, 2008; Heiland 2005*).

For RBM characterisation a literature review has been undertaken on the concepts of river basin management (RBM), integrated water resources management (IWRM), the Water Framework Directive (WFD) and also public participation, its drivers and the chronology of public participation evolution. A detailed review of EU law (Directives) and regulatory frameworks governing river basin management was also performed. Furthermore, for public participation definition and enhancement, a literature review of stakeholder theory was also pursued.

The literature review of RBM, IWRM and WFD (as expressed in sections 2.1 to 2.5) provided the basis for modelling RBM members and its drivers while the literature review of stakeholder theory (section 2.7) added stakeholder typology to the key concepts related to RBM, to bring about the development of a conceptual model to improve stakeholder participation in RBM.

The next sections define the scope of RBM, its components and drivers, the chronology of emerging key concepts related with RBM and stakeholder typology. At the end of this chapter, the first form of this research's conceptual model will be presented.

2.1. Scope of river basin management (RBM)

River basin management (RBM) is the integrated management of waters inside a river basin. RBM includes the management, by a water authority, of water availability in terms of surface water and ground water, water storage in reservoirs, water supply for inhabitants and economic sectors (industries and farming activities such as animal rearing and crops irrigation), pollution control and pollution remediation, water quality and quantity monitoring and also the actors related to the management and implementation of the Water Framework Directive (WFD) and other Directives related to river basin management (RBM) (Cunha et al., 1980; Buchholz, 1998; Hipólito & Vaz, 2011).

RBM has embedded within it environmental, social, political and legal aspects. The environmental aspects are related to water availability, water usage and pollution control, as expressed in the previous paragraph. The social aspects are connected with the different perceptions of individuals, or groups, on their interface with the environment and with the need to educate them about RBM issues. Political aspects lie in the interests of water users and the interrelationship between the different groups of stakeholders. The legal aspects are ruled by international conventions and EU Directives, from a general perspective, and also National Water Plans and National Basin Plans that each member state has to introduce into local strategies of River Basin Management. The understanding of these elements will be elaborated in sections 2.3, 2.4 and 2.5 of this report.

The actors in RBM are the legal state offices (water authorities and related councils who are direct managers), all other stakeholders (or persons with a stake in RBM) from all sectors of the economic community (who have representatives on councils) and citizens (Hipólito & Vaz, 2011; Water

Framework Directive or Directive 2000/60/CE). As has been previously stated in this report, it is important to enhance the participation of all the actors concerned with the issues of RBM, its definition and decision-making processes, in order to attain good water governance (Tippett et al., 2005; Blackstock et al., 2012). This will be clarified in the next sections.

Figure 2.1 captures the scope of RBM. The centre represents water authorities and related councils who are directly involved in river basin management (RBM), and other stakeholders and citizens who are, theoretically, supposed to participate in RBM. Each group of stakeholders (farmers associations, industries, etc.) has representatives on related councils which explains the partial overlaying of the stakeholders' area into the councils' area. The straight arrows represent the areas of public participation.

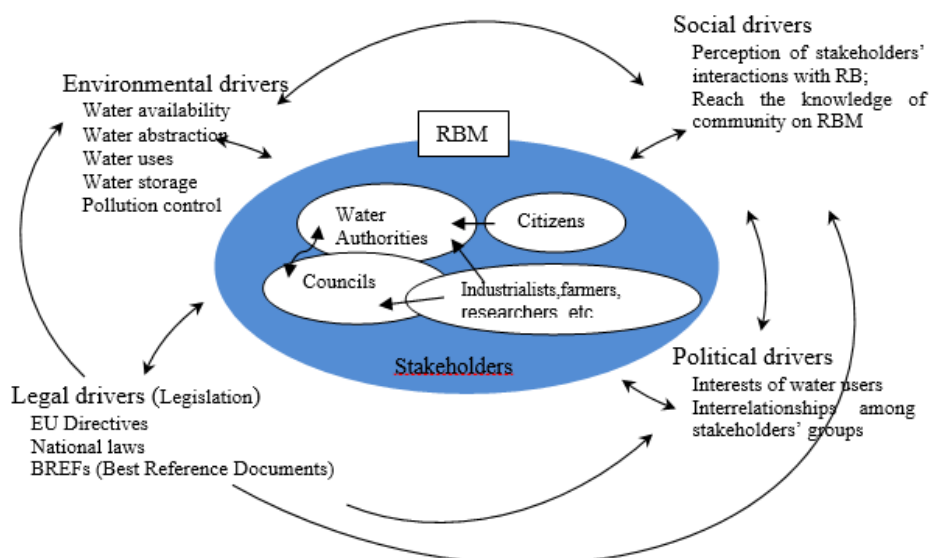


Fig. 2-1 Scope of River Basin Management (RBM)

(Straight arrows in the centre represent public participation actions; curved arrows represent the drivers controlling RBM and their mutual relationships)

The drivers which control RBM are located around the outside of the central area, and these are connected by curved arrows. The curved arrows represent areas of single relationships (a curved arrow with one point), or mutual relationships (a curved arrow with double points) connecting the drivers and stakeholders involved in RBM. Environmental drivers (related to water availability, water use and pollution control) are connected to social drivers with a double pointed curved arrow to represent the relationships between

stakeholder groups and the environment and their perception of how they influence water quality and quantity in the river basin. Pollution in the river basin can threaten water usage and abstraction but stakeholders' needs should be respected and over use by one sector should be avoided (Buchholz, 1998; Hipólito and Vaz, 2011).

Legal drivers overrule environmental drivers (expressed by a curved arrow with one point), and call attention to the political drivers which define RBM actors and encourage their participation in RBM education needs relating to environmental issues.

The nature of these drivers will be explained in section 2.3 of this report.

River basin management (RBM) is said to be difficult because of the complexity of assuring water availability, which is uncertain since it depends on natural episodes of rainfall and water percolation and storage in soil. However, it also needs to equitably fulfil the demands for water supply and control of water pollution due to human action (surface water in rivers, groundwater and coastal water). This complexity needs to be managed by good governance of water resources, which is considered to be the “*range of political, social economic and administrative systems that are in place to develop and manage water resources and the delivery of water services at different levels of society*” (Antunes et al., 2008:932, citing Rogers and Hall, 2003). On the other hand, this complexity, coupled with the vulnerability of natural water supply and human actions on it, led some authors to conclude that RBM should be used in an integrated approach to water resource management (integrated water resources management, IWRM), and by considering, holistically, all the drivers that interact with it (said to be environmental, political, social, economic and administrative as the conceptual model will explain). (Antunes et al., 2008, citing UNESCO – WWAP, 2006 and also Rogers and Hall, 2003).

In the past, before the 1980s, the lack of specific water management led to serious river pollution problems (as in some river basins in Portugal). In fact, in Portugal, due to the nonexistence of legislative control of water quality and of management structures, there was no method to control wastewater discharges from industries, farming activities and also residential wastewater. There was no

clear definition regarding water quality measures and no external body to monitor the harmful impact, on rivers, of untreated discharged water. Farming activities were found to be responsible for water flows carrying manure, fertilisers and pesticides used on land reaching the rivers and poisoning the fish living in rivers. In addition residential wastewaters discharged directly into rivers, due to the non-existence of wastewater treatment plants to remove pollutants prior to discharge, were also found to be responsible for the reduction in water quality (*Buchholz, R., 1998; Corbitt, R., 1989*).

River pollution problems in some areas led to the conscious need for controlling the source and finding a solution for uncontrolled discharge of untreated wastewater from the many industries along some of the rivers (*LNEC, 1986; LNEC 1988*). During several studies on the specific problem of polluted waterways in the River Ave basin, the idea of an integrated solution for the whole river basin arose and was pursued until a final solution was found. The solution, the first of its kind in Portugal, involved the whole basin and was an innovative process (*Cunha et al, 1980; CCRN, 1988*).

After the entrance of Portugal into the European Community, European laws were introduced, governing the definition of water composition for human consumption and even the composition of wastewater to be discharged into rivers.

Nowadays, there is a general consensus on the advantages of water management on a basin scale, based on the concept of integrated water resources management (IWRM), taking into consideration water, land and all the resources related to them namely; the economic activities (industries, farming, and residential water supplies), and providing the optimisation of water use (International Conferences ;GWP 2000).

2.2. Components of River Basin Management (RBM)

Efficient and effective river basin management is dependent upon satisfying three important criteria. In terms of the philosophy, RBM has to be consistent with the integrated water resources management (IWRM) philosophy. In terms

of the regulatory framework, it is governed by the implementation of the Water Framework Directive (WFD). The third criteria is the methodology by which both the philosophy and the regulatory framework are met, which is the pursuance of effective public participation (PP), in order to achieve good water governance (*GWP2000; Antunes 2008; Videira 2008*).

2.2.1. Integrated water resources management (IWRM) philosophy

The integrated water resources management (IWRM) philosophical approach for river basin management (RBM) is a part of RBM and relies on hydraulic resource characteristic evaluation (quality, quantity and pollution of water), multidisciplinary knowledge (hydrology, hydraulics, ecology, chemistry, economy, law, sociology, etc), environmental objectives, types of water usage in the basin, several decision policy levels, types of measures, legal and institutional scenarios and the engagement of all stakeholders to actively participate and contribute to the definition of solutions and decision-making processes. (Hipólito and Vaz, 2011).

Several international organisations have supported the implementation of IWRM, such as United Nations (UN) and the Global Water Partnership (GWP). In 1992, United Nations promoted a Conference on Environment and Development (UNCED), in Rio de Janeiro, whose final document was called "Agenda 21". Agenda 21 was an action plan providing the final outcome of a general agreement and political commitment to sustainable development and environmental cooperation taken by the UN organisations, governments and relevant groups related to the environment, and where chapter 18 points out the need for IWRM implementation. Later, in 1996, the Global Water Partnership (GWP) was established as an international network aiming to pursue the practical implementation of the concept of Integrated Water Resources Management (IWRM) and was open to all international organisations dealing with water resource management, state institutions, research institutions, non-governmental organisations (NGOs), agencies of the United Nations (UN) and also the private sector.

IWRM is said to be a process which is supposed to coordinate local development and management of water, land and all resources related to them

namely; economic activities (industries, agriculture, and residential water supplies), overseeing the optimisation of water use in an equitable and sustainable way in order to guarantee the availability of water for use by future generations (Antunes et al., 2008 and also Allen and Rieu-Clarke, 2010, citing the Global Water Partnership GWP – TAC, 2000). However, the concept of IWRM has been criticised by several authors who support the view held by the Global Water Partnership (GWP) that IWRM does not work in practice, because those involved in water resource management have not dealt with the deeper implications of the concept and neither have they been aware of its political dimension. This political dimension results from the interests of water users which can generate conflicts and implies the need for the adoption of participation and consultation strategies to solve it (Antunes et al., 2008, citing Biswas, 2004 and Gyawali et al., 2006 and Allan, 2003).

Based on the IWRM definition by the Global Water Partnership (GWP) and chapter 18 of “Agenda 21”, Allen and Rieu-Clarke (2010) defend the view that IWRM can provide balanced decision-making processes based on economic, social and environmental concerns, respecting two objectives, equity and sustainability, which are found to be inter-dependent. Equity, in the context of IWRM, is said to be “*an allocation that takes into account all relevant factors and circumstances in order to derive the maximum benefit for all, whilst minimizing the resultant harm*” (Allen and Rieu-Clarke, 2010:240); while sustainability is said to imply protection and maintenance of ecosystems to ensure the use of resources by future generations. Equity means that the use of water resources is equally available to all stakeholders, while trying not to allow one sector to benefit more than others. Sustainability implies equity between different generations and a balance between all interests (economic, social and environmental).

2.2.2. Water Framework Directive

In 2000, the EU Water Framework Directive (WFD), being a piece of legislation providing a framework for water resource governance to ensure protection and sustainable use of water in river basins, defined that the unit for water resources management should be the basin or a group of close basins named “river basin

districts” (article 3), providing programmes of measures adapted to regional and local conditions.

WFD’s main purpose was to provide a European framework for water management of river basins to achieve the protection and “good status” or good quality of all waters (by a certain year). Furthermore, WFD defended the production of River Basin Management Plans (article 13 of WFD) and making operational their programme of measures (articles 4 and 11). The measures should define the characteristics of river basins, review the environmental impact of human activity, identify the economic analysis of water use and the recovery of costs from water services (articles 5 and 9), prepare regulatory legislation and encourage the active involvement of all interested parties in the implementation of the directive, in particular the production, review and updating of the river basin management plans.

In some European countries, like France and the United Kingdom, water management had, for many years, been in use at basin level (by the “Agences de l’Eau” in France and “Water Authorities” in the UK).

The WFD pointed out that successful implementation of WFD relied on coordinated cooperation among “*Community Member States at local level as well as on information, consultation and involvement of the public, including users*” (WFD 2000, note 14), which suggests that WFD drew attention to the importance of participatory processes on the identification of local issues and measures defining their implementation to achieve good governance of water.

2.2.3. Public participation

The desirable success of public participation as a component to implementation of river basin management (RBM), and the Water Framework Directive (WFD) for good water governance does not appear to be measurable in a quantitative way. It is not important for there to be vast numbers of citizens and stakeholders participating in public meetings or answering enquiries related to water management, what appears to be really important is the representative nature of each group of actors (citizens, stakeholders, researchers and policy makers), the transparency of the interests of each group, and their participation and commitment to RBM and the WFD. This can lead to a general consensus

and respect for the interests and needs of each sector of stakeholders and produces a balanced solution in cases of conflict (as referenced by general stakeholders interviewees).

Public participation can be seen as a method to ensure integrated water resources management approaches (IWRM) in River Basin Management (RBM), considering the contribution of the Water Framework Directive (WFD) for good water governance (*Videira 2008*).

Governance of water can benefit greatly from the participation of those who govern at a local level (the basin), who can bring the different interest groups together to negotiations in instances where existing conflict need mediation and where a solution can be worked out. This shows that RBM has a political dimension and should sure of the participation of civil society, government offices, social movements (not governmental organisations, NGOs etc), the private sector and policy decision-makers (Allen and Rieu-Clarke, 2010 and Antunes et al., 2008, citing Currie-Alder et al., 2006 and Allan, 2003), to attain efficiency, effectiveness and sustainability in RBM (Singh, 2006). Based on the statements of the cited authors and the WFD, public participation can lead to a clear understanding and coordination of all interests from the different sectors of activity related to water usage and the solution of any conflicts among them.

From the contents of official reports on participatory events related to the implementation of the Water Framework Directive (WFD) in Portugal (recently published on the web page of the National Water Institute (www.inag.pt), including those for the design of Basin Plans perused by the researcher, it seems that there is a weak definition of the public responsibility role of actors and drivers in RBM. The reports show that there has been little or no representative public involvement and participation in the discussions on environmental issues to meet all stakeholders' needs (*INAG 2009*).

2.3. Nature of drivers for river basin management

This section discusses the nature of drivers for river basin management (RBM). Effective public participation from the whole community served by the river

basin is supposed to be the solution to achieving good water governance in river basin management.

Some authors call special attention to the complexity and uncertainty of environmental issues which are said to result from environmental degradation (due to human activities) and to the variable nature of natural environmental processes on rivers, water quality and recovery of downstream waters by natural water depuration processes (Wilson and Bryant, 1997); sometimes causing irreversible damage which is impossible to solve by natural processes. However, others argue that the political features of integrated approaches to river basin management (RBM) is due to the fact that, besides the need to consider all water users and their objectives, water users have individual interests, pointing to the possible need for mediation and solution of possible conflicts. (Antunes et al, 2008 citing Allan, 2003).

The defence of the participatory decision making process by Wilson and Bryant (1997); Antunes et al., (2008) and Allan (2003) in relation to river basin management (RBM) is very important to many sectors of society and sectors of economic activity because of the impact water usage has on their lives and businesses. Lack of attributable responsibilities for water resource damage and for existing conflicts among water users, who have different interests (Videira et al., 2008, citing van der Hove, 2000 and Stave, 2002), indicates the need for mediation and solutions in areas of conflict by political institutions, with the interaction of the civil society, the private economic sector, government and social nongovernmental organisations (NGOs), whilst at the same time defending the need to introduce new integrated approaches for successful outcomes of RBM such as; participation, consultation and political mediation (Antunes et al., 2008 citing Allan, 2003). Allan and Rieu-Clarke say that *“participation can be defined as ensuring that beneficiaries and interested groups are actively engaged within decision-making processes, and their views are taken into account in the final outcome”* and defending that right should be established to guarantee the rights of stakeholders, civil organisations and under-represented groups to ensure their active participation in the decision-making processes related to river basin management. Lauber et al., (2008) citing Gray (1989) elaborate that collaboration by stakeholders is especially

important when problems are complex and stakeholders view problems from several perspectives, and have various degrees of power to influence the decision-making processes.

McDonnell (2008) says that the main problem to achieving integrated approaches in river basin management (RBM) has been the nature of the approaches that have been pursued, pointing out that drivers and their interactions can be seen as deriving from power relationships between the various actors or stakeholders involved in water governance. He also explains the complexity of providing useful information to support the disparate groups of participants involved in water governance processes and because most of the participants are not specialist the information has to take into consideration the varying levels of knowledge and skills of users. While Videira et al., (2008:966), citing De Marchi and Ravetz (2001), say that participatory processes may lead to *“widening the frame of policy issues including all sectors of society, delivering a decision-making style which is more responsible to democratic principles and improving the quality of decision through the inclusion of multiple perspectives”*, Wolters (2006) defends the “social learning” concept. This concept supports the view that stakeholders’ collaboration is much more important than public consultation and the statement “learning together to manage together”, confirms that the stakeholder’s contribution is said to be worthy since those involved come to understand why specific viewpoints are defended and try to integrate different aspects.

Water management should not be pursued as, merely, a scientific or technological exercise, since it is said to be connected with social, economic, cultural and political factors (Webb et al., 2008) which should be carefully considered together and balanced in an integrated way (Allen and Rieu-Clarke (2010). However, data on some of these factors can be scarce, for instance, socio and economic factors (gender issues and local economic development). The difficulties of integrated water governance indicate the need for careful characterisation of all the factors involved, along with their complexity and mutual relationships (McDonnell, 2008). The benefits of public participation in consideration of all water usage and all related interests is that the possibility of conflicts can be clearly identified and resolved and the needs of the local

community can be noted leading to consensus and transparency in the establishment of strategies for water governance (*Heiland, 2005; Antunes, 2008 citing Allan, 2003*).

Several authors have identified the drivers of river basin management (RBM) as being social, environmental, political and legal and these are summarised in the following sections. The EU Water Framework Directive (WFD) and other related directives and state laws and although they are pieces of legislation, appear under the heading of legal drivers and are also considered in the public participation processes implementation.

Social drivers

Some authors point out that there is a socio cultural uncertainty about water management due to the different perceptions of individuals and groups towards their interaction with the environment (Wilson and Bryant, 1997.) This calls for the introduction of “*extended social learning*” to implement sustainable solutions (Lebel et al., 2010) by providing appropriate forms of information to the public (based on their background knowledge) and also to open their minds to the learning processes of environmental issues, and to help them to identify, present and discuss their needs and visions (Hampton, 1999).

Environmental drivers

The complex management of river basins has many environmental facets and they are related to the general nature of water movement, starting with rainfall and surface water runoff on land, through to infiltration and ground water storage and contribution to river flows and evaporation. It also involves water usage through human interaction, which can contaminate freshwater, having harmful effects on the environment and making water inappropriate for use by other groups and even threatens organisms which live in water. It covers water pollution caused by pesticides and fertiliser runoff from agricultural areas to surface waters or leaching to groundwater (Buchholz, 1998; Wilson and Bryant, 1997). This research will consider all the above effects in broad terms as environmental drivers in RBM.

Political drivers

Integrated approaches to river basin management (RBM), are said to be a political process due to the fact that water users have individual interests and there are power relationships between each group of stakeholders which sometimes cause conflict (Wilson and Bryant, 1997; Antunes et al., 2008 citing Allan, 2003). This happens when there are diverging interests in upstream and downstream access to water by the public in general or by private sectors of the economy (i.e., industries), or lack of knowledge of how laws, regulations and licences will be applied (Videira et al., 2008, citing the UNESCO World Water Assessment Program, WWAP 2003).

Legal drivers

Legal drivers are those factors which have been derived from international conventions, and EU Directives. The EU Directive states that each member state should introduce or modify national laws and regulations to comply with the WFD, and also that National Water Plans and National River Basin Plans should be introduced into local environmental strategies. As pieces of legislation they represent the narrow perspective of the issues covered but they have to be respected, strengthening the need for public participation in their composition, to bring together all the relevant issues, problems and conflict solutions for RBM.

2.4. Chronology of IWRM, RBM and public participation

This chronology emphasises how public participation has evolved in consideration of the complex drivers, mentioned in section 2.3, which control river basin management (RBM).

A new paradigm arose, when the UNESCO International Conference on Water, in Mar de la Plata (1977), defended the need for a holistic approach to water management. This can be seen as the starting point for the genesis of integrated water management. In time, several other international conferences and world forums defined new approaches to water management (Hipólito and Vaz, 2011), bringing it to the international agenda for broad discussion and

attempting to reach consensus and define guidelines for water management. The new paradigm which arose during that conference evolved into the consideration of water resources management as a whole, from an holistic perspective, in an integrated way, due to the assumption that the different users of water are inter-dependent and should be considered together, in order to provide equitable and sustainable approaches for use, giving rise to the concept of Integrated Water Resources Management (IWRM) (United Nations, 1992; UNESCO - WWAP 2006; Antunes et al., 2008; Global Water Partnership, 2000 and 2009; Allen and Rieu-Clarke, 2010; Hipólito and Vaz, 2011).

Table 2-1 summarises the international meetings and conferences which are important to this research, ranging from water availability and pollution initiatives, public participation initiatives and also the Water Framework Directive and Public Participation (PP) Directive. These are discussed, in detail, in Table 2-1 below.

Table 2-1 International conferences grouped by type of initiative

Type of initiative	Year	Conference / Law	Findings
Water availability and water pollution	1977	Conference of Mar de la Plata	The major outcome of this conference was that it identified the need for an holistic approach to water management, including public information, education and research
Water availability and pollution	1991	NGOs meeting in Paris	A major milestone was reached at this meeting with the introduction of the concept of public participation in water resources management, beyond the usual state intervention
Public participation	1992	Conference of Dublin	The major outcomes of this conference were: 1. Guiding principles which considered water as a finite and vulnerable resource and with economic value; 2. Water management should be based on participatory approaches

Table 2-1 International conferences grouped by type of initiative (cont.)

Type of initiative	Year	Conference / Law	Findings
Water availability and pollution	1992	Earth Summit, in Rio de Janeiro	From the important outcomes of this summit, the final document ("Agenda 21") in which chapter 18 expresses a consensus on: Encouragement of integrated management of water whenever there is human impact on the environment; Citizens should have access to information and should participate in decision-making processes.
	1998	Aarhus Convention	The important outcomes of this conference were: Links between environmental rights and human rights Need to provide access to environmental information and public participation
Public participation	2000	2 nd World Water Forum	The major outcome of this forum was: Need for better water governance and integrated water resources management with the involvement of all stakeholders
	2001	Conference of Bonn	This Conference prepared the World Summit in Johannesburg and reached consensus on: Contribution to find solutions for good water governance based on integrated water resources management approaches (IWRM)
	2002	World Summit on Sustainable Development, Johannesburg	A major milestone was reached in this meeting on defending the need to: Prepare integrated water resources management approaches (IWRM) for RBM upgrading, including stakeholders' PP
Water Framework Directive (WFD)	2000	EU Directive 2000/60/EC	This Directive defined important issues such as: Water governance / Right to public information & consultation / Encouragement of active involvement of stakeholders
Directives on PP	2003	EU Directives 2003/4 and 2003/35	These Directives reaffirmed the right of: Access to information and public participation in plans and measures programmes

Fig. 2.2 represents the timeline's milestones on integrated water resources management (IWRM) and public participation, which are important to this research.

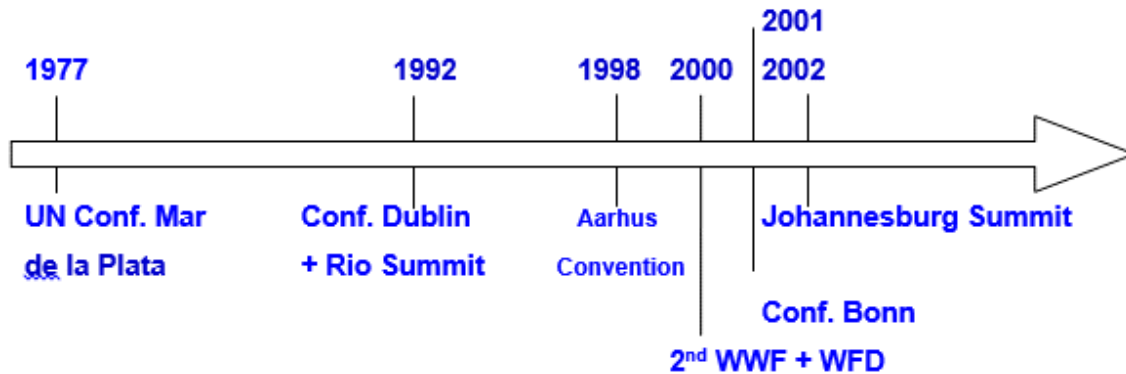


Fig. 2-2 Time line on IWRM and public participation establishment

The 1981 USA Environmental Protection Agency (EPA) Public Participation Policy focused on public participation in decision making and on the implementation of processes for environmental protection; while in Europe, the concept of public involvement only arose in 1992, at the Dublin International Conference on Water and Environment. In spite of apparent commitment from many countries and organisations connected with the environment and the strongly expressed will to pursue its aims, the conclusions of the Dublin International Conference are still to be fully implemented, which explains the reason for this research so many years later.

In 1991, 850 Non-Governmental Organizations (NGOs) met in Paris to discuss environmental issues, introducing the concept of public participation in water resources management, beyond the usual state intervention. Following the Paris meeting integrated water resources management approaches (IWRM), river basin management (RBM), definition of the geographic scale for the concept of implementation and also support for public participation was further deliberated at the 1992 Rio meeting, 1998 Aarhus Convention, the second World Water Forum (den Haag, 2000), the International Conference of Bonn (2001) and the World Summit of Johannesburg (2002) and in EU Directives from 2003. These events are most importance to this research by being connected to the burst of consciousness about the need to adopt integrated

water resources management approaches (IWRM), river basin management (RBM) and public participation for good water governance.

The final document of the Dublin Conference (1992) (“The Dublin Statement on Water and Sustainable Development”) identified some guiding principles, supporting the view that water management should be based on a participatory approach involving users, planners and policy-makers, making them aware of the importance of water and of the benefits of their own involvement in and commitment to the planning and implementation of water policies then emerging as the concept of public participation. Furthermore, the most appropriate geographical unit for the planning and management of water resources was found to be the river basin, thus indicating the need to manage water at a basin level.

Later in 1992, the United Nations held a Conference on the Environment and Development (*UNCED*), on a world wide scale, which was known as the UNCED Earth Summit, in Rio de Janeiro, Brazil and produced the “Rio Declaration on Environment and Development” also known as “Agenda 21” (Rio Summit, 1992). This was a plan of action to be instigated globally, at national and local level, by the organisations of the United Nations, governments and other relevant groups. The Rio Declaration, in Principle 10, supports the view that environmental issues are best handled with the participation of all concerned citizens and that each individual should have appropriate access to information and the opportunity to participate in the decision-making processes, thus illustrating the need for the implementation of public participation.

In 1998, the *Aarhus Convention on Access to Information and Public Participation in Decision-Making*, which came into force in 2001, established a number of rights for the public (individuals and groups) with regard to the environment namely; the right to receive environmental information from public authorities, the right to participate in environmental decision-making and access to justice if these two rights are not respected. According to the convention, the public and stakeholders would have the opportunity to have a voice in the final plans and on their practical application, based on public information previously made available by competent authorities.

In 2000, the second World Water Forum (Second Water Forum, 2000), held in Den Haag, established the premise that water should be governed wisely to ensure good governance in order to promote the involvement of the public and consider the interests of all stakeholders in water management, through public participation implementation.

In 2000, the Water Framework Directive (WFD, 2000) defined the right to public information and consultation and encouraged the active involvement of all interested parties in the implementation of the Directive, in particular in the production, review and updating of the river basin management plans. However, the Directive fails to provide any guidelines on public participation implementation.

In 2001, the International Conference of Bonn on Fresh Water, reviewed the previous practical results and suggested that integrated water resources management approaches (IWRM) were the best way to solve environmental gaps.

In 2002, the World Summit on Sustainable Development, held in Johannesburg, defined the target for preparing integrated water resources management approaches (IWRM) and water efficiency plans for 2005 and reaffirmed its commitment towards the total implementation of Agenda 21 principles established at the Rio World Summit (1992). The implementation plan includes the involvement of all stakeholders. Thus, Agenda 21 became the main issue on the international agenda and identified stakeholders' participation in RBM as the key to achieving water management in a sustainable way.

The second World Water Forum (Johannesburg) consistently followed the principles of previous integrated approaches to river basin management (RBM) and public participation enhancement.

Despite the developments that have taken place, as shown in *Table 2-1* and *Figure 2.2* above, integrated approaches to river basin management (RBM) still has some gaps as it happens in Portugal (*PNA 2000; INAG 2009*).

2.5. Synthesis on adopting public participation (PP) for integrated water resources management (IWRM)

As was explained in section 2.2.1, the integrated water resources management (IWRM) philosophical approach for river basin management (RBM) is part of RBM and relies on the evaluation of the characteristics of water, multidisciplinary knowledge, environmental objectives, legal scenarios and the engagement of all stakeholders to actively participate in decision-making processes (*Hipólito and Vaz, 2011*). Some authors point to the need to consider the interests of all water users, however, taking into consideration all interests can often lead to conflict and indicates the need for the adoption of participation and consultation approaches to solve them (Antunes et al., 2008, citing Biswas, 2004 and Gyawali et al., 2006, and Allan, 2003).

As stated in section 2.2.3 of this report, public participation can be seen as a method to ensure integrated water resources management approaches (IWRM) in river basin management (RBM), taking into consideration the contribution of the Water Framework Directive (WFD) for good water governance. Water governance is said to benefit from the participation of those who are governed, at a local level (the basin), by bringing together their different views in the negotiation process in cases of conflict and achieving a solution (Allen and Rieu-Clarke, 2010 and Antunes et al., 2008, citing Currie-Alder et al., 2006 and Allan, 2003).

Environmental concerns were discussed in Portugal in the 1980s following recognition of one of the north most polluted river areas, where a pollution removal system has been slowly implemented over many years (*CCRN 1988, 1989 and 1993*). In 2008, the formation of water authorities (“Basin District Administrations”) in Portugal was a good starting point for efficient management of water. Thus, it appears it is important to identify any critical points in situ and provide the enhancements for public participation. Generally, in Portugal, citizens do not appear to be very committed to public participation and even stakeholders have little interest in attending public meetings, as expressed in official reports (*INAG 2009*). Webb et al., (2008) also state that stakeholders show little commitment to consultation processes which seems to be a problem, not only in Portugal, but also in other countries.

Nowadays, in spite of the initiatives by many countries who signed international treaties, full implementation of public participation still has its problems (INAG 2009). This situation provides the rationale for the aim expressed in this study (section 1.3). This research is expected to pursue a way of changing community attitudes and behaviour, making them aware of their importance as part of problems solution.

This research is very important in terms of river basin management (RBM) improvement and the enhancement of the body of knowledge in public participation (PP) in order to minimise the gaps in good water governance (as still happens in Portugal) which may be related to a poor knowledge of stakeholders' interests, interactions and possible conflicts.

2.6. National River Basin Management Plans and reports

National River Basin Management documents provide the core basis for national environmental strategies and policies. As such they provide an important element within the stakeholder consultation process in terms of setting out the detailed policy making framework.

The next paragraph will briefly explain how the nature of these plans and reports, which are compulsory for each EU member state in order to apply the Water Framework Directive, will identify how they contribute to the main theme of this research which is on public participation in integrated water management. The participation sessions during its production are reported in published official reports. The documentation of these participatory sessions will show the degree to which the participants were attracted or invited and their level of engagement.

The three types of existing documents had some participation events during their production. As they will illustrate, there was poor participation in some of those sessions. In reports on national strategies for economic sectors, missing data on some of them point to the need for stronger participation and collaboration with the decision-makers. For good water governance, managers need to have a deep knowledge of the relevant drivers for RBM and of the

nature of issues and problems to be solved. Therefore, managers need to seek the close, committed and effective participation of all stakeholders groups. Their participation can identify specific problems which were unknown by managers and present their concerns. Furthermore, stakeholders can provide different perspectives on the nature of problems or on possible problem solutions. As confirmed during the interviews, the relevant associations of economic sectors do collaborate with managers. Conversely, less relevant associations have weaker collaborations although they can have specific problems that need to be solved.

2.7. Stakeholder theory

The following sub sections describe stakeholder theory; its principles, stakeholders' identification and stakeholders' classification.

2.7.1. Introduction

Freeman (1984:24) states that the first possible approach to take into consideration of the external influences of a firm is to imagine all the groups and individuals that could affect a firm's objectives or be affected by them. Those groups or individuals are said to play an important role in the firm and have a "stake" in it; referred to by the term "stakeholder". The author also states that each group of stakeholders can have several smaller groups due to their possible differences and that all of them have to be jointly managed to achieve the success of a company.

Furthermore, Parmar et al. (2010:419) state that, from a strategic management point of view, *"a more useful conceptualization would be competing networks of stakeholders, where one competitor's network is in competition with the others"*. This competition often happens in river basin management, when a network of stakeholders (farmers associations or industry confederations or others) competes to be considered more salient to managers and to gain some priority on their problems solution. This explains the rationale for stakeholders' identification and classification, presented in sections 2.7.2 and 2.7.3.

Mitchell et al., (1997:853), speaking about the Freeman's "*principle of who or what really counts*", explain that it refers to who the stakeholders are and what attribute calls the attention of managers to their particular group.

Freeman (1994) says that the principle which he calls "*The Principle of Who and What Really Counts*," means that "*the primary function of the corporation is to enhance the economic well-being, or serve as a vehicle for the free choices of the owners of the corporation. And, owners are defined as those who hold legal title to shares of stock in the corporation. This principle is embodied in the law of corporations which has historically directed managers and directors to "manage the affairs of the corporation in the interests of stockholders, using sound business judgement."* He also says that ethics should be integrated and points out that often managers have not considered the rights of stakeholders.

Mitchell et al., (1997:853) defend the need for a normative theory for stakeholders' identification and a descriptive theory for stakeholders' salient definition for managers (the last one to explain who or what calls the attention of managers).

Freeman (1984:26) says that there should be a strategy to understand the importance of the issues of each stakeholders group and their ability to help or harm the corporation with those issues. On the other hand, he points out the need for an integrated approach to multiple stakeholders and their multiple issues. He says that "*for each major stakeholder, those managers responsible for that stakeholder relationship must identify the strategic issues that affect that stakeholder and must understand how to formulate, implement and monitor strategies for dealing with that stakeholder group*".

In literature there are several definitions of who is a stakeholder; some of the definitions take a broad view while others have narrower view. Freeman's 1984 definition is said to be one of the broadest definitions in the literature: "*a stakeholder in an organisation is (by definition) any group or individual who can affect or is affected by the achievement of the organisation's objectives*" (Freeman, 1984:46).

The following sections deal with stakeholders' identification and classification.

2.7.2. Stakeholders' identification

As has been said in the previous section, Freeman (1994) proposed three principles to guide a reform of the law of corporation: *The Stakeholder Enabling Principle, the Principle of Director Responsibility* and *the Principle of Stakeholder Recourse*, as depicted in Table 2-2, to help directors and executives in corporation management.

Table 2-2 Principles to guide a reform of the law of corporation (Freeman, 1994)

Principle	Contents
Stakeholder Enabling Principle	<i>"Corporations shall be managed in the interests of their stakeholders, defined as employees, financiers, customers, employees, and communities."</i>
Principle of Director Responsibility	<i>"Directors of a corporation shall have a duty of care to use reasonable judgment to define and direct the affairs of the corporation in accordance with the Stakeholder Enabling Principle."</i>
Principle of Stakeholder Recourse	<i>"Stakeholders may bring an action against the directors for failure to perform the required duty of care."</i>

First of all, there is a need to identify the existing stakeholders of a firm, the nature of their relationship with the firm and their salience towards the firm's management, and the significant features or lack of them, as a way to explain Freeman's principle of *"Who and What Really Counts"*.

Savage, Nix, Whitehead and Blair (1991) argue that the identification of a stakeholder needs the existence of a claim and the ability to influence other stakeholders in a firm who may have some power, with or without a claim; conversely, stakeholders who present claims (which can be legitimate or not) may or may not have power to influence the firm.

Mitchell et al., (1997), cited by several authors, define the possible type of relationship between a stakeholder and a firm. As stated by Parmar et al., (2010:429), Mitchell et al., (1997) defined an approach to analyse stakeholder dynamics (section 2.7.3). Sometimes there is a simple relationship and the stakeholder has a voice; at other times there is a power-dependence line,

where in some cases the stakeholder is dominant and, in other cases, it is the firm who is dominant. In a power/dependence relationship the dominant entity, be it company or stakeholder, holds the power leaving the other entity entirely dependent on the dominant body. There is also the possibility of a mutual power/dependence relationship between the company and the stakeholder.

The legitimacy of a relationship is based on the existence of a contract, a claim by the stakeholder where any risk taken on behalf of the gives the stakeholder a moral claim over the firm. Mitchell et al., (1997) also say that those authors who defend a broader stakeholders' definition are more concerned with their ability to influence the firm.

A theory for stakeholder identification is said to be of great value for determining how power and legitimacy are mutually influenced. Power and legitimacy, combined with urgency, are said to provide the definition of stakeholder types, defining patterns of behaviour between stakeholders and the firm. Some theories explain the role of each of those attributes, which are said to be determinant variables in the definition of relationships between stakeholders and managers. These are summarised in *Table 2-3*.

Agency theory, resource dependence theory and transaction cost theory define the importance of power and urgency. Two organisational theories, the institutional theory and the population ecology theory, focus on legitimacy and urgency. Organisational theories are said to provide an understanding of the environmental effects on organisations but prove to be of little value in defining the power influence. However, some stakeholders have no power but still have salience to the managers, which, once more, provides a reason for the Freeman principle of "*Who and What Really Counts*".

Some authors' defined stakeholder attributes thus: power, legitimacy and urgency, which are presented in *Table 2-4*.

Table 2-3 Theories which explain the importance of stakeholders' attributes and their salience (based on Mitchell et al., 1997)

Important variables for stakeholder / manager relationship's definition	Explanatory theories	Theories basic principles
Power	Agency theory	<i>"The central problem addressed is how principals can control the behaviour of their agents to achieve their interest, rather than the agents' interest"</i> (Jensen and Meckling, 1976). Managers may encourage or limit powerful stakeholders (Mitchell 1997)
	Resource dependence theory	Those who control the resources needed by the organisation have increased power and this can lead to a lack of equilibrium on the power forces of the several agents (Pfeffer, 1981). Powerful stakeholders are salient to managers (Mitchell, 1997)
	Transaction cost theory	Stakeholders outside the firm who participate in it can increase transaction costs in such a way that it is cheaper to take them into the firm to lower those costs. This means that they are important to managers (Jones & Hill, 1988)
Legitimacy	Institutional theory	<i>"Illegitimacy results in isomorphic pressures on organisations that operate outside of accepted norms"</i> (Di Maggio & Powell, 1983)
	Population ecology theory	<i>"Lack of legitimacy results in organisational mortality"</i> (Carroll & Hannan, 1989)
Urgency (degree to which stakeholders claims call for immediate attention)	Agency theory	Both theories treat urgency in terms of its contribution to cost
	Transaction cost theory	
	Resource dependence theory	All these theories treat urgency in terms of outside pressures on the firm
	Institutional theory	
	Population ecology theory	
	Behavioural theory	Urgency is viewed as a consequence of not attaining aspirations (Cyert & March, 1963)

Table 2-4 Definitions of stakeholders' attributes

Attribute	Definitions
Power	<p><i>"Power is a relationship among social actors in which one social actor, A, can get another social actor, B, to do something that B would not otherwise have done" (Pfeffer, 1981:3).</i></p> <p><i>"Power is the ability of those who possess power to bring about the outcomes they desire" (Salancik & Pfeffer, 1974:3).</i></p>
Legitimacy	<p><i>"Legitimacy is a generalised perception or assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs and definitions. (Suchman, 1995:574).</i></p> <p><i>Mitchell et al., (1997), linking power, legitimacy and urgency, say that "an entity may have a legitimate claim on the firm, but unless it has either power to enforce its will in the relationship or a perception that its claim is urgent, it will not achieve salience for the firm's managers".</i></p>
Urgency	<p><i>"Urgency is the degree to which stakeholders claims call for immediate attention" (Mitchell et al, 1997).</i></p> <p>Jones (1993) and Mitchell et al., (1997) say that urgency is based in "time sensitivity" and "criticality". "Time sensitivity" is said to be the degree of unacceptability of delay in attending a claim (not a sufficient condition). "Criticality" is "the importance of the claim on the relationship to the stakeholder".</p>
Additional features <i>(Mitchell et al, 1997)</i>	<p>Stakeholder attributes can change.</p> <p>Stakeholder attributes are not objective.</p> <p>Stakeholders may not be aware of having a certain attribute.</p> <p>Stakeholders may not want to exercise their power.</p> <p>Managers can have different perceptions of stakeholders' attributes as stakeholders do about themselves.</p> <p>Stakeholder attributes may be badly perceived by managers.</p> <p>Managers can balance divergent interests among different stakeholders.</p>
Additional features <i>(Parmar et al, 2010)</i>	<p>Multiplicity of roles for some stakeholders.</p> <p>Multiplicities of stakeholder roles.</p> <p>Stakeholders' cooperation should be pursued by managers.</p>

2.7.3. Stakeholders' classification

Sheng et al., (2011) presents the classifications of stakeholders gathered from several authors as expressed in *Table 2-5*.

Table 2-5 Classifications of stakeholders (adapted from Sheng et al., 2011)

Author	Argument	Description
Freeman, 1984	Ownership, dependents, social arena	Stakeholders who hold ownership of the corporation; stakeholders who are economy-dependent; stakeholders who create the social arena
Savage et al., 1991	Potential to threaten and cooperate with the organisation	(high collaboration low threat) supportive stakeholders; (low collaboration low threat) marginal stakeholders; (high collaboration high threat) mixed blessing stakeholders; (low collaboration high threat) opposing stakeholders
Clarkson, 1995	Type of risk and tightness of the connection	Stakeholders engage in voluntary relationship with the company; stakeholders engage in non-voluntary relationship with the company. Primary stakeholders; secondary stakeholders.
Carroll, 1996	Strategy relationship	Key stakeholders; strategic stakeholders; environmental stakeholders.
Mitchell et al., 1997	Relationship attributes: power, urgency and legitimacy	Dormant stakeholders; discretionary stakeholders; demanding stakeholders; dominant stakeholders; dangerous stakeholders; dependent stakeholders; definitive stakeholders; non stakeholders.
Frederick, 1998	Interest relationship and influence	Direct stakeholders; indirect stakeholders.
Wheeler, 1998	Social	Primary stakeholders; secondary stakeholders; primary non-stakeholders; secondary non-stakeholders.
Porter, 2008	Value chain	Strategic stakeholders; competitive stakeholders; resonant stakeholders.

Mitchell et al., (1997) say that the definition of Freeman's "*Principle of Who or What Really Counts*" is based on several convictions. Managers identify several types or class of stakeholder and what they perceive about stakeholders builds the higher or lower salience of stakeholders from a manager's perspective. Furthermore, the type of stakeholder can be defined based on three attributes – power, legitimacy and urgency. Some stakeholders may have only one of those attributes while others have two and one type of stakeholder has all three. The several types/class of stakeholder are represented in *Fig. 2.3*.

Each circle represents one attribute. Some areas, which are common to two circles, indicate that those two attributes are simultaneously present. There is one area which is common to all three circles, which indicates that all three attributes are simultaneously present.

Classes 1, 2 and 3 are called "latent stakeholders" and have only one of the three attributes; consequently they are less salient to managers. Classes 4, 5 and 6 are the "expectant stakeholders", who have two of the attributes and correspond to moderately salient stakeholders. Class 7 represents the highly salient stakeholders since they have all three attributes. Furthermore, any entity without any of the three attributes is not a stakeholder and will have no salience for the managers.

Latent stakeholders (with only one of the attributes) can be "dormant", "discretionary" or "demanding".

Dormant stakeholders have only power as attribute. Their power use can be threatened if they do not have a legitimate relationship with managers or if they do not have an urgent claim.

Discretionary stakeholders possess only the legitimacy attribute; this does not allow any pressure and they have no power over the firm, nor any urgent claim and cannot establish an active relationship with managers.

Demanding stakeholders possess only urgency as a attribute. The absence of power and legitimacy endangers any degree of salience.

"Expectant stakeholders" (with two of the attributes) can be "dominant", "dependent" or "dangerous".

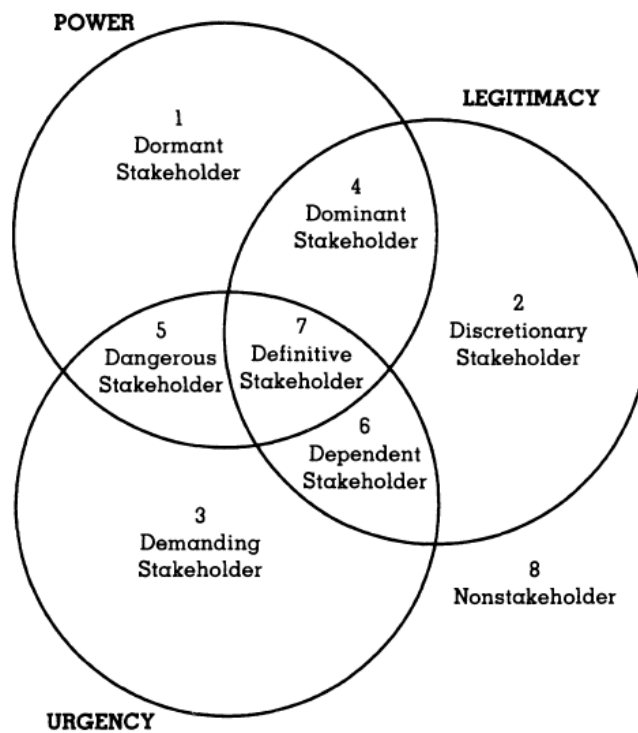


Fig. 2-3 Stakeholder typology (source: Mitchell et al, 1997)

Dominant stakeholders possess power and legitimacy, through which they influence the firm. Dependent stakeholders possess urgency and legitimacy but not power, they depend on others for any salience. Dangerous stakeholders possess power and urgency but the absence of legitimacy can result in them being somewhat coercive.

Definitive stakeholders possess all three attributes. Consequently, they have a higher salience for managers.

Mitchell (1997) points that stakeholders who do not possess all attributes can achieve another class if they acquire additional attributes.

These attributes will be used to produce “rich pictures” of the interviews and help to map the relationships between stakeholders and river basin managers. The relationship identification arose from officially published document analysis and from the statements of the interviewees. The researcher interviewed individuals from several different state management bodies, from environmental NGOs, agricultural and industrial associations and technicians involved with case study participatory events, as will be explained later in this study.

2.8. First conceptual model

Earlier, section 2.1 showed how the drivers for public participation are linked to the way in which RBM operates and the drivers were briefly discussed in section 2.3. The timeline presented in *Figure 2* also showed how the integrated approach evolved and its importance in a present day context. However, the synthesis identified current areas of under-development that have been observed in RBM in Portugal. Based on these drivers we can categorise the effects using the layered approach employed in the study undertaken by Wilson & Bryant (1997). All these factors were brought together in the first conceptual model depicted in *Fig.2.4* below.

Fig. 2.4 defines the first conceptual model. It defines the stakeholders' typology (as expressed in section 2.7.3, *Fig. 2.3*) using a diagram of stakeholders in RBM under several drivers.

The diagram of stakeholders in RBM, under several drivers, has three layers.

Layer 1, represented by the core area in the figure, establishes that RBM consists of key regulatory authorities such as water authorities, in collaboration with their relevant councils. The water authorities involved are the National Water Authority and Basin District Administrations, while the relevant councils who support and collaborate with them are national and local (at river basin level) level authorities. These relationships are governed by the Water Framework Directive (WFD) and by any national laws which overrule WFD principles.

Layer 2 is a sector without limits and represents the different actors involved in RBM such as; municipalities and private concerns, water basin users, researchers and technical groups related to RBM who are supposed to be engaged and committed to public participation on issues related to RBM. Some stakeholder groups in *layer 2* also have representatives on the councils stipulated in *layer 1*, However, citizen groups were not represented in *layer 1*; their inclusion would benefit RBM by broadening participation to encompass the whole community served by the basin.

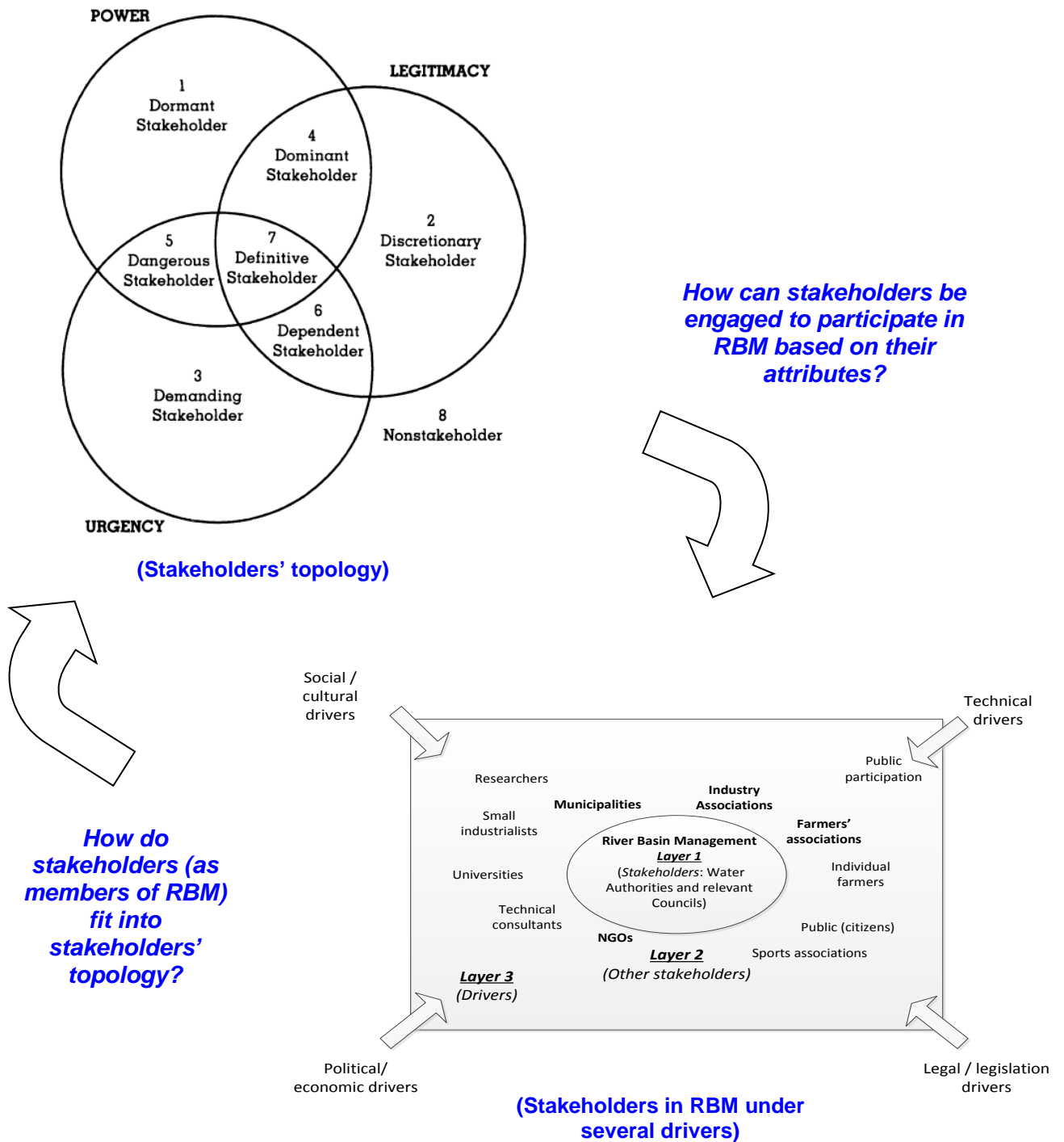


Fig. 2-4 First conceptual model

Layer 3 represents the impact that drivers (represented at each corner of the conceptual model) can have on RBM and the public participation processes. As explained in section 2.3, there are several types of driver: social/cultural, political/economic, technical and legal.

The first step in this multi-layered structure is to have a clear understanding of who the environmental managers and the environmental users of the basin are, to define their relationships and the connections between them and the environment and also to understand any possible conflicts which may occur between them.

This model was not expected to specify how stakeholders' performed within RBM or to show that any one stakeholder group is more important than any other stakeholder group. Conversely, each group of stakeholders performs at different levels that are considered to be equally important.

The distance between each stakeholder group and the core area is variable in an effort to highlight the degree of close relationship with water authorities. Some stakeholders are closer to the core area (core area authorities and relevant councils) and depicted in bold. They are expected to be the groups who most actively participate in RBM. These stakeholders are farmers' associations, Industry associations, NGOs and municipalities. Conversely, small farming concerns, small industrial concerns and citizens are not expected to actively participate in river basin management. It was expected that the second model could be confirmed or altered throughout the research's duration.

Legislation for RBM and public participation was analysed to obtain a comprehensive overview of the legal definitions to try to find out if there was an explicit philosophy on the implementation of active public involvement in decision-making processes. Furthermore, the analysis of published documents found on scientific databases relating to public participation philosophies and case study reports relating to public participation proved to be very useful for determining the drivers controlling public participation (as expressed in section 2.1, *fig. 2.1*).

Stakeholders' topology was presented in section 2.7. Taking into consideration analysis of the stakeholder theory discussed in section 2.7.3 and summarised in Fig. 2.3, stakeholders may have several attributes (urgency, legitimacy and power) or none at all. Stakeholders may change their attributes over time if they gain additional knowledge of the possible influence they may bring to the processes.

Two questions arose on trying to link stakeholders' topology diagram with the diagram of stakeholders in RBM under several drivers. How do stakeholders (as members of RBM) fit into Stakeholders topology? How can stakeholders be engaged to participate in RBM based on their attributes?

The first conceptual model definition corresponds to the end of the first stage of SSM applied to this research (as defined in sections 3.6.3 to 3.6.5), providing the broad identification of the problem to be addressed.

Chapter 3. Research methodology

This chapter explains the methodology of this research, justifies the methods used for data collection and data analysis (section). Special emphasis is due to the application of Soft Systems Methodology (SSM) which will be explained in section 3.4.3 as well as its application to this study (section 3.4.4). The validity and reliability of research designs is explained at the end of the chapter.

3.1. Introduction

Sections 3.2 to 3.4 present the research methodology; the research philosophy; research approaches and research techniques which were used in this study.

The research philosophy facilitates the research approaches that were chosen for this study. The research approaches will be pursued using a range of specific techniques. These are represented in *Fig. 3.1* and will be explained in sections 3.3 (evaluation of research approaches) and 3.4 (research techniques).

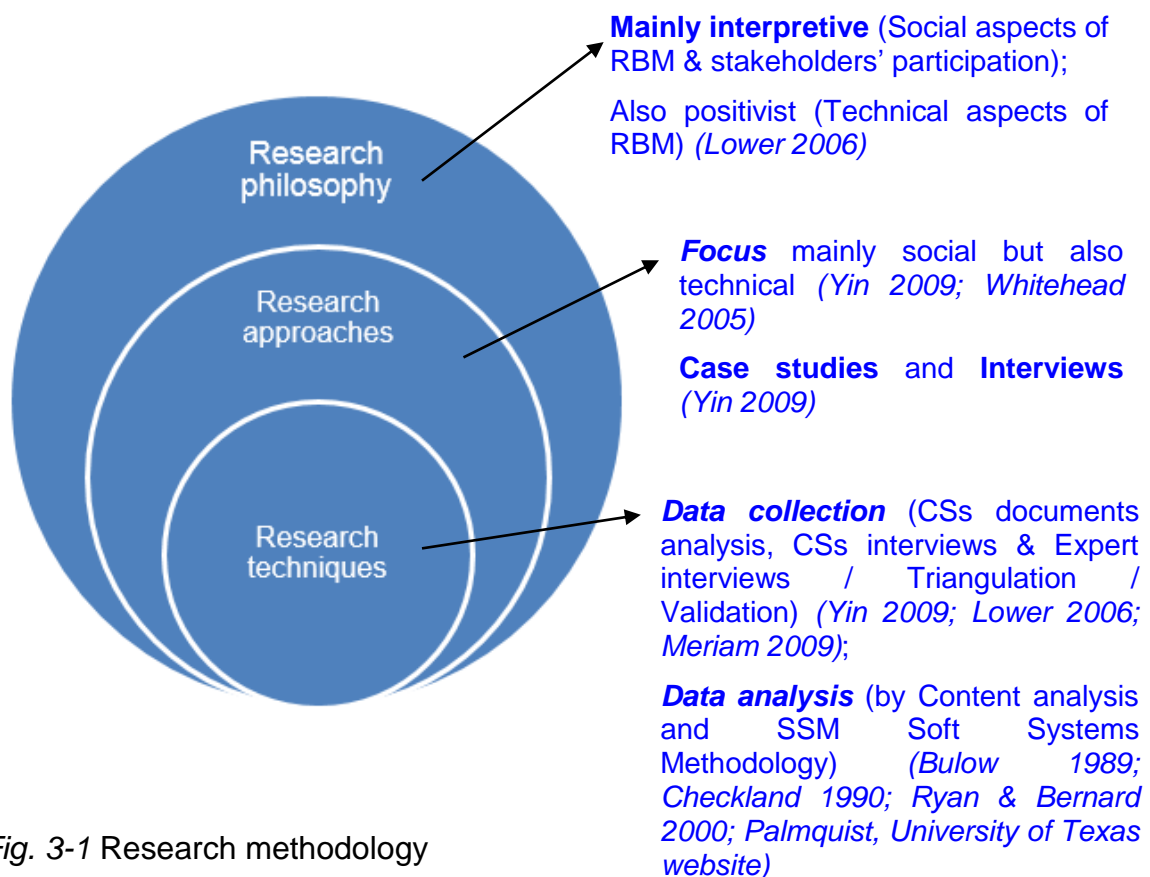


Fig. 3-1 Research methodology

As it is expressed in *Fig. 3.1* and explained in section 3.2, this research philosophy was mainly interpretive due to the social aspects of RBM and stakeholders participation. However, some positivist contribution was considered due to the technical aspects of RBM which need to be fulfilled.

The focus of the research approaches was mainly social but also technical. This determined the considered approaches in this study (case studies and interviews) as presented in section 3.3.

The research techniques underpinned were the collection of data and the data analysis. Data collection was based on the analysis of case studies documents, national RBM policies, laws and reports, case studies interviews and expert interviews. All this data was triangulated and validated.

Interviews data analysis was pursued by Content Analysis (using NVivo 10 program) and Soft Systems Methodology (SSM). The “rich pictures”, produced by the application of SSM to the interviews content analysis outcome, highlighted the gaps in stakeholders’ participation identified by the interviewees (presented in chapter 4).

3.2. Research philosophy

Pursuing the paradigm of public participation is a combination of philosophical principles and technical issues. In the first instance the research philosophy will be defined and in later sections the research approaches will be discussed.

3.2.1. General overview

The following sub sections present the positivist and interpretivist philosophical positions and the position adopted for this research.

3.2.2. Positivist and interpretivist philosophical position

As stated by Löwer (2006), complex research areas usually need several research methodologies to accurately define the “real-world phenomena” and

research approaches can be based on several dimensions such as epistemology, focus, goal, data and number of researched objects.

In terms of epistemology, Löwer (2006) says that while subjectivist research philosophy is known as interpretive; objectivist research philosophy corresponds to the positivist stance and they can be viewed as a continuum (interpretive / positivist) instead of a dichotomy. Several authors divide the continuum in different ways. While Vitalari (1985) divided it into technical, individual, organisational and social; Stamper (1991), differentiated only two divisions, technical and social.

The focus of the research approaches can be technical or social or, as in this study, a combination of both due to the nature of the drivers that condition River Basin Management (RBM), as expressed earlier in section 2.3. The goal of research approach relies on descriptions, explanations and recommendations, which, for this study, are all considered during the research process. Data can be qualitative or quantitative but, for this research, the second option is not relevant due to the socialised nature of stakeholder engagement in public participation in River Basin Management. Conversely, in terms of the number of researched objects, this study is based on a multiple case study exploration as will be explained in section 3.3.

Löwer (2006), outlines which methods are used for which ontological assumptions. *Table 3-1* presents the epistemologies, their assumptions and respective stances. In the epistemological continuum (interpretive/positivist), reality is seen as an outcome of imagination of the interpretive world and as a concrete structure in the positivist context. Between these two assumptions there are some variations on the way reality is seen and the role of human nature also changes along the continuum. For this study, ontological assumptions will consider reality as a social construction (due to the social drivers that influence RBM), a field of information (based on a multiple-case study approach reinforced with interviews) and a concrete process which is the aim and objectives expressed in section 1.3, to provide a framework to enhance public participation in RBM.

Table 3-1 Epistemological assumptions

Source: Lower, 2006, based on Morgan/Smircich (1980) and Galliers (1992)

Epistemology	Core ontological assumptions	Assumptions about human nature	Basic epistemology stance
Interpretive	Reality as a projection of human imagination	Man as a pure spirit and conscious being	To obtain phenomenological insight, revelation
	Reality as a social construction	Man as a social constructor, the symbolic creator	To understand how social reality is created
	Reality as a realm of symbolic discourse	Man as an actor, the symbolic user	To understand patterns of symbolic discourse
	Reality as a contextual field of information	Man as an information processor	To map contexts
Positivist	Reality as a concrete process	Man as an adaptor	To study systems, process, change
	Reality as a concrete structure	Man as a responder	To construct a positivist science

The subject of this research covers both technical and social aspects with strong emphasis on the later. In addition there are very strong connections between both areas.

3.2.3. The philosophical position of this research

Positivist research deals with reality, has a defined structure and deterministic values while interpretivist research is subjectivist and tries to reach insights (see Table 3.1) (Lower, 2006). The position of this research combines interpretive and positivist approaches, but it is inclined towards an interpretivist philosophy rather than the positivist, due to the social nature of public participation in river basin management (RBM). However, there will be an expressive contribution from the positivist world due to the technical aspects of RBM. Social issues

were found to be dominant in the focus of this study, evidenced in sections 2.2, 2.3 and 2.5 (*social drivers*), where the importance of stakeholders' and citizens' effective participation in RBM is considered. Technical aspects of RBM (explained under section 2.3 and 2.5 on environmental drivers) need to be considered jointly.

The next section will discuss the research approaches and justify those which were used in this research. The approaches used had the purpose of facilitating an understanding of water management issues from the perspective of public participation.

3.3. Evaluation of research approaches and justification of the approach adopted

This section presents the possible research approaches, their evaluation and the rationale for the approach adopted in this study.

3.3.1. Introduction

The research approach depends on the research philosophy which, in this research, will be mostly interpretive due to the nature of the study which is mainly perceived from a social stance. However, as explained in section 3.2.2, complex research areas benefit from the use of several research approaches to accurately and holistically define "real-world phenomena".

Research approaches can rely on the use of experiments, surveys, historical events, archival analysis, case studies, interviews and ethnography (Yin, 2009). The following paragraphs discuss these approaches, justifying why some of them were rejected for this study.

Yin (2009: 8) states that the distinction between the approaches relies on three conditions namely, the type of research question, the level of control over events the researcher commands and the degree of focus on contemporary events opposed to historical events.

Experiments are direct observations and manipulation of events in real time. As Yin says (2009: 18), experiments consider only some variables, out of the

context of what is observed, generally conducted in a laboratory. He also states (2009:8) that their research questions rely on knowing “how” and “why”. Experiments require control of behavioural events and they focus on contemporary events. Experiments are said to be carried out when the researcher can directly change the behaviour of events.

Surveys are tests. Their form of research question is “who”, “what”, “where”, “how many”, “how much”. They focus on contemporary events and they do not require the researcher to control events behaviour.

Experiments and surveys are close to the positivism stance due to their practical and objective nature. Experiments are used when it is possible to manipulate variables or behaviour in a laboratory or in the field, separating it from its context. In a laboratory, experiments can be focused on a single variable which controls others. In the field, which is applicable to some specific social issues, the researcher can treat a group of people in a certain way for a very specific purpose and study their response and behaviour (Yin 2009). However, in this study, experiments will not be used. Laboratory experiments are not applicable because the technical aspects of river basin management (RBM), which need to be considered in tandem to define the drivers that condition RBM, cannot be tested in a laboratory or manipulated but can only be observed in their natural setting. Field tests on social issues will not be used. Public participation in RBM involves different groups of actors, with specific interests and several types of behaviour, with interrelations between them which can lead to conflict, as was pointed out in sections 2.3 and 2.5. Field experiments with separate groups of actors would not expose the relationships between the groups or their mutual connections, interests and conflicts, and would make it difficult to provide accurate and valid results.

Surveys have to cope with a phenomenon and its context but need to deal with a limited set of variables (Gill and Johnson 1991). However, surveys within the scope of this study would only be applicable to the operation of facilities (reservoirs, dams and hydropower stations) which do not seem to be relevant to this research due to the strong social nature of public participation in river basin management (RBM). It is important to consider the technical aspects of RBM together to define the drivers that condition RBM but which do not need to be

quantified or surveyed. For example, the quantification of flows and floods, although being part of RBM, are not important for the purpose of this study. This is the reason why surveys will not be considered for this study.

Historical events do not seem to be applicable to this research since RBM is recent, as was pointed out in section 2.4 (*chronology of IWRM, RBM and public participation*).

Archival analysis can be used in consultation of documentation from case studies related to participatory events held in the past and can also be considered for the preparation of interview material.

The next paragraphs discuss what case studies generally mean, what type of case studies are available and their pros and constraints. Following this, interviews and ethnography approaches will be discussed.

Yin (2009:18) defines a case study as an empirical approach which investigates an actual event in his real context, especially when there are no defined limits between the event and his context.

Case studies can be exploratory, descriptive or explanatory. Explanatory case studies try to explain the causes that interfere in real phenomenon. Descriptive case studies can describe a phenomenon in its real context. Exploratory case studies can provide some insights when the phenomenon to be evaluated is not clear.

The case study is said to be important for analysing actual events without the possibility of manipulation of behaviour by the researcher, when the purpose is to know “how” or “why” a social phenomenon works (Yin, 2009).

The great value of cases studies is that they can combine several sources of evidence; the direct observation of what is studied, interviews with people involved and analysis of existing documents (Yin, 2009:11). The sources of evidence need to be triangulated to corroborate and strengthen the evidence found.

However, as stated by Yin (2009: 14), several constraints have been noted in the case study approach. There is the possibility of not being rigorous in case study research procedures or the danger of mistaken evidences being found

which can negatively influence conclusions. Additionally, case studies can be conducted using extensive documentation with which it is difficult to deal. The researcher must be aware that case studies are not a method of data collection. Instead, they must be seen as a way to complement or add evidence to the findings from other approaches. Yin states that some authors argue that case studies do not allow scientific generalisation due to the limited number which can be carried out. In fact the case study approach tries to design and extend theories about a phenomenon and not to reach great generalisations. The use of multiple case studies is of great value in order to try to cover different aspects of what is being researched. The different nature of each case study and their document analysis can complement each other and provide greater evidence on how a phenomenon works.

The main focus of this research is from a social stance, due to people's actions, interrelations and conflicts, which was discussed in sections 2.1, 2.2, 2.3 and 2.8 and in *Figure 2.1* (scope of RBM) and *Figure 2.4* (first conceptual model of the research), though it benefits from the adoption of qualitative research approaches. Although the official reports of past participatory events presents quantitative data on the number of attendees and the percentage from each sector of stakeholders, the data is relevant only in providing a basis for conclusions on the depiction of each sector at those events. Social approaches are based on case studies, interviews and ethnographic research.

In a social context, interviews with people involved with RBM, related to participatory events, and to some extent with the identified case studies, can fulfil the purpose of obtaining the interviewees perspectives of the concept by trying to capture how they think about the related issues. Interviews can provide a relevant additional contribution to the scope of this study.

Ethnographic research is said to deal with close investigation and description of the real world and where all the evidence depends on the researcher and often relies on fieldwork undertaken over a long period of time without a defined structure (Whitehead, 2005).

This study does not warrant such close investigation as presented through ethnographic studies. However, the concepts of public participation, integrated

water resources management and RBM arose recently (as expressed on section 2.4 *Chronology*), and due to the rich nature of the investigation into the phenomenon of stakeholder engagement in RBM, it is possible to conduct several exploratory case studies. The value of the case study process will be further enhanced due to the very few studies already conducted in this area. Further there are identified gaps in the implementation of these concepts as explained in section 2.5.

In research methods, action research is said to be based on reality as a social construction and also as a “realm of symbolic discourse” and man is viewed both as a social builder and an actor (*Lower, 2006*). Case studies are said to be based on man as an actor, aiming to find patterns in what is being studied, which supports the use of a multiple case study approach in this research; to find the interrelations between the stakeholders groups in different contexts and the dimension of their participation in River Basin Management.

In fact, it was possible to identify several Portuguese case studies with different and unique factors that fit within the main scope of this research. The analysis of participatory meetings for past case studies was supposed to convey knowledge on the level of their efficiency, enabling the identification of gaps in stakeholders’ participation.

Table 3-2 presents a synthesis of research approaches, specifying when they are appropriate and which of them were considered for this study.

3.3.2. Defining the unit of analysis

As stated by Yin (2009), when using case studies research design must have the following components:

“a study’s questions;

its propositions, if any;

its unit(s) of analysis;

the logic linking the data to the propositions;

the criteria for interpreting the findings.”

Table 3-2 Synthesis of research approaches

Research Approaches	When appropriate	Considered in this study?
Experiments	When manipulation is possible (laboratory or field), out of context	No
Surveys	Considers the context but deals with a limited number of variables	No
Historical events	Over a very long period of time	No, only Case Study archival analysis
Ethnographic research	Close investigation with the real world, over a long period of time	No (RBM is recent, there are few studies in this area)
Interviews	To obtain interviewees' perspectives	Yes , to capture the views on RBM & Public Participation issues
Case studies	Can provide multiple sources of evidence	Yes , to obtain the nature & complexity of RBM & PP

The form of the study questions can be “who”, “what”, “why”, “how” and “where”. When those questions have the form of “how” and “why”, case study is an appropriate method to be pursued.

The study propositions, as expressed in the objectives of this research, define what should be covered by the scope of the research, therefore, helping to define the adequate information needed.

Yin (2009) points out that the unit of analysis is related to the definition of the area to be studied or what the “case” is. The proper definition of the unit of analysis is said to be key for the stages of a case study approach. Furthermore, Yin states that the “case” can be an individual, an event or an entity. He also states that the unit of analysis can be redefined along the research journey as a product of its natural development.

For this research, the unit of analysis relies on the means to improve river basin management (RBM) based on participatory processes, in order to achieve good water governance.

For the purpose of the unit of analysis some criteria were defined namely, the river basin context, water resources management and their authority, public participation issues and problems of water supply or pollution removal.

As noted in section 1.3, the aim of this study is to investigate methods, measures and ways to improve water governance in river basin management (RBM), considering public participation approaches for the enhancement of stakeholders' engagement and commitment.

The objectives of this research, which were pointed out in section 1.3, are as follows:

- a) Identify key stakeholders and their behaviour within the context of RBM;
- b) Examine stakeholder dynamics (level of engagement, commitment and participation) in identified case studies;
- c) Critically evaluate ways for the solution of gaps in stakeholders dynamics amidst various drivers of RBM;
- d) Propose a framework for improved stakeholders' participation in RBM in Portugal.

Therefore, these objectives rely on the identification of stakeholders in a river basin management context and the enhancement of their participation in RBM for good water governance.

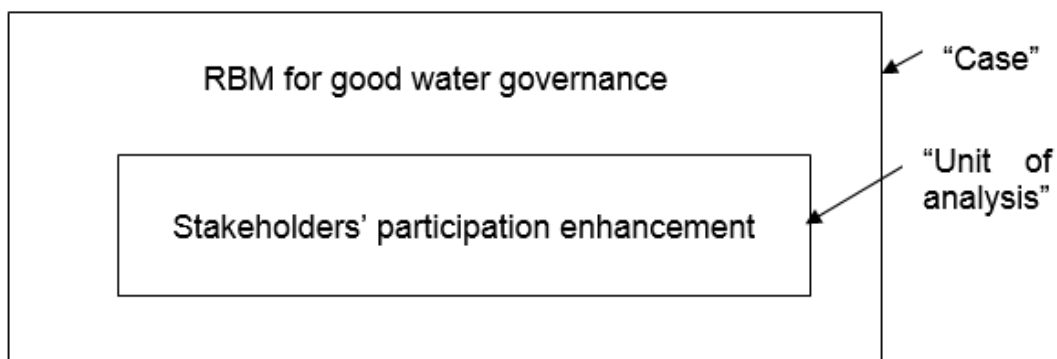


Fig.3-2 "Case" and "unit of analysis"

The unit of analysis for this research is the identification of stakeholders and their participation enhancement in a river basin management context to achieve good water governance. The unit of analysis of this research is depicted in Fig. 3.2.

3.3.3. Adopted approaches

For this study, the general characteristics of research approaches are expressed in *Table 3-3*.

Table 3-3 General characteristics of research approaches pursued in this study

Research Approaches
<i>Focus:</i> mainly social but also technical
<i>Goal:</i> descriptions, explanations & recommendations
<i>Data:</i> mostly qualitative
<i>Number of possible researched objects:</i> multiple-case studies supported by case study interviews and expert interviews to reinforce case study findings.

As was expressed in sections 2.1, 2.2, 2.3 and 2.8, the focus of this study is mainly social but technical aspects of RBM are relevant. Data is mostly qualitative and the number of researched objects is multiple, multiple-case studies supported by case study interviews which were reinforced with expert interviews. This will be detailed in sections 3.4 and 3.5.

Based on the discussion in section 3.3.1 and according to *Table 3-2 (synthesis on research approaches)*, two research approaches were considered for this study, case studies and interviews.

All the research approaches were considered *a priori*, but only those appropriate to this research study were selected.

3.4. Research techniques

This section discusses various research techniques, their use and their benefits and the justification of those pursued in this research.

3.4.1. General overview

Collecting evidence on any issues in a research study can be based on several sources such as direct observations, participant-observation, documentation, archival records, physical artefacts and interviews (Yin, 2009).

Direct observations are applicable when there are acceptable conditions in which to observe any phenomenon when it is actually occurring and in the appropriate context. This is not the case in the area of this study. The researcher could not be present at the National Water Council or the Basin Councils or in stakeholders consultation interviews because she was not a member of any of these councils and their sessions were not open to public.

Participant-observations are observations where the participant can have several roles. The researcher attended past, public sessions on the presentation of the timetable for the works on Basin Plan designs and the discussion on “*Relevant Issues about Water Management for river Tejo Valley*”. In those meetings, the attendees could ask questions or present new issues to be included in those works. Attendees could take a passive observation role or an inquiry position or contribute with some kind of input. In those meetings the participative role of attendees was limited in relation to the number of people present.

Available documentation can include formal studies, administrative documents (reports, proposals, etc.), written reports of events, newspapers articles and institutions’ website information. For this study area the researcher consulted the documents on National Water Plan partial reports, Basin Plans, reports on “*Relevant Issues on Water Management*” for several basins, documents on national strategies for the efficient use of water; for the agriculture sector and for the industry sector and reports on participatory events held in the past. For the case studies involved in this study, some information was available on the websites of their management authorities.

Archival records were not available since public participation in RBM is a recent issue. Physical artefacts do not apply for this study.

Interviews are said to be one of the most important sources for providing information on case studies or on issues under study. They can be prepared by

a protocol including a list of guiding questions. However, the list of questions is not rigid and it is natural that during the interview other questions will arise.

Yin (2009) calls attention to the need for following a defined interviewer's protocol and to ask unbiased questions which means acting in a friendly manner and respecting our line of seeking for information.

Interviews can be in depth interviews, focused interviews and surveys.

In depth interviews usually take an extended period of time and provide the opportunity of asking about facts and also getting the interviewee's opinion about events or even their insights about various issues. Focused interviews are short interviews which follow a prescribed list of questions. Surveys provide quantitative data about a case study or a project.

For this study, quantitative data is not relevant, therefore, surveys were not considered.

Interviews were pursued. An "interview protocol" was prepared which will be explained in section 3.5. Some interviewees were key informants for other interviewees. For this research, methods of data collection such as document analysis, case studies in the area of the research and interviews were considered important to reach the objectives expressed in section 1.3.

Interviews are inclined towards interpretivist assumptions since they try to capture the perspectives of the interviewees. Case studies can be placed between the positivist and interpretative stance, since they deal with both technical and social aspects. The technical aspects of case studies on river basin management are related to water supply, pollution, floods, etc. The social aspects of RBM are related to stakeholders' interrelations and conflicts.

The analysis of existing documents in the area under study can bring relevant information to the issues covered.

The following sections will describe the techniques adopted.

3.4.2. Case studies

In this sub section are presented the characteristics of case studies, their designs and types, their document analysis and the need for interviews to complement the information discovered.

3.4.2.1. Introduction

Case studies can rely on multiple sources of evidence such as documentation, observations and interviews (Yin, 2009) and are thought to be of relevant importance in this research. The identified Portuguese case studies have several published documents focusing on their genesis, their phases, the participatory events, etc., providing multiple sources of evidence. Benbasat et al., (1987) cited by Löwer (2006:20), presented the advantages of using case studies and reinforced the belief of the importance of considering, to some extent, case study information in this research:

“...there are three reasons why case study research is a viable information systems research strategy. First, the researcher can study information systems in a natural setting, learn about the state of the art and generate theories from practice. Second, the case method allows the researcher to answer ‘how’ and ‘why’ questions, that is, to understand the nature and the complexity of the processes taking place.... third, a case approach is an appropriate way to research an area in which few previous studies have been carried out.”

Merriam, and also Carmo and Ferreira cited by Freixo (2009), point out the main characteristics of a qualitative case study as being particular, descriptive, heuristic, inductive and planning in nature. It is particular as it is focused on a distinctive situation, happening, programme or phenomenon and descriptive because the final outcome is “rich” in description of the phenomenon studied. It is heuristic because it leads to the comprehension of the phenomenon studied, inductive because most of these studies are based on inductive thinking (from the parts to the whole) and planning based on the qualitative or quantitative nature of the subject.

Yin (2009:27) states that case study research should be based on several components: the research questions, its propositions (if applicable), the unit (or units) of analysis, the logic between data and propositions and the criteria for their analysis and interpretation. Freixo (2009), citing Yin (2009), says that the study’s questions focus the researcher’s attention on something which must be observed and studied and that unit(s) of analysis can be one or multiple case, processes or groups, due to the existence of a single or several case studies.

Eisenhardt (1989), cited by Löwer, considers that the following steps are needed in case study research:

A priori understanding (literature review on subject covered by the research);

Case selection (reasons or protocol);

Data collection (primary data such as interviews and participation in conferences; (secondary data such as documents available on the web, conference proceedings and presentations) ;

Data analysis;

Theory building and extension (the theoretical approach to reach the research's aim).

These steps will be considered in section 3.4.4, in the definition of the first diagram of data analysis presented in *figure 3.3*.

Yin (2009:102) points out six possible sources of evidence when pursuing case studies: documentation, archival records, interviews, direct observations, participant-observation and physical artefacts. Due to the nature of the study the last three are not applicable. Archival records were not considered because their quantitative data is not relevant to this study.

3.4.2.2. Case studies designs and types

As expressed in section 3.3.1, case studies can be exploratory, descriptive or explanatory. Explanatory case studies try to explain the causes that interfere in real phenomenon. Descriptive case studies can describe a phenomenon in its real context. Exploratory case studies can provide insights when the phenomenon to be evaluated is not clear.

For this study, exploratory case studies needed to be pursued in order to reach the objectives of this research, expressed in section 1.3. These case studies were chosen based on a "case study protocol" which will be detailed in section 3.5.1.

Case studies can be single or multiple case studies. The unit of analysis can be single or multiple. According to Yin (2009), there are four types of case study design. They are differentiated by the number of units of analysis and by the

number of case designs, as depicted in *Table 3-4*. Holistic designs have a single unit of analysis while embedded designs have multiple units of analysis.

This study used a holistic multiple-case study design. It is expected that several case studies will enhance the evidence pursued because each case study has distinctive features. The unit of analysis is the same for all of them.

Table 3-4 Types of designs for case studies (adapted from Yin, 2009)

Number of units of analysis	Case design	
	Single-case design	Multiple-case design
Holistic (single-unit of analysis)	<i>Holistic single-case design</i>	<i>Holistic multiple-case design</i>
Embedded (multiple-unit of analysis)	<i>Embedded single-case design</i>	<i>Embedded multiple-case design</i>

3.4.2.3. Case studies documents analysis

Available documentation related with the case studies are published official reports.

Yin (2009:102) states that documentation has strengths and weaknesses as a source of evidence. As strengths documentation is said to be stable, unobtrusive and exact. It provides broad coverage of events over time. It is stable because it can be assessed as many times as needed. It is unobtrusive since it is not created at the end of a case study. It is exact because it contains references, details and exact names.

In relation to its weaknesses, Yin points out that documentation can be difficult to find, biased selectivity, reporting bias and sometimes inaccessible. Biased selectivity can be derived from the use of incomplete document collections. Documentation can have some bias introduced by the author, which may not be perceived by the researcher. Furthermore, the access to documentation can be difficult.

In this research, several types of documents were analysed, some related to the identified case studies and others related to national strategies on river basin

management and participation meetings, as explained in sections 2.6 and 3.5.1.3. The documents on national strategies were considered to bring national issues into case studies, for reinforcing purposes.

For one of the case studies, the researcher analysed the documents related to several phases of pollution removal solution designs and the related implementation works. Analysis of technical reports found descriptions of past participatory meetings.

For the remaining case studies, the documents for analysis were available online (website of case studies' managing bodies) and were related to the systems' characteristics.

The information gleaned from case study documents was crossed referenced with the interview findings from the case study interviews.

At a national level, consultation events and participatory meetings related to issues of the implementation of the Water Framework Directive (WFD) on river basin management (RBM) were identified. The researcher analysed the official reports of the public sessions and the stakeholders' sectors consultations (agriculture, industry, etc.) to try to reinforce the information available on case studies. They were available on the web page of the Portuguese Water Institute (INAG).

The information in the case study documents was crossed referenced with the interviews held with the technicians who were responsible for planning the consultations to seek more detailed information on those sessions. The main purpose of the interviews was to obtain the point of view of state managers who attended the participation events and to further cross reference it with the viewpoints collected from the stakeholders' interviews.

3.4.2.4. Case study interviews

The case study approach is the mainstay of this research. It is based in holistic multiple-case study with two interviews about the four case studies and five expert interviews to further reinforce the findings.

Case study interviews can complement the information from available documents and capture the interviewees' points of view.

Yin (2009:102) states that interviews have strengths and weaknesses as a source of evidence. As strengths he states that they are targeted and insightful. They are targeted because they rely on topics dictated by the case study or the objectives of the study. They are insightful because they lead to the perception of causes and some explanations.

As weaknesses he points out possible reflexivity, inaccuracy and bias. The possible reflexivity occurs when the interviewee provides information which is what the interviewer wants to hear, reflecting the interviewer's own ideas. Bias is often discerned due to the questions not being explicit enough.

3.4.3. Expert interviews

Interviews can be conducted from a specific case study. Interviews with different actors in RBM can provide their point of view on RBM and participation activities and reinforce the case study as was pursued in this research.

For this purpose, a structured interviews approach was adopted, based on expert interviews. RBM managers' interviews (at national level and at local level) and stakeholders' sectors interviews related to river basin management issues and participatory events were conducted. All sectors of stakeholders were interviewed and some interviewees were related to the case studies' participatory events.

The stakeholders' interviews had the purpose of identifying their views on their relationship with managers and with other sectors of stakeholders, their own attributes and their role in RBM, their salience and to obtain their insights into the issues under study.

This facilitates an understanding of water management issues from the perspective of public participation. Although the chosen case studies are Portuguese, due to the availability of their data and the possibility of interviews with technicians related to the area of research, once an understanding of all the issues is reached these can be applied to any situation.

3.4.4. Triangulation

The multi-structured interview approach process for data analysis is depicted below in *Figure 3.3*. An extension of this figure will be presented in chapter 4 (*fig. 4.1*) under data analysis.

As was stated in section 3.4.2.1, five steps were considered for data analysis: a priori understanding, criteria for selection, data collection, data analysis and theory building and extension (*Eisenhardt, 1989; Lower, 2006*). *Figure 3.3* shows what was pursued in each of these steps.

The discussion in previous sections shows that rationalisation of an approach that considers case study document analysis, case study interviews and supported by reinforcing expert interviews can provide a consistent base to reach the objectives of this research expressed in section 1.3.

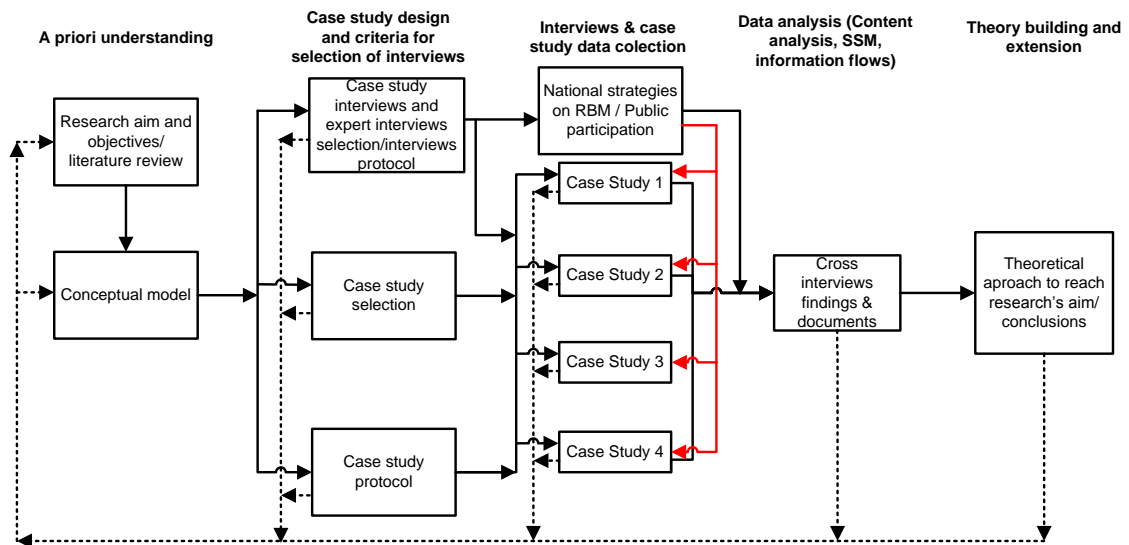


Fig. 3-3 First diagram of data analysis
(Source: the researcher, adapted from *Yin, 2009*)

Official documents on national strategies for the implementation of the Water Framework Directive and on agricultural best practices definition and also EU BREFs (Best Reference Documents) for the several economic sectors were also considered. Official reports on the past participatory meetings, in the context of RBM in the basin districts of the identified case studies were also

considered. All those documents contained data supporting the case study features, as it is indicated in red in *Fig. 3.3*, which was important for the researcher's preparation for the interviews. The data collected from these documents, is explained in chapter 4.

3.5. Methods of data collection used in this research

In this research two methods were used for data collection; interviews and document analysis, with the purpose of eliciting evidence from multiple sources for the purpose of this research.

Fig. 3.4 summarizes the research methods that were used in this research.

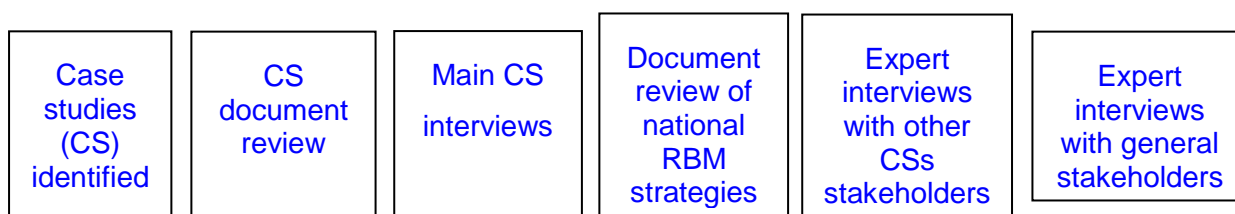


Fig. 3-4 Research methods which were used in this research.

3.5.1. Case studies

The next sections present the case studies protocol, the four case studies identified, their documents analysis and their interviews.

3.5.1.1. Case studies protocol

The first step in the protocol was to choose the different criteria for case study selection. In the context of this research they are as follows:

- River basin context – appropriate river basin to capture issues related to district level stakeholder engagement. This is because there are significant differences in each district due to the nature of water uses in the river basin and pollution problems due to the different industries present in each basin.

- Water supply or pollution removal – the RBM chosen should have had water supply problems or pollution remediation needs.
- Water resources management – there should be an authority responsible for water resources management in the chosen RBM context.
- Any form of public participation – there should be some form of public participation to provide information on stakeholders' interrelations and needs.

3.5.1.2. Case studies identified

At a national level, in Portugal, four case studies were identified, linked to water supply or pollution removal solutions at basin level (*Table 3-5*) with public participation events held in the past in those river basins. In all four case studies, the main focus is on water resource demands at a local river basin management. This would involve use of water, wastewater discharges, pollution control, control of animals which by-pollute the area and farming.

The case studies were selected on the basis of the justified case study criteria, which was presented in section 3.5.1.1.

Prior to the case studies taking place it was essential that a proper grounding on the policy making front was obtained as it would help by refining, as well as on some occasions, generating the specific case study questions. For this purpose, several expert interviews with key members of water authorities (managers), Portuguese Environmental Agency, agriculture stakeholders' representatives, industry sector representatives and RBM experts were conducted.

Table 3-5 Case studies considered in this research, supported by some interviews

Case	Unique factors within the case studies
Case Study 1 – River Ave Basin (north region)	Pollution removal system of River Ave Basin (pollution due to textile industry facilities) Within the scope of the case study, Case Study 1 has unique features of pollution removal system for a large number of textile industries concentrated along the middle part of river Ave.
Case Study 2 – Carvoeiro/Vouga Water supply integrated system of (near Aveiro, centre region)	Integrated water supply system for the area of Carvoeiro / Vouga In addition to the discussion in section 4.5.1.2, Case Study 2 brought a unique integrated water supply system for the solution of river salinization (due to seawater intrusion) and pollution by uncontrolled wastewater discharges.
Case Study 3 – Cascais-Guia (near Lisboa)	Wastewater collection along the coast between Lisboa and Cascais and wastewater treatment plant. In addition to what has been added in the scope, Case Study 3 offers a unique situation in terms of wastewater collection along the coast and wastewater treatment.
Case Study 4 – Wastewater treatment plant of West Region (for pigs rearing installations) near Lisboa)	Wastewater treatment plant for effluents from a large numbers of pig rearing installations in West Region. Within the scope of the case study, Case Study 4 has unique features of pollution removal of the effluent from a large number of pig rearing installations concentrated in an area near Lisboa.

3.5.1.3. Case studies documents analysis

Case study document analysis pursued by the researcher had the purpose of obtaining data on case study features, on participatory events held in the past and preparation for the case study interviews. Documents were available online on the management bodies' websites.

The researcher consulted written documents about the stages of the case studies. Published conference proceedings relating to case studies and the River Basin Plans were also available. For example, the documentation on the

plans for the Ave valley pollution removal system, its participatory events and also the documents relating to the methods used to outsource the management body for the system were consulted. The implementation of this pollution removal system was very long, from the first reports of pollution in River Ave, due to a large number of textile industries discharging wastewater directly into the river, until the final construction, a number of years ago, of several wastewater treatment plants and sewers to re-route wastewater from the factories to the treatment plants.

The data collected on the River Ave case study was made available by an expert who was part of the team from the private office responsible for the studies on river Ave pollution remediation (from 1988 to 1993). The data on the other case studies was obtained online from the website of the Regional State Commission and other managing bodies. River Basin Plans were also available from the website of the National Water Institute (www.inag.pt at the date of consultation).

At a national level, public consultation events related to issues of the implementation of the Water Framework Directive (WFD) on river basin management (RBM) were identified. The researcher analysed the official reports from the public sessions and from the industrial sectors' consultations (agriculture, industry, etc.), available on the web page of the Portuguese Water Institute (INAG) (www.inag.pt at the date of consultation), and interviewed some of the technicians who were responsible for planning the consultations to seek more detailed information on those sessions. The main purpose of these interviews was to obtain the point of view of State managers on those participation events to enable further cross referencing with the viewpoints of the stakeholders to reinforcement the case studies' findings.

3.5.1.4. Case studies interviews

The case studies identified using the criteria enumerated in section 3.5.1.2, were considered in the selection of interviewees. The interviewees had been directly involved, in the past, with participation events. The Interview Protocol was composed of a number of questions which were the same for all interviewees and the remaining questions were specifically searching as

regards the particular case study and to capture the interviewees' point of view on participation issues and past participatory events. This will be detailed in section 3.5.2.

There was a crossing of findings from case studies documents analysis and case study interviews.

3.5.2. Interviews

This sub section presents the interview planning and justification, ethical approval and protocol.

3.5.2.1. Interviews planning

The main focus of this research is from a social stance, due to people's actions, interrelations and conflicts. In a social context, interviews with people involved with river basin management (RBM), and to some extent with the case studies, have the purpose of obtaining the interviewees' perspective on the concept, trying to capture what they think about the related issues. It was expected that they would provide a relevant contribution for the scope of this study which is the reason why interviews were considered for this research.

This explains the adopted research approaches specified in section 3.3, which are based on interviews (some of them directly supporting the case studies) and document analysis. For this purpose, two case study interviews and five expert interviews were carried out. A structured interview approach was adopted, based on case study interviews and expert interviews.

The two technicians who were interviewed in relation to the case studies were connected with more than one case study. Therefore, they were expected to provide a broad perspective on the desirable features of public participation and a comparison of the different case study events associated with public participation. They were also expected to provide possible differences in interpretation and convergent or divergent perspectives of the same case study and the public participation events.

The case study interviews were conducted with senior study managers covering the four identified case studies. To reinforce these interviews, five expert

interviews were also conducted. It was important to carry out interviews with experts in the field because they highlight stakeholders' perceptions better than the case studies and have expert views on participation which is an important aspect of this research. Two experts who were interviewed were managers at a national level and also one local manager (water authorities). In addition stakeholders from the agricultural and industrial economic sectors were also interviewed. This is clarified in *Table 3-6* as given below.

Therefore, the researcher interviewed experts who were senior members of staff and technicians from water authorities related to past participatory events, and stakeholders from within the community and from outside it. Some interviewees were related, in the past, with participatory events in the context of some Portuguese case studies.

In RBM the actors are the managers, stakeholders from agriculture, stakeholders from industry, experts, NGOs and citizens.

The next paragraphs will explain the rationale for case studies interviews, which will later be linked to the managers' interviews. Following on from this the reasons for conducting stakeholders' interviews and experts' interviews will be explained.

For the case study interviews, four case studies were considered, based on the previously defined unit of analysis (river basin context; water supply or wastewater pollution removal; existence of a water resources management authority; any form of public participation). The case studies are the existing Portuguese case studies related to this research. The four case studies have the same scope, as the case study selection criteria required, but had different, specific characteristics.

In the first instance the researcher analysed the official reports on each case study characteristic and the reports about the participation events. To complement the data collection on the participatory events the researcher interviewed technicians who were involved in their planning. The purpose of these interviews was to seek their views on public participation in river basin management and obtain more detailed information on participatory events.

Ave valley pollution removal system (case study 1, as expressed in *Table 3-5*) was identified as the first type of participatory event to be held. This was based on the findings from written documents about this case study. The implementation of the pollution removal system was spread over more than thirty years, from the first reports of pollution in the River Ave in the 1970s (due to a large number of textile industries discharging wastewater directly into the river), to the final construction, few years ago, of several wastewater treatment plants (and the sewers to reroute wastewater from the textile factories to the treatment plants).

Furthermore, case study interviews were conducted with technicians who coordinated the following projects: Ave valley, integrated water supply system of Carvoeiro/Vouga, Cascais-Guia wastewater collection and treatment system and wastewater treatment plant of West Region (near Lisboa) which comprised the chosen case studies (*Table 3-5*), to seek their views on public participation events in river basin management.

Additionally, national managers who prepared and conducted previous public participation (PP) events on the relevant issues of River Basin Management (RBM) in all basin districts and covering the river basins of the identified case studies were also interviewed. This supports additional data from the case study interviews and explains the importance of interviewing the experts.

National managers also conducted public participation events on the implementation of the Water Framework Directive (WFD) at national level. The findings related to these public meetings sought to bring national issues to the case studies and *vice versa*, based on published documents that reported these participatory events.

Some official reports published online by the National Water Institute (INAG) about the National Water Plan, Basin Plans and national strategies for the agricultural sector and for the industry sector were analysed by the researcher, and were used as the basis for managers' interviews. The researcher interviewed those who were responsible for the planning and supervision of public consultation events relating to the issues of implementation of the Water Framework Directive (WFD) and those strategic plans. This entailed three

interviews with managers at local and national level. The purpose of the interviews with managers was to capture additional data on public participation (PP) events which were conducted in the past, beyond those opinions expressed in their official written reports. Additionally, the purpose was to encapsulate the personal view of the interviewees on desirable PP features and stakeholders' interrelations which arose during those processes. These interviewees were expected to provide more perspectives and add value to the stakeholder participation framework produced in this research.

Two additional expert interviews consulted stakeholders from the economic sector (agriculture and industry), to seek a deeper understanding of their views beyond those expressed in official reports and their relationships with managers and with each other.

Stakeholders' interviews considered the importance of agricultural sector which is officially reported to be responsible for the higher water consumption and for pollution in some river basins. Industry is considered to be the sector which is often responsible for the major problems of pollution generated by wastewater discharges.

This is a multiple case study approach (covering four case studies) with two interviews to support the case studies and five expert interviews (stakeholders, policy makers and other experts) to further reinforce the case studies.

In *Table 3-6*, the first column identifies the interviews and the middle column presents the interviewees. The right column addresses the issues for each interview.

The ethical approval process for the interviews is explained in section 3.5.2.3. The Interviews Protocol is presented in the *Appendix*.

The purpose of these interviews was to capture additional data on public participation (PP) events which were conducted in the past, beyond those opinions expressed in written reports to encapsulate the personal views of the interviewees on the desirable PP features and stakeholders' interrelations which arose during those processes. The additional interviewees were expected to provide more perspectives and add value to the stakeholder participation framework produced in this research.

Table 3-6 Interviews planning

Interviews	Interviews respondents	Addressed issues
Interview 1	Manager of case studies 1 and 2	Support Case Study 1 (Ave river pollution removal system) and Case Study 2 (Carvoeiro/Vouga System)
Interview 2	Manager of case study 3 and Case study 4	Support Case Study 3 (Cascais/Guia system) and Case Study 4 (West Region wastewater treatment plant for treatment of effluent from pig rearing)
E1(M) Expert interview 1 (Manager)	National manager for planning, stakeholders consultation and policy maker	Reinforce case studies, bringing national strategies on river basin management and participation issues to all the case studies
E2(M) Expert interview 2 (Manager)	National manager for planning and stakeholders consultation on coastal areas management	Reinforce case studies, bringing national river basin management policy on coastal areas and participation issues to the Case Study 3
E3(M) Expert interview 3 (local manager)	Basin District Administration manager	Reinforce case studies, bringing river basin management and participation issues to the Case Studies 3 and 4.
E4(SI) Expert interview 4 (stakeholder, industry)	Industry stakeholder	Reinforce case studies, bringing industry issues for river basin management by their participation
E5(NSA) Expert interview 5 (stakeholder, agriculture)	Stakeholder (National agriculture)	Reinforce case studies, bringing agriculture sector issues for river basin management by their participation

3.5.2.2. Interviews justification

The interviews conducted by the researcher were two case study interviews and five expert interviews, as explained in chapter 3, section 3.5.2.1. The case study interviews were related to four identified case studies. The expert interviews sought to reinforce the case studies' findings. The five expert interviewees were managers, agricultural and industrial representatives.

Fig. 3.5 presents the model for the interviews. The type of interviews, the respondents and the issue addressed are shown in Table 3-7.

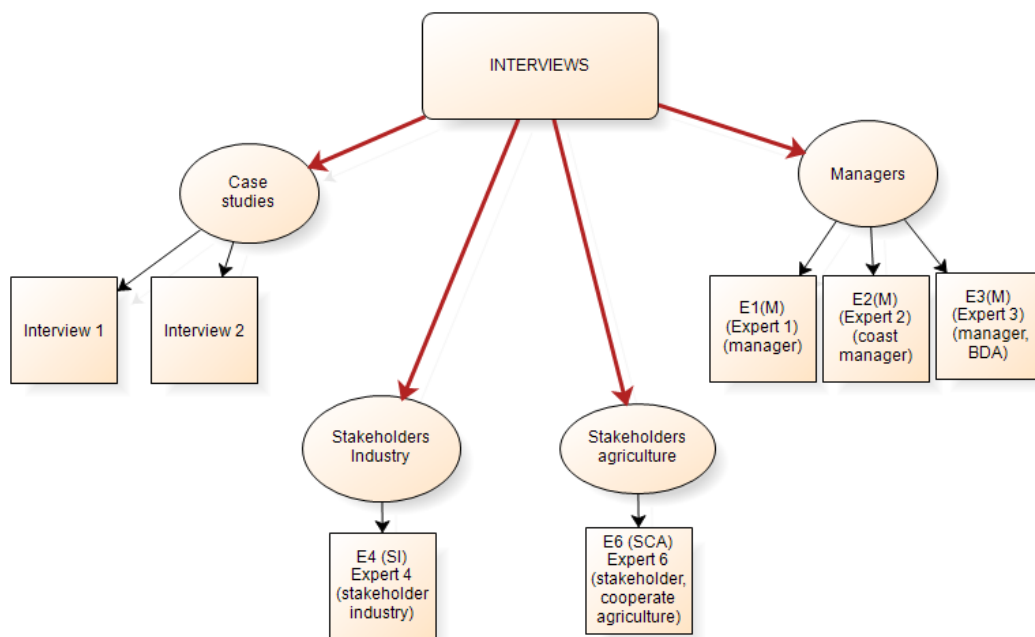


Fig. 3-5 Interview model (created with NVivo 10)

The first questions on the semi-structured interview guide were common to all the interviews. The remaining questions were specific to the interviewee. In the Ethical Approval process included in the Appendix are the sets of questions which were used for each type of interviewee.

A number of institutions who were part of various State Offices when the interviews were carried out have moved into a unique organisation; the “Ministry of Sea, Environment, Agriculture and Territorial Management”.

The new organisation was the result of the amalgamation, due to ministerial reorganisation, of the “Ministry of Environment, Agriculture, Fishing and Territorial Management”, the old “Ministry of Energy”, the “Ministry of Agriculture

and Sea” and “Ministry of Environment, Territorial Management and Energy”. The original National Water Institute, the original Portuguese Environmental Agency (APA) and the Basin District Administrations were merged to form the new Portuguese Environmental Agency (APA, I.P.). A number of technical staff who had worked in the old departments had, over the years, developed relationships based on trust with stakeholders, as was confirmed during the interviews. The introduction of new technical staff implies the need to try to regain the confidence of stakeholders.

Table 3-7 presents the interview plans with the activity sector or role, type of institution and interviews main subject addressed.

3.5.2.3. Ethical approval procedure

The interviews were subject to the new guidance on Salford University’s ethical approval process.

The Ethical Approval Form for Post-Graduates was submitted to the College Ethics Panel along with the Interview Protocol and was approved.

The Ethical Approval Form information consisted of:

- Identification of the research project;
- Project focus and objectives;
- Research strategy;
- Rationale which led to the project;
- Methodology approach;
- Individuals involved;
- Method for gaining informed consent from anyone involved in the study;
- System for addressing Data Protection issues;
- Number of subjects involved in the study;
- Code of Ethics followed.

The Code of Ethics followed is UKRIO, Code of Practice for Research.

Table 3-7 Interview planning by activity, sector or role

Interviewees		Type of institution	Interviews main subject
Case Study interviews (Systems' managers)	Interview 1	Management Body for water supply system or wastewater collection & treatment system	Public participation in case studies development
	Interview 2		
Expert interviews (Managers)	E1(M) Expert Interview 1 (National manager)	National Management Body	National strategy on participatory processes in RBM -- Management Plans and Stakeholders' Sector interviews
	E2(M) Expert Interview 2 (coast and dams manager)	National Management Body	Participation in Management Plans for the Coast and in Management Plans for Dams and Reservoirs
	E3(M) Expert Interview 3 (local manager, BDA)	BDA (Basin District Administration)	Participation meetings, mainly on "Relevant Water Management Issues" for each basin, sponsored by the BDA
Expert interviews (industry)	E4(SI) Expert Interview 4 (stakeholder, industry)	Industry Confederation	Involvement in public participation forms with national and local managers and ministries
Expert interviews (Agriculture)	E5(NSA) Expert Interview 5 (stakeholder, agriculture)	Agriculture Confederation	Involvement in public participation forms with managers and the Agriculture Ministry

3.5.2.4. Interview Protocol

The Interview Protocol was made up of; an Information Letter to Interviewee, a Research Participant Consent Form (to define the conditions of the interview and data protection) and a Semi-Structured Interview Guide. The Interview Guide contained questions which were common to all interviewees and the rest of the questions were focused on the interviewee's specialised contribution.

The information letter explained the aim and objectives of the research and the subject of the interview and asked for interview consent.

The Research Participant Consent Form explained the interview and how it would be conducted, interviewees were asked whether they had any objection to the interview being recorded and informed them that they could withdraw from the interview at time and without explanation. The form was read by the interviewee before the interview and signed to show that he/she clearly understood the process and was at liberty to choose the conditions of the interview. In case of withdrawal, any information provided would be destroyed and this fact was communicated by letter to the interviewee.

The Semi-Structured Interview Guide contained a list of questions which acted as guideline for the interview.

The researcher made the first contact face-to-face with the interviewee, presenting the whole Interview Protocol (Information Letter to Interviewee, Research Participant Consent Form and Semi-structured Interview Guide). This first contact had the purpose of gaining consent for the forthcoming interview. The interview was always scheduled for a later date. The inclusion of the list of questions at the first contact meeting was to allow the interviewee to understand the guidelines for the interview.

The first contact was also important to find out if the interviewee's organisation had a Code of Ethics, or any other procedure, for which consent must be obtained before the interview could take place. The presentation of the Semi-structured Interview Guide to the interviewee, in this first contact, was to provide enough information for the interviewee to make a decision about the issues expressed in the Consent Form.

The Interview Protocol is presented in the *Appendix*.

As stated in the Ethical Approval Form, the data collected, the audio recordings of interviews (where consent had been given) and the notes taken during the interviews (whenever audio recording was not allowed) were kept by the researcher on her personal, external computer drive that was password protected and safely stored in the researchers' home. All the conditions expressed by each interviewee in the signed "Research Participant Consent Form" will be completely respected, assuring confidentiality and anonymity. All data collected will be destroyed after a reasonable period of time once the research is completed.

3.5.3. Triangulation

Several questions arose concerning the triangulation for this research. What is the reason for the analysis of official reports of case studies and why conduct interviews about them? How can this procedure be validated and proved to be important enough to clarify the process of public participation events held in the past for each of the case studies? On one hand, the researcher needs to get as much information as possible on the consultation and public participation process in the case studies. On the other hand, the purpose is also to understand how they were conducted, their outcome and the degree of success of those processes. Did they bring together all the drivers for each case study? Was there a large and representative participation by all groups of stakeholders? Was there a clear and exhaustive identification of the needs and interests of each group, including the citizens?

Two types of triangulation can be applicable, the triangulation of data sources and the triangulation of research techniques. Triangulation of data sources has been, and will continue to be, pursued to corroborate the same facts and seek answers by using several sources of evidence. In this research, this type of triangulation relies on case study document analysis and interviews related to case studies. The interviews were "in depth interviews" (Yin 2009), seeking the facts and opinions of interviewees and providing views from different people in the case studies, river basin management and participatory events. Interviews were based on interview guidelines and interviewees were senior staff,

government officers, water authority employees, stakeholders from within the community and outside it, as discussed in section 3.5.2 and *Table 3.6*.

Triangulation of research techniques is based on the case studies' qualitative data collection and analysis (see section 3.4.1) relying on the process of analysing data from interviews and document reviews. In section 3.4.4, *Fig. 3.3* represents the first diagram of the data analysis, where the interviews' findings were analysed individually and also cross referenced with published documents, and merged together using Soft Systems Methodology (as explained in section 3.6.) helping to define the flow of information, interrelations, interests and conflict among the actors of river basin management (RBM). The data and insights provided by the interviews can also influence the final outcome of SSM application.

3.6. Analysis of data and building theory

In this section content analysis and Soft Systems Methodology are explained as they were used in this research.

3.6.1. Content analysis

The interviews transcriptions were processed using content analysis techniques. The following paragraphs define what content analysis is and describe the use of computer-assisted tools in this research.

As expressed by Ryan and Bernard (2000), "*classical content analysis comprises techniques for reducing texts to a unit-by-variable matrix and analysing that matrix*".

The first stage is to establish a group of codes, following which the text should be broken down into units. Each unit of text can then be coded by using the codes created in the first stage and a matrix can be produced.

There are two types of content analysis: conceptual analysis and relational analysis (Palmquist, *University of Texas website*). While conceptual analysis

deals with the frequency of concepts in a text, relational analysis reveals the relationship between those concepts.

In conceptual analysis the researcher looks for the number of times that a certain word or phrase appears in a text or the number of positive or negative words that characterise a situation or support an argument. This type of analysis counts words but does not determine the relationships between them. For the purpose of this research the number of times that a word was used by the interviewees is not important but the concepts that arose during the interviews and their interrelation are significant.

Relational analysis determines the relationships between concepts that appear in a text. Palmquist says that the success of relational analysis relies on the initial, clear definition of the concepts that are to be analysed. Furthermore, the reliability of a content analysis process depends on its stability, reproducibility and its accuracy. The stability refers to the coding which should be the same for similar data in interview transcripts. The reproducibility is assured when coding turns out to be the same for different people who were interviewed. The accuracy of the coding will yield good final results when measuring or defining the outcome. Relational analysis was considered for this research to analyse the interview transcriptions.

Palmquist says that content analysis has advantages and disadvantages. The advantages are said to rely on the close use and interpretation of transcripts in an unobtrusive way, allowing the identification of social interactions and an understanding of their possible complexity. Furthermore, it can provide qualitative or quantitative results.

He says that the disadvantages are that the researcher can be unaware of the context in which the text was produced and can establish relationships in an inaccurate way. It is said to take too much time to perform and can lead to mistakes in interpretation of the transcriptions. When using conceptual analysis, it can be reduced to counting the frequency of words used by the interviewee.

Some computer-assisted tools are available to perform content analysis. The researcher used the computer programme NVIVO 10.

3.6.2. The use of NVIVO 10 in this research

NVIVO 10 is software used for content analysis developed by QSR International. It can be used to apply qualitative techniques to organise and analyse data. It allows questions such as “how” and “why” arising from data to be answered. It is a tool to manage data and find patterns within the data. However, it will not perform the analytical work that has to be made by the researcher.

NVIVO software provided a method for analysing the interviews transcripts; define codes (the attributes and relationships to be identified) and arrange data.

NVivo uses “sources” and “nodes” and the concept of “coding”.

Sources are the research materials. They can include documents, PDFs, audio recordings, videos, etc. The sources used in this research were the transcripts of the interviews.

“Coding” is the process of arranging the source material by theme or topic and coding it in “nodes”. “Nodes” are described as ‘containers’ where codes can be stored along with the selected parts of the material relating to a particular feature of data. Following this, the data contained in each node can be used to search for patterns. .

Once NVivo has analysed the data it can create a framework matrices, queries or frequency of words used in the sources. It can also create charts, models, graphs and reports.

For this research, the number of times that a word was used by the interviewee was not relevant but the concepts and their relationships which arose during the interviews were important. The main purpose of this research is the identification of attributes and relationships among stakeholders in the context of river basin management, in order to pursue the enhancement of public participation.

The first step in the software use was the importation of transcripts to NVIVO, after which, single nodes and tree nodes were created. These nodes were created according to the attributes of stakeholders and their relationships or additional features of stakeholders’ behaviour as expressed in chapter 2, *Table 2-9*. The nodes created represent the attributes of power, legitimacy and

urgency (from the stakeholder theory), but also other stakeholder features for the identification and comprehension of any relationships among them. The significant parts of the interviews where those attributes arose were stored in the related nodes.

Fig. 3.6 shows an example of the nodes and coding used in the analysis.

Some nodes are free nodes, as for “EU politics”, “managers’ actions”, “stakeholders’ salience”, “stakeholders’ urgency” and “trust relationships”. Other nodes are tree nodes such as “consultation”, “legitimacy” and “power and competition”. An additional node was created with the name of the interviewee to enable the production of matrices within NVivo 10.

For each interview, a matrix was built in NVIVO. It was designed to relate code references to each interviewee, allowing the capture of each important issue arising from the references and the number of times the interviewee spoke about that issue.

Name	Sources	References
Consultation	0	0
Consultation adequacy	1	11
Consultation frequency	0	0
Consultation objectives	1	2
Consultation tools	1	9
E1(M) Interviewee	0	0
EU politics	1	4
Legitimacy	0	0
Stakeholders concerns	1	11
Stakeholders knowledge	1	29
stakeholders legitimacy	1	4
Managers actions	1	7
Power and competition	0	0
stakeholders collaboration	1	12
Stakeholders engagement for participation	1	24
Stakeholders power and competition	1	21
Stakeholders salience	1	15
Stakeholders urgency	1	8
Trust relationships	1	5

Fig. 3-6 Example of nodes and coding in NVIVO 10

The matrices produced by NVivo10 were used as the basis for the application of Soft Systems Methodology which would design “rich pictures” as explained in section 3.6.3. For this purpose, a summarised table was created, grouping the tree nodes and defining the information to be used in “rich pictures”.

3.6.3. Soft Systems Methodology

To understand a situation of purposeful human activity which is not well defined *a priori*, a qualitative methodological approach seemed to be more appropriate than a quantitative one (see section 3.3.1). It seemed more important to view the situation using an holistic approach, to diagram it and identify some critical themes or actions which could be improved or even changed. It appears more important to comprehend the whole problem and identify the parts, with some critical features or actions, than to deal with little parts of the whole. This could be helpful for the purpose of attaining good water governance in river basin management (RBM) based on enhanced participatory approaches and on stakeholders’ interrelations, interests and conflict characterisation. “Soft Systems Methodology” in association with the triangulation of other research techniques explained in section 3.5.3, seemed to be the most appropriate approach.

According with Checkland (1990), SSM is a structured way of thinking; focusing on a real-world situation perceived to be problematic, with the aim of bringing about improvements in the situation. SSM addresses messy, ill-structured, problematic situations. This methodology is a cyclic process of enquiry making use of ‘*holons*’ (the name of the concept as a whole). It is a good tool to use when the facts of the situation are ill-defined and where the objectives are not clear and that both ‘what to do’ and ‘how to do it’ are problematical. The essence of soft system thinking is that it provides a coherent intellectual framework that can be used to try to understand and intervene usefully in everyday situations. Checkland described SSM as a seven-stage process as represented in *Fig. 3.7*

Bulow (1989:36) summarised SSM as “*a methodology that aims to bring about improvement in areas of social concern by activating in the people involved in the situation a learning cycle which is ideally never-ending. The learning takes*

place through the iterative process of using systems concepts to reflect upon and debate perceptions of the real world, and again reflecting on the happenings using systems concepts.”

The upper part of the seven-stage figure, above the irregular line, represents the phases in the real world while the bottom part belongs to the system's 'thoughts' about the real world. Initially, after identification of the messy and problematic situation, "rich pictures" will be defined, expressing the problem situation, as shown in *Fig. 3.7*. The next two phases belong to the system's thinking sphere, defining "root definitions" as the basis for the conceptual models. The models can be compared to real world situations, pointing to the need for change and leading to the definition of actions to improve or even solve the initial problematic situation. Checkland (1990) defined the creation of "rich pictures" as being diagrammatic representations of the situation's entities (structures), processes, relationships and issues. He also defined the need to create "root definitions", "CATWOE" meaning and SSM stages.

The names of relevant systems must be written in such a way that they make it possible to build a model of the system named. The names themselves are known as '*root definitions*' since they express the essence of the perception of the purposeful activity system to be modelled. Root definitions (RD) describe the system that will be modelled later. Each root definition uses a certain perspective of the system. They are concise verbal definitions expressing the nature of purposeful activity systems regarded as relevant to exploring the problem situation. A full RD would take the form: *do X by Y in order to achieve Z*.

CATWOE are the elements considered in formulating root definitions. The core is expressed in **T** (transformation of some entity into a changed form of that entity) according to a declared 'Weltanschauung' or worldview **W** (assumptions made about the system or how the system is perceived from a specific point of view). **C** are the customers (victims or beneficiaries of T), **A** are the actors (those who carry out the activities within the systems), **O** is the owner (person or group who could abolish the system or have control over it) and **E** is the environment (the environment within which the system operates and which influences the system, but which the system has no control over).

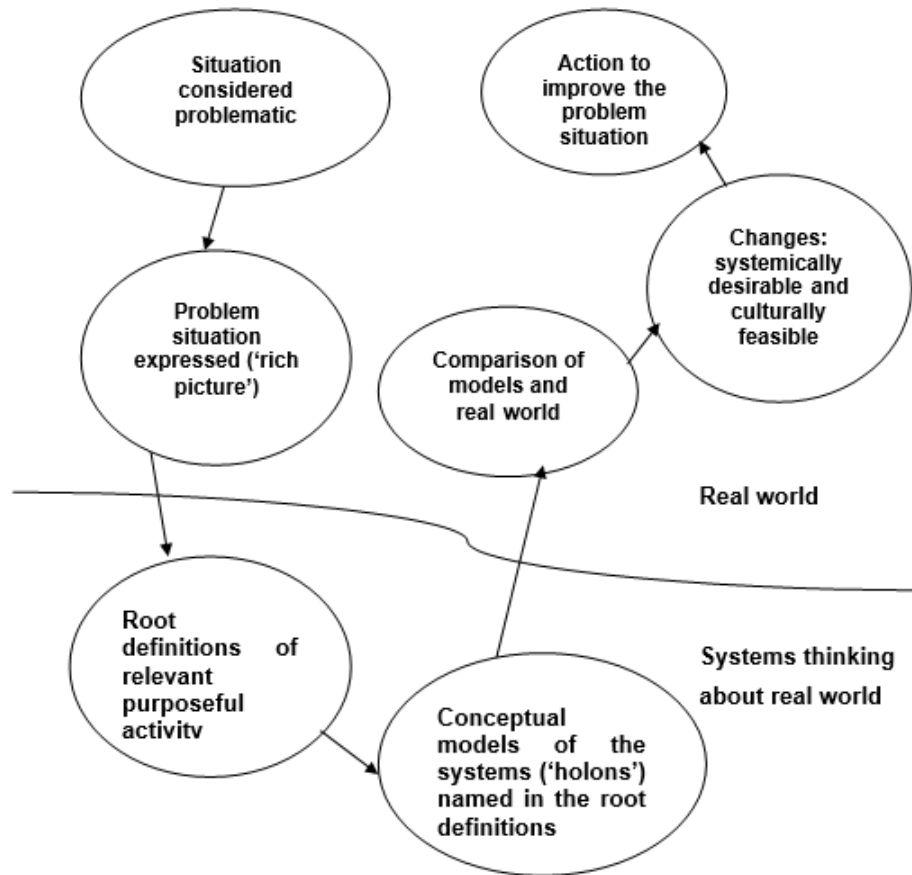


Fig. 3-7 Soft Systems Methodology (SSM) stages

CATWOE definitions can help this research to define the drivers for public participation in each case study, differentiating customers from actors and owners and also provide a broader perspective. After root definitions and CATWOE definitions have been determined, a conceptual model can be diagrammed; a structured set of activities necessary to realise them, consisting of an operational sub-system and a monitoring and control sub-system.

3.6.4. SSM application to case studies

Checkland & Scholes (1990:31) say that *“in many cases there will be visible in the real world some organised purposeful action which could be reflected in the choice of a motional human activity system whose boundary would coincide with the real world manifestation... In SSM this kind of choice is referred to as a primary-task system.”* Conversely, *“an issue-based relevant system is a system to resolve disagreements on resource use or a system to define information*

flows to and from the management committee". In general, their boundaries would not map on to real-world organisation boundaries.

The distinction between primary task and issue-based relevant systems is not sharp or absolute. Checkland says that "*primary task systems map on to institutionalised arrangements; issue-based systems are relevant to mental processes which are not embodied in formalised real-world arrangements.*"

The structure of CATWOE implies that a 'full' RD core transformation would be 'a system to do X by Y in order to achieve Z', where T will be the means, Y,Z is related to the owners' long term aims, and there must be an arguable connection which makes Y an appropriate means of conducting the task.

SSM will be applied to the four case studies, to obtain public participation definitions in the context of River Basin Management (RBM).

Fig. 3.8 shows the framework for application of SSM in this research. Under each of the stages is indicated what is expected to be achieved.

Stages 1 and 2 determine the problem situation. Stage 1 will identify the broad problem to be addressed; which is the need to improve water governance in river basin management (RBM) whilst considering the influence of stakeholders and citizens and their participation. In stage 2, data analysis of case study documents and interview outcomes will be pursued. Government officers, water authority employees, stakeholders and other individual community representatives were interviewed as expressed in section 4.5.2.1 and *Table 4-6*. Interviews will follow pre-determined guidelines to try to capture the views of the interviewees from different perspectives. Later, case study "rich pictures" will be drawn based on the data analysis and interview outcomes. Different "rich pictures" will be created for each of the case studies, taking into consideration the contribution of the interviewees related to it, and finally, all the "rich pictures" will be compared. It is expected that the comparison will identify the RBM situations and conflicts, stakeholders groups and their influence on situations and develop an understanding of the conflict situation.

Stages 3 and 4 will define conceptual models for the engagement of stakeholders and citizens to participate in the improvement of River Basin

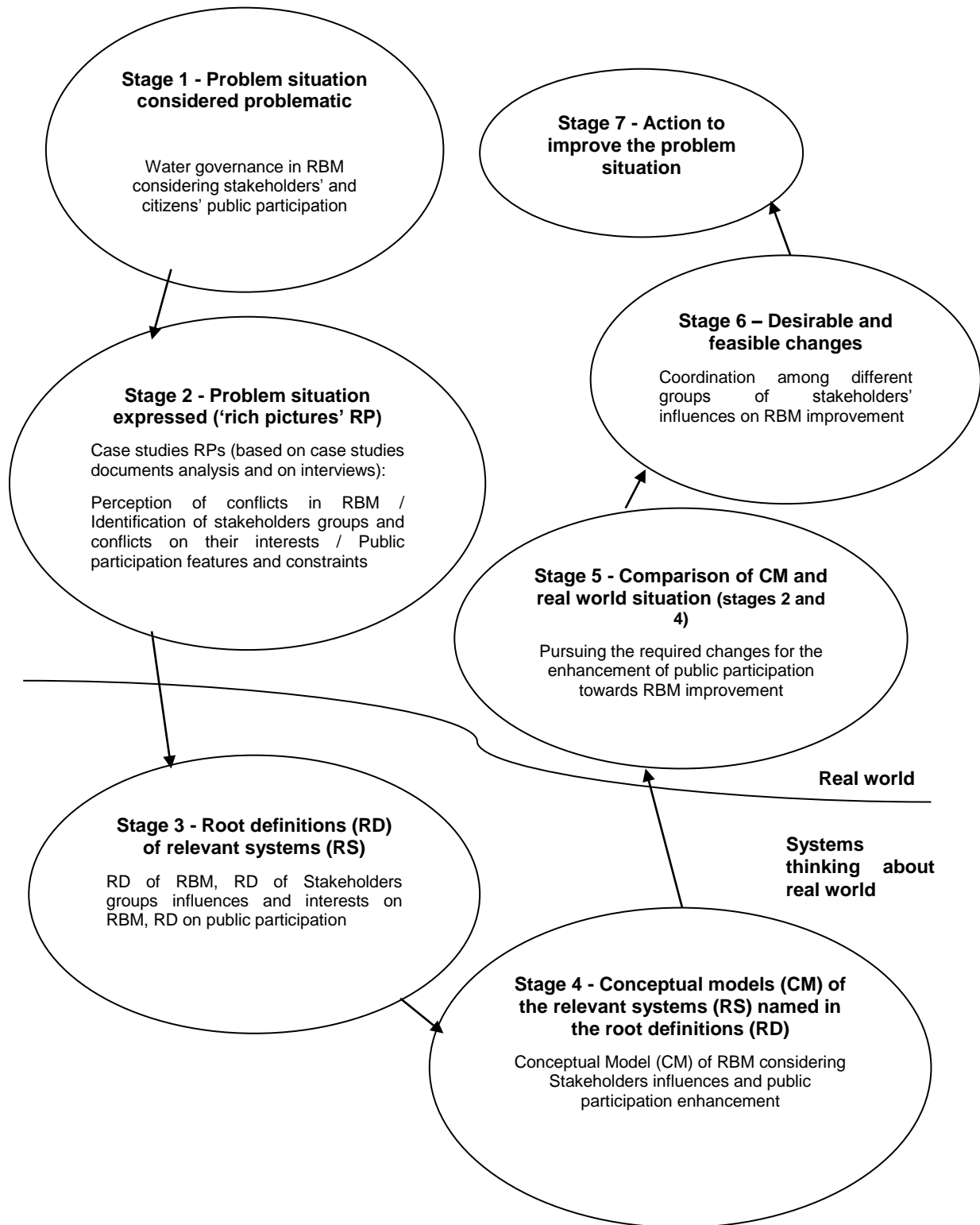


Fig. 3-8 Stages of SSM for this research

Management (RBM). During stage 3, root definitions of RBM, stakeholders' influences and public participation will be defined. The "CATWOE" elements will be established and the anticipated transformation will be identified

(improvement of RBM with public participation enhancement), and a definition of the actors will be obtained (government officers, water authority employees, stakeholders and citizens).

In stage 4 conceptual models, based on the previous stages will be defined, while stage 5 may be compared with the situation in stage 2, to decide whether to move forward to the next stage or return and improve the previous stages. Stage 6 is expected to provide the desirable changes required to enhance the commitment of stakeholders and citizens in RBM, inducing new attitudes and behaviour towards public participation in RBM. Finally, stage 7 may provide definitive action to achieve the aim and objectives of this research.

For example, a primary task RD (root definition) is to attain good water governance in river basin management. An issue-based RD could be; how to enhance public participation to achieve the primary task RD.

3.6.5. SSM application to interviews

The first step in the application of SSM to interview data is to define the situation that is considered to be problematic: water governance in river basin management considering the required enhancement of stakeholders and citizens public participation.

Following Freeman (1984), the construction of a stakeholders' map was pursued. Freeman (1984:54) states that *“any framework which seeks to enhance an organisation’s stakeholder management capability must begin with an application of the basic definition. Who are those groups and individuals who can affect and are affected by the achievement of an organisation’s purpose? How can we construct a “stakeholder map” of an organisation?”*

In the case of this study, stakeholders are managers (state managers and private managers), farmers associations, individual farmers, industry confederations, individual industrialists, environmentalists, researchers and citizens. The nature of their relationship was explored during the interviews to try to determine their attributes in terms of power, legitimacy and urgency or the lack of one or more of them.

3.7. Validity and reliability of research designs

Yin (2009) states that several tests can be used to prove the validity and reliability of research design and case studies findings. *Table 3.8* presents the four test definitions (*from Kidder & Judd, 1986, cited by Yin, 2009*) and also the case study tactics and the phase of research in which the tactics take place as defined by Yin.

To construct the validity of this research, the data collection phase will use multiple sources of evidence and will try to establish a chain of evidence based on the findings. The data collection phase of this research is based on the defined case study protocol (section 3.5.1.1) and the problem to be addressed which is the aim of this research; to provide a framework for the improvement of stakeholder engagement and greater participation in RBM, in order to enhance integrated water management in the context of a river basin in Portugal to reach good water governance.

The researcher will use multiple sources of evidence since multi-case studies will be embraced, based on Portuguese case studies (presented in section 3.5.1.2, *case studies identification*), interviews related to the case studies (section 3.5.2.1 and *Table 3-6*) and also with two stakeholder associations (farmers national association and a national industry association) to capture their views and also archival records. *Fig. 3.3 (section 3.4.4)* represents the stages of the data analysis process which will be followed in this research.

To ensure reliability, the data collection phase of this research is based on the defined case study protocol (section 3.5.1.1) and the problem to be addressed, which is the aim of this research, based on case study characteristics and their findings. The final purpose of this study is to set out a framework for the enhancement of effective public participation in river basin management, which can be used anywhere at a similar level (the basin).

Data analysis will use Soft Systems Methodology (SSM) and will cross reference the case studies' findings to try to establish matching patterns or examining rival explanations and if possible comparing and contrasting the perspectives of stakeholders or other actors who may provide alternative or complementary features for refining the final framework.

Table 3-8 Design tests and case study tactics within this research (Source: Yin, 2009:41)

Tests	Case study tactic	Phase of research in which tactic occurs
Construct validity (identification of correct operational measures for the concepts being studied)	Use multiple sources of evidence Establish chain of evidence	Data collection Data collection
External validity (defining the domain to which a study's findings can be generalised)	Use replication logic in multi-cases studies	Research design
Reliability (demonstrating that the operations of a study and the data collection procedures can be repeated, with the same results)	Use case study protocol Develop case study database	Data collection Data collection

Chapter 4. Data analysis

This chapter explains the case study analysis process. It presents the type of data which was considered, the techniques which were used for the analysis and the process of the analysis.

4.1. Introduction

The data analysis was based on interviews and document analysis. The following sections provide the detailed document analysis, the interviews findings and the process of the analysis. Thus, this chapter presents stage 2 of SSM applied to this research, as expressed in section 3.6.4 and Fig 3.8, expressing the problem situation (by the production of “rich pictures” and their outcomes).

The document analysis was targeted at investigating the level of public participation that has taken place in the area of river basin management. The document analysis also provided the basis and the background to prepare the interview questions to be used in the case studies.

Sections 3.4.2.3 and 4.5.1.3 and Fig 4.1 established the role of the document analysis within this research. Fig. 4.1 is an extension of Fig 3.3, presenting the type of data collection that was used. Fig. 4.2 shows the process undertaken for case study analysis.

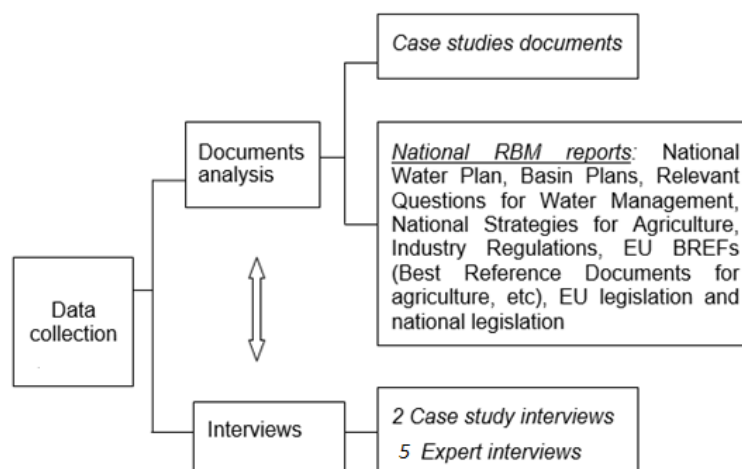


Fig.4-1 Data collection – Documents review and interviews

Case studies	Main case study interviews	Document review	Expert interviews with other CS stakeholders	Expert interviews with general stakeholders
CS 1 - River Ave pollution removal system (due to textile industries)	Interview with CS 1 manager (or Interview 1)	Document review on CS 1	E1(M) National Manager	E4(SI) Industry Stakeholder
CS 2 - Carvoeiro/Vouga Integrated water supply system (salt intrusion & illegal wastewater discharges)	Interview with CS 2 manager (or Interview 1)	Document review on CS 2	E1(M) National Manager E2(M) Coast & Dams Manager	E4(SI) Industry Stakeholder E5(NSA) Stakeholder (National Agriculture.)
CS 3 - Cascais-Guia Wastewater collection along the coast and wastewater treatment plant (for good quality of sea bathing water)	Interview with CS 3 manager (or Interview 2)	Document review on CS 3	E1(M) National Manager E2(M) Coast & Dams Manager E3(M) Local Manager (BDA X)	E4(SI) Industry Stakeholder E5(NSA) Stakeholder (National Agriculture.)
CS 4 - West Region Wastewater treatment plant for a great amount of pig rearing installations	Interview with CS 4 manager (or Interview 2)	Document review on CS 4	E1(M) National Manager E3(M) Local Manager (BDA X)	E4(SI) Industry Stakeholder E5(NSA) Stakeholder (National Agriculture)

Fig.4-2 Case study analysis

As expressed in *Fig. 4.2*, the documents for each case study were reviewed and case study interview was carried out with a senior case study manager. As explained in section 3.5.2.1 and in *Table 3.6*, to reinforce the case study interviews, five expert interviews were also conducted, with three other case studies stakeholders and with two national representatives for general stakeholders.

Two of the expert interviewees who were other case study stakeholders, were managers at a national level and another one was a local manager (all of them being senior staff from water authorities). In addition stakeholders from the agricultural and industrial economic sectors (named “general stakeholders”) were also interviewed.

For each case study, in accordance with their features, the contribution from one, two or the three other case study stakeholders and also one or both general stakeholders was considered.

The expert interviews’ planning was presented in chapter 3, *fig 3.4* and *Tables 3-6 and 3-7*. *Fig.4-3* presents the expert interviews which were performed and validated by the interviewees.

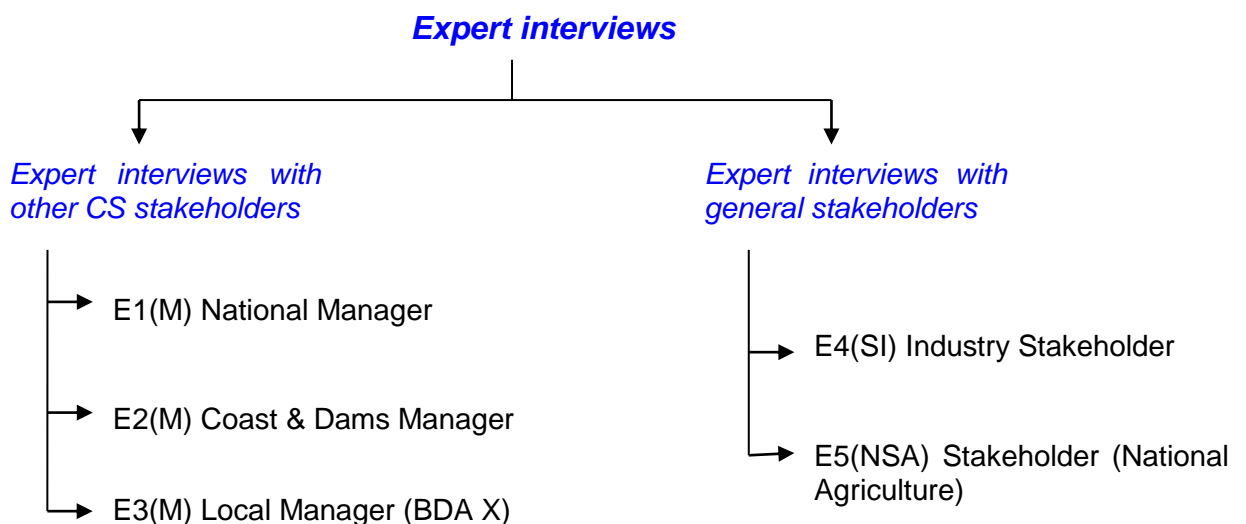


Fig. 4-3 Expert interviews

The interviews had the purpose of seeking more in depth information on case studies and on participation characteristics. The case study related interviews that were undertaken (interview 1 and interview 2) overlap, to a certain extent, because the interviewees had connections with more than one case study in river basin areas. For instance, Interview 1 catered to case studies 1 and 2, while Interview 2 catered case studies 3 and 4.

The interviewees were high ranking staff connected to the case studies. Other, possible, case study interviewees were not considered since they would not add value to the information provided by the designated interviewees. This set the rationale for inviting five additional expert interviewees to bring their point of view and to complement the case study interviews.

The scope of this thesis is water resources demands at local river basin level considering stakeholders' participation in RBM. In terms of stakeholders' participation it would involve use of water, wastewater discharge and pollution control. As will be explained later in this chapter, the National Water Plan reported on the lack of participation within river basins in Portugal, thus supporting the rationale for this research.

Fig 4-4 presents the structure of this chapter after documents review, defining the path which will be followed in data analysis and discussion about the definition of the final framework.

The first step was the analysis of national strategic plans on RBM and applicable legislation because they bring issues from national guidelines on RBM into the case studies.

Following this, for each case study all available documentation was analysed along with the main interviews undertaken relating to each case study. The coding, analysis (by content analysis) and the rich pictures produced by Soft Systems Methodology application for each main case study interview will be examined and a summary of each case study will be presented.

Based on the outcomes from the case study documents and on the outcome from the main case study interviews, cross case analysis will be performed followed by a discussion of those outcomes and the definition of the contribution to the main question of the study.

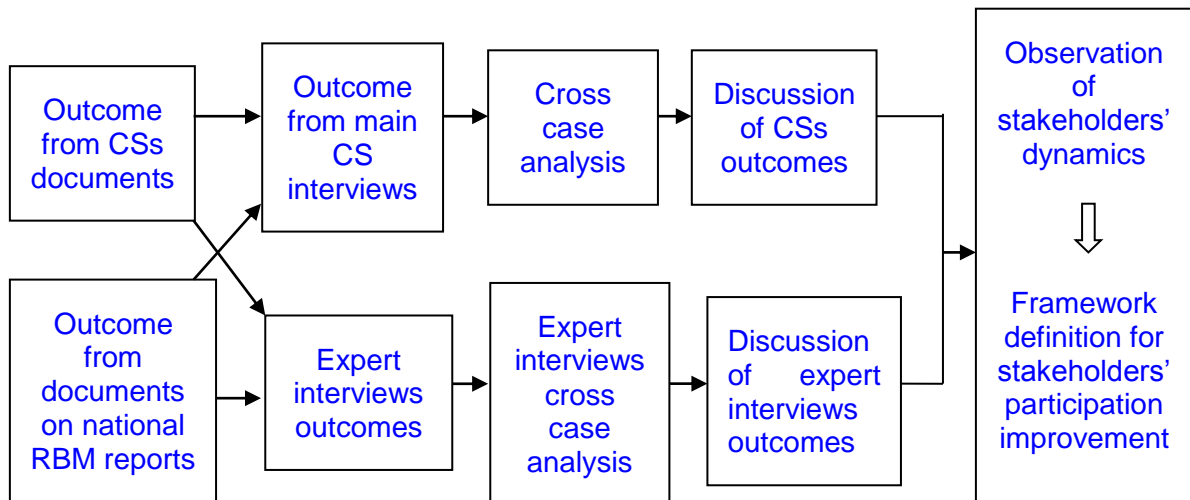


Fig. 4-4 Links between data sources and their outcomes, and the path towards the final framework

Following the sections relating to the four case studies, the expert interviews, along with other case study stakeholders and with general stakeholders will be coded and analysed (using the same techniques as for the case studies interviews) to complement the main case studies' interviews information. Soft Systems Methodology applied to each expert interview will be examined. Based on the expert interviews outcomes, cross case interviews analysis will be performed followed by a discussion of the outcomes and the definition of the contribution to main question of the study.

Finally, the observation of stakeholders' dynamics will be presented. Based on the previous cross case analysis (for case studies and complementary interviews), the final conceptual model will be developed at the end of this chapter, answering the objectives of this research. Final findings and proposals will be presented in chapter 5.

The following paragraphs present the data from national RBM official documents because national guidelines bring their issues into case studies. It also includes data on relevant economic sector activities which are usually present in each river basin.

The documents analysed were determined by their relevance to the case study information. Therefore, they provided valuable contextual information on case study characteristics and participatory meetings that had taken place between local authorities and stakeholders including references to the level of collaboration between them.

National RBM reports, the remit of which went beyond the case study boundaries, were also analysed because they present various guidelines on RBM issues and economic policies that influence RBM, though they influence the case studies.

Official documents regarding national strategies for the implementation of the Water Framework Directive, the definition of agricultural best practice and also EU BREFs (Best Reference Documents) for the several economic sectors were also considered. Official reports on past participatory meetings in the context of RBM in the Basin District Administrations (BDAs) of the identified case studies were also analysed.

The documents analysed provided relevant information on economic sectors characteristics (agriculture and industry) and references to the level of collaboration between their representative associations and State Officers.

All those official documents provided data to support case studies features, as indicated in *Fig. 3.3 (chapter 3)*. The documents were also important for the researcher's preparation for interviews.

National Water Plan

The National Water Plan is a document which defines river basin management strategies for the whole country, using a global perspective. It establishes national policies for water management, their principles and guidelines. One could conclude that the plan benefits from the participation of all groups of stakeholders. It is the basis for the River Basin Management Plans and other water management plans (*available online in Portuguese Environmental Agency, "APA, I.P.", www.apambiente.pt*) and the guidelines influence the solutions considered at basin level, through the case studies which were identified in this research.

The first National Water Plan (*PNA 2000*) was published in 2002. It has been under revision prior to the future publication of an updated and upgraded version.

It is said of *PNA 2000* (volume II, section 2.7 of PNA) that until 2002 there was no data available on participation and citizens' commitment. It identifies the main problems of participation and their cause which are presented in *Table 4-1*.

Although the National Water Plan from 2000 states that until 2002 (the date of revision and publication) there was no data available on participation and citizens' commitment, it clearly identified the main problems and causes for the stakeholders poor participation.

Table 4-1 Main problems on lack of participation and the main causes, as covered in the National Water Plan PNA 2000 (*adapted from PNA 2000*)

Main problems	Main causes
Little participation in public events and inefficient results	<p>Generally, participation is made after decisions with a unique hypothesis not during early phases of the decision process;</p> <p>There is inefficient promotion of participation;</p> <p>There are difficulties for open and informed discussion of issues due to their technical complexity and conflict of interests;</p> <p>The experience of democratic participation is recent and not consolidated enough for the majority of the population and state offices.</p>
Lack of knowledge of the participation system	<p>There are little data on objectives or systemic analysis relating to participation and its efficacy;</p> <p>There is a lack of indicators on the level of participation and process efficacy (this does not allow for a comparison between the preferences of citizens and the degree of participatory influence on final decisions);</p> <p>There are no studies or integrated analysis of political science or how real participation systems work;</p> <p>There is little environmental culture.</p>
Difficulties for people to access information on the environment and especially on water issues	<p>The format and support of information is not adequate for disclosure;</p> <p>There are few channels for public assessment of information availability;</p> <p>There is reluctance by offices and people who have the information to share it on tax free basis.</p>

Table 4-1 Main problems on lack of participation and the main causes, as covered in the National Water Plan PNA 2000 (*cont.*)

Main problems	Main causes
<p>Poor awareness, interest, curiosity, comprehension, critical ability or discussions on water integrated issues</p>	<p>There is a “separation” between specific technical circuits and society;</p> <p>There is a lack of “bridges” between the perspectives of the “techno-scientific world” and communities, especially in rural area, towards water issues;</p> <p>There is a deficit of environmental culture for the majority of population.</p>
<p>Deficit of water quality monitoring and on basins data</p>	<p>The number and localisation of monitoring gauges has been insufficient;</p> <p>There is a recent availability of that data to the public.</p>
<p>Insufficient information for legislation application</p>	<p>Monitoring systems and controls do not allow the verification of legislation in respect of water use licences nor the identification of unauthorised users;</p> <p>There are problems with the system of water use licences;</p> <p>There is an insufficiency of water use controls;</p> <p>There is insufficient national information on socio-economic activities that use water and their location.</p>
<p>Inadequate information flows</p>	<p>Many entities have data containing relevant knowledge on water issues but no systems to share them;</p> <p>There is inadequate data collection, without validation routines, problems with their collection, inadequate archive systems or errors in the indicator composition;</p> <p>There are few rules for indicators and glossaries;</p> <p>Data access is difficult due to the format and archive organisation;</p> <p>There is a deficit of routines for continuous actualisation.</p>
<p>Deficit of systemic knowledge about water</p>	<p>The system is extremely complex, with many parameters which have temporal and special variations, close interrelations, dynamic evolution due to human behaviour and water characteristics as a resource which is mobile and can be reused;</p> <p>There are inefficient relationships between different institutions;</p> <p>There is a deficit of communication with different types of language and nucleons of “close professional cultures”;</p> <p>Investigations and politics and their financing are separated from the objectives and there is a need for planning and management of hydraulic resources.</p>

For the review of the National Plan, consultation events were held relating to stakeholders’ participation. There were two different types of consultation; one was related to the *Relevant Issues of Water Management* (“QSIGA” in

Portuguese) for each Basin District and the other consisted of economic sector interviews for the identification of relevant concerns and problems of water management for the economic sectors (agriculture, industry, etc.).

The next paragraphs will explain these two different types of participation.

For the consultation related to the *Relevant Issues of Water Management* (“QSIGA”) for each Basin District a number of participation sessions were held which were open to all stakeholders and citizens. The National Water Institute (INAG) defined an initial list of relevant issues. The purpose of the sessions was to identify the most relevant issues for each basin district. INAG published an official report on the results from those sessions. *Table 4-2* reports the data of that report, presenting the final results for each basin district session.

Table 4-2 is based on the final official report which was merged with the partial reports made by each Basin District Administration. The table shows that information provided by some of the BDAs was more complete, presenting the number of organisations invited, the number of attendant organisations and the number of attendees, whilst other BDAs only provided the number of attendees.

The fact that data provided by BDAs did not supply the same detail for each district shows that there was no previously defined basis for individual data collection. This appears to allow the conclusion that no concern was paid to the need to provide detailed information and uniformity of data on several individual reports.

For the BDAs that provided detailed information the reduced number of attendees compared with the number of invited organisations showed a poor level of participation. This reinforces the purpose of this research, to provide a framework to enhance public participation.

At the end of each participatory meeting attendants were invited to answer a short written enquiry to evaluate the meeting and to point out relevant issues for water management in their Basin District or River Basin. The right column of *Table 4-2* shows the low number of written answers provided by the attendees. However, reports point to the issues to be upgraded as a result of oral discussion by the attendees. These issues are expressed in *Table 4-3* BDAs

related to the case studies considered in this research (identified in chapter 4) are the BDA North, the BDA Centre and the BDA Tagus valley.

Table 4-2 Data on participation meetings for “QSIGA” (Relevant Issues on Water Management for each Basin District) (Held in 2009)

Source: INAG 2009, Report “Relatorio_Resultados_PP_QSiGA_30_Junho_2009.pdf”, INAG website (preliminary report on the Relevant Issues on Water Management for each Basin District)

Basin District (BD) / Basin District Administration	Public Sessions (city)	Organizations invited	Organizations attending	Attendants	% of answers to the final written
BD1 – Minho and Lima Rivers BDA North	Tui (Spain)	--		≈ 40	--
	Ponte de Lima (Portugal)	--		67	--
BD2 – Cávado, Ave and Leça Rivers BDA North	Santo Tirso	--	--	46	42% on meeting evaluation
BD3 – Douro River BDA North	Régua (Portugal)	--	--	45	58% on meeting evaluation
	Valladolid (Spain)	--	--	86	
BD5 – Tagus river BDA Tagus Valley	Alcântara	--	--	56	--
	C Branco	--	--	76	
	Portalegre	--	--	86	
	Santarém	--	--	67	
BD6 – Sado & Mira rivers BDA Alentejo	Lousal	--	--	25	21 answers on meeting evaluation
BD7 – Guadiana river BDA Alentejo	Évora (Portugal)	-- (*)		96	50 answers on meeting evaluation for Évora meeting
	Mérida (Spain)	-- (*)		66	
BD8 – Algarve little rivers BDA Algarve	Faro (Forum)	500 (80)	-- --	102 (28)	--

(*) *These meetings were sponsored by Portugal and Spain*

Table 4-3 Participatory process on “QSIGA” sponsored by Basin District Administrations (BDAs) – Aspects to upgrade as pointed during the public participation meetings (From INAG 2009, Report on QSIGA)

(Source: Report “Relatorio_Resultados_PP_QSiGA_30_Junho_2009.pdf”, INAG National Water Institute and BDAs, June 2009, INAG website.)

Basin District Administration	Aspects for future upgrading
BDA North	<p>Efficiency in announcing meetings; Internal organisation and support for meeting preparation; Impact on press media; Model of meetings should be diversified; Upgrade of written questions for meeting evaluation is needed; It would be desirable to have early disclosure of meeting results; Need to diversify tools for participation; Solve the lack of continuity on participation from stakeholders and water users.</p>
BDA Centre	<p>Communication between stakeholders and managers should be supported by specialised technicians; Disclosure tools should be different according to the type of stakeholders Language should be simple and adapted to the public expected to attend. Some meetings should be scheduled for the period after work; Information should be available a long time before meetings, updated and available online.</p>
BDA Tagus valley	<p>Information to support meetings should be divulged a long time before meetings; Communication among State offices and the public should be upgraded; Stakeholders’ identification should be upgraded; Some thematic meetings on more specific issues should be promoted.</p>
BDA Alentejo	<p>Impact on press media should be enhanced; Meetings model should be enlarged to permit meetings for different sectors of water users; Conclusions from meetings should be available within a short period of time; There is a need to seek several different tools to facilitate participation; Participation and consultation should be in simple and clear language, adapted for expected attendees; Citizens should be involved in hydraulic resources protection.</p>
BDA Algarve	<p>In order to increase citizens commitment and engagement written contributions should be encouraged, municipalities should be more involved in making documents available for public consultation and receiving written contributions (instead of being received by the central State Office); The BDA Algarve expressed their intention to promote this idea in future consultations.</p>

From the issues outlined for future upgrading a pattern emerged for the need for better and diversified tools and techniques for stakeholders' commitment and engagement in participation. It also points to the need for providing clear and easily understood support documentation long before meetings take place providing enough time for their comprehension and criticism. The knowledge of these findings was used by the researcher to obtain deeper information and opinions from the interviewees.

Additionally, a written enquiry regarding QSIGA was sent to 725 entities spread across the whole country. The INAG report on QSIGA states that only 45 replies were received representing 6.2%, mainly from State Departments and agriculture associations. The industry sector displayed weak participation in the exercise. The official report on this enquiry states that some questions were either not understood or had no answers. This illustrated the need for using clear and easily understood language in these enquiries.

The other type of consultation had the purpose of identifying the relevant concerns and problems of water management for the economic sectors (agriculture, industry, etc.). Therefore, a number of economic sector audits were made by INAG, the National Water Institute (*INAG, 2010, reported in INAG website*).

The meeting timetable and each target group (January 2010) were published in documentation available from the National Water Institute (INAG) but it does not provide detailed information about the issues that were discussed. For those interviews, all relevant associations and private offices from each economic sector, the State Offices and State Regulatory Boards related with those sectors and the Municipalities Association are said to have been consulted. However, it is not clear if they were only invited to participate in the interviews or if they actually attended. One of the interviewees who was the representative for his association and who was responsible for attending the interviews did not remember being present at his sector's meeting.

The sectors which had separate consultations are listed below:

Urban (water supply and wastewater collection and treatment);

Industry;

Agriculture, forestry and fishing;
Energy;
Tourism;
NGOs (national non-governmental organisations)

For the economic sectors, who are stakeholders in RBM, the purpose of the consultations was to understand the behaviour of stakeholders and the level of trust relationship between them and the river basin managers and also among the several stakeholders associations.

The consultation meetings were not conducted simultaneously with all groups of stakeholders because each sector under consideration had specific issues and concerns. This fact was also explored during stakeholders' interviews to try to capture their opinions.

Basin District Management Plans (BDMP)

Basin District Management Plans ("PGRHs" in Portuguese) were prepared based on previous Basin Plans published for each main river in Portugal.

The first participatory meeting to consider the Basin District Management Plans (PGRHs in Portuguese) was held to discuss the timetable and work programme for their production. The characteristics of this participatory meeting and attendees' criticisms of it are expressed in *Table 4-4*.

The evaluation report on the PGRHs timetable presentation session ("Relatorio_PGRH_201207(1).pdf") was available on the National Water Institute website (www.inag.pt) at the time of the consultation.

Documents on national strategies for agriculture sector

"ENEAPAI (QREN 2007/2013)", the National Strategy for Agriculture Sector Effluents (agro industry, animal rearing and effluents handling) provides data on the economic sector for agriculture and determines integrated solutions for wastewater treatment. The data provided by various State Offices about the agriculture sector revealed some inconsistency and no compatibility.

Table 4-4 Participatory meeting on Basin District Management Plans production timetable

(Source: Report (Relatorio_PGRH_201207(1).pdf, 2007, available in www.inag.pt)

Information availability	INAG website (for 6 months before the meeting), emails and letters, leaflets, articles in national newspapers, enquiries to public sessions participants
Public sessions promoters	National Water Institute (INAG), Portuguese Hydraulic Resources Association (APRH), Basin Councils (CBHs)
Invited entities	Regional Coordination Commissions (CCDRs), other State Offices related to issues, National Water Council (CNA), Basin Councils (CBHs), Sector stakeholders' organisations, NGOs.
Agenda	Presentation of the process of elaboration of PGRHs; Discussion and explanations; Conclusions
Scale	Regional (meetings in four towns across the country)
Invited offices/entities	241 entities, namely the consultants from Basin Councils and Regional Coordination Commissions (CCDRs). About 1000 emails sent.
Public sessions participants	283 at a national level equivalent to 147 entities and 30 municipalities (from a total of 279), all Regional Coordination Commissions (25), industry sector and agriculture sector associations, NGOs and Universities. (60% of participants were from State Offices).
Written enquiry (end of meeting)	<ul style="list-style-type: none"> • Was the presentation session useful? • Was the session clear on the process of BDMPs (PGRHs in Portuguese) elaboration? • Was there a positive outcome from the meeting? • Was the information provided?
Criticism expressed in the written enquiry	<p><i>Publicity of meeting</i></p> <ul style="list-style-type: none"> • Promote a better disclosure of information • Promote the sessions disclosures • Promote disclosure by the media and universities • Meeting characteristics • Reduced time for discussion, which did not allow public participation; • Session inappropriate for people involved; • Clarifying session, although poor participation • Initial oral presentations too long and with excessive information; • Some suggestions: need to define specific objectives of the session and prevent public participation from being a simple administrative procedure due to being established by the WFD.

Furthermore, only a small percentage of licensed facilities had environmental data. Table 4-5 presents the data for some agro industry sectors to illustrate this point.

As can be seen in *Table 4-5*, some sectors have only a small percentage of installations holding environmental data when compared with the number of licensed installations. This leads to the need for better collaboration between State Offices and agricultural stakeholders.

In the case of the olive oil production sector, the report states that information from the two columns is not comparable. In fact, data provided shows that the number of installations with environmental data is higher than the number of licensed installations. Information for the central region and the Alentejo region shows a huge difference in those two columns. This shows that State Offices need to define a universal system for data treatment. These problems were pursued with State managers during the interviews.

Table 4-5 Diagnosis for some agro industry sectors – Number of licensed installations and number of installations with known environmental data (ED)

(Source: ENEAPAI 2007-2013)

Information source: (*) Ministry of Agriculture; (**) Regional Coordination Commissions; (***) Regional Coordination Commissions and National Water Institute (INAG)

Region	Agro industry sectors							
	Cattle rearing		Pig rearing		Olive oil		Wine production	
	Number of licensed facilities (*)	Nr of facilities with ED (**)	Number of licensed facilities (*)	Nr of facilities with ED (**)	Number of licensed facilities (*)	Nr of facilities with ED (**)	Number of licensed facilities (*)	Nr of facilities with ED (**)
North	3345	62	473	53	134	149	153	39
Centre	2424	543	4753	512	294	755	66	13
Lisbon & Tagus Valley	320	94	3921	--	91	88	193	13
Alentejo	234	142	1410	260	72	235	61	13
Algarve	34	0	273	--	6	26	2	1
<i>Total</i>	6357	841	10830	825	597	1253	475	79

In order to prepare for the interviews with representatives from agricultural stakeholders, official documents relating to agricultural good practice were analysed and they are listed below:

PEN 2007/2013, National Strategic Plan for Rural Development, with EU guidelines on rural development;

PRODER, New Agriculture and Environmental Measures, for new methods of agriculture such as integrated production and biological agriculture, biodiversity protection and integrated territorial interventions;

RURIS, Rural Development Plan for Continental Portugal, encouraging several simultaneous land uses for economic viability and increase in potential land uses;

AGRO, Operational Agriculture and Rural Development, supporting National Irrigation Plan for providing Farmers Associations with technical information;

Code of Good Agricultural Practices;

Basic Manual of Agricultural Practices.

Documents pertaining to national strategies for water supply and wastewater treatment

The documents analysed were:

PNUEA, National Program for the Efficient Use of Water which defines national guidelines and measures to be implemented in agriculture and industry; strategic objectives are also defined, such as, raising national consciousness to the importance of water sustainable uses;

PEAASAR 2000/2006 and *PEAASAR 2007/2013*, Strategic Plan for Water Supply and Wastewater Treatment defining the guidelines on the efficient use of water by the national policy for RBM integrated solutions. It also defines the possibility of creating new multi municipal systems, based on the association of several municipalities inside the same basin for water supply or wastewater systems management. Case studies 1 (Ave valley) and 2 (Carvoeiro/Vouga) are examples of that type of joint management by several municipalities.

Industry sector regulations

The researcher analysed the *UE BREFs*, *Best Reference Documents* which are applicable to each economic activity sector, namely agriculture, animal rearing,

industries, etc. They define the best available techniques for each sector of industry. They also present data on each sector for EU State members. For the Portuguese sectors it highlights weak or missing data for some sectors installations. However, increasing collaboration between stakeholders and State Offices to solve these gaps is important. For good water governance it is crucial to have the most extensive knowledge about drivers for river basin management as was expressed in chapter 2.

Legislation

EU Directives related to RBM and participation were analysed due to their application being compulsory for EU member States:

Water Framework Directive (WFD);

IPPC Directive (Integrated Pollution Prevention and Control)

Directives on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters;

National legislation was also analysed, namely Law 58/2005 which reorganised the WFD in Portugal.

4.2. Case study discussion

Section 4.1 pointed out that the National Water Plan reported on the main problems and causes for the lack of stakeholder and citizen participation within river basins in Portugal.

Four case studies were identified in Portugal, as presented in section 3.5.1.2 and *Table 3-5*. *Fig. 4.5* shows the location of the four case studies in Portugal, where BDAs means the Basin District Administrations.

4.2.1. Case Study 1 (River Ave basin – Ave valley pollution removal system)

This case study conforms to the case study criteria discussed in chapter 3, section 3.5.1.1 (river basin context, with pollution removal, water resources management and participation).

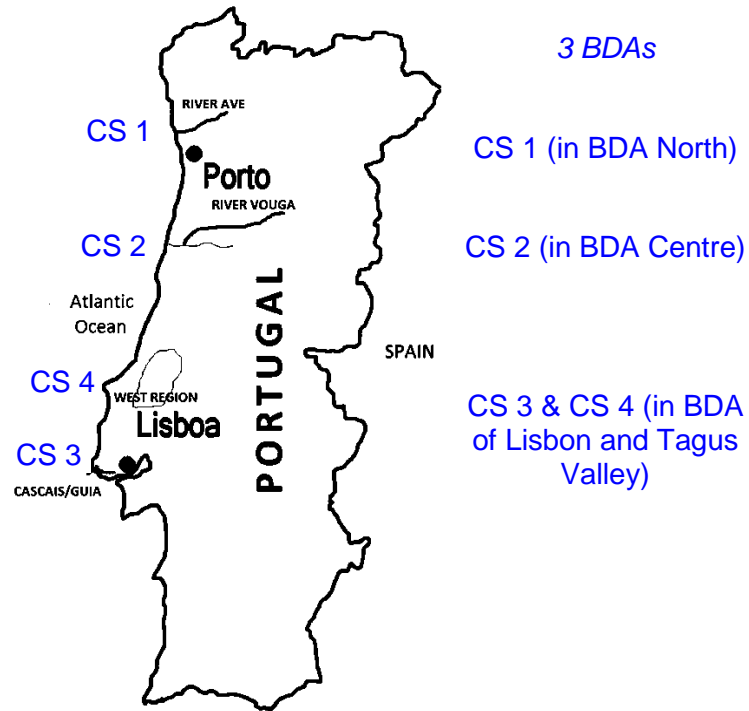


Fig. 4-5 Location of Portuguese case studies identified for this research

However, the special emphasis that is the key to Case Study 1 is the River Ave valley pollution removal system. Pollution of the River Ave was mainly due to the large concentration of industrial installations along the middle part of the river. The majority of the industries were textile producers. This provided the ideal context to study stakeholder engagement within the river basin of River Ave.

The key stakeholders within this case study are:

- Industries;
- Municipalities;
- State Offices related with water management;
- Citizens living in the basin.

The next sections present the document review for Case Study 1, the Case Study Interview coding and analysis, a summarised table produced using NVivo 10, the “rich picture” and a summary of case study findings.

4.2.1.1. Document review for Case study 1

The document review for Case Study 1 is summarised in *Table 4-6* which is an extension of *Table 3-5* presented in chapter 3.

Pollution in the River Ave has been a problem since the 1970s, as stated in published reports (*CCRN 1977; MAPRH 1983; LNEC 1986; CCRN 1987; CCRN 1988 and LNEC 1988*).

The main issues which were identified from the reports are summarised in the table below.

Table 4-6 Document review for Case Study 1 (pollution removal system for River Ave basin)

Case Study (CS)	Scope of CS	Documents analysed	Main issues identified
Case Study 1 River Ave Basin (north region)	Pollution removal system of River Ave Basin (pollution due to large concentrations of textile industry installations along the middle part of river)	<p>Reports on pollution problems in the river dating from the late 1970s (<i>CCRN 1977; MAPRH 1983; Santos 1984; LNEC 1986; CCRN 1987; LNEC 1988</i>);</p> <p>River Ave studies on pollution diagnosis and remediation solutions discussion (<i>AMBIO 1988, AMBIO 1989, AMBIO 1993</i>);</p> <p>Website for Case Study, www.tratave.pt (information on system characteristics and connection of Case Study Management Body with municipalities served by the System)</p>	<p>Weak and unfeasible responses to the first written enquiries for data collection on industrial wastewater;</p> <p>Lack of uniformity in the several enquiry questionnaires;</p> <p>Lack of data on collaboration between the CS Managing Body and the State Offices (with the Basin District Administration (BDA North) and with the National Water Institute);</p> <p>Lack of data on recent participation of local stakeholders' representative associations;</p> <p>Some questions about the participation of municipalities in the Management Body of this case study.</p>

The researcher analysed documents available relating to this case study including the first reports of river pollution problems published in the late 1970s (*Table 5-1*). Pollution in the River Ave was mainly due to a huge concentration of textile industries. The lack of Portuguese rules and controls for wastewater discharges in the 1970s led to the pollution of the river.

The solution for River Ave pollution remediation was based on reports of pollution problems in the river in the late 1970s (*CCRN 1977*) and during the 1980s (*MAPRH 1983, LNEC 1984, LNEC 1986, CCRN 1987, CCRN 1988*). The reviewed documents were important because they provided data on several consultations with stakeholders in the basin and they also discussed the poor level of stakeholder engagement.

Some of the consultations held between 1981 and 1987 were conducted to obtain data about the River Ave pollution characterisation. The first consultations were conducted by private offices.

An enquiry in 1983 (referenced in *Santos 1984*), was held by the National Laboratory of Civil Engineering (LNEC), the purpose of which was to obtain data on industrial water consumption and characteristics of wastewater discharges.

Santos, 1984 provides data on the consultations held with local stakeholders in November 1983. As official data on industrial water use and effluents produced was scarce, face to face enquiries were made at that time. The consultations took place with a number of the industries within the basin, including large and small installations which were known for producing significant pollution discharges into the river. A letter was sent, in advance, explaining the purpose of the face to face enquiry. *Santos (1984)* states that information provided by industries was often incomplete, though the number of consultations seems to have been scarce. Following this enquiry, and in spite of there being approximately 1500 existing industries in the basin, only 200 additional questionnaires were sent by mail with a letter explaining the objectives of the consultation.

Table 4-7 presents the activity of the existing industries in the basin, their number (in 1983) and the number of face to face enquiries that took place with the industries.

Table 4-7 Industries in the River Ave basin (in 1983) and number of enquiries that took place with the industries

Activity	Number of installations (in 1983)	Number of enquired installations
Textile industry	566	45
Drinks industry	275	22
Food industry	81	9
Machinery and equipment	91	7
Metallurgy	84	7
Concrete	41	3
Chemical	22	2
Transformation industry	14	1
Rubber	7	1
Leather	6	1
Paper	6	1
Sum of all transforming industry	1193	99
Car repairing	255	11
<i>Total</i>	<i>1448</i>	<i>110</i>

As stated in Santos (1984), answers to enquiries sent by mail showed a lack of rigour or missing data for some questions (only 16 were correctly answered). The enquiry itself seemed to be well constructed since it asked for important information related to the subject. From my analysis of the content of that letter some gaps were evident illustrating the poor cooperation from industrialists, as shown below:

- Stakeholders involved (industrialists involved in the enquiry) were not aware of the consultation purposes;
- In the letter there was a lack of emphasis on the importance of industrialists' cooperation;
- There was no explanation on the criteria for choosing which industries would be consulted;
- There were no references to the reason for their selection in the letter;
- There was no reference to the importance of having correct data;
- No reference to future EU integration and required compliance with EU Directives was provided;
- The importance of determining water needs for each industry sector was not referenced.

Conversely, the enquiry answers could be poor due to being representative of the large number of different industries spread along the basin. From the literature and as stated by Santos (1984), different installations of the same type of industry can show a wide range of variability and unpredictability on the characteristics of the wastewater produced due to the procedures and possible reuse of partially treated wastewater along the chain.

For the pollution remediation, three studies were conducted (*AMBIO 1988*, *AMBIO 1989*, *AMBIO 1993*). As stated in *AMBIO 1988*, a consultation held by a private company in 1983 was directed at 99 industries (from 1193 industries involved in the pollution problems), 45 being textile industries (from a total of 566 in this sector). It was said that those industries were the ones which contributed more towards the pollution produced. However, there is no available information to corroborate this statement.

As stated in *AMBIO 1988*, the consultations held by a private company in 1987 were directed at 20 industries (the first consultation) and 7 industries (the latest consultation).

From the analysis of those studies, I found that the consultations were carried out with a restricted number of industries to obtain data on the type of wastewater produced. They were chosen based on previously published official reports as being the industry's most responsible for the river pollution.

The Pollution Removal System of the River Ave basin started to work in 1998. A number of industrialists connected their installations to the system, however, for others, a great deal of effort was required to convince them of the advantages of being connected to the system.

Nowadays, industrial installations in the area of the Pollution Removal System are connected to it. To obtain a license to work they need to provide environmental data on manufacturing procedures to the State Offices before being connected to the system or to have their own treatment plant.

Data expressed in the website of the System Managing Body highlighted the situation in 1997 and in 2000. Some changes are evident as positive aspects but some constraints still remained unsolved in 2000. This is expressed in *Table 4-8*.

These findings provided the rationale for conducting the Case Study Interview 1. The interview related to this case study had the purpose of determining the actual nature of stakeholders' participation to discover if there is an actual, relevant improvement on stakeholders' engagement for participation.

4.2.1.2. Interview 1 coding and analysis

Interview 1 catered to case studies 1 and 2 as the interviewee had connections to both case studies.

Fig. 4.6 presents the NVivo 10 coding for Interview 1.

From the NVivo 10 coding, a summarised table was created grouping the tree nodes and presenting the interview references. *Table 4-9* lists the nodes which were used in NVivo coding (right column) and the grouped nodes which were considered in the summarised table (left column). The summarised table was used as a basis for the design of "rich pictures", where each attribute was

represented in a different colour. A legend of the colours is provided on each “rich picture”.

Table 4-8 Positive and negative features of the River Ave pollution situation in 1997 and 2000 (source: CCRN 1977, MAPRH 1983, LNEC 1984, LNEC 1986, CCRN 1987, CCRN 1988, AMBIO 1988, AMBIO 1989, AMBIO 1993)

Year	Negative features	Positive features
1997	<p>Non-existence of an integrated management system for the basin;</p> <p>Some cases of river pollution, in the High Ave, not included in the Pollution Removal System (“SIDVA”) extension;</p> <p>No integration of water supply system in SIDVA;</p> <p>Some pollution problems due to industry wastewater discharges not connected to the interceptors or in areas without interceptors;</p> <p>Problems of hydrological data collection due to un-linked data collection done by several entities. This did not allow good data collection to support decision-making policies;</p> <p>Some remaining restrictions to aquatic sports and leisure on the river.</p>	<p>Regulations on industrial wastewater discharges in an attempt to avoid serious pollution problems;</p> <p>Water quality and treated wastewater discharges regulations (Portuguese Decree-Law 74/90);</p> <p>Decrease of pollution problem situations;</p> <p>Fewer problems with hydrological data collection;</p> <p>Fewer restrictions on aquatic sports and leisure;</p> <p>Presence of aquatic life.</p>
2000	<p>Some pollution situations endangering water supply sources;</p> <p>Hydrological data collection problems not defined by required data;</p> <p>For SIDVA, there was no external control on studies for the extension of the system, on the timing or on definition of a solution for the whole basin.</p>	<p>Major amount of industry installations were connected to SIDVA;</p> <p>Extension of SIDVA interceptors;</p> <p>Design for the enlargement of wastewater treatment plants.</p>

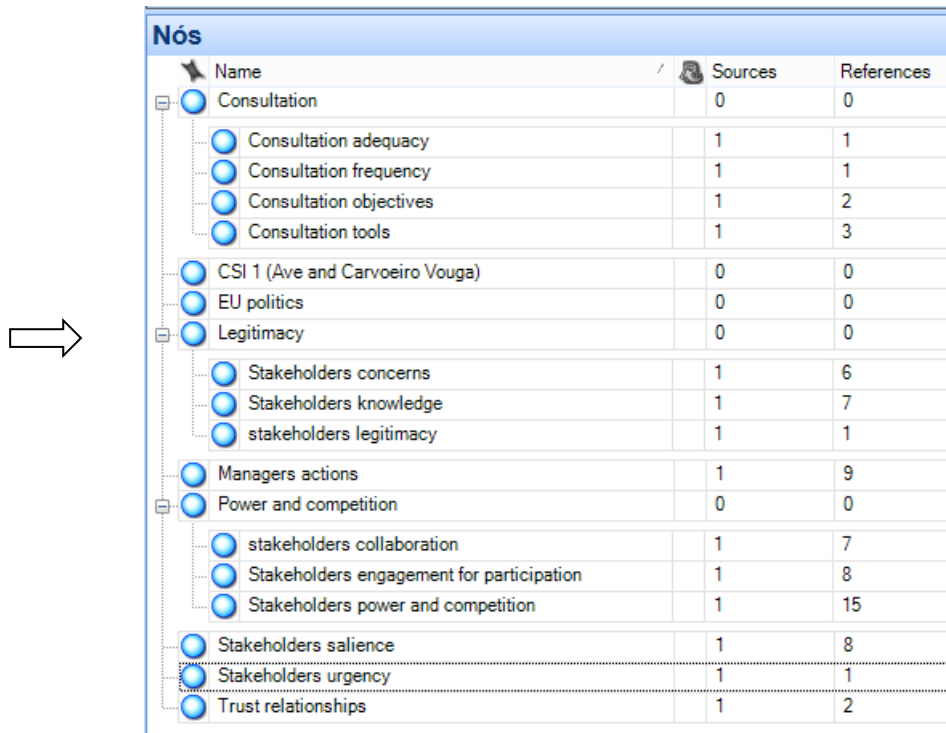


Fig. 4-6 NVivo 10 coding for Case Study Interview 1

Table 4-9 Attributes considered in NVivo coding (nodes) and grouped attributes (to be used in the “rich pictures”)

Attributes to be considered in the summarised table (<i>colour to be used on “rich pictures”</i>)	List of attributes which were used in NVivo coding (NVivo nodes)
Consultation (<i>brown</i>)	Consultation adequacy Consultation frequency Consultation objectives Consultation tools
EU politics (<i>blue</i>)	EU politics
Legitimacy (<i>grey</i>)	Stakeholders’ concerns Stakeholders’ knowledge Stakeholders’ legitimacy
Managers’ actions (<i>green</i>)	Managers’ actions
Power and competition (<i>red</i>)	Stakeholders’ collaboration Stakeholders’ engagement for participation Stakeholders’ power and competition
Stakeholders’ salience (<i>black</i>)	Stakeholders’ salience
Urgency (<i>orange</i>)	Urgency
Trust relationships (<i>rose</i>)	Trust relationships

Table 4-10 presents the summarised table created from NVivo coding for Case Study Interview 1, with the considered nodes and interview references expressing the number of references for each node. The table is depicted below.

Table 4-10 NVivo coding outcome for Interview 1

Attribute	Description	Conflicts and gaps
<p>Consultation <i>(brown)</i></p>	<p>Adequate and high participation:</p> <ul style="list-style-type: none"> • in old Basin Councils (1994 and 1995) (1 time); • in Basin Plan definitions. (2 times). <p>Available documents and reports were shared by all basin Council members (3 times).</p>	<p>After the extinction of Basin Councils, active participation meetings involving the case study managers with BDA are scarce.(1 time)</p>
<p>EU politics <i>(blue)</i></p>	<p>(Not mentioned)</p>	<p>(Not mentioned)</p>
<p>Legitimacy <i>(grey)</i></p>	<p>For this interviewee all stakeholders concerns are legitimate (1 time);</p> <p>Stakeholders who are water users have a good knowledge of RBM issues (1 time);</p> <p>Information to citizens throughout the year, in local newspapers, on efficient water use, wastewater collection and treatment (1 time).</p> <p><u>Case Study 1 (River Ave):</u></p> <p>Reports and newsletters available on the website (www.tratave.pt) (1 time).</p> <p><u>Carvoeiro/Vouga case study:</u></p> <p>Common concerns for all stakeholders (river regularisation, pollution by wastewater discharges and seawater intrusion) (6 times).</p>	<p>Carvoeiro/Vouga and Ave System Management Offices are not represented in the actual Basin District Council (1 time);</p> <p>Lack of information to citizens on RBM issues, except during consultation for the Basin Plan (1 time);</p> <p>Carvoeiro/Vouga System has only activity reports on the website (www.aguasdovouga.com) (1 time).</p>

Table 4-10 NVivo coding outcome for Interview 1 (cont.)

<p>Managers actions (<i>green</i>)</p>	<p><u>Case Study 1 (River Ave):</u> Ave System's Managing Body publishes a monthly newsletter to provide information to stakeholders (1 time);</p> <p><u>Case study 2 (Carvoeiro/Vouga):</u> Municipalities in the area wanted to have a unique Management Body for water supply systems and wastewater collection and treatment (1 time).</p>	<p><u>Case Study 1 (River Ave):</u> The source of uncontrolled wastewater discharges into the river is identified, the State Offices are informed about it but they take no actions to solve it (3 times);</p> <p>Few meetings with the BDA to discuss required measures (1 time).</p> <p><u>Case study 2(Carvoeiro/Vouga):</u> No action for river pollution remediation (1 time);</p> <p>No feedback, from BDA, to data reports sent by the case study Managing Body nor any attempt to discuss required measures for river pollution remediation (2 times).</p>
<p>Power and competition (<i>red</i>)</p>	<p><u>Case Study 2 (Carvoeiro/Vouga):</u> Local stakeholder collaboration is very important because they can have opposing interests and identify specific local problems (5 times);</p> <p>Energy and water supply sectors were the most collaborative for the Basin Plan definition (1 time);</p> <p>In old Basin Council all groups of water consumers were represented, including municipalities (5 times);</p> <p>NGOs, water supply sector, agriculture (need for seawater intrusion problem solution), industry and energy were very participative (3 times);</p> <p>Energy sector provided the solution for other sector's problems (with a dam construction), there was no conflict but a common interest (river flows and pollution remediation)(3 times) ;</p> <p>Public water supply is the first priority during summer (1 time).</p>	<p>In the old Basin Council, all stakeholders groups were represented; however, measures defined in the Basin Plan were not applied (1 time);</p> <p>After Basin Council extinction, there were only a few meetings for the Basin Plan definition (2 times);</p> <p>Recently, a gap in action related to the objectives defined in the Basin Plan seems to be responsible for weak participation (1 time).</p> <p><u>Case Study 2 (Carvoeiro/Vouga):</u> Constraints on river water use during summer, due to pollution by animal rearing and water needs for small dams energy production (3 times);</p> <p>The objective of river pollution remediation was not fulfilled, probably due to lack of measures application and conflict solutions by the BDA (4 times);</p> <p>Some uncontrolled discharges may be due to the cost of legal discharges (1 time).</p>

Table 4-10 NVivo coding outcome for Interview 1 (cont.)

<p>Stakeholders salience (<i>black</i>)</p>	<p>For the interviewee, there was not a more salient stakeholder but water supply was considered to be a priority (4 times); With a new dam construction energy is foreseen to become an active group (1 time).</p>	<p>In past conflicts, NGOs, stakeholders' associations and citizens were the most collaborative (1 time). <u>Case Study 2 (Carvoeiro/Vouga):</u> Some past conflicts were identified, for:</p> <ul style="list-style-type: none"> • water supply during summer; • agriculture and industry (due to seawater intrusion into the river (2 times);
<p>Urgency (<i>orange</i>)</p>	<p>More urgent concerns were presented by the NGOs; agriculture and industry (due to seawater intrusion into the river) and the energy sector which has always some power concerns (1 time).</p>	
<p>Trust relationships (<i>rose</i>)</p>	<p>Good and transparent relationship between the Vouga System Management Body and the BDA but with identified gaps (as defined in right column).</p>	<p>Basin Plan objectives have not been applied, leading to lack of trust on defined measures implementation (1 time); The enhancement of participation should be pursued by BDAs, to recover the high participation of the old Basin Councils and fulfil the Basin Plans objectives (1 time).</p>

4.2.1.3. Rich picture for Case Study 1

This section presents the findings relating to Case Study 1.

As it can be seen in the “rich picture” in Fig. 4.7, the active participation meetings of this case study manager with the local BDA are scarce, following the extinction of the old Basin Councils. In fact they do not have representatives on the local Basin District Council and they are not actively engaged in participation with the BDA.

The interviewee also stated that the local BDA has a neutral position in conflicts solution. The sources of illegal wastewater discharges into the river are identified, the State Offices are informed about them but they do not take

actions to solve it. The possible explanation for these uncontrolled discharges was pointed out as being the cost of legal discharges to enable competition with other municipalities' stakeholders who do not have this cost. Furthermore, few meetings were said to have been held by the BDA to discuss required measures for pollution remediation and control.

The interviewee stated that relationships with the BDA were good. However, he has identified some gaps, such as, Basin Plan objectives have not been applied, which has led to a lack of trust about defined measures implementation. He stated that the enhancement of participation should be pursued by BDAs since the high participation during the time of Basin Councils became weak after their extinction. The reason for participation decrease was seen as probably due to the absence of motivation derived from the lack of implementation of Basin Plan objectives.

4.2.1.3. Summary of Case Study 1

The case study documents analysed show the gaps in stakeholders' engagement for participation in the past. As was shown in *Table 4-7*, only a few industries were part of the enquiry; the remaining installations were not considered, nor were they engaged in providing their data and being part of the process of pollution identification.

As explained in section 4.2.1.1, the purpose of the Case Study Interview 1 covering this case study was to find the actual level of commitment for participation, to complement the information derived from the available published reports.

Local stakeholders, who are water users, were said to have a good knowledge of RBM. However, this case study interview shows that the gaps in participation, which were experienced in the past for this particular case study, still exist. The interviewee emphasised that the BDA does not promote discussion of required measures implementation with the manager of the Pollution Removal System for River Ave. Additionally, the BDA has not promoted any actions to solve the existing, uncontrolled, wastewater discharges into the river, which were reported by the System Manager.

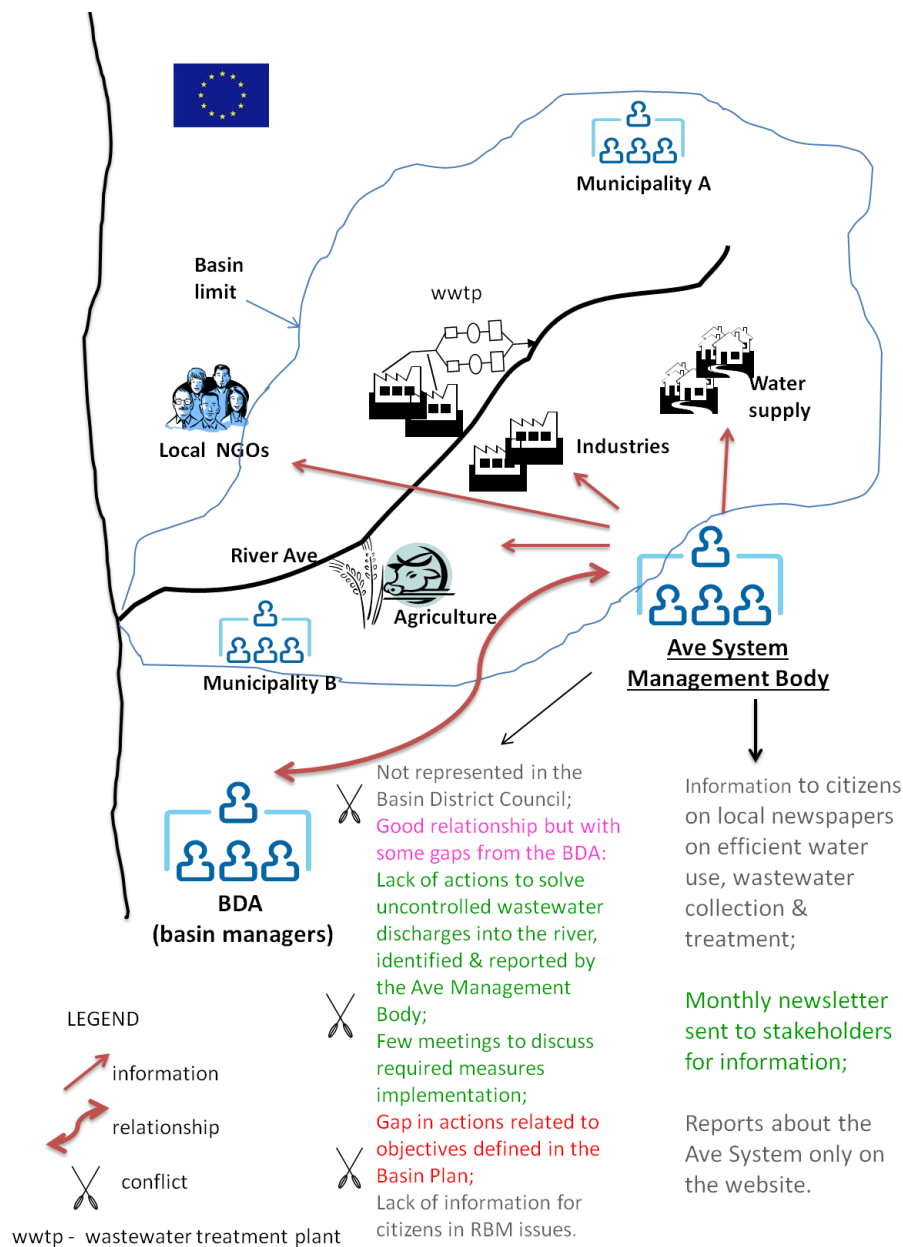


Fig. 4-7 Rich picture for Interview 1 (Case Study 1)

The fact that the WFD only say that participation should be encouraged may be the reason why participation is not more strongly pursued. However, effective participation in RBM issues for integrated water management at basin level would help to fulfil the application of WFD principles.

For the interviewee, there are no more salient stakeholders. Industrialists, municipalities, citizens and State Offices related to water management are seen as having the same importance. However, he stated that in past conflicts, NGOs, stakeholders' associations and citizens were the most collaborative groups within the Ave System Managing Body.

Furthermore, this interview led to the knowledge that the case study's Managing Body does not have the desired feedback on their reports from State Offices, such as the BDA, on gaps identification and hypotheses pointing out their solutions. There have been few meetings with the BDA to discuss the required measures that are to be applied. Therefore, it was asserted that this does not lead to a motivation for participation. This was said to be due to lack of fulfilment of past objectives. It was said that it was desirable to recover the high level of commitment and participation that occurred in the old Basin Councils with representatives from all groups of water users. As this interviewee said;

“Collaboration is important but conclusions and their implementation are even more important”.

The above statement shows that collaboration is important but is not enough to achieve good water governance. It is also necessary to implement the conclusions brought about by participation.

4.2.2. Case Study 2 (Carvoeiro / Vouga)

Case Study 2 is related to the Carvoeiro / Vouga Integrated Water Supply System.

This case study conforms to the case study criteria discussed in chapter 3, section 3.5.1.1 (river basin context, with pollution removal, water resources management and participation). However, the special emphasis that is the key to Case Study 2 is pollution of the River Vouga.

Pollution of river Vouga was due to uncontrolled wastewater discharges into the river and seawater intrusion into underground water during some periods in the year (due to reduced flows during summer and unsustainable extraction of

water for water supply). This has imposed some constraints on water use by agriculture, industry and even for human consumption.

The integrated water supply system is composed of water abstraction wells near the River Vouga, water pumping, treatment, transport and storage in reservoirs located in the vicinity of the eight municipalities served by them. It has a distance operation system which allows the control of the system's operation in real time from a control room close to the main reservoir.

The key stakeholders within this case study are:

- Industries;
- Energy;
- Agriculture;
- Water supply;
- Municipalities;
- Citizens;
- NGOs;
- System Managing Body.

The next sections present the document review for Case Study 2, the Case Study Interview coding and analysis, the summarised table produced using NVivo 10, the “rich picture” and summary of case study findings.

4.2.2.1. Document review for Case study 2

The document review for Case Study 2 is summarised in *Table 4-11* which is an extension of *Table 3-3* presented in chapter 3.

The main issues which were identified are summarised in the table below.

The documentation identified the nature of this case study to be an integrated water supply system for the area of Carvoeiro/Vouga. They also presented the Managing Body organisation (since 1995) and the guidelines for the system management and planning for an extension of the system to supply additional municipalities.

Annual Reports from 2010 to 2012 were analysed, providing information on the system's management during those years. However, there are no published

documents on any participatory meetings leading to the rationale for conducting an interview to seek participation information. In fact, the need to pursue an interview relating to case study 2 was based on the lack of recent published reports about the relationship between the case study's Management Body and State Offices and the level of engagement and participation of local stakeholders in problem solution. The website of the Managing Body contains no information about participation.

Table 4-11 Document review for Case Study 2 (Carvoeiro / Vouga Water Supply System)

Case Study (CS)	Scope of CS	Documents analysed	Main issues identified
<p>Case Study 2</p> <p>Carvoeiro / Vouga (integrated water supply system, near Aveiro, in central region)</p>	<p>Integrated water supply system for the area of Carvoeiro /Vouga</p>	<p>Documents on the procedures of the Managing Body of this case study system;</p> <p>Website of CS (www.tratave.com) (available information on system characteristics and connection of Carvoeiro/Vouga System Management Body with municipalities served by the system and Annual Reports from 2010, 2011 and 2012).</p>	<p>Lack of data on collaboration between the CS Managing Body and the State Offices (with the Basin District Administration in the area of this CS and with INAG, the National Water Institute);</p> <p>Lack of data on recent participation with local stakeholders' representative associations;</p> <p>Missing data about the participation of municipalities in the Management Body of this case study.</p>

4.2.2.2. Interview 1 (Case study 2) coding and analysis

The previous coding for Interview 1 also applies to case study 2. The interviewee has connections to both case studies 1 and 2.

Table 4-10, section 4.2.1.2, identified the answers about this case study provided by the interviewee.

4.2.2.3. Rich pictures for Case study 2

Interview 1 catered also to Case Study 2 (Carvoeiro/Vouga System) and provided some findings (*Fig. 4.8*)

The interviewee stated that there is no great feedback from the BDA to the data reports sent by the Carvoeiro/Vouga Managing Body. Furthermore, there was no attempt, by the BDA, to discuss the required measures needed for river pollution remediation. The interviewee stated four times that the objective of river pollution remediation defined in the Basin Plan was not fulfilled. And this was probably due to the lack of measures application and conflicts solution by the BDA.

He pointed out that some uncontrolled wastewater discharges into the river may be due to the cost for legally discharging.

The interviewee stated that he could not identify salient stakeholders. However, he pointed out NGOs, water supply sector, agriculture, industry and the energy sector as having been very participative. Furthermore, he stated that the energy sector provided the solution for all stakeholders' common concerns. He even stated that it was expected that the energy sector would become a very active group after the conclusion of a dam construction which will solve the main constraints of water use.

Additionally, the interviewee stated that Basin Plan objectives have not been applied and which has lead to a lack of trust in relation to the implementation of the defined measures. Finally, he expressed the need for enhancement of participation which should be pursued by the BDA. This would probably recover the high commitment and participation that occurred in the old Basin Councils and would fulfil the Basin Plan objectives.

4.2.2.3. Summary of Case study 2

As discussed in section 4.2.2, in the past pollution of the River Vouga has led to some constraints in water use by agriculture, industry and even human consumption. As was stated by the interviewee, the energy sector provided the solution for other sectors' problems (with a dam construction). There was no conflict but a common interest in the need to remediate river pollution (due to

uncontrolled wastewater discharges into the river) and guarantee river flows to avoid seawater intrusion into underground water due to insufficient water flows at certain times in the year.

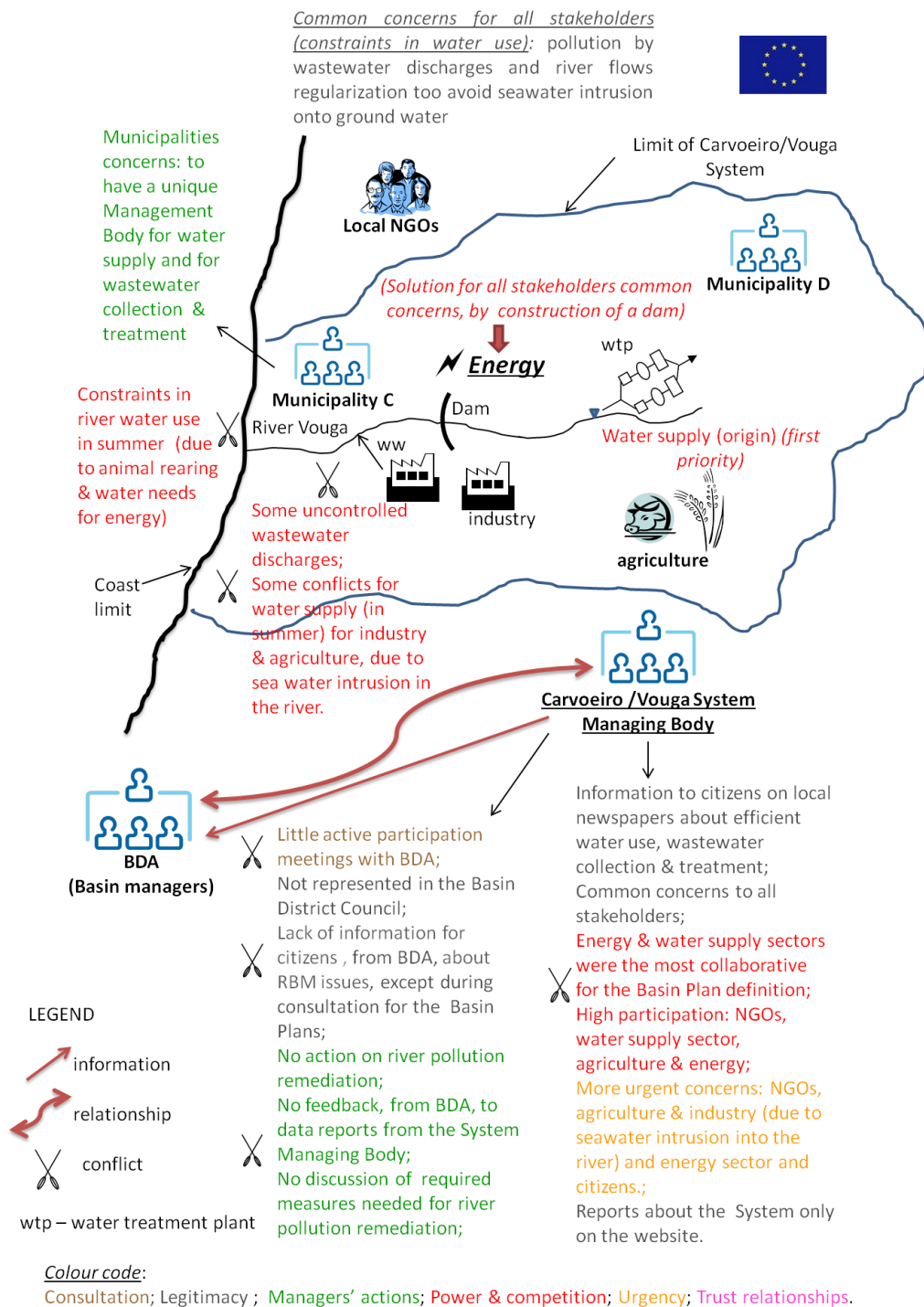


Fig. 4-8 Rich picture for Interview 1 (Case Study 2)

Due to these common concerns, there was no conflict amidst stakeholder sectors. One stakeholder sector (energy) provided the solution for all of the stakeholder sectors by the construction of a dam to store water.

Finally, the enhancement in participation of stakeholder groups should be pursued by the BDA because the BDA is part of river basin management (RBM). The BDA should be the leader in conflict solutions by engagement in participation and measures discussion with all stakeholders. Participation in integrated water management to apply the principles of WFD should be seriously pursued by the BDA.

As has already been highlighted in Case Study 1 summary (section 4.2.1.4) but also applies to this case study, the interviewee said that;

“Collaboration is important but conclusions and their implementation are even more important”.

The above statement shows that collaboration is important but it is not enough to achieve good water governance. It should be complemented with the conclusions brought about by implementation.

4.2.3. Case Study 3 (Cascais- Guia)

This case study conforms to the case study criteria discussed in chapter 3, section 3.5.1.1 (river basin context, with pollution removal, water resources management and participation). However, the special emphasis that is the key to Case Study 3 is about the wastewater collection and treatment system along the coast between Lisboa and Cascais, with a wastewater treatment plant in Cascais-Guia. This system solved the problem of uncontrolled wastewater discharges along that part of the coast, which led, in the past, to poor quality seawater along the beaches. This provides the ideal context to study stakeholder engagement within the river basins from Lisboa to Cascais.

The key stakeholders within this case study are:

- Municipalities;
- Citizens;
- NGOS;
- System’s Managing Body.

The next sections present the document review for Case Study 3, the Case Study Interview 2 coding and analysis, the summarised table produced using NVivo 10 coding, the “rich picture” and summary of this case study’s findings.

4.2.3.1. Document review for Case study 3

The document review for Case Study 3 is summarised in *Table 4-12* which is an extension of *Table 3-3* as presented in chapter 3.

The main issues which were identified are summarised in the table below.

Table 4-12 Document review for Case Study 3 (Cascais – Guia)

Case Study (CS)	Scope of CS	Documents analysed	Main issues identified
<p>Case Study 3 Cascais-Guia</p> <p>(wastewater collection and treatment system, along the coast between Lisboa and Cascais)</p>	<p>Wastewater collection along the coast and wastewater treatment plant (to solve uncontrolled wastewater discharges which led to poor quality seawater near to beaches)</p>	<p>Website of CS (www.sanest.pt)</p> <p>(information on system characteristics and connection of CS Management Body with municipalities served by the system)</p>	<p>Lack of data on collaboration between the CS Managing Body and the State Offices (within the Basin District Administration of the Tagus Valley and with the National Water Institute);</p> <p>Lack of data on recent participation of local stakeholders’ representative associations;</p> <p>A number of questions about the participation of municipalities with the Management Body of this case study.</p>

The lack of data on participation in the analysed documents provided the rationale for the interview related to this case study.

4.2.3.2. Interview 2 coding and analysis

The interviewee for this case study also provided information on the case study 4 as the interviewee had connections to case studies 3 and 4.

The NVivo 10 coding for this interview is depicted below in *Fig 4.9*.

Name	Sources	References
Consultation	0	0
Consultation adequacy	1	3
Consultation frequency	0	0
Consultation objectives	1	4
Consultation tools	1	6
CSI 2 (Cascais Guia and West Region)	0	0
EU politics	0	0
Legitimacy	0	0
Stakeholders concerns	1	1
Stakeholders knowledge	1	10
stakeholders legitimacy	1	2
Managers actions	1	5
Power and competition	0	0
stakeholders collaboration	1	3
Stakeholders engagement for participation	1	5
Stakeholders power and competition	1	4
Stakeholders salience	1	3
Stakeholders urgency	1	2
Trust relationships	1	2

Fig. 4-9 NVivo 10 coding outcome for Interview 2

From the NVivo 10 coding a summarised table was created grouping the tree nodes and presenting the interview references expressing the number of references for each node. The table is depicted below.

Table 4-13 NVivo coding outcome for Interview 2

Attribute	Description	Conflicts and gaps
<p>Consultation <i>(brown)</i></p>	<p>Support material for consultation: presentations, leaflets, mailing, small documents (2 times); Some works construction approval depends on consultation with all stakeholders (1 time).</p> <p><u>Case study 3 (Cascais-Guia):</u> Different consultation meetings for each stakeholder group were adequate because they provided a broad discussion and understanding of the system and its benefits (6 times); The main target was the citizens and meetings with them were conducted using simple language to be easily understood (1 time).</p> <p><u>Case study 4 (West region, pig rearing):</u> Consultation meetings with local municipalities provided analysis and discussion of solutions; additional meetings with industrial representatives showed the benefits of an integrated solution (3 times).</p>	
<p>EU politics <i>(blue)</i></p>	<p>(Not mentioned)</p>	
<p>Legitimacy <i>(grey)</i></p>	<p>Environmental education in schools about sustainable water use has proved to have positive impacts on families' perception of water usage (1 time).</p>	<p>Water supply systems and wastewater collection /treatment systems are often managed by different managers which sometimes results in conflicting positions due to different investments and taxes (1 time);</p> <p>Low perception of RBM issues and works benefits by the public, in spite of divulgation efforts by managers (8 times);</p> <p>Press media trend for emphasising only the negative situations of water or wastewater systems (1 time);</p> <p>Some industries in the area of the case studies are polluters; however, municipalities and State Offices are not able to control them because they represent relevant economic interests for their region (2 times).</p>

Table 4-13 NVivo coding outcome for Interview 2 (cont.)

<p>Managers' actions (green)</p>	<p>Some small municipalities are managers of their water supply and wastewater treatment systems which are inadequate and need to be controlled but they feel it is a threat to their autonomy (1 time).</p>	<p>The huge investment in water supply and wastewater treatment systems was not followed by control and surveying activities by the managers, sometimes protecting economic interests (2 times);</p> <p>It is necessary to provide information on sustainable water use and promote environmental education (2 times).</p>
<p>Power and competition (red)</p>	<p>Stakeholders' collaboration is important to involve them in the solution of possible conflicts (1 time);</p> <p>Local citizens were engaged for the explanation meetings about works, though showing motivation (3 times)</p> <p>Generally, water supply, followed by pollution prevention and remediation should be the most important factors to be fulfilled (1 time);</p> <p>For water use purposes, energy is the most powerful sector in Portugal (1 time);</p> <p><u>Case Study 4 (West Region, for pig rearing):</u></p> <p>A specific enterprise was created to build a wastewater treatment plant due to the effort required to engage pig rearing associations to participate (1time).</p>	<p>Some conflicts between public and private sectors are due to the private sector attempting to control important roles as water managers (1 time).</p> <p><u>Case Study 3 (Cascais -Guia):</u></p> <p>Long and difficult periods of negotiation with the municipalities to reach consensus on several interests (1 time);</p> <p>An environmental association opposed to the localisation of the wastewater treatment plant with insufficient grounds and political interests, which delayed implementation of the solution(1 time);</p> <p>Environmental associations and municipalities did collaborate; citizens need to be motivated to participate (1 time).</p> <p><u>Case Study 4 (West Region, for pigs rearing):</u></p> <p>Some installations are not connected to the system and costs of operation are difficult to handle (1 time).</p>
<p>Stakeholders salience (black)</p>	<p>Stakeholder salience is connected to their economic capacity and sometimes to their political capacity but generally there is good collaboration from all of the associations (1 time);</p> <p>Their influence must be related to local priority actions namely, pollution remediation needs (2 times).</p>	
<p>Urgency (orange)</p>	<p>Issues related to water supply must be the first priority (1 time).</p>	<p>Actually, the urgent situations are connected with wastewater problems and lack of adequate control and surveying of pollution situations (1 time).</p>

Table 4-13 NVivo coding outcome for Interview 2 (cont.)

Trust relationships (<i>rose</i>)	Recently, there is increasing trust between stakeholders and managers, except for the citizens (1 time); Stakeholders show a better knowledge of environmental issues (1 time).	
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4.2.3.3. Rich picture for Case study 3

The “rich picture” for Interview 2 and Case Study 3 (Cascais-Guia System) (Fig. 4.10) provided some findings.

The interviewee stated that different consultation meetings were held for each group of stakeholders. The rationale was said to be the belief that each group would have different perceptions about the system. Separate meetings for each group allowed the use of support materials and the use of appropriate language for their understanding.

The main target of the consultation meetings was said to be the citizens, to gain their acceptance of the system’s location and to understand the benefits to be gained. The interviewee stated that environmental education in schools has proved to have had a positive impact on families’ understanding of sustainable water use. However, citizens need to be further engaged to motivate them to participate. Citizens still a poor perception of RBM issues, even after managers’ efforts to provide them with information. The press media was said to emphasise only negative situations of water or wastewater systems, therefore not helping to enhance citizens’ trust in the benefits of the work. However, local citizens have become progressively more engaged in their specific meetings, showing some motivation.

4.2.3.3. Summary of Case study 3

The interviewee said that the several participation meetings, sponsored by the Case Study 3 Managing Body, explained the reasons for adopting the solution provided to stakeholders and provided a broad discussion and understanding of the System’s features.

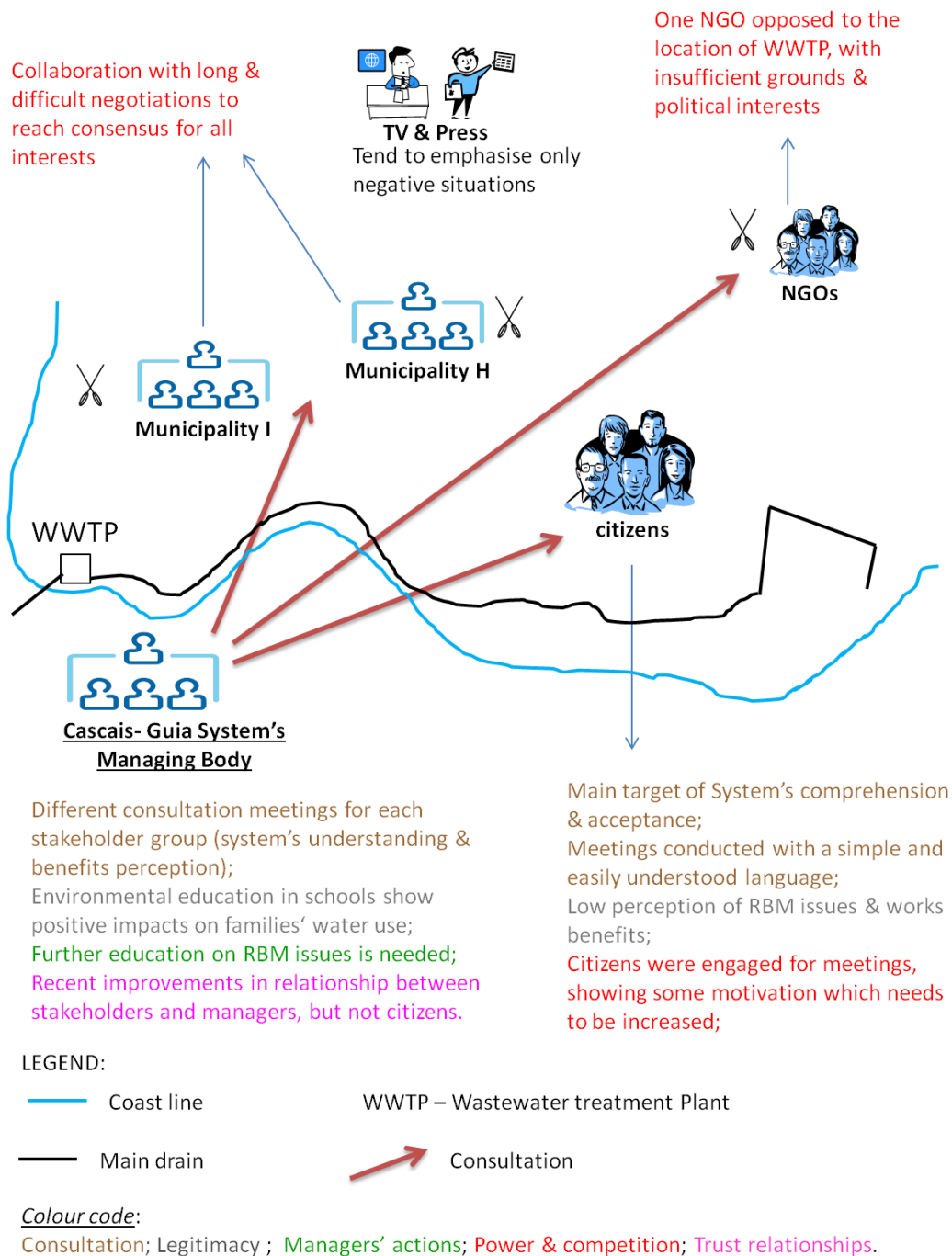


Fig. 4-10 Rich picture for Interview 2 (Case Study 3)

However, it was stated that there was a long and difficult period of negotiations with the municipalities to reach consensus in several areas of interests. Municipalities are said to feel that they would lose their municipal control because the new systems usually aggregates several municipalities. However,

they already have to work with other municipalities on other integrated systems management schemes and cooperate on any possible colliding interests.

In some cases municipalities are small and manage their own water supply and wastewater treatment systems, which often prove to be inadequate, and these need to be controlled. However any control actions are seen as a threat to their autonomy.

This case study deals with the benefits that participation can bring about for the comprehension of integrated water management solutions and their acceptance by the stakeholders who are important actors in RBM.

The interviewee also stated that, recently, there had been a huge investment in water supply and wastewater treatment systems in Portugal. However, this huge investment was not followed up, by systems' managers, with controls and surveying activities for those industries who pollute the water supply. One possible reason for this was pointed as being the inability of State Offices to control such industries because of the economic advantage for their region. Finally, he stated that stakeholders' higher or lower salience is connected with their economic capacity and sometimes even to their political capacity.

He stated that the private sector attempts to play a major role by holding high ranking positions as water managers. However, a satisfactory water supply followed by pollution prevention and remediation should be the most important factor to be fulfilled.

Additionally, the interviewee concluded that;

“It is worthwhile integrating the stakeholders’ whose interests are strongly convergent with those who show conflicting interests; especially those with conflicting interests because those who have convergent interests are naturally solved”.

The above statement shows that encouraging stakeholder groups, who hold opposing views, to participate in water management committees can help to provide them with an understanding of the differing viewpoints and to find a final, balanced solution.

4.2.4. Case Study 4 (West region, pig rearing installations)

This case study conforms to the case study criteria discussed in chapter 3, section 3.5.1.1 (river basin context, with pollution removal, water resource s management and participation). However, the special emphasis that is the key to Case Study 4 is the implementation of a joint wastewater treatment plant for the large number of pig rearing facilities in that area. It still requires further great efforts to become fully implemented. It provides the ideal context to study stakeholder engagement in wastewater collection and treatment in the coastal region.

The key stakeholders within this case study are:

- Pig rearing sector;
- Municipalities;
- System's Managing Body.

The next sections present the document review for Case Study 4, the Case Study Interview coding and analysis, the summarised table produced using NVivo 10, the “rich picture” and summary of case study findings.

4.2.4.1. Document review for Case study 4

Information on case study 4 was found in an official document on the national strategy for the agricultural sectors' treatment and disposal of effluent (*ENEAPAI2007*). This official report shows a lack of environmental data about the high percentage of pig rearing facilities in that area, as depicted in *Table 4.5*. “Trevo Oeste”, the enterprise which was formed to study possible solutions to this problem, provided the basis for a joint working party with agro industrialists. The final outcome of this endeavour was the construction of a wastewater treatment plant to cope with the effluent from pig rearing installations. On the enterprise website (www.adp.pt > Directory > Portugal > Trevo Oeste SA), there is little information relating to the wastewater treatment plant and only states that the enterprise was set up in 2005 with the aim of constructing a wastewater treatment plant that follows the guidelines set by *ENEAPAI* (in *INAG, ENEAPAI*), for pig rearing installations.

However, the small amount of data available, as depicted in *Table 4.14*, points to the need for collaboration between State Offices, the BDA where this case study is located, the Managing Body for the treatment system and stakeholders from pig rearing installations.

The document review for Case Study 4 is depicted in *Table 4-14* below.

Table 4-14 Document review for Case Study 4

Case Study (CS)	Scope of CS	Documents analysed	Main issues
<p>Case Study 4</p> <p>Wastewater treatment plant, West Region (near Lisboa)</p>	<p>Wastewater treatment plant to manage effluent from the large number of existing pig rearing facilities in the West Region</p>	<p>Official document on national strategy for the agricultural sectors' treatment and disposal of effluent ("<i>ENEAPAI</i>", National Strategy for agricultural sectors' treatment and disposal of effluent from the agro industry, animal rearing and effluent handling).</p> <p>Website of Case Study (www.adp.pt > Directory > Portugal > Trevo Oeste SA) (information on system characteristics and connection of CS Management Body with municipalities served by the system)</p>	<p>From "<i>INAG, ENEAPAI</i>":</p> <p>Data available about agricultural sector, provided by several, different State Offices, revealed some inconsistency and no compatibility;</p> <p>Only a small percentage of the licensed installations have environmental data available.</p>

The report available (ENEAPAI) generated some questions about this case study and the level of participation between their managing bodies and the State Offices managers. The answers to these questions were pursued during Interview 2.

4.2.4.2. Case Study 4 Interview coding and analysis

The coding for Case Study Interview 2, which was presented under Case Study 3, in *Fig.4.9*, also applies here, because the interviewee was the same and provided information on both case studies at the same interview.

Table 4-13 depicted the NVivo coding outcome for Interview 2, which catered case study 3 and this case study 4. In the summarised table there are references for each of the case studies, expressing the number of references for each node.

4.2.4.3. “Rich picture” for Case study 4

The “rich picture” for Interview 2 and Case Study 4 (West region system) is presented in *Fig. 4.11*, which provided some findings.

The interviewee stated that consultation meetings with local municipalities provided analysis and discussion of solutions for the pollution remediation. Additional meetings were held with representative from the pig rearing industry to show them the benefits of an integrated solution. However, following those efforts and the construction of a wastewater treatment plant, there are still some installations which are not yet connected to the system. This leads to difficulties in handling the operation costs of the wastewater treatment plant.

4.2.4.4. Summary of Case study 4

The interviewee expressed his conviction that, in spite of the remaining problem concerned with connecting all pig rearing installations to the system, it proved to be a positive involvement with stakeholders because it led to the construction of the wastewater treatment plant. The final outcome was as a consequence of stakeholders’ engagement in participating with the Managing Body (stakeholder groups in case study 4). However, some installations are not yet connected to the system, therefore, more work is need to engage those installations still resisting connection by educating them about the benefits of being connected to the treatment system.

The above statement shows that encouraging stakeholder groups, who hold opposing views, to participate on water management committees can help to provide them with an understanding of the differing viewpoints and to find a final, balanced solution.

4.2.5. Cross case study analysis

Four case studies were identified in Portugal, as presented in section 3.5.1.2 and *Table 3-5*. The common feature of all the case studies is integrated water management. They all deal with water resources demands at a local river basin level. All case studies involve the participation of local stakeholders and citizens, their use of water and control over pollution.

From the case study interviews, collaboration reinforcement between BDAs and stakeholders is said to be highly important. However, it was stated that to gain stakeholders' trust it is crucial to implement the conclusions from their collaboration and provide more information on RBM issues.

Interviewees stressed that BDAs should be the leaders in conflicts solutions. Arranging different consultation meetings for each group of stakeholders was said to allow the use of language adapted to the level of perception of each group on RBM issues. This can enhance their interest in being part of the search for a solution to problems.

It was reported recently that municipalities faced a reduction in their autonomy. Conversely, interviewee from CS 4 stated that a recent huge investment in RBM systems in Portugal has not had the desired effect on managers who need to control and survey those stakeholders who pollute the water system. Therefore, these are urgent issues that need to be handled. Water supply and pollution prevention and remediation should be the most important factors to be fulfilled, as he said.

Table 4-15 presents, for each case study, the outcome from case study documents, the outcome from Case Study interview, the discussion and the contribution to the main question of this study.

Case Study	Outcome from CS documents	Outcome from interview (as in the “rich picture”)	Discussion	Contribution to main question of the study
CS1 (Ave)	<p>Weak and unfeasible responses to past enquiries.</p> <p>Lack of data on:</p> <ul style="list-style-type: none"> • Collaboration between the CS Managing Body and State Offices; • Recent participation of local stakeholders associations. <p>Some questions arose about local municipality participation in the Managing Body of CS 1.</p>	<p>Lack of information to citizens only during local consultation for the Basin Plans or on some specific issues of RBM in local newspapers & monthly information sent to stakeholders;</p> <p>Some gaps on relationship with BDA: lack of actions and few meetings to discuss and solve pollution problems reported by CS1 Managing Body (CS1 MB / CS manager identifies illegal wastewater discharges, informs the BDA but they do not take any actions to solve the problem;</p> <p>CS1 MB is not represented in the Basin District Council though without active involvement with it.</p>	<p>CS1 manager stated a good relationship with the related BDA. However, he identified relevant gaps as;</p> <p>Meetings between the CS1 manager and the related BDA are scarce and solutions and required actions implementation for river pollution remediation are not discussed nor implemented.</p>	<p>Highlights the level of information and knowledge of RBM issues, provided to citizens and stakeholders which remains scarce;</p> <p>Highlight the nature of gaps in the participation relationship between the CS1 Management Body and the related BDA.</p>
CS 2 (Carvoeiro / Vouga)	<p>Weak and unfeasible responses to past enquiries.</p> <p>Lack of data on:</p> <ul style="list-style-type: none"> • Collaboration between the CS Managing Body and State Offices; • Recent participation of local stakeholders associations; • Local municipality participation in the Managing Body of CS 2. 	<p>Common concerns for all stakeholders and high participation lead to a solution provided by one of the groups;</p> <p>Local municipalities wish to have a unique managing body for water supply and wastewater;</p> <p>Same issues about citizens information as for CS1;</p> <p>Same gaps in relationship with BDA as for CS 1 (with a different BDA);</p> <p>CS1 MB not represented in Basin District Council.</p>	<p>CS2 manager presented some contradiction. He stated that there were good and transparent relationships with the related BDA. However, he pointed out the lack of interaction between BDA and the CS2 manager to discuss measures and programme actions necessary.</p>	<p>The same as for the CS1 (plus lack of compromise from BDA to discuss & implement measures to solve identified illegal wastewater discharges);</p> <p>The finding that when there is a relevant common concern among all stakeholders there are no conflicts but a joint collaboration and commitment to find a solution.</p>

Case Study	Outcome from CS documents	Outcome from interview (as in the “rich picture”)	Discussion	Contribution to main question of the study
CS 3 (Cascais / Guia)	<p>There were no documents available except information on the website of the CS 3 Managing Body (System’s characteristics and connection of CS Management Body with municipalities served by the system);</p> <p>Lack of data about participatory events.</p>	<p>Different consultation meetings were held for each group of stakeholders (with different perceptions about the system);</p> <p>Meetings support materials and language used were simple and suitable for each group;</p> <p>School environmental education also benefits families knowledge on RB issues;</p> <p>Citizens still have poor perception of RBM issues and need to be motivated to participate more;</p> <p>Long negotiations with municipalities served by the CS 3 System.</p>	<p>The interviewee stated that municipalities had collaborated. However, he reported the long & difficult negotiations with municipalities to reach consensus on several interests;</p> <p>Different consultation meetings for each group of stakeholders were held based on their different perceptions about the system; this allowed the use of support materials and appropriate language for their understanding of issues; this proved to be a positive strategy.</p>	<p>Careful planning of participation meetings provide solutions comprehension and acceptance by people, solving conflicts;</p> <p>Municipalities fear losing their autonomy when being controlled and when new water systems aggregate two or more municipalities;</p> <p>Stakeholders’ salience is connected with their economic capacity or politic issues.</p>
CS 4 (West Region)	<p>Lack of data on pig rearing installations located in the region;</p> <p>Data available (collected by different State Offices) is inconsistent or is no compatible;</p> <p>An enterprise was created to work on the CS solution, with stakeholders collaboration.</p>	<p>Consultation meetings with local municipalities for solutions analysis and discussion;</p> <p>Additional meetings with stakeholders representatives to show benefits of integrated solutions;</p> <p>Positive final outcome, due to stakeholders engagement;</p> <p>Remaining problems on costs handling, due to some installations not connected to the system.</p>	<p>Inconsistency on data collection does not enable requisite knowledge of those installations;</p> <p>The interviewee stated that it proved to be a positive involvement with stakeholders because it led to the construction of a wastewater treatment plant as a consequence of stakeholders’ engagement & participation; however, more work is needed to engage those resisting installations.</p>	<p>Stakeholders’ engagement in participation is crucial to the discussion of solutions, understanding of differing viewpoints, conflicts resolution, integrated solutions definition and their successful implementation.</p>

Fig 4.12 summarises the case studies findings discussion, highlighting that case study 3 was the most successful, followed by the case study 4, due to the great efforts made by these case studies manager to promote stakeholder engagement.

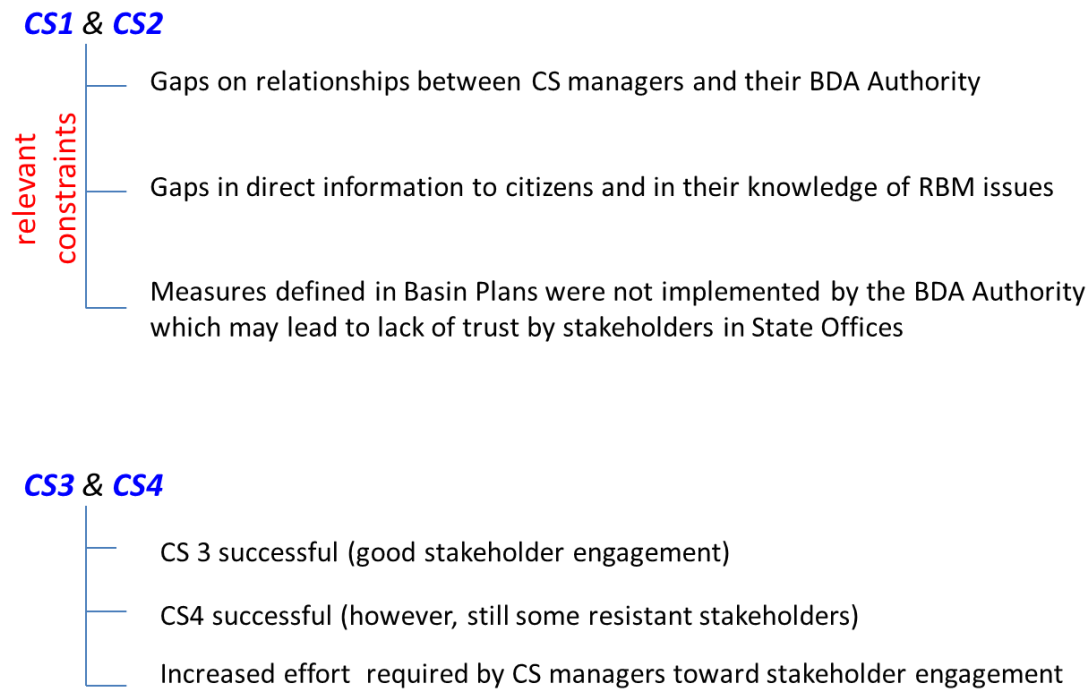


Fig. 4-12 Summary of case studies findings discussion

It was reported by the interviewee of case studies 3 and 4 that participatory meetings were carefully prepared to provide support materials and language suitable for the stakeholders' level of knowledge. Furthermore, it was stated that the proposed solutions and all issues related to them were always clearly explained and discussed with the attendees. The interviewee also highlighted that several participatory meetings were held. Each of them was targeted at a specific group of stakeholders and the language used was expected to be clearly understood by those attending.

Cross case study analysis led to the following final findings:

- Case studies are at local level, so should have higher participation due to their interest for local stakeholders;

- Local stakeholders have poor knowledge of CSs and RBM issues and would benefit from separate information meetings suited to each group;
- Increased knowledge of CSs and RBM issues could increase peoples' engagement in participation;
- Case studies are in the context of RBM although under managers' actions (at national and local level), national laws and European Directives.

The case study interviews documented the position of their systems' managers but not the stakeholders' point of view. Therefore, this provided the rationale for conducting expert interviews to

- Reinforce CSs interviews;
- Highlight the point of view of national managers
- Highlight the point of view of stakeholders groups
- Find the degree of their engagement.

For this purpose, expert interviews with other case study stakeholders and with general stakeholders were pursued.

4.3. Expert interviews

Expert interviews were conducted to reinforce case studies interviews, to introduce the view point of important stakeholders as part of participation involvement. Additionally, the expert interviews were aimed at discovering the degree of engagement by stakeholders in participation. The case studies present set the context of pollution removal, integrated water supply, wastewater collection and treatment, whereas the expert interviews establish the stakeholders' viewpoints on the contextual issues.

The next sections present the expert interviews, the coding prepared using NVivo 10, the summarised tables, the rich pictures and the experts' findings.

4.3.1. Expert interviews analysis

The following sections present the analysis of expert interviews which were planned in *Fig 3.5* and *Tables 3-6* and *3-7*.

4.3.1.1. E1 (M) Expert Interview 1 (National manager)

The E1(M) expert interviewee is one of the managers at national level. At this level the national guidelines for water resources preservation are defined, to fulfil the principles outlined in the Water Framework Directive (WFD) which is compulsory for all EU member states. The national guidelines are expressed in the National Water Plans and introduce national policies on RBM into the case studies.

The purpose of this interview was to highlight the perspective of managers on the high or low commitment and engagement of stakeholders in participation. In the past attempts have been made to engage stakeholders by employing various techniques at several participation meetings. The published reports relating to those meetings contain information about the techniques employed. Sometimes they prepared interactive material, trying to capture the attention of less committed attendees. Working groups for thematic discussion following presentations by managers and forums on the website have also been used.

The NVivo 10 coding prepared from this interview is depicted below in *Fig. 4.13*. From the NVivo coding a summarised table was created (*Table 4-16*). This table was the basis for the corresponding rich picture.

Name	Sources	References
Consultation	0	0
Consultation adequacy	1	11
Consultation frequency	0	0
Consultation objectives	1	2
Consultation tools	1	9
E1(M) Interviewee	0	0
EU politics	1	4
Legitimacy	0	0
Stakeholders concerns	1	11
Stakeholders knowledge	1	29
stakeholders legitimacy	1	4
Managers actions	1	7
Power and competition	0	0
stakeholders collaboration	1	12
Stakeholders engagement for participation	1	24
Stakeholders power and competition	1	21
Stakeholders salience	1	15
Stakeholders urgency	1	8
Trust relationships	1	5

Fig. 4-13 E1 (M) interview coding made with NVivo 10

Table 4-16 Attributes' details, description and conflicts (summarised table) – E1(M), Expert 1 (manager)

Attribute	Description	Conflicts
Consultation <i>(brown)</i>	<p>Representatives of stakeholder sectors were invited (1 time);</p> <p>National managers prepared documents for participation (using a common language) (1 time);</p> <p>Some meetings were for all stakeholder sectors (i.e. for the "Relevant Issues About Water in each Basin District") (1 time);</p> <p>For the "National Water Plan", consultation was separate for each sector (9 times).</p> <p>Main tool for conflict remediation is legislation (1 time);</p> <p>Specific tools for meetings with each stakeholder sector, for National Water Plan and Basin Plans (8 times).</p>	<p>Some questions during participation meetings denoted that attendees had not read the documents previously made available (1 time).</p>

Table 4-16 Attributes' details, description and conflicts (summarised table) –
E1(M), Expert 1 (manager) (cont.)

<p>EU politics (<i>blue</i>)</p>	<p>Sometimes crops are defined according to EU guidelines but Portuguese farmers are not prepared for a certain types of crop (1 time).</p>	<p>EU Commission does not understand Portugal's need for dam construction and thinks that southern countries experience droughts due to poor water management (1 time) In EU meetings there are two different perspectives: northern countries against southern countries (1 time); EU is unaware of different climatic conditions in southern countries (1 time).</p>
<p>Legitimacy (<i>grey</i>)</p>	<p>Each sector has specific concerns (3 times); Right to water use has been planned, to avoid conflicts, based on priorities (5 times). Some interested citizens seek for knowledge of RBM and participate (3 times); Some awareness work has been done with schools with NGOs support (& times),</p>	<p>Most citizens have little knowledge of water issues and related press news is superficial or reports only one side of the problem (8 times); NGOs are frequently against dam construction (1 time); Farmers contested water taxes and measures for animal rearing (pigs) and their application was delayed (6 times); Knowledge of stakeholders' data is required to form a proper management body (5 times). National Statistics Institute (INE) has data in a format which is not appropriate for managers needs (1 time); Data format from different State Offices is often different, not allowing data to flow from different sources (6 times).</p>
<p>Managers actions (<i>green</i>)</p>	<p>Participation meetings have published reports, available online (2 times); Recent huge investment for new water supply systems (1 time).</p>	<p>Participation meetings' reports from each BDA have different levels of information or there is little data on attendees (1 time); Some past conflicts were due to employing different managers for a dam and for the water supply system (3 times)</p>

Table 4-16 Attributes' details, description and conflicts (summarised table) –
E1(M), Expert 1 (manager) (cont.)

<p>Power and competition <i>(red)</i></p>	<p>Sectors which always collaborate: NGOs, large agricultural associations, enterprise confederations, energy, "Waters of Portugal" (AdP) and Municipal Association (all are represented in National Councils (15 times);</p> <p>Sector representatives are consulted on national issues and policies, especially groups who collaborate more (1 time).</p> <p>National managers try to progressively engage more stakeholders and citizens (12 times);</p> <p>Some important actions carried out by water services managers -- leaflets on efficient water use, distributed by mail and door to door (1 time).</p>	<p>National State Offices have not collaborate between them and have different data formats for the same issues; this does not allow sectors' problems to be clearly identified (pig rearing, etc) (3 times);</p> <p>Individual stakeholders are not engaged in participation (1 time)</p> <p>Some municipalities and citizens, within the locale of the meeting, participate occasionally, if there is any problem to be solved there (2 times);</p> <p>National managers agree that some issues on consultation documents are very technical and difficult for citizens and stakeholders to understand (1 time).</p>
<p>Stakeholders salience <i>(black)</i></p>	<p>Stakeholder sectors are more active: NGOs, large confederations (agriculture and industry), "Waters of Portugal" (AdP) with representatives on Administration Councils (7 times);</p> <p>Large industries are controlled by legislation rules (1 time);</p> <p>Administration Councils invite large associations to participate based on their high representation in a sector (6 times).</p>	<p>Agriculture Ministry has been permissive with animal rearing sector, delaying timing for compliance with EU legislation (1 time).</p>
<p>Urgency <i>(orange)</i></p>	<p>Some stakeholder sectors are trying to respect EU and national legislation (1 time).</p>	<p>Some sectors' groups (animal rearing) have been trying to avoid pollution remediation due to the investment required for implementation (1 time);</p> <p>Agriculture and animal rearing sectors need urgent information about wastewater treatment and fertilizer application and solutions to mitigate the problems (4 times);</p> <p>Need to design WWTPs for groups involved in pig rearing and to seek a consensus on taxes to be paid (2 times).</p>

Table 4-16 Attributes' details, description and conflicts (summarised table) – E1(M), Expert 1 (manager) (cont.)

<p>Trust relationships (<i>rose</i>)</p>	<p>National managers have Work Groups with representatives from stakeholder sectors and NGOs (2 times);</p> <p>Good relationship with water services' managers who provide data and knowledge on systems management(1 time) ;</p> <p>Progressive increase in trust relationships between National Managers and stakeholders during recent years (1 time).</p>	<p>Recently ministerial departments changed and a fusion of different State Offices took place. The change of technicians involved with previous Work Groups could endanger the existing connections and trust relationships maintained with stakeholder sectors.</p>
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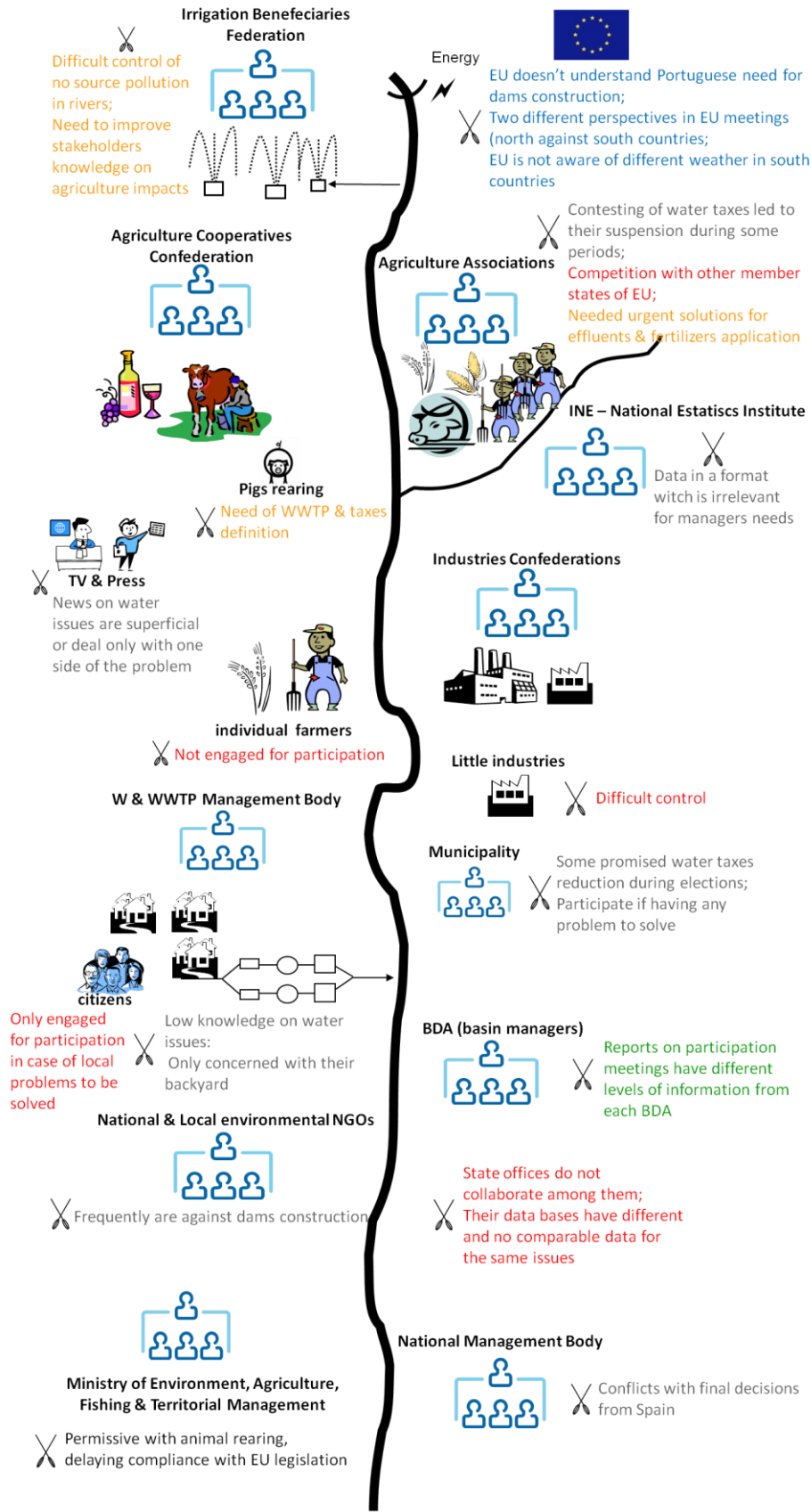
The rich picture of this interview is depicted below (*Fig. 4.14*).

This interview led to some important findings. Collaboration among different State Offices is often difficult. They produce data in different formats, which does not allow data cross referencing or the existence of a unique national data base. It was highlighted that each State Office defines the parameters for their data. Furthermore, the National Statistics Institute does not provide data that adequately meets managers' needs and global regional data was said to be of no relevance. Managers need to be familiar with the data about each installation, their location, water origins, water abstraction amounts, etc. Data feasible knowledge held by managers was said to be of great importance to allow good water management and to prioritise the definitive use of water.

It was pointed that some municipalities use promises of reductions to water taxes during election periods, using water as a political weapon. The prosecution of such promises would create asymmetry in water taxation all over the country which is not desirable.

Agricultural and industrial associations who have many members collaborate with managers. The agricultural sector is the greatest user of water; but the industrial sector is bears the greatest responsibility for pollution.

The European Union, showing a lack of understanding of the differences between northern and southern countries, was pointed out as a constraint. The climatic conditions of southern countries determine the need for water storage



Colour code:
 Legitimacy; Managers actions; Power & competition; Urgency; Trust relationships.

Fig. 4-14 Rich picture for E1(M) interview

in reservoirs, to contend with summer conditions, sometimes with severe droughts phenomena. Droughts are climatically natural episodes which cannot possibly be controlled by man.

Furthermore, the recent fusion of a number of State Offices, by politicians, was said to be of great concern. The interviewee fears that existing connections and trust relationships with stakeholder sectors would be diminished. It was stated that:

“After the recent fusion of some State Offices, different people will interact with stakeholders. We may lose the existing connections and trust relationships with stakeholder sectors. And those trust relationships can take too many years to appear again”.

The above statement shows that long term relationship between stakeholders and managers is seen to have produced trust relationships. The belief in these existing trust relationships was said to be crucial for stakeholder knowledge, their concerns, and their perception of RBM issues. Trust is the key to working together, managers and stakeholders, for the final benefit; which is to preserve water resources quality or remediate pollution in some rivers. A clear and realistic identification of RBM constraints, namely, the pollution sources, is necessary to determine the dimension of the problem and to define measures to solve it. Trust relationships can enhance stakeholders' commitment and engage them in broad participation in the defence of water resources.

Reports on past participation meetings often show different details from one BDA to another. Detailed reports using a pre-determined template, calling for exhaustive data from those meetings would be desirable.

Conversely, there are no published reports on stakeholders' sector consultations and no information about their outcome is provided to other sectors. These sector consultations could provide closer relationships between particular sectors. It is probable that the majority of concerns from stakeholders' would have been exposed; however, the lack of reports about those meetings could lead to the belief that managers are protecting their sector against others, thereby undermining trust relationships.

4.3.1.2. E2 (M) Expert Interview 2 (Coast and dams manager)

The E2(M) expert interviewee is one of the managers at national level for coast and dams' planning. They define the national guidelines for water preservation and water use definitions, on coast and dammed reservoirs, to fulfil the principles defined in the Water Framework Directive (WFD) which is compulsory for all EU member states. The national guidelines are expressed in the Coastal Plans and Dam Plans and introduce national policies on RBM into the case studies in those areas.

The purpose of this interview was to highlight the perspective of managers to the high or low commitment and engagement of stakeholders in participation.

The NVivo 10 coding prepared from this interview is depicted below in *Fig. 4.15*.

From NVivo coding, a summarised table was created, *Table 4-17 presented below*;

Name	Sources	References
Consultation	0	0
Consultation adequacy	1	6
Consultation frequency	0	0
Consultation objectives	0	0
Consultation tools	1	4
E2(M) Interviewee	0	0
EU politics	0	0
Legitimacy	0	0
Stakeholders concerns	1	8
Stakeholders knowledge	1	13
stakeholders legitimacy	1	5
Managers actions	1	6
Power and competition	0	0
stakeholders collaboration	1	9
Stakeholders engagement for participation	1	20
Stakeholders power and competition	1	13
Stakeholders salience	1	5
Stakeholders urgency	1	2
Trust relationships	1	4

Fig. 4-15 NVivo 10 coding for E2 (M) expert interview (Coast and dams' manager)

Table 4-17 Attributes' details, description and conflicts (summarised) – E2(M), Expert 2 (manager) (coastal areas and dams)

Attribute	Description	Conflicts
Consultation (<i>brown</i>)	The important tool is communication (1 time); Several used tools, including information online about plans (2 times).	Administration needs to provide supporting information for citizens, to obtain feedback from them (3 times); Stakeholders' knowledge is not high and civic consciousness is not well developed (2 times); Need to present technical issues in a simple and understandable way (1 time); Additional tools should be used to enhance stakeholders' participation (2 times).
EU politics (<i>blue</i>)	<i>(not mentioned)</i>	<i>(not mentioned)</i>
Legitimacy (<i>grey</i>)	On coastal management Plans: concerns are about beach use and beach support facilities, leisure activities, swimming safety (2 times); Stakeholders' associations have a good perception of the main issues for their sectors (1 time); Some BDAs and municipalities sponsored a number of meetings to explain RBM issues and increase knowledge (efficient water use, droughts, etc) (5 times); Collaboration of local residents is important because they can identify local problems (2 times).	Stakeholders' concerns depend on the specific characteristics of a coastal area (5 times); Lack of knowledge on legislation for beaches and on water use limitations, due to its complexity (5 times); Different perceptions within the same group of stakeholders, due to different levels of knowledge (1 time). Some interests expressed by stakeholders are outside the scope of the Plans (5 times).

Table 4-17 Attributes' details, description and conflicts (summarised) – E2(M), Expert 2 (manager) (coastal areas and dams) (cont.)

<p>Managers' actions <i>(green)</i></p>		<p>Administration needs to gain people's interest (1 time);</p> <p>Issues should be presented in a more comprehensive way and with transparency (2 times);</p> <p>Information should cross several sources (1 time);</p> <p>Administration should ask municipalities to motivate local people and distribute information to them (2 times).</p>
<p>Power and competition <i>(red)</i></p>	<p>Stakeholders' collaboration is very important to support the main concerns of the stakeholders' sectors during planning and territorial management (4 times);</p> <p>Some local thematic workshops for invited stakeholders (3 times);</p> <p>Coast Plans and Dam Plans: consultation with all stakeholders, with a high degree of participation (16 times)</p> <p>Important stakeholders: agriculture (agro industry, animal rearing and forestry) and urban expansion; on dammed reservoirs, the leisure water use (navigation) 3 time);</p> <p>For coastal area plan elaboration, legislation did not consider the participation of beaches managers before their action to be involved (1 time);</p> <p>The purpose of Management Plans is to preserve water and avoid conflicts of interests (3 times)</p>	<p>Stakeholders' participation is variable but should be enhanced (3 times);</p> <p>Stakeholders' collaboration depends on local issues and the degree to which they affect people (1 time);</p> <p>Administration needs to increase information to gain people's involvement (3 times);</p> <p>In dammed reservoirs there are some conflicts of interests on quantity and quality (1 time);</p> <p>In some locations conflicts between several activity sectors (fishing & bathing (3 times);</p> <p>Stakeholders' actions depend on their own problems and the possibility of solving them (1 time);</p>

Table 4-17 Attributes' details, description and conflicts (summarised) – E2(M), Expert 2 (manager) (coastal areas and dams) (cont.)

<p>Stakeholders salience (black)</p>	<p>Stakeholder's identification can be done by interests, claims and potential conflicts.</p> <p>For some specific issues, a number of stakeholders are more salient.</p> <p>For dammed reservoir plans, a national organisation can be important but a local association is even more important because they have a direct local stake.</p>	<p>Agricultural stakeholders are salient because they can reduce water quality and prevent some water uses, in spite of modern technologies.</p> <p>Salient stakeholders are: agriculture (mainly agro industry, animal rearing and at some point forestry) and urban expansion; on dammed reservoirs, and leisure water use (navigation).</p> <p>Stakeholders' identification by their economic classification can endanger a transversal consideration of all of them.</p>
<p>Urgency (orange)</p>		<p>Concerns are not about water consumption except in some circumstances.</p> <p>Coastal management urgent issues are related to erosion, coastal defences and climatic changes and not with water use.</p>
<p>Trust relationships (rose)</p>	<p>After BDAs (Basin District Administrations) were initiated, there was a higher degree of trust relationship between stakeholders and managers due to the proximity of citizens/managers.</p> <p>The necessary water use licences show stakeholders that managers are transparent in their water management and act to preserve water quality.</p> <p>Administration has the perception that if entities are involved, planning processes will be better.</p> <p>On recent IA evaluation, there is a lower degree of participation by citizens.</p>	<p>Managers need to clearly define the objectives and present technical reasons for any decision.</p> <p>Lack of a good civic consciousness but this has been increasing.</p>

Fig. 4.16 presents the “rich picture” for this interview.

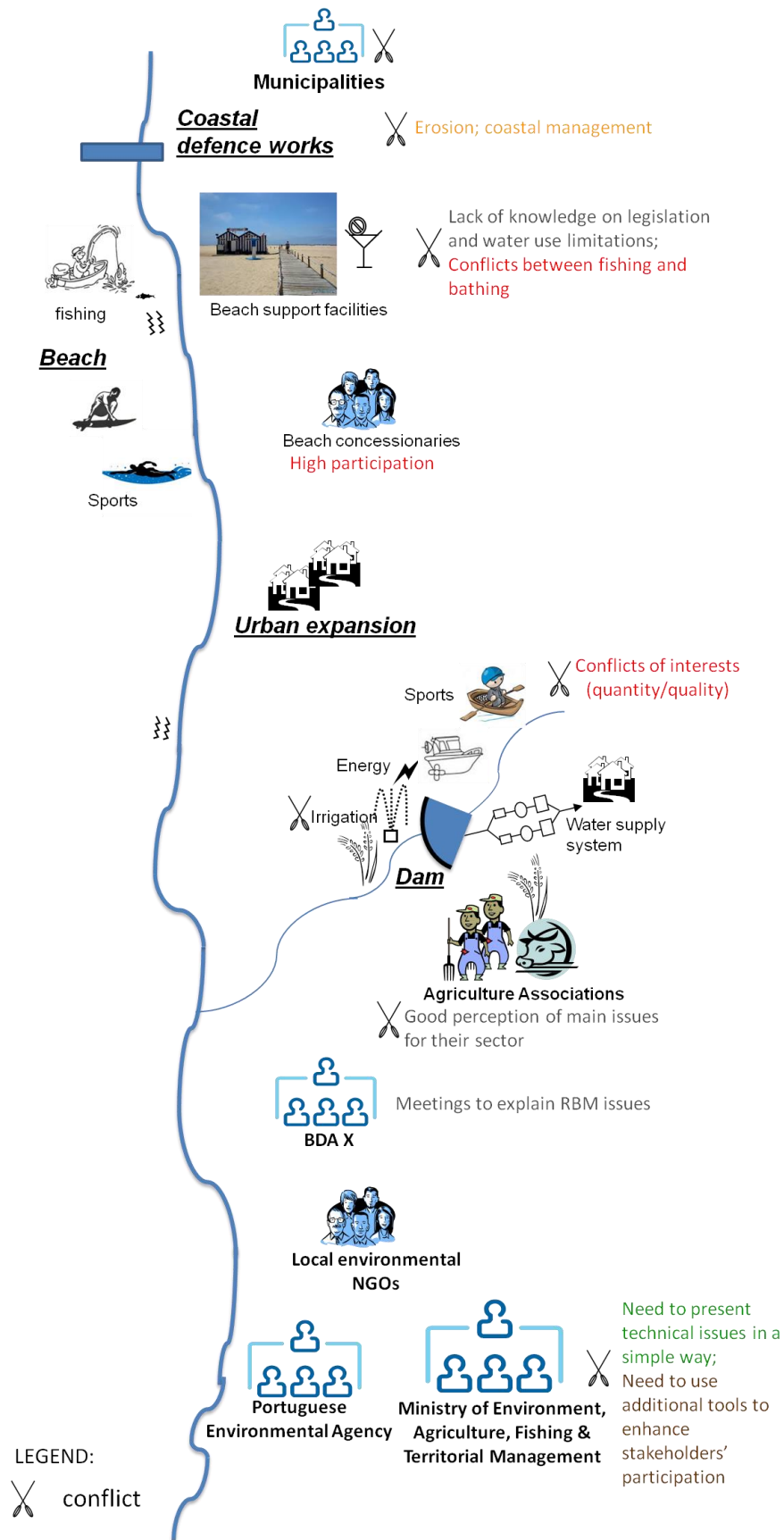


Fig. 4-16 Rich picture for E2 (M) interview

This interviewee pointed out some desirable managers' actions. The interviewee expressed the need for Administration to gain people's interest, by presenting RBM issues in a comprehensive way. He stated that there is a long way to go before this goal is fulfilled. Furthermore, he stated that Administration should be able to lead municipalities in performing their role of motivating and engaging local inhabitants to participate. Thus, this interviewee reinforced the same position defended by manager E1(M).

Administration was said to have the perception that if stakeholder associations are more involved with the planning process, the final outcome will be much improved. However, communicating information to stakeholders needs to be improved to increase their interest in understanding RBM issues. Enhancing the comprehension of RBM issues and the impact that human actions can have on the problems can engage people's enthusiasm to participate.

The interviewee stated that encouraging people to participate in consultations about Coast and Dams' Planning was good because local people feel that it is related to their own 'backyard'. In Dams' Management Plans there are no great areas of conflict because they are seen to be the key to local development.

The interviewee concluded that;

“The purpose of a Management Plan is to preserve water and avoid conflicts of interests”.

The above statement shows that a plan's purpose is to preserve good water quality and to consider the interests of all concerned in order to reach a balanced conflict resolution.

4.3.1.3. E3 (M) Expert Interview 3 (Local manager, BDA X, Basin District Administration)

The E3(M) expert interviewee is one of the managers at basin level. They work with stakeholders in their basin area, to fulfil the principles defined in the Water Framework Directive (WFD) which is compulsory for all EU Member States. They have been responsible for the preparation of the participation meetings

and stakeholder consultations. They are supposed to have a close relationship with the stakeholders within their basin areas.

The purpose of this interview was to highlight the perspective of managers to the high or low commitment and engagement of stakeholders in participation, in the context of river basin management.

Fig 4.17 depicts a general stakeholders' map for river basin management participation, for the case of participatory actions in one Basin District Administration as identified by interviewee E3 (M).

The straight lines in *fig. 4.17* indicate that it was an effort to engage stakeholders in participatory events sponsored by the BDA. The stakeholders who are represented in blue *italics* were those who were expected to be weak at participation, as intimated in data from official reports about those participatory events. From the outcomes from this interview, those lines could be substituted by arrows with one point (if there was only an engagement from RBM state managers to the stakeholder) or two points (when there was a commitment from the stakeholder to the manager to participate).

The urgency of any action or problem solution was said to be determined by only BDA managers, in case of high impact on hydraulic resource protection or recovery, serious problems or the opportunity of an action (due to existing financing or direct impact on the rivers). Stakeholder salience is perceived by the BDA managers. The symbol "X" in *Fig 4.17* indicates that there is some kind of conflict.

Fig. 4.18 depicts the map of stakeholders' attributes identified in the interview with BDA X. The arrows represent what pertains exclusively to BDA X managers.

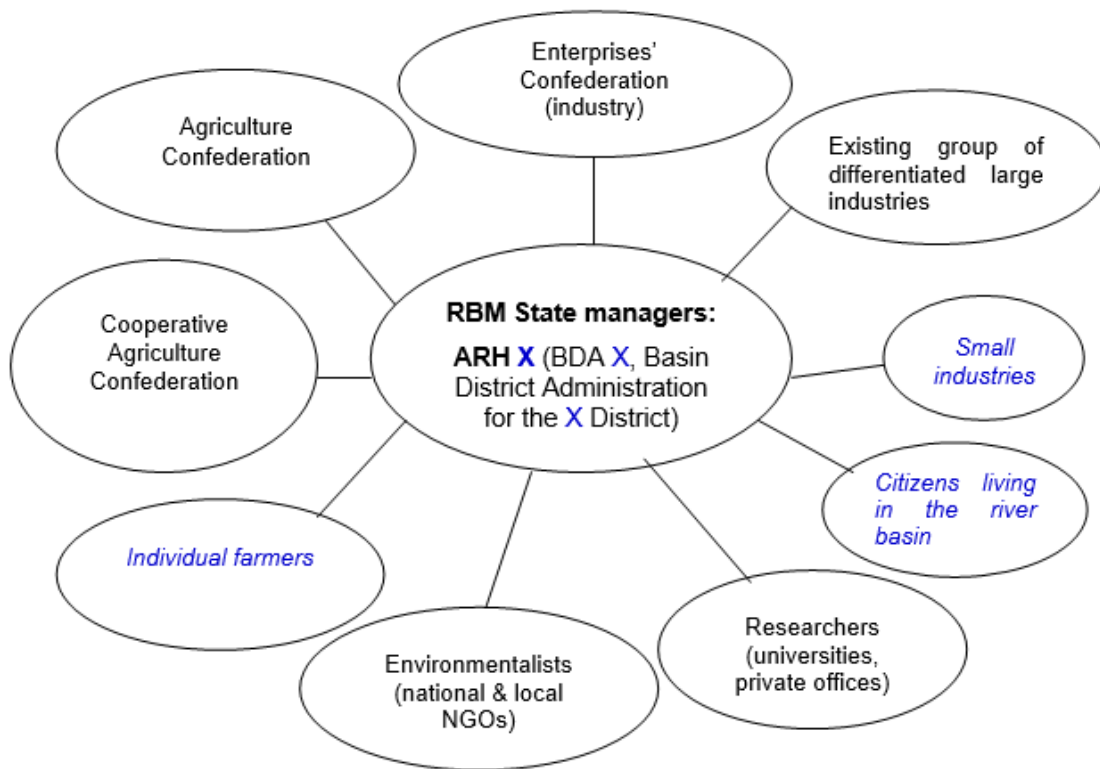


Fig. 4-17 General stakeholders' map for river basin management participation, in the case of participatory actions in the Basin District Administrator interviewed

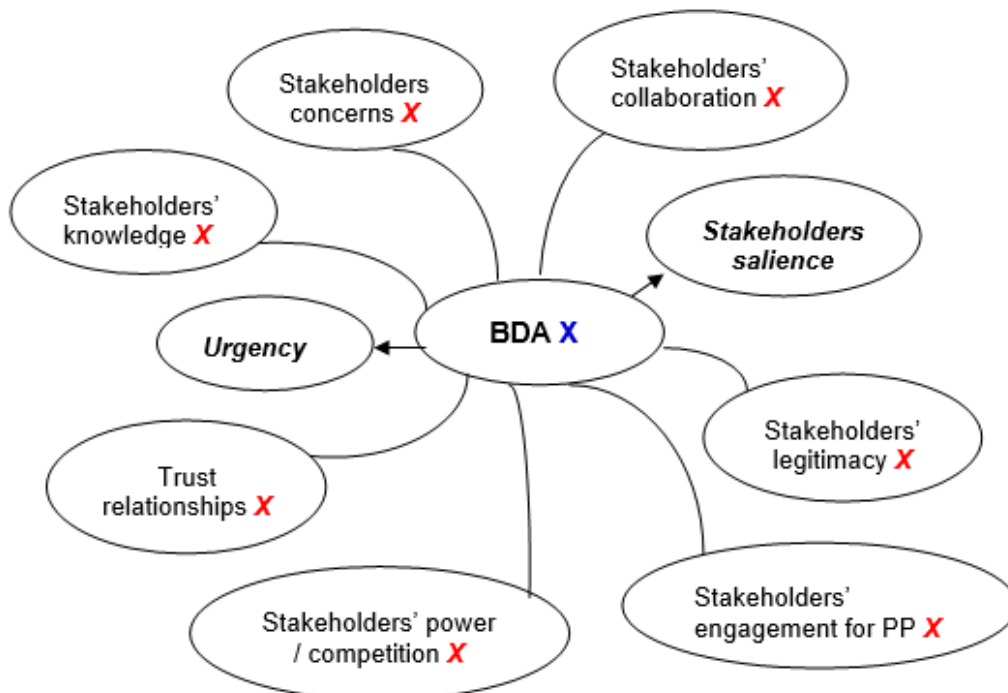


Fig. 4-18 Map of stakeholders' attributes identified during the interview with a Basin District Administrator

Fig. 4.19 depicts NVivo 10 coding for the interview with E3 (M), the BDA X
 From the NVivo coding, a summarised table was created (Table 4-18).

Name	Sources	References
Consultation	0	0
Consultation adequacy	1	5
Consultation frequency	0	0
Consultation objectives	0	0
Consultation tools	1	6
E3(M)	0	0
EU politics	1	2
Legitimacy	0	0
Stakeholders concerns	1	2
Stakeholders knowledge	1	3
Stakeholders legitimacy	1	3
Managers actions	1	9
Power and competition	0	0
Stakeholders collaboration	1	6
Stakeholders engagement for participation	1	6
Stakeholders power and competition	1	4
Stakeholders salience	1	4
Stakeholders urgency	1	4
Trust relationships	1	5

Fig. 4-19 NVivo 10 coding for E3 (M) - BDA X

Table 4-18 Attributes' detail, description and conflicts (summarised table) – E3 (M) - BDA X

Attribute	Description	Conflicts
EU politics (blue)	Directives compliance is compulsory (1 time).	Problems with compliance for pig rearing sector (1 time).
Consultation (brown)	<p>Increasing response to consultation (1 time);</p> <p>Relevant stakeholder associations frequently consulted (aware of RBM issues) (1 time);</p> <p>Stakeholder sectors are represented on State Councils (1 time);</p> <p>Use of several types of consultation tools (5 times).</p>	<p>National statistic data not adequate for RBM needs (1 time);</p> <p>Lack of economic data from stakeholders (for WFD compliance) (1 time);</p> <p>Difficulty in engaging people to attend meetings; municipalities' technical staff not engaging stakeholders in participation (1 time).</p>

Table 4-18 Attributes' detail, description and conflicts (summarised table) – E3
(M) - BDA X (cont.)

<p>Managers' actions (green)</p>	<p>Close consultation and work with relevant stakeholder associations (aware of RBM issues) (2 times);</p> <p>Some consultation meetings for specific stakeholder sectors (1 time).</p>	<p>Difficult in controlling small water users with impact on RBM (1 time);</p> <p>Problems with environmental law compliance, especially for pig rearing sector (1 time);</p> <p>Tolerance of politicians towards tax avoidance by farmers associations(1 time);</p> <p>Municipalities lack of deep engagement with Administration and local stakeholders and citizens (3 times).</p>
<p>Power and competition (red)</p>	<p>Good collaboration with relevant stakeholder associations (1 time);</p> <p>Great efforts for stakeholder engagement in participation (2 times);</p> <p>Good collaboration from relevant stakeholder associations (agriculture, industry, etc) (2 times).</p>	<p>Extensive conflicts:</p> <p>Huge difficulty in accessing people, to engage them to participate (4 times);</p> <p>Lack of participation culture (1 time);</p> <p>Poor collaboration by individual farmers and small industries (1 time);</p> <p>Lack of collaboration by pig rearing sector (1 time);</p> <p>Problems with compliance with laws (1 time);</p> <p>Farmers sector tax avoidance (1 time);</p> <p>Some conflict among sectors during water scarcity periods (2 times).</p>
<p>Legitimacy (grey)</p>	<p>For BDA, legitimacy means compliance with legislation (1 time);</p> <p>Different levels of concerns inside each stakeholder sector (2 times).</p>	<p>Lack of understanding of RBM issues (1 time);</p> <p>Attendees at participatory events often do not understand what is being discussed (1 time);</p> <p>Minor conflicts due to new laws on water extraction licences (2 times);</p> <p>Need to increase environmental education and information on measures, programmes & their impacts (1 time).</p>

Table 4-18 Attributes' detail, description and conflicts (summarised table) – E3 (M) - BDA X (cont.)

<p>Urgency (orange)</p>	<p>The BDA determines the urgency and is not guided by stakeholders' pressures (1 time);</p> <p>For urgent problems, stakeholders are more aware of them and can help managers to resolve them (2 times).</p>	<p>Conflicts during severe climatic conditions or uncontrolled discharges (1 time).</p>
<p>Trust relationships (rose)</p>	<p>BDA provides information on economic sectors and water needs (1 time);</p> <p>Initiatives to enhance stakeholders' engagement and information (1 time).</p>	<p>Lack (or unclear) economic data on stakeholders activities (needed for compliance with WFD) (1 time);</p> <p>Relevant stakeholders' associations often hiding their knowledge of their impacts on RBM (1 time);</p> <p>Low levels of participation at meetings for all sectors (1 time).</p>
<p>Stakeholders salience (black)</p>	<p>Major salience:</p> <ul style="list-style-type: none"> - Relevant Stakeholders Associations (agricultural and industrial) for their perception of RBM issues (1 time); -Sub sectors with relevant problems (1 time); <p>Low salience:</p> <ul style="list-style-type: none"> - Individual stakeholders (1 time). 	<p>Small industries, apparently with less salience, due to low impact on RBM, are difficult to control (1 time).</p>

The “rich picture” of this interview is depicted in *Fig. 4.20*.

As can be seen in the “rich picture”, stakeholder groups which are salient to the BDA are those which represent a large number of stakeholders. The BDA X interviewee stated that those groups have a better knowledge of RBM issues than the smaller groups. For the BDA, the relevant stakeholder associations are seen as being able to help managers find solutions to urgent problems and on applying the necessary measures for their solution.

The BDA X interviewee stated that legitimacy means compliance with legislation. Therefore, legitimacy is not dictated by stakeholders' claims and

Stakeholders are represented in State Councils



Compliance problems, for pig rearing sector
 Lack of economic data from stakeholders for WFD compliance

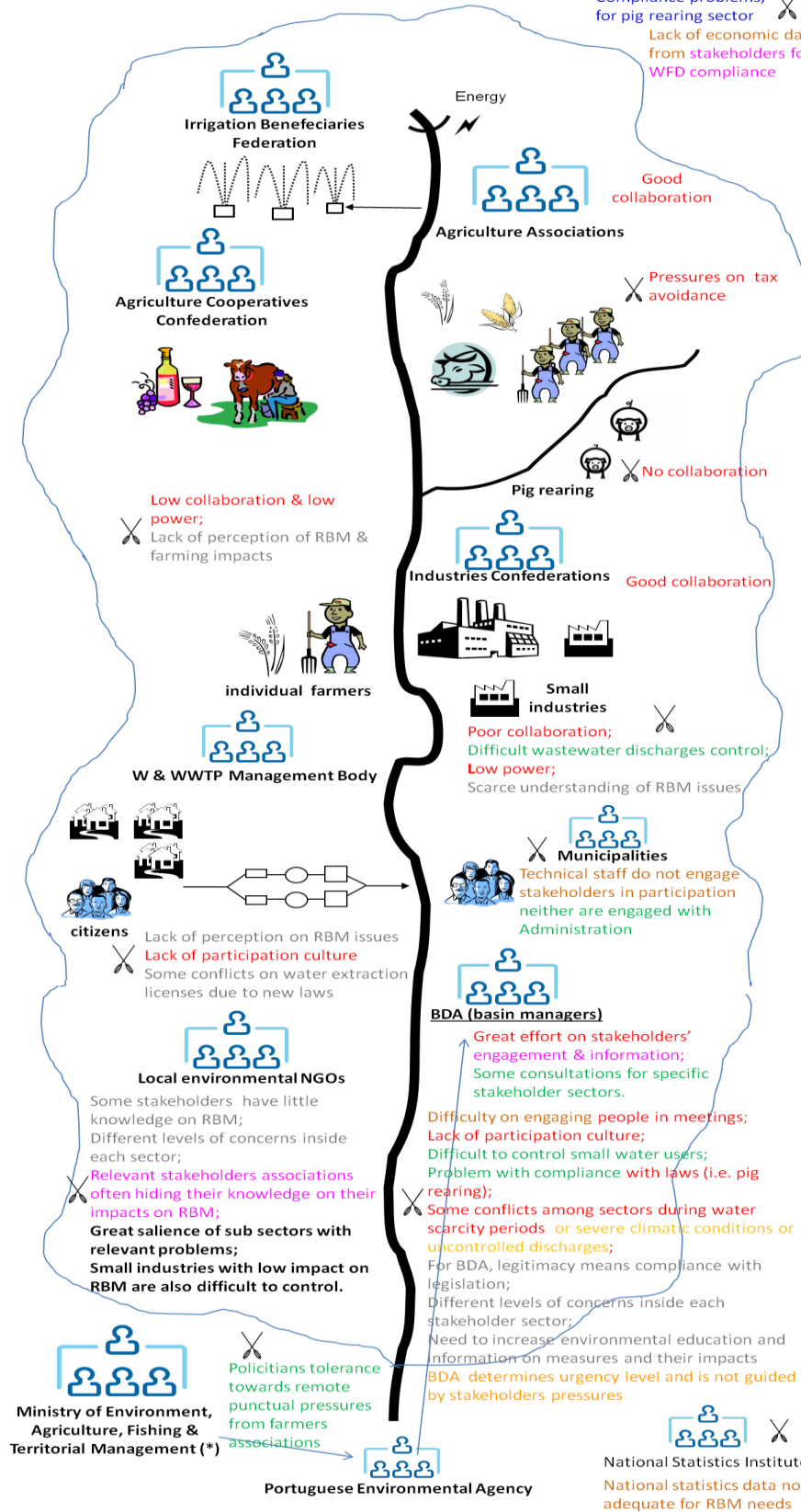


Fig. 4-20 Rich picture for E3 (M) (BDA X) interview

concerns but is a consequence of the actions and measures needed to attain the targets defined in the WFD.

Furthermore, the interviewee stated that the urgency of any problem's solution is determined by the BDA managers. It is based on the impact on RBM and on the opportunity for action. The BDA states that priority actions are not guided by stakeholders' pressures.

Consequently, based on stakeholder theory (explained in chapter 2, section 2.7) the unique attribute of stakeholders, which appears to be relevant to the BDA, is power. From *Fig. 2.3*, the BDA only recognizes "dormant stakeholders". However, large groups of stakeholders from each sector of activity are frequently consulted by the BDA. Although the BDA determines what issues need urgent resolution, they can be influenced by those consultations. It was even stated that the BDA knows that sometimes relevant stakeholder associations hide their knowledge of their impacts on RBM. The BDA may not be totally aware of those impacts.

The lack of participation and cooperation by some municipalities was also noted through their failure to engage local communities and stakeholders. They could have an important role engaging local stakeholders, especially those groups which are not salient to the BDA but who may have specific problems to solve.

Two other concerns were expressed. It is necessary to provide information about RBM in simple language, since stakeholders often do not understand the RBM issues, their impacts and the legislation whose application is compulsory. It was stated that there is no "culture for participation". Though, as the interviewee said, to reach a better engagement of stakeholders it is important to let people know that

"A Plan is not a Plan for the Administrators but a Plan from the society to the protection of water resources".

The above statement means that a plan is from all parties, stakeholders and citizens living in the water basin area, to control water use and protect water from pollution, by protecting water resources.

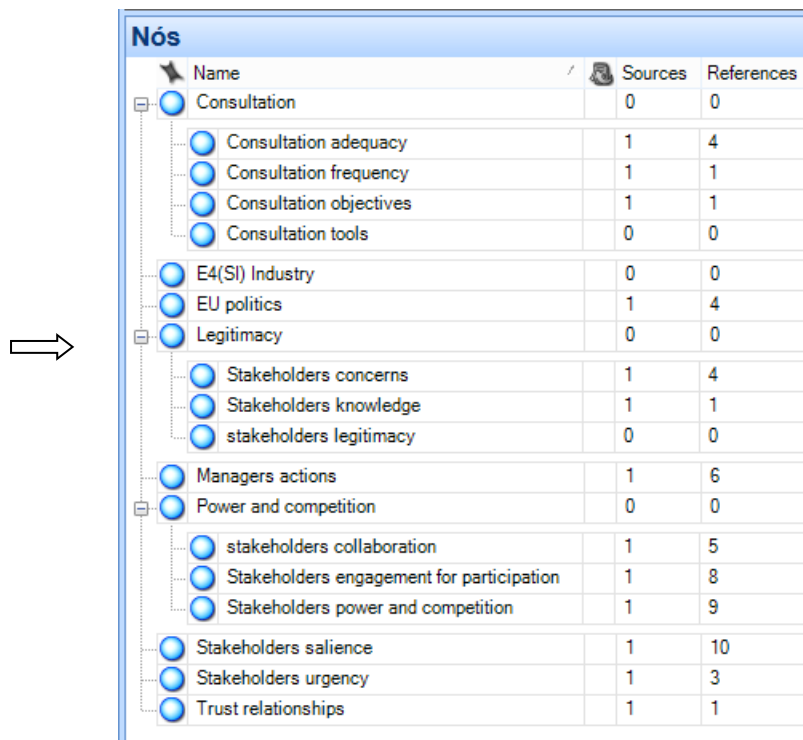
4.3.1.4. E4 (SI) Expert Interview 4 (Stakeholder, industry)

This expert interviewee is part of an industrial association. This association is a “social partner”, though it is always consulted by the Government on new laws and collaborates often with State Offices. Therefore, he is responsible for the institutional relationships with Administration. He is the representative for that the industrial association on National Councils such as the National Water Council.

The purpose of this interview was to capture the perspective of the industry sector to their commitment and engagement as stakeholders in participation.

A number of industry sub-sectors have been responsible, in the past, for water pollution in rivers, as it happened in River Ave (case study 1). However, the need for an environmental license for their activities and the obligation for their effluent output to be connected to a wastewater treatment system has solved a number of previous pollution situations. However, it is probably that episodes of uncontrolled discharges into rivers is due to an attempt to avoid paying taxes.

Fig.4.21 depicts NVivo 10 coding for E4 (SI) expert interview.



Name	Sources	References
Consultation	0	0
Consultation adequacy	1	4
Consultation frequency	1	1
Consultation objectives	1	1
Consultation tools	0	0
E4(SI) Industry	0	0
EU politics	1	4
Legitimacy	0	0
Stakeholders concerns	1	4
Stakeholders knowledge	1	1
stakeholders legitimacy	0	0
Managers actions	1	6
Power and competition	0	0
stakeholders collaboration	1	5
Stakeholders engagement for participation	1	8
Stakeholders power and competition	1	9
Stakeholders salience	1	10
Stakeholders urgency	1	3
Trust relationships	1	1

Fig. 4-21 NVivo 10 coding for E4(SI) expert interview (stakeholder, industry)

From NVivo 10 coding a summarised table was created grouping the tree nodes and presenting the interview references expressing the number of references for each node. *Table 4-19* is depicted below.

Table 4-19 Attributes details, description and conflicts (summarized table) –E4 (SI) (Stakeholder Industry)

Attribute	Description	Conflicts
Consultation (<i>brown</i>)	E4(SI) ia a “social partner” (1time); Consults with all sectors about laws (environmental impact, pollution control and responsibility for environmental harm) (4 times).	Consultations are always adequate but State Offices often do not consider their output(1 time)
EU politics (<i>blue</i>)		EU politics are not so feasible nowadays due to the people who are in charge (2 times); EU does not understand the climatic asymmetries (especially droughts) among northern hemisphere countries and southern hemisphere countries (2 times).
Legitimacy (<i>grey</i>)	E4(SI) consultation on laws by Government (1 time); Some consultations for the whole sector, others for specific sectors (1 time); Some sectors are very active (1 time);	After BDAs started (2008), water demands were separated from other issues by industrial environmental licences (1 time); Industries cannot use water from their wells if they are close to a water supply systems (1 time).
Managers actions (<i>green</i>)	State Offices good work depend on individuals who work there (1 time); Some BDAs do not work actively (2 times); E4(SI) has blocked disclosure of industries environmental data; they do not know how it will be handled (1 time)	State Offices do not have good relationship between them (1 time); Data on a number of industrial installations is different according to which State Office are responsible for the installations (2 times).

Table 4-19 Attributes details, description and conflicts (summarized table) –E4 (SI) (Stakeholder Industry) (cont.)

<p>Power and competition (<i>red</i>)</p>	<p>Collaboration with National Water Council and sector consultations (5 times)</p> <p>More active sectors are members of associations and normally have problems to solve (5 times);</p> <p>E4 (SI) does not have a regional position; thinks BDAs are only a name as most of them do not work properly (3 times).</p>	<p>E4(SI) fears water services possible privatisation because water is an essential necessity (2 times);</p> <p>Some conflict between sectors (3 times);</p> <p>Pollution Control Directive changed and does not provide an integrated approach (4 times);</p>
<p>Stakeholders salience (<i>black</i>)</p>	<p>E4(SI), as a social partner, is always consulted by the Government (2 times);</p> <p>Industries with higher salience have technical staff or are exporting industries (4 times);</p> <p>“Waters of Portugal” is very salient and legislation has protected them (3 times).</p>	<p>Poorly represented sectors do not have a voice (1 time).</p>
<p>Urgency (<i>orange</i>)</p>	<p>Limitations to competitiveness due to legislation and Administration attitudes (3 times).</p>	
<p>Trust relationships (<i>rose</i>)</p>		<p>Municipalities feel they have lost a great deal of their autonomy (1 time).</p>

This interviewee stated that his association does not have regional engagement. For him, Basin District Administration is only a name. However, they are represented on all Basin District Councils. His engagement was said to be of institutional order and his association is concerned with the legislation affecting industries, namely the laws related with river pollution control. A “rich picture” is not presented for this interview.

This interviewee reinforced a number of statements made by managers about EU politics, namely the different perspectives held about northern countries towards southern countries. However, he pointed out recent change in the

perspective of EU politics which he said was due to the different individuals ruling EU organisations.

He also called attention to some limitations on industrial competitiveness due to legislation and Administration attitudes.

The salience of his association was stated as deriving from being considered a “social partner” and a number of associated enterprises are very collaborative due to having highly skilled technical staff at managerial level; representing an important part of Portuguese economy.

He stated that on environmental issues there are two plans: institutional transversal issues and the vision of specific sectors. When his association is consulted, specific sectors or all industry members are conferred with, according with the subject under consultation.

He said that *“organisations with better salience have a duty to search for equilibrium because sometimes Administration does not have it”*.

This means that he believes in having a comprehensive perception of his sector and their relevant concerns and he is more aware of their needs than the Administration.

He also stated that there are limitations to the competitive aspects of industrial sectors, imposed by the existing legislation and also the Administrations’ attitudes. This has not provided the sector with the power they would want to achieve, although being a “social partner” offers a privileged position for exerting pressure and the legitimate claims of his sector.

According to stakeholder theory (*section 2.7.3*), this stakeholder has legitimacy and urgency as attributes, through being a “dependent stakeholder”.

4.3.1.5. E5 (NSA) Expert Interview 5 (Stakeholder, agriculture)

This expert interviewee is responsible for the water department of the agricultural association. This association represents a large number of organisations which are related farming. Their main objective is the defence of farmers’ interests and to act as a bridge between environmental policies and the agriculture sector. They analyse the environmental policies and provide advice

on these policies to association members. The associations have regional and sector councils and also have a permanent representative in EU.

The NVivo coding for this interview is depicted below.

Nós		
Name	Sources	References
Consultation	0	0
Consultation adequacy	1	12
Consultation frequency	1	2
Consultation objectives	1	3
Consultation tools	0	0
E5(NSA) Interviewee	0	0
EU politics	1	4
Legitimacy	0	0
Stakeholders concerns	1	14
Stakeholders knowledge	1	2
stakeholders legitimacy	0	0
Managers actions	1	2
Power and competition	0	0
stakeholders collaboration	1	9
Stakeholders engagement for participation	1	5
Stakeholders power and competition	1	14
Stakeholders salience	1	4
Stakeholders urgency	1	4
Trust relationships	1	2

Fig. 4-22 NVivo coding for E5 (NSA) interview

From NVivo 10 coding a summarised table was created grouping the tree nodes and presenting the interview references expressing the number of references for each node. *Table 4-20* is depicted below.

Fig 4.23 presents the “rich picture” for this interview.

The interviewee stated that there is a huge variety of agriculture sectors. Each sector has several types of problem. The EU agricultural common policy is expected to condition agriculture in the future.

Table 4-20 Attribute details, description and conflicts (summarised table) – E5(NSA) (Stakeholder Agriculture)

Attribute	Description	Conflicts
Consultation (<i>brown</i>)	<p>Farmers' association main objective is to defend farmers' interests (1 time);</p> <p>Frequent consultations with National Water Institute and BDAs (1 times);</p> <p>Represented on National Water Council (1 time).</p>	<p>Some consultations seemed to be only in respect of WFD compliance obligations and were inefficient (4 times);</p> <p>Support documents are often sent too late to be properly analysed before meetings, not allowing their proper analysis and consultation with members consultation (3 times);</p> <p>Some members are engaged in participation but do not have a solid opinion but are equally considered as Farmers Associations (2 times).</p>
EU politics (<i>blue</i>)	<p>Each agricultural section has different problems and the next EU Agricultural Policy will condition the future of agriculture for all (2 times)</p>	<p>Agriculture finance issues are deteriorating due to EU rules (2 times).</p>
Legitimacy (<i>grey</i>)	<p>The Agricultural Confederation encompasses Farmers Associations, Federations of Irrigators' "Unions" and Regional Councils (3 times).</p> <p>The Agriculture Confederation has representatives on the EU agricultural common policy committee (1 time).</p>	<p>Problems in cattle rearing and pig rearing sectors (1 time);</p> <p>Agriculture has a huge variety of practices and concerns (6 times);</p> <p>Common Farming Politics will condition agriculture (2 times);</p> <p>Efficient water use is needed (1 time).</p>
Managers' actions (<i>green</i>)		<p>Several State Offices have different data on agriculture in their area (2 times).</p>

Table 4-20 Attribute details, description and conflicts (summarised table) – E5(NSA) (Stakeholder Agriculture) (cont.)

Power and competition <i>(red)</i>	Collaboration with National Water Council and Work groups for consultation (8 times); Consultation with their associations (3 times); Some farmers belong to several associations according with their interests (3 times)	Unknown water needs for crops in Portugal (2 times); Each sector of agriculture has its problems (2 times); Agriculture is said to be responsible for pollution but sometimes the source is different (7 times); Statistical data is not usable (1 time)
Stakeholders' salience <i>(black)</i>	Represented on National Water Council (2 times); They are "social partners" (2 times).	
Urgency <i>(orange)</i>		Some problems remain unsolved in production sector (3 times); Environmental politics interfere with agriculture (1 time).
Trust relationships <i>(rose)</i>	Close relationship with the Water National Institute and BDAs (2 times).	

They are frequently consulted by the National Water Institute and BDAs. They are represented on the National Water Council. When consulted they search for information, explanations and try to influence environmental policies for the benefit of their sector.

A criticism was made about the difficulty of being more collaborative with State Offices when consultation support documentation has to be completed in such a short time. Normally, State Offices produce technical documents, using technical language; new documentation needs to be prepared using simple language for their associate's to understand. The interviewee stated that local farmers have in-depth knowledge about local problems; therefore, their advice is very important. Farmers' associations are said to support farmers, creating trust relationships and obtaining information and advising them. The association engages farmers in expressing their opinions.

The agricultural sector is often accused of being responsible for polluting the rivers. However, on many occasions the source of pollution is other than the agricultural sector. The lack of usable data does not favour clear identification of the source of the problem.

According to the stakeholder theory (expressed in section 2.7.3), this association presents several attributes.

Urgency is due to their expressed need to solve a number of pollution problems in sectors such as cattle and pig rearing. They say that there are installations with the best technology available, but they still experience problems; but many others remain without a solution.

Legitimacy is established because the agricultural association possesses a large number of farmers as members; the association raises the concerns of their members with the Administration, and is also responsible for being fully conversant with all the EU policies.

Power seems to be, to some extent, based on the option of having a strong relationship with Administration, keeping up the pressure for the benefit of their members. The interviewee said that they try to analyse environmental policies, and search for ways to use them for the benefit of the agricultural sector.

They try to maintain a “definitive stakeholders” position, according to *fig. 2.3*.

4.3.2. Cross case interviews analyses

The expert interviews tried to evaluate the stakeholders’ point of using the findings from the case studies.

Cross case interviews analyses are presented in *Table 4.21*.

E1 (M) highlighted some specific problems with a sub-sector of agriculture, however, there was no clear identification of stakeholders’ attributes.

E2 (M) interviewee pointed out the need to consider a stakeholder’s classification based on the possibility of their conflict with others.

E3 (M) interviewee clearly identified that stakeholders were “dormant” for the BDA. Legitimacy was said to mean compliance with legislation. Urgency was

said to be determined by the managers. However, it was identified that sometimes, relevant stakeholders hide the knowledge of their impacts on RBM.

E4 (SI) expert was identified as a dependent stakeholder. E5 (NSA) expert was identified as trying to maintain a position as a “definitive” stakeholder. Both try to press the BDA for the benefit of their associates.

4.3.3. Summary and emerging framework

At the end of chapter 2 and after reviewing the literature on stakeholder theory, the first form of the conceptual model was presented. Thus, stage one of SSM was completed, providing a broad identification of the problem to be addressed, in order to reach the aim and objectives of this research.

The conceptual model was concerned with linking the RBM model with the stakeholder topology diagram. It asked two questions. How do stakeholders (as members of RBM) fit into stakeholders’ topology? How can stakeholders be engaged to participate in RBM based on their attributes?

In terms of the RBM model, some stakeholder groups were suspected of being more important or having a higher impact for managers in river basin management.

At a later stage the research process was based on;

- Case studies using the same scope (RBM, water demands, pollution and participation) but each one having unique features;
- Data from interviews 1 and 2, merged with case study data, providing the necessary additional information on those case studies, on participation levels.
- Expert interviews, for stakeholders’ identification and classification.

Introducing national policies and RBM issues into the case studies added the stakeholders’ point of view on participation.

Cross case studies findings, cross case interview outcomes and “rich pictures”, allowed the identification of two additional stakeholders and the observation of stakeholder dynamics.

Table 4-21 Cross case interviews analyses

Interview	Outcome from expert interview	Contribution to main question of the study
<p>E1(M) National Manager(RBM Plans and National Plans)</p>	<p>State Offices do not collaborate and have different data formats for the same issues; this does not allow cross data analysis to take place and neither sector provides clear clarification (i.e., as for pig rearing sector);</p> <p>Sometimes farmers contest tax applications and the Agriculture Ministry has been lenient and delayed timing for compliance with EU legislation;</p> <p>Some issues on consultation documents are very technical & difficult for stakeholders to understand;</p> <p>Reports on participation meetings held by BDAs have different levels of information or have scarce data on attendees;</p> <p>Recent fusion of several State Offices and changes in technical staff involved with previous work groups can endanger existing trust relationships with stakeholders sectors.</p>	<p>E1(M) stated that some questions during meetings showed that attendees had not read the available documents; however it may be that they had read them but did not understand them due to their limited knowledge of RBM issues (as pointed by the CS 3 and E2(M) interviewees);</p> <p>No reports on separate stakeholders sectors consultations were provided to other sectors; this can lead to the belief that Administration is safeguarding a specific sector against others; thereby undermining trust relationships.</p>
<p>E2(M) Coast & Dams Manager</p>	<p>Stakeholders actions are based on their personal problems and the possibility of solving them;</p> <p>The important tool for stakeholders engagement is to increase communication from Administration;</p> <p>Stakeholders knowledge of RBM needs to be improved and this could be achieved by Administration providing supporting information in a clear and simple language;</p> <p>Different perceptions within the same group of stakeholders is due to different levels of knowledge;</p> <p>Stakeholders lack of knowledge concerning some legislation is due to its complexity;</p> <p>Information should be available to many sectors;</p> <p>Administration should ask municipalities to motivate local people ;</p> <p>Identifying stakeholders by their economic classification can endanger the transversal consideration of all stakeholders.</p>	<p>Identification of the complexity of legislation for stakeholders comprehension and their poor knowledge of RBM issues;</p> <p>Administration needs to promote stakeholders knowledge about RBM issues in clear and easily understandable language;</p> <p>Administration needs to engage municipalities to motivate local stakeholders to participate;</p> <p>Administration needs to organise data collection patterns to all cross referencing of information from different sources.</p>

Interview	Outcome from expert interview	Contribution to main question of the study
E3(M) Local Manager (BDA X)	<p>Great difficulty in engaging people in participation;</p> <p>Many municipalities do not engage local stakeholders in participation;</p> <p>Lack of understanding of RBM issues implies the need to increase environmental education and clear information about measures and their impacts;</p> <p>Problems with environmental laws compliance, especially for pig rearing sectors;</p> <p>Tolerance of politicians to tax avoidance by farmers ;</p> <p>Relevant stakeholders associations often hide their knowledge of their impacts on RBM;</p> <p>Low levels of participation for all stakeholders sectors;</p> <p>E3(M) stated that large stakeholders associations have a better knowledge of RBM; therefore they can help managers to find solutions.</p>	<p>This interviewee corroborated some points presented by the other managers; the need to provide information about RBM in simple language to provide a clear understanding of RBM issues, their impacts & legislation;</p> <p>Although the BDA determines which are the most urgent issues, large stakeholders associations which are often consulted may be able to influence BDA decisions;</p> <p>Identified that some stakeholders hide their knowledge on their impact on RBM;</p> <p>A significant number of municipalities do not cooperate with identifying and engaging local stakeholders for participation and often do not take part on participatory meetings.</p>
E4(SI) Industry Stakeholder (no rich picture as they do not feel to have a RB connection)	<p>The Industry Association is a “social partner” and is represented in all National Councils but does not feel it has regional engagement. They are simply concerned with legislation affecting industries (i.e. laws on river pollution control);</p> <p>Industry Association has blocked disclosure of industries environmental data because they do not know how it will be handled (misuse of such information could endanger competitiveness among enterprises);</p> <p>Industries limitations in competitiveness are due to legislation and Administration attitudes;</p> <p>After BDAs start (2008) environmental licenses for industry do not have an integrated approach with water demands and other issues; these are treated separately.</p>	<p>Relationship between State Offices is poor and the data collected is different with no comparable patterns;</p> <p>Good work by State Offices depends on the skills of the individuals who work there and some BDAs do not work properly;</p> <p>State Offices often do not consider consultation outputs;</p> <p>“Waters of Portugal” is very salient and legislation has protected them;</p> <p>Industries with higher salience have high skilled technical staff or are exporting industries;</p> <p>Sees industry sector as being a “dependent stakeholder” (legitimacy & urgency).</p>

Interview	Outcome from expert interview	Contribution to main question of the study
<p>E5(NSA) Stakeholder (National Agriculture)</p>	<p>They are frequently consulted by State Offices and are represented on National Water Council and on the EU Agricultural Common Policy Committee;</p> <p>Agriculture has a huge variety of practices and concerns;</p> <p>Some consultations discuss only issues in respect of the WFD;</p> <p>Agriculture is said to be responsible for pollution, but other sources are also involved;</p> <p>Farmers' Association's main objective is to defend farmers' interests.</p>	<p>Data on agriculture available from State Offices is not comparable;</p> <p>Unknown official data relating to water requirements for crops, from all over the country;</p> <p>EU common policies condition agriculture;</p> <p>Sometimes they are less collaborative due to the short time for consultation and technical language of official documentation supporting it (which implies that the Association prepares simpler documents for members consultation);</p> <p>They appear to act as "definitive stakeholders" (urgency, legitimacy and power);</p> <p>Their urgency relies on the need to solve pollution problems (cattle and pig rearing sectors);</p> <p>Their legitimacy is due to the large number of member they represent and being responsible for being fully conversant with EU policies;</p> <p>Power is due to their strong relationship with Administration and their analysis of environmental policies, keeping up the pressure for their members' benefit.</p>

The two new identified stakeholders (energy sector and a national water enterprise) were not considered in the first version of the RBM conceptual model (in section 2.8, Fig. 2.4). These two stakeholders were identified by the expert interviewees (other case study stakeholders and general stakeholders) as being salient to the RBM authorities. This part of the RBM model was corrected and is shown in the Fig. 4.24, presenting the final identification of stakeholders in RBM, thus satisfying the first objective which was the identification of key stakeholders and their behaviour within the context of RBM.

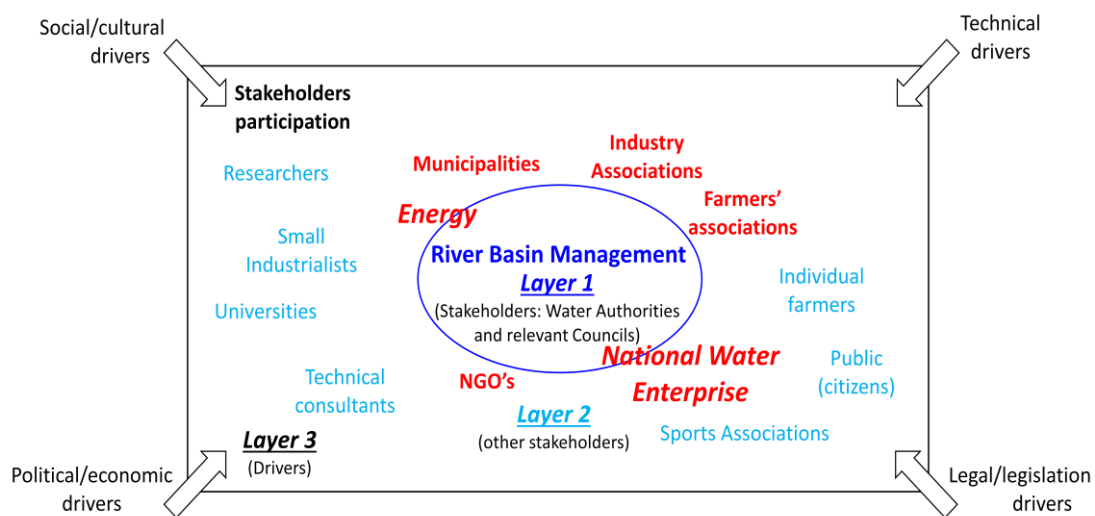
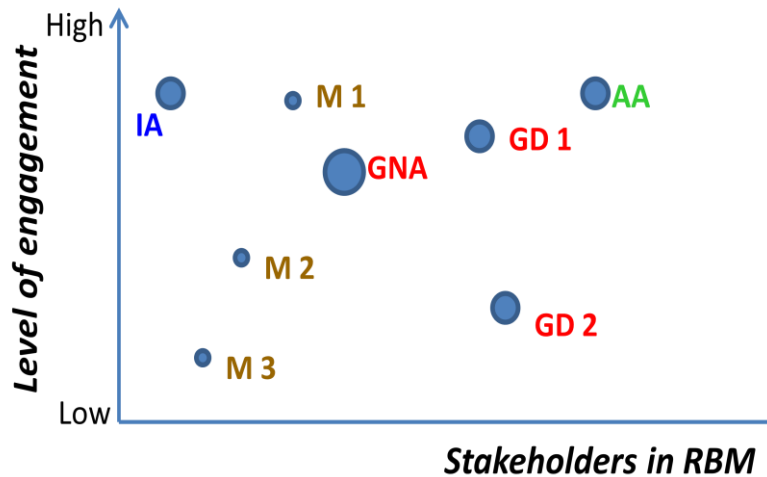


Fig. 4-24 Final RBM model – Stakeholders identification

The two newly identified stakeholders appear to play a major role in RBM. Although, in this final RBM model, they are portrayed in large, bold characters and cross the limit line of layer 1. They probably have all the necessary attributes (according to stakeholder theory), and they seem to be in a privileged position. However, this shows the need for further research, to confirm this assumption.

Large farmers' associations and large industry associations also cross the same line but are portrayed in smaller characters, meaning that they are important stakeholders. Sometimes they are successful in their role of definitive stakeholder - fulfilling and controlling their pressures on RB managers; while at other times they conform to the role of dependant stakeholders.

Additionally, the observation of stakeholders' dynamics, based on cross case analysis, is presented in *Fig. 4.25*, highlighting the level of engagement of the different stakeholders in RBM. This satisfied the second objective which was to examine stakeholders' dynamics (level of engagement, commitment and participation) in identified case studies.



GNA – Government National Authority
GD 1, GD 2 – Government Departments
M 1, M 2, M 3 - Municipalities
IA – National Industry Association
AA– National Agriculture Association

Fig. 4-25 Observation of stakeholder dynamics

Government Departments and municipalities appear in different positions since they were identified by the general stakeholder interviewees as having different levels of engagement from one department to another.

For each of the considered group of stakeholders, the following issues were identified:

Government Authorities / Departments

- Lack of collaborative actions among them;
- Work efficiently when their Head has a high level of skills and commitment;
- Data collected by different Offices has different standard formats (not compatible);

- Data gaps do not provide feasible identification of pollution sources (i.e. claims from agriculture sector).

Municipalities

- Can be very collaborative or avoid collaboration;
- Often fear to lose their autonomy when controlled or having to work together;
- Need to enhance their role in the motivation of local stakeholders in participation;
- Need to be engaged to promote local stakeholders knowledge of RBM issues.

Agriculture sector

Pressure over Administration to:

- Solve their urgent issues, namely the need to get feasible official data on water needs for crops from Administration;
- Claim legitimacy as representing all types of agriculture and having many associates.

Data on agriculture available from State Offices needs to be comparable;

Problem of unknown official data on requirement of water for crops, throughout the country has to be solved;

Short time for consultations and technical language of official supporting documentation (which implies that the Association prepares simpler documents for their associates' consultation) needs to be revised;

They clearly state that their role is to defend their associates' interests.

Industry sector

- Considered a "social partner" by Government;
- Do not feel they have regional or basin concerns;
- Feel they have limited power (due to legislation and Administration attitudes);

- Feel as though they are a “dependent” stakeholder (only with the attributes of legitimacy and urgency);
- Have blocked disclosure of industries’ data due to lack of trust concerning careful handling by Administration.

Based on cross case analysis and stakeholders dynamics observation the final outcomes were defined and appear in *Fig. 4.26*. *Fig. 4.26* brings together all the components of analysis results, pointing to the changes needed to achieve the aim of this study. Those outcomes also provide a critical evaluation of the paths to solve the gaps, based on cross case analysis, thereby meeting objective c).

The final conceptual model presented in *Fig. 4-27* represents a framework for the improvement of stakeholders’ participation, thus achieving the last objective. It establishes the rationale for the proposals discussed in chapter 5 where the creation of two types of partnering groups is defended; a partnering group among State Offices and partnering water users groups within each basin. The basin water users group should, desirably, have a close connection with the related BDA.

Case study managers identified good but distant relationships with the BDA to which they belong. They desire a closer relationship to solve local problems, which have been identified by them, by discussing the measures required and their implementation.

At this point in the study, stage two and three of SSM (defined in sections 3.6.3 to 3.6.5 and *Fig. 3.8*) were completed with the cross case analysis, the observation of stakeholder dynamics (*Fig.4.25*) and the final outcomes (*Fig. 4.26*). In addition, stage four of SSM is also completed by the final conceptual model as showed in *Fig. 4.27*.

Government Department (GD X) (Coast and Dams)

Need to work on improving stakeholders' information on RBM issues to increase their interest in participation;

Need to present technical issues in a simple language to gain people interest;

Stakeholders associations should be more involved in the planning process, especially on their local problems to be solved, for a better final output;

Administration should ask municipalities to motivate local people and distribute information to them;

Administration needs to fix data collection patterns, to enable cross referencing of information from different sources.

Agriculture Association

(Tries to be a definitive stakeholder)

Data on agriculture available from State Offices needs to be comparable;

Problem of unknown official data relating to water needs for crops throughout the country has to be solved;

Short time for consultations and technical language of official documents supporting it needs to be simplified.

National Water Authority (NWA)

Need to provide knowledge on water issues to citizens, in a single language;

National Statistical Institute should be engaged to publish data in a format appropriate to managers needs;

Data format from State Offices needs to be compatible, to allow data cross reference;

National State Offices need to collaborate between them;

Participation meeting reports from each BDA should have the same pattern of information;

Some issues under consultation are very technical for stakeholders (need to use of a simpler language).

Industry Association

(Tries to be a definitive stakeholder but feels as being a dependent stakeholder) (They are simply concerned with legislation affecting industries)

Need to establish mechanisms of careful industries information handling to gain industries trust on Administration capacities for it (by partnering groups with strong representativeness from industry sector);

Industries' environmental licenses, established by the Administration, should have an integrated approach on water demands and other issues, as it happened in the past.

BDA

National statistic data needs to be adequate for RBM needs;

Lack of participation culture needs to be solved locally;

Lack of economic data from stakeholders needs to be solved, promoting trust relationships;

Municipalities' technical staffs need to engage local stakeholders for participation and increase their own engagement with Administration (namely with their BDA);

Lack of understanding of RBM issues needs to be solved by providing clear information on it;

Need to increase environmental education and information on needed measures and their impact;

(BDA identifies stakeholders as being only dormant. BDA determines urgency and sees legitimacy as meaning compliance with legislation).

CSs managers

Stakeholders' need to have information on RBM issues to improve their knowledge on it;

Need to improve relationship with BDAs, to discuss needed measures;

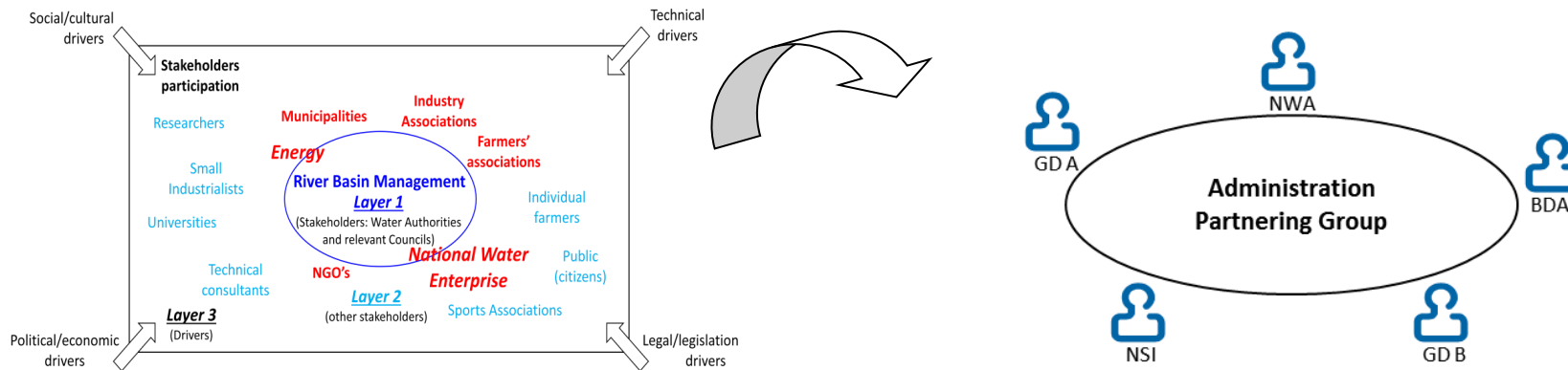
Need to implement conclusions from participation meetings and measures pointed in Plans to gain stakeholders trust and future higher participation;

Different consultation meetings for each stakeholders group enable the use of adequate language to their level of knowledge on systems' solutions and RBM issues;

Need of effective control of polluters.

(Colours legend: Data format / RBM issues needed learning / Trust relationships development)

Fig. 4-26 Final outcomes



Main identified gaps to be solved:

Provide stakeholders education on RBM issues, using simple language;

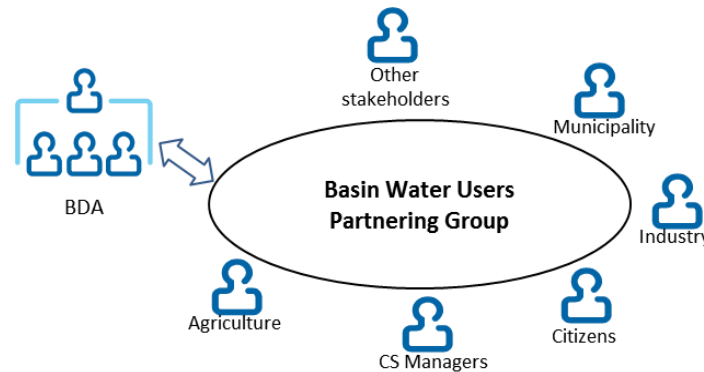
Engage local municipalities to establish stakeholder education processes locally;

Extend consultation time extension;

Fix common data collection patterns among State Offices to cross referencing of information from different sources;

Engage National Statistics Institute (NSI) to publish data in the required format for managers & stakeholders use;

State Offices need to establish mechanisms for careful industries data handling to gain their trust



Establish common patterns of data collection for data crossing referencing;

Define mechanisms for careful handling of sensitive industrial information to gain their trust;

Provide knowledge and information to all stakeholders using simple language, to gain all stakeholders engagement for participation.

Enhance knowledge of RBM issues (key role from municipalities);

Share local information on RBM;

Promote trust relationships among all groups and encourage greater participation commitment.

Fig. 4-27 Final conceptual model

Chapter 5. Conclusions and proposals

This chapter presents the fulfilment of the defined objectives, the findings of the study, proposals to various stakeholders, contributions to knowledge, limitations of the study and areas for further research.

5.1. Fulfilment of defined objectives

Section 4.3.3 presented the summary of data analysis and the developed framework to achieve the objectives of this study (which were defined in section 1.3).

As expressed in section 4.3.3, objective a) was achieved by the final RBM model presented in *Fig. 4.2.4*, which represented the final identification of stakeholders in RBM.

Objective b) was achieved by the observation of stakeholders' dynamics, based on cross case analysis, as presented in *Fig. 4.25*, high-lighting the level of commitment and engagement of the different stakeholders in RBM participation in identified case studies.

Fig 4.26 provides a critical evaluation of paths to solve those gaps, based on cross case analysis, meeting objective c).

The proposals presented in the final conceptual model (*chapter 4, Fig. 4-27*) were based on the identification of gaps in participation derived from cross case study analysis and cross case interviews analysis and also the information from documents on case studies and on national strategies expressed in national plans. They present a framework for the improvement of stakeholders' participation, with a proposal for creating partnering groups, thus achieving the last objective.

5.2. Findings of the study

The aim of this research was to provide a framework for the improvement of stakeholder engagement and greater participation in RBM, in order to enhance

integrated water management in the context of a river basin in Portugal to reach good water governance.

The objectives of this study, expressed in chapter 1 (section 1.3) were as follow:

- a) Identify key stakeholders and their behaviour within the context of RBM;
- b) Examine stakeholder dynamics (level of engagement, commitment and participation) in identified case studies;
- c) Critically evaluate ways for the solution of gaps in stakeholder dynamics amidst various drivers of RBM;
- d) Propose a framework for improved stakeholders' participation in RBM in Portugal.

Case studies document analysis identified four unique case studies in Portugal. They all conformed to the case study criteria discussed in chapter 3, section 3.5.1.1 (river basin context, with pollution removal, water resources management and participation).

The four case studies were more or less successful in their specific objectives, with some gaps remaining unsolved for most of them. The most successful was case study 3 in the coastal region, which solved the problem of wastewater discharges into small rivers which resulted in polluted beaches in that area.

Interviews related to the case studies introduced the identification of stakeholders engaged in participation. When the promoters of participation meetings were able to identify all stakeholders and engaged all their groups, the final result was positive. However, that final outcome was possible because the language used during the meetings was adapted to suit stakeholders' knowledge and also by the use of supporting material modified for attendees' comprehension.

To reinforce the case studies results and the interview findings, expert interviews were conducted.

Based on stakeholder theory, a list of questions was created, the answers to which, would attempt to highlight the attributes required for stakeholders. The purpose was to classify stakeholders, understand to what extent each classification of stakeholder was engaged in participation and which classification were the most active.

The documents analysed provided little information on stakeholders' participation details. However, the interviews confirmed that large sector associations were more salient to managers who said that they could work easily with them due to their understanding of the issues in question. What they were not aware of was that stakeholders could hide their understanding of their impacts on RBM. Conversely, less salient stakeholders could also convey important knowledge about their sectors' concerns.

The use of the names for the attributes, derived from the stakeholder during the interviews, was new to the interviewees. They were not aware of the possible understanding of stakeholders' behaviour and power and the reasons why some were so difficult to engage. That is the main contribution of this study.

Section 4.3.3 presented the summary of data analysis and the emerging framework.

The interviews suggested insights into the gaps existing in RBM; which are listed below;

- A lack of comparable data on the characterisation of stakeholder sectors activities;
- No active role played by many municipalities to engage local stakeholders to participate;
- Need to pursue the understanding of stakeholders' attributes and the consequent classification.

Data needs to conform to the same patterns in all State Offices, to allow cross referencing and provide usable data. In particular, State Offices need to develop a close conversation with the National Statistic Institute (INE) in order to establish the type of data treatment to be performed. National managers expressed, in their interviews that they provide data for the INE but the Institute publishes data values on a regional, general basis. That basis is not adequate to meet managers' needs. They need to have localised, detailed data and not global regional data. Lack of detailed and usable data endangers the basis necessary for good water governance. In fact, wrong or unusable information on

RBM drivers is a strong constraint to good water governance. For good water management, strong and useful knowledge on all drivers is crucial.

Local municipalities should be compulsory obliged to encourage local citizens and local stakeholders' to become engaged in RBM participation. Local stakeholders are close to their region's concerns and can identify with local problems, which are unknown to national managers, and to seek solutions to such problems. Stakeholders' associations, such as the agriculture sector, when consulted by National State Offices, consult their regional members to obtain a local point of view. However, this consultation process often has a short time scale, defined by managers. This situation is viewed by stakeholders to be a simple way of complying with the timetable imposed by the EU.

The final proposals to various stakeholders are expressed in section 5.3.

5.3. Proposals to various stakeholders

The final proposals are a consequence of the final conceptual model (*Fig.4.27*) and can be expressed as follows:

Establish a "partnering" culture for collaborative relationships

- among State Offices (probably ruled by the Ministry of Environment)
- among water users in each basin with State Offices;

Create more intense individual partnering groups (local water users) within the "BDA" Authorities to interact with their BDA;

"BDA" Authorities should work towards creating a common platform to share information and knowledge among basin partnering groups.

Two types of partnering groups for RBM should be created, as expressed in the final conceptual model (*Chapter 4, Fig. 4.27*):

- Administration Partnering Group for sharing patterns and information on RBM among State Offices handling carefully the confidential information from stakeholder groups
- Basin Water Users Partnering Group (all stakeholders who are water users)

Dyer, IPI 2008 defined the desirable characteristics of partnering groups, their goals and the basis for how they should work, as follows.

Partnering groups to be created should be based on the goals of

- Communication
- Trust development
- Compatibility among different visions
- Common engagement for an integrated goal (which, for this study, is to reach good and feasible RBM).

The work of partnering groups should rely on;

- Good collaboration;
- Open communication and high commitment;
- High level of trust;
- Creativity;
- Use of new management tools to improve stakeholders' behaviour & acceptance of "partnering" culture.

The presented final framework aims to guide the policy makers in RBM on how to enhance participation in RBM, however, urgent efforts are needed among Administrations and stakeholders groups. It would be desirable to establish a strong "partnering" culture among Administration and stakeholders

It will be highly important to gain trust among all groups of stakeholders and the community served by the river basin to reach good water governance. Stakeholders need to feel that their collaboration and commitment has the power of preparing clarified and strong relationships by joint collaboration and RBM improvement.

Furthermore, it would be desirable to include more RBMs in Portugal to conduct studies in RBs in other regions where WFD is applicable. As WFD is applicable to the whole of the EU, the study can be transferred from Portugal, providing a reflection of the constraints still existing in Portugal for a proper RBM. This could help others to avoid the mistakes or omissions which were experienced in Portugal.

5.4. Contributions to theory and practice

The main contribution to knowledge from this research is to propose stakeholder theory as a basis for stakeholder identification and their behavioural characteristic. Conversely, Soft Systems Methodology use due to the social nature of participation on RBM is considered for the first time in RBM studies.

Managers and expert interviewees were not aware of the possibility of understanding stakeholders' behaviour and power and the reason why some are so difficult to engage. This is the main contribution of this study; to highlight the importance of the power held by stakeholders.

The contribution to theory was:

- The review of literature on stakeholder theory
- The relocation of stakeholder theory in RBM.

This was not done before this study. Therefore, it represents a new vision, enhancing the importance of the social side of RBM. It brings to the forefront the need for careful handling of social drivers in RBM in order to improve water governance.

As a contribution to practice, the study established the key role played by the partnering culture for enhancing stakeholder dynamics and participation in RBM.

5.5. Limitations of the study

The main limitation of this research is the lack of information on municipalities' behaviour towards RBM issues and participation for water governance.

In Portugal, there are three hundred and eight municipalities and a National Municipalities Association. This Association is represented on the National Water Council.

In the first instance, the researcher planned to interview representative from this Association based on the possibility that it would provide information on the actions and participation of municipalities'. It was expected that the above meeting would capture the common position of municipalities in relation to RBM, the national strategies for RBM and a clear understanding of the way they pursued their role to enhance public participation, not only by the several types of stakeholder but also the common citizens, due to their close proximity with local residents.

Based on the official reports, which have been published by the National Water Institute, the researcher verified that the Association is always consulted about Basin District Plans and in sector interviews for the National Water Plan.

After consulting their regulations, available on their website (www.anmp.pt), I found information on the nature of such association. It is a private association, which means that it is not ruled by any State Office or ministry. Their statutory regulations define their purpose: defence, dignifying and representation of local politic power (the municipalities).

Searching the sections of their website, a list of their representatives on many national commissions was found. All these representatives are presidents of a municipality. In the area of "water and waste" there are national documents on water management (Plans).

One of the expert interviewees confirmed that this association does not aim to express a common position for all municipalities on their perspective of RBM, although they have representatives on National Councils, namely the National Water Council.

Most municipalities are managers of water supply distribution systems and wastewater collection and treatment systems. As it was illustrated by the expert interviewees who are water managers, municipalities could have a special role for local citizens and stakeholders. Their proximity to local inhabitants and stakeholders could provide many opportunities to encouragement local inhabitants' to participate in RBM. However, the managers interviewed stated that many municipalities do not cooperate with the Administration.

The researcher planned to interview a number of municipalities to obtain answers to several questions. What criterion should be used to select just a few municipalities? How to ensure that the municipalities selected were representative of any possible position related to RBM and participation?

During some expert interviews, municipalities' participation or their absence on past participatory events was focused. Conclusive statements about gaps in municipalities' participation behaviour were provided. The interviewee from the industry sector associations stated that lack of commitment to participation by the many municipalities may be a consequence of a certain level of pressure from the government. To be allowed to apply for EU funds, they were pressed to stop being managers of their water supply systems and wastewater treatment systems; and their utilities would be managed by a national enterprise. This was seen as an attempt to erase their autonomy which was previewed in the national constitution.

Lack of data on or interviews with municipalities proved to be a limitation for this research. From the expert interviews with managers, a common concern about the need for municipalities' engagement was expressed, to gain trust among all groups of stakeholders and local citizens. Good water governance needs the participation of all, by means of trust and transparency.

5.6. Areas of further research

Further research could be undertaken to conduct more river basin management studies in other regions where WFD is still applicable. Therefore, the study could be expanded in Portugal to areas where WFD is still applicable.

Furthermore, the attempt to lead water authorities to consider the contribution of this study's findings to guide their future actions for participation enhancement will provide the possibility of performing the last stages of SSM (Fig. 3.8).

5.7. Conclusions

The literature review indicates that public participation in River Basin Management (RBM) is not yet fully implemented, in spite of its chronological evolution which was presented in section 4.4. As expressed in section 4.5, on the synthesis of adopting public participation for integrated water resource management, a general theoretical gap in knowledge was identified, which could be addressed by this research. The purpose of this research is to provide a framework for improved “stakeholder participation” in RBM which will aim to optimally address the drivers discussed in section 2.3.

This research has attempted to coordinate and bring together several core areas of knowledge from quite a disparate body of literature. First, literature from RBM set the scene to adequately scope the interaction between the stakeholders. The research then drew from several legal and regulatory frameworks that operate mainly in the EU region. Finally, the study engages with literature on public and stakeholder engagement and participation initiatives to take the existing RBM literature to a new level by proposing an improved stakeholder participation framework. The main contribution to knowledge, which will be highly valuable within the context of Portugal, is that this research relocates literature found in RBM and the EU legal and regulatory frameworks within the stakeholder engagement area.

Quite specifically the framework that is produced in this research will guide some of the policy makers in RBM on how to optimise the participation of the stakeholders required by assessing multi-stakeholder viewpoints in parallel, without compromising some of the public concerns by considering both “invited” and “uninvited” members of the public; taking Wynn’s (2007) thesis into consideration.

The interviews, with some of them supporting multiple case study analysis, combined with SSM and document reviews enabled the researcher to engage with key stakeholders in relevant RBM scenarios to gather this key piece of knowledge. The findings so far (particularly the River Ave case study) confirm

the synthesis of literature that some of the key stakeholders were not included within the stakeholder participation initiative and that an improved framework could have easily identified this gap. The research is likely to support the achievement of a major societal goal which is to gain trust among all groups of stakeholders and the community served by the river basin, which could lead to improved contribution and commitment to achieve good water governance.

References

- Aarhus Convention, 1998. *Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters*. Aarhus, Denmark.
- Allen, A.; Rieu-Clarke, A., 2010. Good Governance and IWRM – a Legal Perspective. *Irrigate Drainage System*. Springer
- Antunes, P.; Kallis, G.; Videira, N.; Santos, R., 2008. Participation and Evaluation for Sustainable River Basin Governance. *Ecological Economics*, Elsevier
- Barreteau, O.; Bots, P.; Daniell, K., 2010. A Framework for Clarifying « Participation » in Participatory Research to Prevent its Rejection for the Wrong Reasons. *Ecology and Society*.
- Blackstock, K., Waylen, K., Dunglinson, J., Marshall, K. Linking, 2012. Process to Outcomes – Internal and External Criteria for a Stakeholder Involvement in River Basin Management Planning. *Ecological Economics* 77 (2012) 113-122.. Elsevier
- Buchholz, R., 1998. *Principles of Environmental Management, the Greening of Business*. New Jersey: Prentice Hall, Inc.
- Bulow, I., 1989. The bounding of a problem situation and the concept of a system's boundary in soft systems methodology. *Journal of Applied Systems Analysis* 16, 35-41.
- CCRN 1988. *Drenagem, Tratamento e Rejeição de Águas Residuais no Vale do Ave a Montante de Santo Tirso. Estudo Prévio. Hidro 4*. Comissão de Coordenação da Região Norte.
- CCRN 1989. *Drenagem, Tratamento e Rejeição de Águas Residuais no Vale do Ave. Estudos Complementares. Hidro 4*. Comissão de Coordenação da Região Norte.
- CCRN 1993. *Drenagem, Tratamento e Rejeição de Águas Residuais no Vale do Ave. Estudo Técnico-Económico. Hidro 4*. Comissão de Coordenação da Região Norte
- Checkland, P. Scholes, J. 1990. *Soft Systems Methodology in Action*. Chichester: John Wiley & Sons.
- Checkland, P, 2000. *Soft Systems Methodology: a thirty year retrospective. Systems Research and Behavioural Science*. Chichester: John Wiley & Sons.
- Corbitt, R., 1989. *Standard Handbook of Environmental Engineering*. New York: McGraw-Hill Inc. A.S. Figueiredo, V.A. Lino, M., 1980. *A Gestão da Água – Princípios Fundam*
- Cunha, L.V. Gonçalves, A. S. Figueiredo, V. A. Lino, M., 1980. *A Gestão da Água – Princípios Fundamentais e Sua Aplicação em Portugal*. Lisboa, Fundação Calouste Gulbenkian
- Directive 85/337/EEC, 1985. *Directive on the Assessment of the Effects of Certain Public and Private Projects on the Environment*.
- Directive 2003/4/CE, 2003. *Directive on Access to environmental information*
- Directive 2003/35/CE May 2003. *Providing for Public Participation in Respect of the Drawing up of Certain Plans and Programmes Relating to the Environment and amending with Regard to Public Participation and Access to Justice Council Directives 85/337/EEC and 96/61/EC*
- Dublin Conference, 1992. *The Dublin Statement on Water and Sustainable Development*. Dublin, Ireland.
- Freeman, R.E., 1984. *Strategic Management: a Stakeholder Approach*. Boston: Pitman Publishing Inc.

- Freeman, R.E., 1994. The Politics of Stakeholder Theory: Some Future Directions. *Business Ethics Quarterly* 4:4 (1994):409-421.
- Freixo, M., 2009. *Metodologia Científica, Fundamentos Métodos e Técnicas*. Lisboa: Instituto Piaget
- Gill, J. and Johnson, P. (1991), *Research Methods for managers*, Paul Chapman publishing limited.
- Global Water Partnership, GWP-TAC, 2000. *Integrated Water Resources Management*. GWP Technical Advisory Committee, Background papers n.4
- Global Water Partnership, GWP-TAC, 2009. *Water Management, Water Security and Climate Change Adaptation: Early Impacts and Essential Responses*. GWP Technical Advisory Committee, Background papers n.14.
- Hampton, G., 1999. Environmental Equity and Public Participation. *Policy Sciences* 32: 163-174. Netherlands: Kluwer Academic Publishers
- Heiland, S., 2005 Requirements and Methods for Public Participation in SEA, in Schmidt, M., João, E., and Albrecht, E., *Implementing Strategic Environmental Assessment*. Springer-Verlag
- Hipólito, J.; Vaz, A.C., 2011. *Hidrologia e Recursos Hídricos*. Lisboa: Instituto Superior Técnico, IST Press
- INAG/AMBISIG 2010, *PNA 2010 – Relatório – Avaliação das Audições Sectoriais Sobre as Problemáticas PNA 2010*.
- INAG 2009. “*Relatorio_Resultados_PP_QSiGA_30_Junho_2009.pdf*”, INAG website (preliminary report on the Relevant Issues on Water Management for each Basin District)
- INAG 2000. *Plano de Bacia Hidrográfica do Ave (2000)*. Lisboa: INAG
- INAG 1999. *Plano de Bacia Hidrográfica do Tejo (1999)*. Lisboa: INAG
- ENEAPAI 2007-2013. *Estratégia Nacional para os Efluentes Agropecuários e Agroindustriais*. Lisboa: INAG, 2007
- Jaspers, F., 2003. Institutional Arrangements for Integrated River Basin Management. *Water Policy* 5 (2003) 77-90. IWA Publishing.
- Lencastre, A., 1984. *Lições de Hidrologia*. Lisboa: Universidade Nova de Lisboa
- LNEC 1986, *Jornadas sobre Gestão dos Recursos Hídricos na Bacia Hidrográfica do Rio Ave, Santo Tirso, 1986*. Lisboa: LNEC
- LNEC 1988, *Metodologias para Avaliação de Políticas de Recursos Hídricos – Plano de Gestão da Bacia Hidrográfica do Rio Ave*. Lisboa: LNEC, 1988
- Löwer, 2009. *Interorganisational Standards*. Munchen. Physica-Verlag
- McDonnell, R., 2008. Challenges for Integrated Water Resources Management: How Do We Provide the Knowledge to Support Truly Integrated Thinking? *International Journal on Water Resources Development*, 24:1, 131-143
- Mitchell, R.K.; Agle, B.R.; Wood, D.J.1997. Toward a theory of stakeholder identification and salience: defining the principle of who and what really counts. *Academy of Management Review*, vol. 22, n 4, 853-886.
- Monteiro, J. Melo, G., 2006. *Boletim Informativo nº 11. Águas do Ave*, S.A.
- NRC 2001. *Assessing the TMDL Approach to Water Quality Management*. National Research Council, USA

- PEAASAR 2000/2006, *Plano Estratégico de Abastecimento de Água e de Saneamento de Águas Residuais*. Ministério do Ambiente e do Ordenamento do Território, 2000
- PEAASAR 2007/2013. *Plano Estratégico de Abastecimento de Água e de Saneamento de Águas Residuais*. Ministério do Ambiente e do Ordenamento do Território, 2007
- Pereira, A.C., *História da Indústria do Vale do Ave (1890-2001)*, Santo Tirso, 2002
- PNA, 2001. *Plano Nacional da Água*. INAG
- PNUEA, 2001. *Programa Nacional para Uso Eficiente da Água*. Ministério do Ambiente e do Ordenamento do Território
- Parmar, B. L.; Freeman, R.E.; Harrison, J.S.; Wicks, A.C.; Purnell, L.; de Colle, S., 2010. Stakeholders Theory: The State of the Art. *The Academy of Management Annals*, 4:1, 403-445.
- Rio Summit, 1992. *Agenda 21 - Report of the United Nations Conference on Environment and Development (Rio de Janeiro, Brazil, 3-14 June 1992)*.
- Rodrigues, M.C. et al, 2009. *Teses em Gestão Integrada da Água*. Edição Principia
- Santos, M.A., 1984. *Utilização da Água na Indústria – Inquérito na Bacia Hidrográfica do Rio Ave, LNEC, ITH14, Lisboa*
- Second Water Forum, 2000. *Ministerial Declaration of The Hague on Water Security in the 21st Century*.
- Sheng, M.; Keyi, W.; Jian, W., 2011. The corporate stakeholder management integrated model research: a conceptual framework and theoretical approach review. *Journal of Convergence Information Technology*, vol. 6, n 7, 415-424.
- Singh (2006). Equitable gender participation in local water governance: an insight into institutional paradoxes. *Water Resources Management*. Springer
- Tippett, J., Searle, B., Pahl-Wostl, C., Rees, Y. 2005. Social Learning in Public Participation in River Basin Management - Early Findings from HarmoniCOP European Case Studies. *Environmental Science and Policy* 8 (2005) 287-299. Elsevier
- Videira, N.; Antunes, P.; Santos, R., 2009. Scoping River Basin Management Issues with Participatory Modelling; the Baixo Guadiana Experience. *Ecological Economics* 68 (2009) 965 - 978 Elsevier
- Webb, T., Burgin, S., Maheshwari, B. 2009. Action Research for Sustainable Water Futures in Western Sydney: Reaching Beyond Traditional Stakeholder Engagement to Understand Community Stakeholder Language and Its Implications for Action. *Syst Pract Action Research* (2009) 22:1-14. Springer
- WFD, Water Framework Directive, Directive 2000/60/CE. *Official Journal of the European Communities*, L327/1-L327/72
- Whitehead, T, 2005. *Basic Classical Ethnographic Research Methods*. CEHC
- Wilson, G.; Bryant, R., 1997. *Environmental Management. New Directions for the Twenty-First Century*. London: UCL Press
- Wolters, H. et al, 2006. *Social Learning in Water Management: Lessons from the HarmoniCOP Project*. E-Water Official Publication of the European Water Association (EWA)
- Wynne, B., 2007. Public Participation in Science and Technology: Performing and Obscuring a Political-Conceptual Category Mistake. *East Asian Science, Technology and Society: an International Journal* (2007) 1:99-110. Springer
- Yin, R., 1993. *Applications of Case Study Research*. California: Sage

Yin, R., 2009. *Case Study Research Design and Methods*. California: Sage

Appendix

Interviews Protocol

INFORMATION LETTER TO INTERVIEWEE

Dear Sir,

You are invited to participate in a PhD research conducted by Mrs. Maria Helena T. Cardoso Gamboa at School of Built Environment in Salford University. The subject of this research is “Integrated water management at basin level – a framework to enhance public participation in river basin management”.

The objectives of this study are:

- Identify key stakeholders and their interest within the context of river basin management;
- Examine methods and the successful context for stakeholders’ participation in identified case studies;
- Critically evaluate appropriate methods for stakeholders’ engagement and commitment amidst various drivers of river basin management;
- Recommend a framework for improved “stakeholder participation” in river basin management.

You will be invited to an interview on participatory events on stakeholders’ participation on river basin management. The interview will take approximately one hour and a half.

There are no known risks associated with this research. You can be assured that the degree of identification or anonymisation specified by you on the attached Consent Form will be strictly followed by the researcher. Your response will be held in strictest confidence, under no circumstances the result specific to your company or yourself will be made available to any individual or organisation. Your participation in this research study is completely voluntary; you may withdraw your consent to participate at any time without explanation. However, your participation is very important to this study.

In case you decide to withdraw from the research at any time, the data provided until then will be erased and not used or referenced in this research’s thesis, neither on published research – papers, conferences, etc. and the researcher will communicate the data removal by a signed letter.

The interview will only be audio recorded if you express your permission for that in the attached Consent Form.

If you have any queries about this study, please do not hesitate to contact with me by e-mail: mhgamboa@sapo.pt.

Thank you in advance for your participation.

Best Regards

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Research Participant Consent Form

Title of Project: *Integrated water management at basin level – a framework to enhance public participation in river basin management*

Name of Researcher: Maria Helena Teixeira Cardoso Gamboa

Name of Supervisor: Dr. Bingunath Ingirige

I confirm that I have read and understood the information sheet for the above study and what my contribution will be.	Yes	No
I agree to take part in the interview	Yes	No
I have been given the opportunity to ask questions (face to face)	Yes	No
I agree to take part in the above study	Yes	No
I agree to the interview being audio recorded	Yes	No
I understand that my participation is voluntary and that I can withdraw from the research at any time without explanation	Yes	No
In case I withdraw from the research, the data provided until then will be erased and not used or referenced in this research's thesis, neither on published research – papers, conferences, etc. The researcher will communicate the data removal by a signed letter.	Yes	No
Neither I, nor my employer (<i>delete which is not applicable</i>) may be identified in this research's thesis or on published research – papers, conferences, etc. My words may be quoted provided that they are anonymised.	Yes	No
I consent data collection about the interview's subjects	Yes	No
Data provided by me / my employer (<i>delete which is not applicable</i>) may appear not only in the researcher thesis but also on published research – papers, conferences, etc.	Yes	No

Name of

participant:

Signature:

Date:

Name of researcher : Maria-Helena T. Cardoso Gamboa

Researcher's e-mail mhgamboa@sapo.pt

Semi- Structured Interview Guide

Section 1 - PERSONAL INFORMATION OF INTERVIEWEE

Name _____

Office name _____

Department _____

Position _____

Section 2 - INTERVIEWS QUESTIONS

Four sets of questions:

Set 1 - Interviews on National strategy / Local strategy (Managers) -

National managers and BDA X (Basin District Administration X)

Set 2 – Interviews on Case Studies Participatory Processes - Technicians related with the four case studies

Set 3 – Participation (stakeholders’ perspective) – National Agriculture Association

Set 4 – Expert interviews - Participation management (Tools and stakeholders’ identification and salience) – National Industry Association

Common questions for sets 1, 2 and 4;

Additional questions for each of those sets;

Separate list of questions for set 3 (stakeholders’ perspective).

Table 1- Interviews planning

Interviewees	Set of questions / Main subject	Purpose
National manager	<u>1 National Strategy (National Managers)</u> Participation in <i>Management Plans</i> ; Stakeholders’ <i>Sector Auditions</i>	Clarification on participatory events’ features beyond the information in official reports
National manager	<u>1 National Strategy (National Managers)</u> Participation in <i>Coastal Management Plans</i> and <i>Dams Management Plans</i> ;	Clarification on participatory events’ features beyond the information in official reports
BDA X (Basin District Administration X)	<u>1 National Strategy (Local Managers)</u> Participation meetings, namely on Significant Water Management Issues, sponsored by the BDA of Lisboa and Tagus Valley	Clarification on participatory events’ features beyond the information in official reports
Systems manager (Systems of two case studies)	<u>2 Case studies</u> Past participatory events (for case studies 1 and 2)	Perspective on participatory events on the two case studies
Systems manager (Systems of two case studies)	<u>2 Case studies</u> Past participatory events (for case studies 3 and 4)	Perspective on participatory events on the two case studies

Interviewees	Set of questions / Main subject	Purpose
National industry association	<u>4 Participation (stakeholders' perspective)</u> Involvement in public participation forms with National Managers and BDAs	Information of details of public participation episodes
National agriculture association	<u>3 Participation (stakeholders' perspective)</u> Involvement in public participation forms with National Managers and BDAs	Information of details of public participation episodes

Common questions for sets 1, 2 and 4

Q1. In your point of view, how important is stakeholders collaboration and to what extent for good RBM issues and WFD implementation?

Q2. Do you think that all groups of stakeholders, including the citizens, have a proper perception of RBM issues and the human interaction with the environment?

Q3. Do some sectors present more urgent concerns needing to be handled? Which sectors and which concerns?

Q4. Did you identify different levels of concerns or interests inside each group of stakeholders?

Q5. Did you identify competing interests from different groups of stakeholders? If so, how did you handle this situation?

Q6. Did you identify active movements from any group or groups of stakeholders towards their claims fulfilment?

Q7. Have you considered the establishment of any kind of classification for stakeholders, other than the one based on the economic activity sector?

Q8. In your point of view, do some stakeholders have a more important role on collaborating with managers?

Q9. Do you think that all stakeholders have to be considered at the same level, with the same importance? Or are there some groups, or some stakeholders inside each group who have a major role on their collaboration on RBM issues?

Q10. Which tools have been used when dealing with multiple stakeholders' interests?

Q11. Have you identified some concerns and/or interests from some stakeholders' groups which were not legitimate?

Q12. Have all stakeholders' groups, including citizens, been considered to have equal right on access to water use?

Q13. Do you think that stakeholders have gained trust towards the State Offices in recent years, to work together in a transparent relation?

Q14. Did you ever identify any situation where any group or sector of stakeholders was opposite to a specific RBM issue implementation or regulation?

Additional questions for sets 1, 2 and 4:

Set 1 (additional) – National strategy / Local strategy – Managers' perspective

(INAG, the National Water Institute and BDA of LTV, Basin District Administration of Lisboa and Tagus Valley)

(INAG – Participatory events on Management Plans)

(BDA of LTV - Participatory events on the Overview on significant water management issues in BDA of LTV and Basin Council meetings)

Q15. Did any sort of learning on RBM issues have been sponsored by State Offices?

Q16. In recent participatory meetings on issues related with the implementation of the WFD, namely the significant issues on water management, how were the participants engaged? In case of mails which were sent, can I have access to their text? What was the type of message on them?

Q17. In your point of view, can the several stakeholders who attended those meetings be considered representative of their group of stakeholders?

Q18. Do you think that the support information provided for stakeholders' consultation before those meetings was adequate to their different levels of knowledge on those issues and on RBM? Was it also adequate for citizens' comprehension to provide a basis for their participation? If not adequate, what could be done to increase the understanding of those issues?

Q19. During recent years, which sectors of stakeholders were consulted on the implementation of WFD issues and on what specific issues?

Q20. What methods or tools were used on those consultations?

Q21. On national written consultations, namely on significant issues on water management, did you get a representative number of answers and a high collaboration and commitment?

Q22. On sectors consultations on RBM, do you identify different levels of concerns inside each group of stakeholders?

Q22. Have those stakeholders who are not members of their sector's associations been engaged on collaborating with the State Offices?

Q23. Have you noticed recently any increase in stakeholders' commitment on collaboration with State Offices? If so, do you think it was due to stakeholders' initiative or was it pursued by the State Offices?

Q24. Have you ever brought together all stakeholders' sectors in the same consultation meeting? If so, did you get a high representativeness of all sectors? If not, what do you think that could engage them?

Q25. What groups of stakeholders have been more collaborative with State Offices?

Set 2 (additional questions) - Case studies interviews

Q15. At what stages of case study did participatory events took place and for what purposes?

Q16. Could you describe the adequacy of the consultation? What groups of stakeholders did participate? All those groups which are present in the area of the basin?

Q17. Who did plan the participatory events?

Q18. How were stakeholders and citizens engaged for it?

Q19. Did stakeholders and citizens have any support material for the comprehension of the issues for consultation (reports, etc)? If yes, was that material adequate to their different levels of knowledge on the issues involved?

Q20. Did any sort of learning on RBM issues have been sponsored before the consultation?

Q21. Did you get a relevant participation on those events? Were participants representative of each group of stakeholders?

Q22. Was there a relevant participation from citizens?

Q23. Which groups of stakeholders were more collaborative?

Q24. Were all stakeholders' sectors consulted in the same meeting? If so, did you get a high representativeness of all sectors? If not, what do you think that could engage them?

Q25. What methods or tools were used during those consultations? Do you think they were efficient for the people involved?

Q26. Did the concerns expressed by the participants were considered in the case study development?

Q27. Which tools were used when dealing with multiple stakeholders' interests?

Set 4 (additional questions) – Expert interviews (Industry association, etc.)

Q15. Can you identify successful participatory events and their context in Portugal or in other countries?

Q16. What do you think that contributed to those successful participation processes?

Q17. In your point of view, what tools should be used on participatory processes to provide successful outcomes?

Q18. In your point of view, what type of strategies should be implemented to enhance stakeholders and citizens' commitment and engagement on participatory processes on RBM and WFD implementation?

Set 4 (additional questions) – Additional expert interviews – (NGOs, etc.)

Q15. What types of strategies and tools have been adopted to inform citizens on RBM issues, promote their environmental education and involve them on participatory processes?

Q16. To what extent have those strategies been successful?

Q17. Did you consider the implementation of any form of active involvement for citizens in the basin where they live?

Q18. Have you promoted any meetings on the information about RBM issues adequate to citizens' knowledge level?

Set 3 - Participation (stakeholders' perspective) - (farmers associations, etc.)

Q1. During the last five years, how many times have you been consulted by the INAG and the River Basin Managers?

Q2. What were the consultations about?

Q3. Could you describe the adequacy of the consultation?

Q4. Did you express the concerns of the whole agriculture sector? Or was the consultation about the concerns of only a sub sector?

Q5. In your Association, do you find that all members express their concerns and needs?

Q6. How do you assure that all stakeholders on your sector have a voice and express their concerns? How does it happen in Farmers Associations?

Q7. Can you explain how do work those Associations?

Q8. Are the majority of farmers of each Basin District members of each Farmers Association? What are their benefits?

Q9. If there is relevant number of farmers who is not a member of Farmers Associations, what is the reason for it, in your point of view? How do they express their needs and concerns?

Q10. How does your sector provide data to State Offices, their frequency and type of data involved?

Q11. How do you act to ensure that you have a voice towards the decision-makers? Do you think that your representatives' participation on Basin Councils is enough for it?

Q12. How frequent are the Basin Councils reunions?

Q13. Have your urgent claims been attended by the managers?

Q14. What are the subsectors of farmers? Are they given equal consideration?

Q15. Do you think that there are some issues on your sector that are not yet fulfilled and which are urgent to fulfil? If the answer is yes, which are they? Are they for the whole sector or for some sub sectors?

Q16. Have your sector already be directly consulted along with other different sectors on the same meeting?

Q17. Do you think that there are other economic sectors whose concerns are more easily considered by decision-makers? If the answer is yes, why does it happen in your point of view?