Revista de Direito da Cidade vol. 10, nº 1. ISSN 2317-7721
DOI: 10.12957/rdc.2018.31082

PARTICIPATORY RIVER RESTORATION PROJECTS: A TOOL FOR BETTER WATER MANAGEMENT

PROJETOS DE RESTAURAÇÃO FLUVIAL PARTICIPATIVOS: UMA FERRAMENTA PARA MELHOR GESTÃO DAS ÁGUA

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Abstract
The current condition of rivers with loss of biodiversity leads to the search for alternatives to restore these ecosystems. This work aimed to investigate if rivers restoration is conducted in Portugal participatory way involving stakeholders, as recommended by the European Union Water Framework Directive and if has an influence on people's perception of the river. Thus, the investigation were development through field visit, interviews with the technicians of municipalities involved in the revitalization of rivers, consulting the specific literature of the theme, elaboration and application of questionnaire to the stakeholders, verifying their perceptions about the river and its participation degree in projects, as well as the development of qualitative and quantitative character analyzes. It can be concluded that for the example studied, restoration projects have not been built collectively, resulting in a lack of knowledge of the population and consequent neglect with the river, demonstrating poverty of social capital. The analysis of the results obtained in this research reveals the importance of Portugal to review its water management procedure, including more participatory processes throughout its territory, causing municipalities to develop mechanisms for stakeholder involvement.

Keywords: Management; Public Participation, River Restoration, Share Capital; Stakeholders

Resumo
A condição atual dos rios com perda de biodiversidade leva à busca de alternativas para restaurar esses ecossistemas. Este trabalho teve como objetivo investigar se a restauração dos rios é conduzida em Portugal de forma participativa envolvendo partes interessadas, conforme recomendado pelas Diretrizes do Panorama de Água da União Européia e se tem influência na percepção das pessoas sobre o rio. Assim, a investigação foi desenvolvida por meio de visita de campo, entrevistas com os técnicos dos municípios envolvidos na revitalização dos rios, consultando a literatura específica do tema, elaboração e aplicação de questionário às partes interessadas, verificando suas percepções sobre o rio e seu grau de participação em projetos, bem como o desenvolvimento de análises de caráter qualitativo e quantitativo. Pode-se concluir que, para o exemplo estudado, os projetos de restauração não foram construídos coletivamente, resultando em falta de conhecimento da população e consequente negligência

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DOI: 10.12957/rdc.2018.31082

com o rio, demonstrando a pobreza do capital social. A análise dos resultados obtidos nesta pesquisa revela a urgência de uma proposta de revisão dos procedimentos de gerenciamento de água, incluindo processos mais participativos em todo o seu território, fazendo com que os municípios desenvolvam mecanismos para o envolvimento das partes interessadas.

Palavras-chave: Gestão; Participação Pública, Restauração de Rios, Capital Social; Stakeholders

INTRODUCTION

The current scenario of ecosystem degradation due to the deteriorated ecological status of the rivers, together with their consequent loss of biodiversity, leads to the need to seek alternatives to conserve and restore these ecosystems. Despite the significant advances in the control of pollution sources, rivers and streams continue to be contaminated due to the pressures exerted by human activities (PETTS, 1990, KARR and CHU 1999, TEIGA 2003, MOREIRA et al., 2004).

In the urban landscape, rivers and streams have been incorporated into the daily scenario of asphalt and concrete, either by regularization and channeling - with the consequent artificialization of the natural bed -, or by cutting the riparian vegetation and introduction of exotic species, and the other human activities that cause degradation.

In addition, the actions referred to negatively affect the relationship between human being and river, insofar as their essentiality is disregarded as an element of the nature necessary for life.

Thus, environmental concerns on the part of the public and the scientific community regarding the degradation of riverine systems have increased mainly in water management and the social implications associated with its restoration (SMITH and MERENLENDER, 2008).

In this sense, the advances in water resources management has evolved into more participatory approaches seeking a partnership between "the government, users and local communities balance between the technical requirements of the works [recovery of rivers] with social expectations of the population in general" (BONTEMPO et al., 2012, p. 4-5).

Hence, the research explores the challenges posed by sustainable development in the context of the implementation of the EU Water Framework Directive (WFD) with regard to the need for participatory processes to be included in water resource planning and management.

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As for river restoration, Coelho (2009, p. 1) mentions that it is necessary to "ensure that interventions promote the continuous improvement of the riverine system and not to economic interests such as real estate speculation."

According to Gameiro (2010, p. 2) "[...] it is important to create and disseminate case studies on restoration of riparian zones so that the tools and methodologies are replicated in similar cases".

The objective of this work, therefore, was to verify through the investigation in the Jamor river, how the river restoration is being conducted in Portugal, analyzing if the same occurs in a participatory way involving the stakeholders; if the population surrouding of the river feels contemplated with the projects; and whether the river restoration alters the society's perception of the river.

The purpose of this study was to evaluate the community's perception of the restoration project for the river Jamor, called the "*Eixo Verde Azul"*, developed jointly by three municipal councils: Oeiras, Sintra and Amadora.

Also, it was tried to verify if there was adhesion to the project by the people interested in the management of the river and if, in the vision of these, the project contemplates the needs of the local community and the users of the river.

Finally, it was sought to identify if it is possible to change people's perception of the river and, consequently, to influence their habits by means of restoration actions of water bodies.

METHODOLOGY

The research was developed consulting an already existing bibliography, as well as interviews with stakeholders and technicians from Oeiras City Council, involved in river revitalization projects.

As for the bibliographical research, by the teachings of Lakatos and Marconi (2003):

> "Bibliographical research, or secondary sources, covers all bibliographies already made public in relation to the topic of study, from individual publications, newsletters, newspapers, magazines, books, researches, monographs, theses, cartographic material, etc., to oral means of communication: radio, recordings on magnetic tape and audiovisual: films and television. Its purpose is to put the researcher in direct contact with everything that was written, said or filmed on a certain subject" (LAKATOS and MARCONI, 2003, p.183).

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The research will provide the accumulation of knowledge about the management and restoration of the Jamor river making it possible to extrapolate the results obtained here to other places.

Thus, the hypotheses that can be confirmed can be generalized to other populations or situations similar to those studied. For Bennett (2004, p. 19) this type of study has "[...] high levels of theoretical validity and the possibility of using random generalizations to construct more complex models of cause and effect." The author also highlights the importance of the ability to identify new hypotheses in the development of research.

Nevertheless, technical visits were made to the local, with observation about the conditions of the river in the section delimited for the study. It was traveled around seven kilometers, from the diversion of the natural channel of the river to the channel of the tiles in the garden of the Palace of Queluz, shortly before the administrative limit between the Municipalities of Oeiras and Sintra; until the river mouth in the locality of Cruz Quebrada, where it flows into the Tagus River.

For the development of the research, interview techniques were used to the residents / users of the region around the Jamor river, in order to collect their perceptions and verify the degree of involvement with issues related to the river.

For the interview with the technicians of the municipality the same categories of analysis were used, composed by the questionnaire applied to the stakeholders, however, we adapted the technical information that they could provide.

Regarding the use of qualitative research, we considered the positions of Triviños (1992) who understand “[...] the researcher does not stay at the margin of the investigated reality, being necessary to delve into its context to know its peculiarities and understand the meanings that the reality has for each one” (TRIVIÑOS, 1992, p. 13).

In this way, the data were collected through a semi-structured interview, that is, even having a set of predefined questions, the interviewees were given the freedom to point out other issues during the interview.

As it was found that the users of the upstream part of the river had a different profile from those downstream, different approaches were chosen. Stratified random samples were taken, considering that the studied populations were not totality homogeneous, which according to Manzato and Santos (2012) are those whose variable of interest presents a substantially different behavior, having, however, a fairly homogeneous behavior within each stratum.

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The sampling method was the probabilistic method, in which any member of the target population had a non-zero probability of being included in the sample.

In the upstream part of the river, where the stakeholders were characterized as water users - irrigators - the invitation to participate to the survey was made to the people present at the around the river during the technical visit.

In this interval of the river, the expectation would be to interview twenty people, who compose the local population, according to information obtained in the town hall of Oeiras. However, only 12 people found on site, and responses were obtained from seven, as five of them declined participation. The criterion used in this sampling was approach of one person every 100 meters.

The sports complex of Jamor, built 73 years ago, has the particularity of being accessible to everyone, from high profile sportsmen to ordinary citizens, offering sports, recreation and leisure. It is worth mentioning that the users of the sports park are characterized by the use of areas adjacent to the river, without making use of its waters.

The questionnaires were applied with people who passed by the river, crossing through to pedestrian bridge to enter the sports center.

For this approach, we remained on the bridge for four hours - two hours in the morning and another two in the afternoon - in order to cover the users of the site in the two periods, establishing the representativeness of the sample. In this section, of the 36 approaches, the interview was made with 14 people who became available to respond to the questionnaire. Here, the statistical criterion was adopted, of which, every two passers-by, the third one was approached and invited to participate in the research.

Regarding the issues surrounding ethics in research, in Portugal, the rule is to consult to the Ethics Committee only when there are doubts in matters related to research ethics (UNIVERSITY of LISBON, 2016, p. 9153).

For this reason, the present investigation was not submitted to the Ethics Council, since it was a research for public opinion in a broad sense, with unidentified participants and the data were verified statistically, according of the guidelines contained in Resolution n. 510 (BRASIL, 2016).

It should also be noted, this research was based on the rights of the people who participated, with informed consent, that is, the oral consent of the participants was requested, ensuring their understanding of the terms to be agreed, with voluntary participation and the

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possibility of quitting the interview and requesting changes to the terms agreed during the investigation, as well as the guarantee of preserving the anonymity.

The questions were synthesized in a questionnaire with eleven questions, merging open and closed questions, giving the interviewee a focus on the subject and, at the same time, leaving him the will to talk about his / her yearnings, perception and the outlook for the region after the works planned for the revitalization of the river.

The region of the Jamor river was chosen to carry out the investigation because this river is the object of future fluvial restoration intervention. Due to the difficulty of data availability by the public agencies of Portugal, investigation was limited to the part of the river inserted in Oeiras, one of the counties of which this river belongs because this municipal council contributed with the information, providing data of projects, interviews and technical accompaniment in the visit to the river.

The importance of this research lies in gathering information to contribute on the theme, especially with regard to the governmental projects related to the river restoration, encouraging professionals working in urban planning to construct urban environments more harmonious with the ecological concepts and that contemplate the expectations of the users of these public spaces. This goal can be achieved through the joint elaboration of restoration projects, allowing the shared management of water, a need that is corroborated by Ramalho (2007, p.111) statement that "[...] effective management depends on the involvement of communities, of an interdisciplinary team and mainly of the performance of the public power".

The role of public power in promoting public participation seems to be directly related to the success of the participatory process in the management of water resources.

> “The possibility of increasing society's power to participate in water governance is directly related to the exercise of political power, the more direct it is, the greater the democratic capacity of institutions, whose decisions will be closer to translating the genuine popular will” (BERRETA, 2013, p.77).

MANAGEMENT AND FLUVIAL RESTORATION

According to Teiga (2011) the protection and management of water resources in Portugal began with the publication of the Law of Dona Maria II (Law of July 9, 1849), evolving to the current Water Framework Directive of the European Union, dated October 23, 2000.

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The urban space is shaped by the tension between the environmental, political, economic, social and cultural areas, making the urban phenomenon quite complex. In this context, river restoration is a way of integrating the rivers into the urban landscape.

The conservation of aquatic ecosystems is a necessity that must become an engineering goal, since it means much more than a probable result (MITSCH and JORGENSEN, 2004). For this reason the restoration of aquatic ecosystems should occur through studies and shared projects of several areas of knowledge.

Thus, "engineering and ecology must be integrated into the conservation and restoration of ecosystems through a common approach" (GAMEIRO, 2010: 6).

This is a paradigm that will have to be overcome since the strand adopted by the sciences in the past in both developed and developing countries has been to control the functioning of ecosystems in an attempt to demonstrate their mastery over nature rather than seeking the harmony with it (WENDEL, 2009).

In this way, the ecological, hydrological and landscape values of the river ended up not being contemplated in the engineering projects, a decision also corroborated by economic questions.

So the intervention in rivers and on their banks is still the subject of discussions between those who have a more conservationist view and those who are purely technical (CARDOSO, 2017).

Therefore, the idea that has been diffused by academia in the past was that technology could solve everything, with the believing that conservation of nature and public participation in any management process is not necessary. However, the result was the progressive degradation of water quality and ecosystems.

In relation to this, Bouguerra (2005) points out that:

> “Contrary to what many people think, technique alone could not solve problems definitively, mainly because the success of a technology depends to a large extent on the attitude of the population itself, and how it integrates it into its projects” (BOUGUERRA, 2005, p. 133).

For a long time, the solution given by engineering to the urbanization problems was to regularize the river beds, so that the flows were sent downstream through the shortest path and with great flow velocity, usually waterproofing the margins. With this practice biodiversity was lost and floods intensified, causing great damage. (BINDER, 1998).

Although the European continent was spared major flood events in the 1990s, floods on the Douro and Mondego rivers in Portugal are becoming more frequent. In addition, other

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places along Portuguese territory are affected, which is why engineering projects are promoted that seek to minimize the problem, directing actions to control and mitigate the risk of floods. (SILVA, 2005).

Marques and Magalhaes Junior (2014, p.102) present a reflection on the "socio-environmental effects of structural interventions in urban watercourses", warning about "the municipal conflicts generated by the transfer of environmental liabilities between municipalities", which highlights the need for actions within the river basin.

Currently, there is agreement in the academic community that the best way is to respect the river channel and its floodplain, since the practices of rectification and occupation of the margins entail losses and, in some cases, transference of the problem to downstream. The current approach contemplates the preservation of the river banks and, when necessary their occupation, the buildings are that adapt to the floods.

According to Gameiro (2010):

> "[...] the allocation of rivers and streams increasingly involves the application of methods and techniques that aim at their renaturation and the conservation of their ecological and geomorphological functions, often through the removal of dams, meandering of water lines, stabilization of margins and rehabilitation of the riparian ecosystem. The renaturation of the rivers requires the creation of new concepts of hydraulic engineering, a new planning of the territorial occupation as well as the development and implementation of innovative methodologies and techniques applied to the restoration of ecosystems" (GAMEIRO, 2010, p. 6-7).

Cardoso (2017) points out that the rivers provide the elaboration of unique urbanistic projects:

> "The river elements are elements of great importance in this context of social, economic and spatial transformations. In addition to the importance of their environmental dynamics, they present a great potential for the constitution of singular urban spaces, valuing what is irreproducible and giving its own identity to a place" (CARDOSO, 2017, p. 27).

Therefore, the environmental management of river systems consists of defining strategies for their conservation and valorization, in an integrated perspective, adopting as a unit of management the river basins. Therefore, all the phenomena that occur within the basin should be considered when planning the land use within this space (PORTO and PORTO, 2008; SAFAVI et al, 2015).

Thus, it is necessary to take into account also the people who interact with the environment and can cause the success or failure of an intervention in the river. Current trends in planning, urban and environmental management are concerned with the creation of more

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democratic forms of management through the adoption of participative methodologies and practices. (COSTA et al, 2002).

In the area of urban planning it is common to consider the issues of collaboration and public participation in the creation of a city design.

> "The understanding of concepts such as space, landscape and place contribute to the construction of a qualified landscape, endowed with identity and ties with its users. As well as, the concepts of perception, sensitization and appropriation contribute to the preservation of the fluvial landscapes and to the expectations of these users. This process requires the participatory management" (RAMALHO, 2007, p. 100).

Kingston and Ravetz (2005, p.4) believe that information technology tools can provide a means to assist "planners, policymakers and citizens from different backgrounds to build consensus on the design and development of a place."

The authors defend the idea that the improvement of the regeneration process can be gauged by the way it involves the citizens: "An essential ingredient for improving the decision-making process is to improve the way citizens are included in decision-making process between and within governance structures" (HEALEY, 1997, UNECE, 1998 apud KINGSTON and RAVETZ, 2005, p. 4).

Kingston and Ravetz (2005) suggest the use of an "e-participation system to support and improve dialogue" between governance and population, but not as consultation and participation, but as a way of "informing focus on spatial planning and regeneration" (KINGSTON and RAVETZ, 2005, p. 13).

Riparian rivers and ecosystems have an intrinsic ecological value and are highly valued by the public. According to Gameiro (2010, p. 22) "The rehabilitation of riparian ecosystems must be integrated with the planning instruments, since it must be seen globally and not as an isolated and punctual intervention".

Still the same author refers to the indispensability of producing a scientific basis: "As the practice of river restoration increases, the need to develop a scientific basis is obvious, as evidenced by the numerous working groups and policy initiatives of governments, nongovernmental organizations and in terms of academic research" (GAMEIRO, 2010, p. 11-12).

In the conception of Cardoso (2017):

> "Even with the difficulty of overcoming the dominant culture, there are experiences of intervention projects in fluvial environments that establish a more harmonious relationship in urban and environmental issues, respecting the environmental dynamics and incorporating the fluvial environment in the morphology and urban landscape" (Cardoso, 2017, p. 29).

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Tippett et al (2007), in turn, mention the need for new planning methodologies, in what nature is treated as an integral part of the human settlements context, incorporating it into the urban landscape.

In this way, Wendel (2009) mentions that: "In most cities, despite the aesthetic and economic appeal about the presence of nature, it is noted that only some natural elements are valued, such as vegetation (transformed into a green area)". We still see great works that land or channel streams and rivers (WENDEL, 2009, p. 22).

It appears that despite the lack of rigorous scientific foundations and well-tested principles, restoration of rivers is one of the most important aspects of hydrological sciences (MALAKOFF, 2004, p. 939).

Marques and Magalhães Junior mention:

> "In proposing the transformation of the urban hydrographic axes into linear parks and leisure areas, these approaches defend the revitalization of urban spaces from the attraction that the waters exert. In this logic, only with social use can the urban environment be effectively revitalized" (MARQUES and MAGALHÃES JUNIOR, 2014, p.101).

Whether it is due to this premise or simply the obligation to comply with the WFD, the fact is that Portugal is seeking alternatives to restore the ecological balance of its rivers, which can be perfectly exemplified by the case study of Jamor river.

CASE STUDY: THE RIO JAMOR

The river Jamor is a tributary of the river Tagus that is 15.8 km long, begins in Serra da Carregueira and ends into the river Tagus, in the locality of Cruz Quebrada.

This river received several denominations over time, with sections denominated according to the locality where it pass. Nowadays, as already mentioned, it is called the river Jamor and its route covers the municipality of Oeiras, Amadora and Sintra. In the upper stretch, is still known as Belas river.

The case study focused on the stretch of the Jamor river inserted in the municipality of Oeiras, according to the area delimited by the red circle, which can be visualized in the map of Figure 1:

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Figure 1: Location of the study area

Source: http://gazetademiraflores.blogspot.pt/2016/11/eixo-verde-e-azul-o-projecto-e-as.html

Through a survey of the official websites of the Municipalities, included in the river basin of the river Jamor, there found himself a project that combines the efforts of three Chambers, in order to plan the river basin, including sharing investments for the restoration of Ribeira do Carenque and the river Jamor.

The project called "Eixo Verde Azul" realizes the connection of the three municipalities through the construction of an ecological axis contemplating the requalification and creation of new green spaces along the streams (Jamor river and its tributary river of the Carenque), from your begins, in Serra da Carregueira, crossing Belas and Queluz, to the mouth in the locality of Cruz Quebrada (CÂMARA MUNICIPAL OEIRAS, 2017). This project proposes the construction of a bicycle lane and a rain containment basin to regulate the flow and minimize the effects of floods in the Queluz Palace and downstream avoiding damages to the historical patrimony housed in him. This palace already was very affected by the floods, especially in year 2008.

In an interview with the technical team involved in the project to revitalize the Jamor river, by the Municipality of Oeiras, it was verified that there was no involvement of the community in the elaboration of the project, however they intend, before the beginning, accomplish the publicity campaign, informing the population about the importance of the interventions that will be carried out.

According to information provided in interview granted by the technical staff the project is being awaited by residents and users of the area of the Jamor river and public participation in Oeiras took place within the framework of the elaboration of the Strategic Plan Oeiras - 2015; when the priority interventions - many of which included in the "*Eixo Verde Azul*"

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Project - were discussed. In addition to the revitalization of the river, it is underway in the Oeiras Municipal Council, the project for minimizing the effects of floods near the river mouth.

PROFILE OF RIBEIRA DO JAMOR

A technical visit was made to the study site, which allowed the elaboration of a profile of the river Jamor, in the stretch of the tiles channel to river mouth, in the locality of Cruz Quebrada, recogniting of the main uses of water along the river during the path.

The technical visit to the tiles channel was begun in the garden of the Palace of Queluz (Figure 2).

Figure 2: Visit to the tile channel in the Palace of Queluz

Source: Photographed by the author, 2017.

This channel was built with the purpose of damming the river Jamor for recreational purposes of the royal family, who at the time practiced games and competitions in its waters. At present it is in a state of drought, remaining only a water line in the central channel.
After the tile channel the river remains rectified on the sides, however without the tile covering and, apparently, without the background coating, presenting dense vegetation in its channel.

The first stage of the technical visit was completed at the road A37 (IC 19) in the bridge where the waters of the Carenque river and the Jamor river meet. In this first section, it can be verified the river with silting, which can be visualized in the Figure 3:

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Figure 3: Jamor river at the junction with Carenque river

Source: Photographed by the author, 2017.

The bridge to the crossing of the river Jamor under the A37 (IC 19) is a vulnerable place for floods. In this place the extravasation of the river occurs, since its channel does not support the flow of its waters added to those of the Carenque river besides the high degree of sedimentation that aggravates the situation even more.

According to information obtained by interview with the technical staff of the Municipality of Oeiras, the "*Eixo Verde Azul*" Project contemplates the construction in of an upstream containment basin, but outside the administrative boundary of municipality of Oeiras.

In the section after the A37 road bridge, the river is bordered on one side by Queen's Road (N117), and on the other, by a closed forest, where there is no human activity and whose access to the river makes is difficult.

It was observed that along the stretch upstream of the river, between the Queluz palace and the Jamor Sports Complex, the use of space occurs through family farming activities, the river water being used for irrigation. There are several canalized diversions, diverting the waters from the river to the plantations. These practices require one municipality cadastre to know the flow used in the irrigation activity because for this activity the water of better quality is needed, as well as security as to the regularity of the flow.

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In the region where the river runs through the sports complex of Jamor, especially around the golf course, the river not visualized by the public that uses the place, being covered by vegetation of cane. Thus, it is clear that some form of intervention is necessary for its revitalization, inserting nooks to contemplate the landscape by the users of the place and planting of native species.

In the rest of the sports park of Jamor the river is rectified, being able to be seen the bottom and the remodeled margins with structure in gabion. However, there is not view focus given to the river so that it could be noticed by the users of the sports complex and, gradually, the people sensitize about the valorization and protection of the waters.

The river mouth of the Jamor lies on the Tagus River (Figure 4), which then flows into the sea. In this section, it was noticed that in the morning the Jamor river is practically dry and, in the afternoon, due to the reflux of the river Tagus, the channel is filled of water, which potentiates the contamination of the Jamor river in this place.

Figure 4: Final the Jamor river in place named Cruz Quebrada

Source: Photographed by the author, 2017.

It is worth noting the existence of the hydrometric station installed in the channel of the Jamor river, located outside the area of this study. Their data is made available on the website www.snirh.pt. This data are important why they assist in the management of floods downstream of the station.

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RESULTS AND DISCUSSION

From the bibliographic research it was verified that one of the major projects carried out to revitalize the Jamor river in the past decades was contracted through a public tender promoted by the Municipal Council, with the participation of professionals who would to decide on actions of revitalization without public consultation. This same project was responsible for the construction of a football stadium, which was well received by the population. However, it was found that no concrete action was taken to revitalize the river itself. Thus, the project in question, which had the primary objective of restoring the region of the river Jamor, totally neglected the river and its ecological function.

During the technical visit, several deposition of solid waste on the margins and in the river composed of construction waste, remnants of electrical and electronic and bags plastic were observed (Figure 5).

Figure 5: Waste deposited on the banks of the Jamor river

Source: Photographed by the author, 2017.

This show lack of care and negligence of the local population with the river. This attitude reflects the confusion that they make of the urban river concept, seeing as a transport channel of waste and not as an ecosystem endowed with environmental value.

Regarding the results of the interviews, the percentage of 62% of respondents stated that they lived in the area more than ten years ago.

Of the total number of respondents, 67% said they did not use river water for any purpose, 29% already used it for watering and 4% for other purposes.

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On the other hand, 71% would like to use river water for leisure, and 29% of respondents said they did not know whether or not to wanted river water use for another purpose other than irrigation.

Most interviewees in the upstream section want the removal of trees from the river banks because they believe they cause the river to overflow due to the "trash" trapped in roots on days of heavy rains. Analyzing this question, it is noticed that these interviewees did not understand that the problem are not the trees, but the dumped solid waste unduly in the rivers. Here the need for environmental education actions in this place is evident.

Among those interviewed, 81% said they did not know how the water quality is, even though they may have noticed that there has been some improvement in the last 20 years, mainly regarding the odor issue, after installing a sanitary network. Of the total number of respondents, 19% said they knew the water quality was not good.

Most of the interviewees thought that the priority action of the City Council should be the cleaning of the river.

On the other hand, but in the same sense, the majority of respondents reported that the City Council does not fulfill its promises of intervention in the region. However, when asked if they are aware of the project that be executed soon, 95% said they did not know about the content of the “Eixo Verde Azul” Project, demonstrating lack of interest in river management.

When asked if they would like to give the opinion on the project, contributing to the improvement of the river, 33% said they did not want to give their opinion, 43% answered that they would have opined and 24% said they did not know. This result serves as a warning about the lack of involvement and knowledge on the part of the local community with the issues related to the river and the need to create social capital to change this posture.

In this respect, participation must be considered as a complex process in response to full democracy, political maturity and citizenship, so "[...] Participation is also a decision of society: only occurs when there is real political will of leaders and, at the same time, the social groups perceive and accept that this is the best way to achieve the collective goals” (BERRETA, 2013, p. 24).

For this reason, it is necessary to create mechanisms for community involvement in local actions by the City Councils and better dissemination of information.

Among the suggestions of the interviewees to encourage the coexistence of people with the river, most cited the clearing of the margins and improved access to the river, followed by the promotion of public events on the margins.

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It is noticed that there is a lack of a process of identity on the part of the users of the area of the Jamor river, that would transform the region surrounding the river (its margins) in a place of coexistence and its waters would induce the contemplation of the landscape.

CONCLUSION

This article confirmed the need for Portugal to start a more effective movement to encourage the practice of social participation, especially in relation to water resources management, given the orientation of the European Union and, above all, for the formation of social capital.

It is important to emphasize Jacobi's (2006) position, previously cited, that it is not enough to legally guarantee to the population the right to participate in the management, establishing councils, public hearings, forums, among other methods of participation. For the author, the lack of interest and apathy of the population, in relation to public participation, are generalized since it is the result of the small development of their citizenship. (JACOBI, 2006 apud BERRETA, 2013).

So it was observed that the river restoration is being conducted in Portugal without the effective participation of the stakeholders. By means of an analysis of the answers to the interviews, it was evidenced that the population of the surroundings of the river does not feel contemplated by the projects of the Municipal Council, and they have limited understanding of the concepts of river management and restoration and they believe it is only the duty of the rulers to do something.

From the analysis of the results obtained in the interviews added to the observation of the conditions of the river along its course, it is noticed that there is not sufficient involvement of the population that uses the space and the waters of the river with the restoration project being developed by the municipal governments. The diverse accumulations of solid waste and the opinion of the local inhabitants against the existence of ciliary vegetation denote lack of knowledge of the population and neglect with the river.

It is concluded that, although the Green Blue project is innovative in considering the limit of the river basin and for join the action of three Municipal Chambers, it should have invested also in the inclusion of the population so that the same one became involved, feeling part of the process of transformation of the Jamor river. This would be a great step to leverage the process of public participation and creation of social capital in Portugal.

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DOI: 10.12957/rdc.2018.31082

It is perceived the need of the municipalities to take some measures, such as: to attract the community to the debate of the management of the rivers and to establish priorities, to take information to the stakeholders in a more accessible way, as by means the installation of water quality information boards and other information; carry out educational campaigns and environmental education actions to improve people's living in the floodplains of the river, recognizing this as a natural phenomenon; besides reinforcing the information on the correct disposal of the solid residues, avoiding of contamination of the waters due to its deposit in the banks of the river.

It is believed that the restoration of a river by itself cannot achieve all the results expected by the design without the involvement and appropriation of space by the community. The river restoration does not change the community's perception of the river if it does not build the jointly project with acquiring and exchanging knowledge with the technical staff. In this sense, Ramalho (2007, p. 112) points out: "[...] we have argued that in order to design the city it is necessary to exercise citizenship and that to improve the city it is necessary to invite its citizens."

The data obtained in this research indicate that the previous projects did not contemplate the river as an element of the landscape, which is evident when it is observed that the banks placed in the sports complex of the Jamor, lead their users to sit with their backs to the river (Figure 6).

Figure 6: Garden benches in the sports complex of Jamor

Source: Photographed by the author, 2017.

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DOI: 10.12957/rdc.2018.31082

As for the "Eixo Verde Azul" Project, joint planning and implementation among the three municipalities is a pioneering initiative, considering the river basin's limit and the totality of the river and not only its administrative limit and, in this sense, should serve as an example in projects futures. However, public participation should have been strengthened, which could be done without significant costs through information technology tools, as proposed by Kingston and Ravetz (2005).

It is suggested that the contemplation of the landscape, which demands smaller water quality, should be the stimulated use in the stretch of the sports complex, which is not currently being tapped.

Here a reflection on the words by Bouguerra (2005), mentioned previously, regarding the need of stakeholders involvement for the success of technology.

As long as we stand with our backs to the river, either because of a lack of knowledge or involvement, there is clearly a crisis of citizenship, which is characteristic of people living in a politically and socially disjointed community.

This citizenship can only be achieved by stimulating public participation, which in turn creates social capital. Through the case study of the Jamor river, we suggest the use of river restoration projects as a tool to support the management of water and to create social capital, associating the renaturation of water bodies with urbanization.Further studies on the influence of public participation on the success of river restoration projects are needed so that public policies encourage this type of participation.

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Trabalho enviado em 02 de novembro de 2017.
Aceito em 02 de dezembro de 2017.