The communication of the risk of coastal erosion in Portugal: a global problem, a local trouble

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Abstract: In the past two decades a set of instruments has been devised by the Portuguese authorities to handle the issue of coastal erosion. We argue that this legal apparatus not only lacks the internal integration necessary for its effectiveness, but it also fails to recognise the ways in which the problem materialises in the everyday life of coastal areas. Through a case study in the village of Furadouro in Western Portugal, we demonstrate how this top-down implementation of policies does not promote a true communication of risks, in the sense that the problem of coastal erosion is not "put in common" across levels of governance.

Keywords: coastal erosion, Dewey, regimes of engagement, risk, policy integration

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La communication du risque d'érosion des côtes au Portugal : un problème global, un trouble local

Résumé : Au cours des deux dernières décennies, les autorités portugaises ont conçu un ensemble d'instruments pour gérer le problème de l'érosion des côtes. Dans cet article nous analysons cet appart légal, en montrant comment il lui fait défaut l'intégration interne nécessaire à son efficacité. Ce qui est plus, il n'arrive pas

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à interagir avec la variété de manières que le problème a de se manifester dans la vie au quotidien des zones côtières. A partir d'un cas d'étude, nous allons discuter comment l'implémentation « par le haut » de ces mesures d'action publique n'arrive pas à promouvoir la construction d'un cadre partagé d'interprétation de l'érosion.

Mots-clés : érosion des côtes, Dewey, régimes d'engagement, risque

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In this article we discuss an approach to "environmental communication[1]" in which we perceive "communication" as the process by which meanings are shared and made common among interacting human beings engaged in a process of collective problem-solving or inquiry. According to Dewey (1927, p. 153), it is by way of communicating about events that a "general will and social consciousness" entailing a "community of interest and endeavour" takes shape.

Following this line of reasoning, we consider "environmental communication" as the social production of discursive and material conditions to define, share and act upon an environmental problem. To communicate an environmental problem is to put it in common - through discourses, instruments and practices - among partially overlapping and potentially inclusive circles of concerned actors (Pellizzoni, 2003). Communication, in this sense, is crucial to the existence of a "public" in Dewey's sense: "The public consists of all those who are affected by the indirect consequences of transactions to such an extent that it is deemed necessary to have those consequences systematically cared for" (1927, p. 245–246).

Through the case study of coastal erosion affecting the village of Furadouro in the western coast of Portugal, our aim is to point out some of the difficulties of effective communication of environmental problems. Our hypothesis is that these difficulties are related to the fact that coastal erosion, as many other environmental concerns, is defined as a public issue at different levels of territorial governance: supranational, national and local levels. As Jasanoff and Martello (2004) argue, environmental governance requires an effective engagement between the global and the local levels of action which, however, is often lacking. We argue that what changes across these levels is not just the actors that participate in the process and the conflicting interests they represent, but the ways in which the environment and its problems are framed cognitively and in practice.

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1 "Environmental communication" is generally understood as "the deliberate exchange of environmental information, knowledge, and even wisdom" (Flor, 2004, p. 4), aimed at changing attitudes toward environmental issues. It can take several different forms that range from unidirectional communication based on the information deficit model, to media-centred awareness-raising and socialisation, to the engagement of citizens in large-scale participatory processes involving social movements (Bulkeley, 2000; Brulle, 2010; Östman, 2014).

As pointed out by authors such as Porter (1995) and Scott (1998), the instruments supporting the territorial organisation of the modern State have evolved, as there has been a progressive standardization of the categories and tools of spatial representation they rely on (maps and set of quantitative data). This representation goes hand in hand with the simplification of the web of interdependencies accounting for the phenomena observable at the local level.

The progressive shift towards a global understanding of environmental problems has reinforced this tendency to govern the environment "at a distance" (Foucault, 2007; Rose & Miller, 2008). In this perspective, the specificities of the diverse localities and their environments should be translated and expressed through conventional frames, relying on general, standardised categories and models of explanation that guarantee the correct operation of instruments meant to assure forms of general coordination (territorial zoning, networks of infrastructures, etc.).

In these forms of top-down governing, quantification and measurement are key operations to define and represent environmental "goods" and "bads". The "logic of commensuration" (Espeland & Stevens, 1998; Desrosières, 1998), especially in terms of a balance between costs and benefits, is presented as the possible guiding rule supporting public decision. Basically, spatial inscription of society is reduced to a list of general and conventional functions provided by the material space, which is accordingly described as a resource.

However, if we come down to the local level, we observe that this space is, in fact, a place of everyday life for people[2]. Following Lefebvre (1991), everyday life is a plane of existence within which a wide range of interaction and sharing takes place. Everyday life points to a form of commonality that can be understood as a common ground of sense-making created through shared proximity and mutual frequentation. In the everyday life of a place, "familiar" modes of engagement (Thévenot, 2007) coexist with public frames of understanding, which can "commonise" cognition at increasing relational distance by relying on common references that are "objectified".

This means that when we adopt a perspective from everyday life we have to deal with the highest degree of variety of cognitive and moral registers mobilised by people to frame and to (e)valuate the surrounding social and material reality. This diversity of frames and registers produces diverse and often conflicting qualifications and assessments of what a problem is, what damage is, what goals should be pursued and, consequently, what is the right thing to do in a given situation (Centemeri, 2014).

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2 The debate on the difference between space and place is particularly advanced in geography and philosophy. We refer to Gieryn (2000) for a state of the art of the problem of place in sociology, and the implications of a sociological approach taking into account the "emplaced" nature of social phenomena.

While at the global (and national) level there are spaces "at risk" that must be managed, at the local level there are threatened places where people live. These places not only have physical features but they exist through meaning, memory and identity as well (Gieryn, 2000). While at the global (and national) level goals and means are defined according to highly general definitions of societal common goods, at the local level troubles and concerns, which are associated with personal and collective experiences of the place and its history, have to be incorporated into the definition of a shared goal. As pointed out by Joas (1996, p. 154), "the goals of action are usually relatively undefined, and only become more specific as a consequence of the decision to use particular means. Reciprocity of goals and means therefore signifies the interaction of the choice of means and the definition of goals". It is at the local level that this reciprocity of goals and means in public decision seems to us more clearly recognisable as crucial in accounting for the effectiveness of public action.

What we argue through the case study of Furadouro is that communication of an environmental problem is particularly demanding due to the need to articulate general international obligations with everyday life in the places where the problem is directly affecting people. Everyday life accounts for the specific ways in which the problem has emerged, is defined and can be dealt with locally.

More specifically, through the detailed analysis of the case of Furadouro, we will point out some obstacles that can account for the lack of effective articulation between the local and the global communication of the problem of coastal erosion. At the international and national levels, these difficulties rest on the intricacies of a top-down legal apparatus designed to ensure a formal complying of too general criteria whose aim is to tackle coastal erosion as a global problem (section 2). But they also lie in the specific characteristics of Furadouro as a place, considering its history and political culture. Its origins as a precarious extension of nearby traditional fishing towns, the shift in economic activities with the increase in beach tourism, and the partial suburbanisation of the settlement (Schmidt, Prista, Saraiva, O'Riordan & Gomes, 2013) account for the lack of a public concerned with coastal erosion (section 3 and 4). As this case study shows, by default, an active role of public institutions in prompting public participation and the existence of local cultural conditions to support the articulation between personal and public modes of framing a problematic situation are both crucial ingredients to devise solutions that assure the effective "integration"[3] of the various policies needed to effectively act upon an environmental problem (section 5).

[3] Integrated policies are policies that "cover a variety of sectorial interventions involving a range of actors, from local to global" (UN, 1992a).

1. The implementation of the Portuguese system of coastal erosion management: a formal and incongruous compliance with international norms

At the global level, the problem of coastal erosion is framed as one of the main risks associated with climate change (Haque & Burton, 2005). The first major document on climate change including coastal erosion is the United Nations Framework Convention on Climate Change (UN, 1992b). It was negotiated at the United Nations Conference on Environment and Development (UNCED), widely known as the "Earth Summit", held in Rio de Janeiro in June 1992. In this document, coastal erosion is referred to as a consequence of climate change national authorities should be accountable for.

In the framework of the IPCC (1992) assessment and forecasts for climate change, "the coast" is a category that allows one to draw borders on a map according to general principles that do not refer specifically to any coast in particular but to a coast "in general", a standard coast. The coast, including the risks from the impact of human activities on the climate, is thus regarded as manageable according to common methodologies to assess and reduce vulnerability, such as a standard call to share information between countries. These recommendations translate into the call for integrated policies, which is reinforced by Agenda 21 (UN, 1992a), the major outcome of this framework convention. It immediately prompted several initiatives and coordinated strategies at the European level, among which the Eurosion Project (European Commission, 2004), that uses the same type of general information.

The main result of the Portuguese compliance with international standards in coastal management was the creation of the POOCs (Shoreline Management Plans) in 1993. POOCs were the first legal instruments specifically aimed at regulating the preservation, qualification, risk management and uses of the coast and, more specifically, the beaches. These nine plans, one for each of the nine sections in which the coast was subdivided, have mandatory effects on all areas within a 500 metre strip inland from the shore (and a maritime strip up to 30 metres deep), with the exception of the zones under port administration. All uses and development of this specific stretch of territory are strictly regulated and municipal plans must conform to the POOCs. These plans, the first of which came into force in 1998 (POOC Sintra-Sado), were prepared under the coordination of the Water Management Institute (INAG) and in stretches of coast overlapping natural parks by the Nature Conservation Institute (ICN).

However, these POOCs do not materialise any real policy integration by themselves. Besides the exclusion of areas under port administration and the resulting lack of control over the effect that their interventions have on coastal dynamics (Dias, Ferreira & Ramos-Pereira, 2005), watershed management is not under the jurisdiction of the POOCs. Nevertheless, the consequences of watershed

management on sediment transport is one of the main issues these plans have to deal with (Dias, 1993; Veloso-Gomes, 2007). Since the first generation of POOCs came into effect, several legal initiatives have been taken in order to implement integrated policies on the coast and watersheds, namely the Water Law and the National Strategy for Integrated Coastal Zone Management (ENGIZC). However, a report issued by the National Council for the Environment and Sustainable Development in 2009 (CNADS, 2009) points out that this strategy lacks an adequate institutional framework in order to be effective.

One can see there is no integration in the fact that, on the one hand, local territorial management plans (PDM) were implemented several years before the first generation of POOCs was completed. As a result, when the POOCs came into force, many coastal areas they should have prevented from being urbanised were already urbanised or licensing rights had been acquired (Schmidt et al., 2013). On the other hand, the National Programme for Territorial Management Policies (PNPOT), which aims at integrating the POOCs and other sectorial and regional plans, was issued several years after the shoreline management plans. As a result, as many POOCs were not revised when they were due (10 years after coming into force), they still do not fully comply with the rest of the territorial management policies the PNPOT is supposed to coordinate. Moreover, Melo & Rodrigues (2010) draw attention to the fact that the additional damming of some rivers carried out by the recent National Programme for Dams with High Hydroelectric Potential (PNBEPH) encroaches on and collides with both the watershed management plans and the Water Law, which, albeit generically, intended to regulate sediment transport from river basins to the coast.

POOCs are the way by which the chaos of a specific part of the "unplanned" Portuguese territory (Baptista, 2011), namely the coastal areas, is made readable, apprehensible and comparable in accordance to the principles of "modern" international coastal management. But while they broadly contribute to respond to some of the formal and quantifiable requirements of tackling coastal erosion, the lack of a *de facto* integration in a comprehensive territorial management framework limits their effectiveness. Because of their isolation, the POOCs can thus be regarded as the expression not of a preventive or precautionary approach to environmental problems, as postulated in the general principles that inform these plans at the global level, but of modernity's pretension to rule the effects instead of governing the causes (Agamben, 2013).

2. A long term perspective on coastal erosion in Furadouro

One aspect that stands out when we observe coastal erosion at the local level is the web of interdependencies that account for the emergence of the problem in the first place, which are far more complex than simply climate change. While it has been demonstrated that rising ocean levels accelerates coastal erosion processes and

that the occurrence of a greater number of extreme weather events contributes to an increased release of energy on the coast (Dias et al., 2005), the problem of coastal erosion is amplified by other territorial dynamics as well.

The physical characteristics of the western Portuguese coast make it very prone to erosion. As an interface between land and ocean, the coast is a dynamic system in which there is substantial energy release. Coastal areas, especially when characterised by low-lying dune systems, are extremely mobile (Coelho, Silva, Veloso-Gomes & Taveira-Pinto, 2009). Human presence in the coast has therefore evolved throughout history by adjusting and accommodating to these particularly ever-changing environmental conditions.

Until the mid-20th century what is now defined by the planning instruments as the "coastal strip" was sparsely populated with mostly precarious constructions in some way related to fishing. The increase in tourism and construction industries led to a progressive urbanisation of these areas from the 1960s onward (Schmidt et al., 2013). Permanent structures, not adapted to coastline oscillations, were extensively build, first in the south (Algarve) and later in most of the Portuguese coast. One of the consequences of the urbanisation process is what Ramos-Pereira calls the "mobility-fixity paradox" (2008). This paradox is related to an increase in both the frequency and magnitude of coast oscillations, caused by the modification of the biophysical dynamics, the latter being a consequence of interventions meant to assure the "fixation" of coastal areas. This fixation, necessary for urban development, hastens the mobility of the area, thus subverting its own purpose.

There is consensus among scholars on the effects of coastal urbanisation on coastal erosion as it disturbs the dune systems formation and regeneration processes. In cliff areas, the load brought upon them by urban developments increased their instability. Another example of local anthropogenic interventions with a significant impact on the coastal strip was the construction of protection structures, mainly beach groins, ripraps and harbour breakwaters. While these interventions were aimed at stabilising the coast near human settlements and harbours, they also had the effect of causing the coastline to recede even more further down-drift from where they were implanted (Veloso-Gomes, 2007). These factors add to non-locally exerted action, such as the decreased sediment transport resulting from damming, as mentioned above.

The territory where Furadouro nowadays lies is a good example of the mobile nature of some sections of the Portuguese coast. Furadouro is a coastal settlement ("lugar" for "place" in Portuguese) in the municipality and civil parish of Ovar, some 25 km to the north of Aveiro, in Central Portugal. The oldest known references to this settlement date back to the late 1500s. It is described as an anchorage or a place where people were solely engaged in fishing-related activities, a description that persisted until the 19th century (Lamy, 2012; Vechina, 2011). As other

settlements that grew from temporary wooden facilities supporting fishing, the structures were mostly light and adapted to the mobility of a territory recently formed by accretion (Chaves, 2008). The area where Furadouro lies today was still in the open sea in the 12th century, some kilometres offshore (Dias et al., 2005). Inhabitants are well aware of the history of the place. There is a living memory of the progressive artificial fixation of the beach and a historical memory of how the sea always presented some sort of danger. That "the sea will eventually reclaim its place" is a sort of shared common saying.

One of the first serious incidents regarding coastline retreat recorded in Portugal happened precisely in Furadouro (1857). There were some extreme weather events during which some shacks and houses were destroyed by the sea, but several incidents occurred since then. In 1939, Furadouro's masonry chapel, built in 1766 to replace the former wooden one erected in 1759, was destroyed by the sea. In Espinho, some 15 km north from Furadouro, the persistence of sea water flooding prompted the first heavy engineering coastal defence implemented by the Portuguese state. The experimental works began in the late 1800s and a complete structure was finished in 1911 (Dias, 1993; Martins, Almeida & Pinho, 2009).

These settlements became more permanent, as coastal development was connected to the expansion of tourism and the suburbanisation of the coast, at the same time that the effects of the damming in the Douro watershed became more visible. In a 1966 fiction film, *Mudar de Vida* (Change of Life), directed by Paulo Rocha, Furadouro, where the action takes place, is portrayed as a territory in deep change. The advance of the sea and the poor income from fishing forced the main character to emigrate. There was a clear need for heavy protection against coastal retreat in Furadouro and a coastal defence was constructed in the early 1970s. It consisted of a longitudinal riprap and beach groins that have since been replaced by similar structures on different locations in the waterfront. Nowadays the shoreline in Furadouro is totally artificialized by such structures, and the south part of the beach, a space between two groins, has only a small portion of dry sand in its summer profile (Dias et al., 2005).

According to the shoreline management plan, Furadouro is categorised as a touristic and fishing settlement and was not included in the areas "under threat" by the sea within the time-span of the POOC (10 years), contrary to other coastal areas immediately to the north, where special actions were devised. Thus, no new interventions were planned and the ones already implemented fell in the "interventions to keep" category. However, in 1999 the Portuguese Water Institute classified that stretch of coast as a high risk area due to its history of intense coastal regression. In the case of Furadouro, an average of 8 metres per year of coast retreat was recorded during the 1984-1990 period (Pereira & Coelho, 2013). Serious incidents that lead to overtopping with subsequent flooding and destruction of street

furniture in the seafront promenade have become frequent from 2010 on, precisely at the end of the plan's validity, which nevertheless is still being revised.

Confronted with increasing damages, the local population has not actively mobilised and asked for prompt action adequate to an "under threat" area. There is no open and systematic local debate. The discussion about how to tackle coastal erosion occurs at the regional and national levels chiefly within the scientific community in terms that the local population regard as distant from their reality. In order to understand why, we have to further investigate the way in which coastal erosion is experienced in everyday life in this coastal area.

3. The limits of communication of coastal erosion and the lack of trust in collective action

Data from a questionnaire conducted by Pinho in 2006 (Pinho, 2008), before critical overtopping situations became frequent, showed that more than 90% of the population of Furadouro was aware of coastline retreat, with 73% of those considering this process to be very noticeable and 75.3% supporting the solution of coastal defence structures. The causes pointed out by the respondents were climate change and the rise of the sea level, but also coastal defence structures. Our interviews and observations largely confirm these results.[4] People in Furadouro are well aware of coastline retreat and of the global reasons accounting for it.

However, there is no sign of collective local action taking place in order for the population to participate in the definition of the measures to address this. In general, in the everyday life in Furadouro coastline retreat exists mainly as a source of personal "troubles" that do not turn into a public "issue"[5]. This means that familiar and individual ways of defining the problem are not articulated with more general concerns. There is no inquiry involving the inhabitants, experts, public and collective actors in order to define a shared frame of understanding of the problem.

For some actors, mainly the ones that are directly affected by wave overtopping and sand depletion, coastal erosion is an individual problem. For some surfers, for example, it is a problem because of the impact erosion has on the shape of the waves. The lack of sand poses problems in terms of profitability for business owners, who see the quantity of sand available for bathers reduced and the touristic

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[4] The field work in Furadouro consisted in ethnographic observation of life in the village and of the activities related to the coastal area. We stayed in Furadouro for two periods, in August and November 2013. 15 semi-structured interviews were carried out in November 2013 and in January 2014 to actors that fall into 4 categories: habitants who engage in some sort of coast-related activity; habitants with no direct connection to the sea; non-habitants who have a commercial interest in Furadouro; and institutional actors, like municipal officials and technicians, and environmental organizations representatives.

[5] The distinction between "trouble" and "issue" has been analysed by C.W. Mills (1954). This distinction provides a framework that distinguishes between problems that become of public concern and problems that remain of personal concern.

importance of the settlement at stake. They also share the concern with the safety of dwellers, for the lack of sand worsens overtopping incidents, with subsequent flooding and damage to property. For institutional actors, the problem is of a broader scope, also encompassing issues like the loss of territory and general environmental value.

The closer actors are to the experience of the problem of erosion in their everyday life, the more this problem seems to be perceived as their own personal problem. Of course, everybody is aware that their personal problem is part of a broader issue. However, they assume that it is a technical issue political actors should deal with, not inhabitants. A clear separation is established between the problem as it is experienced, which is considered as a personal problem, and the problem as a public issue that should be dealt with and solved by public actors. Like one of the inhabitants stated: "We're waiting for what they [the authorities] think they'll do. We always wait in expectation about what's going to happen."

Expectation for action from public authorities is intertwined with a substantial lack of information about the actual institutional actors in charge of managing coastal erosion risks - how they work, how they make decisions. Responsibility for coastal management is often wrongly ascribed by inhabitants to the municipal authority. Many, even some of those who refer to the Ministry of the Environment, also identified the Aveiro Port Authority as the public institution responsible for coastal management. This authority does in fact control fishing and beach concession licensing, but it doesn't otherwise manage the coast outside the strict limits of the harbour. Two business owners with beach concessions also stated or implied that the municipal authority "should lobby" on behalf of the settlement, even though they knew it couldn't intervene directly in coastal management.

There is a widespread critique of the ways in which public authorities are dealing with the problem, the main reason being the absence of serious intervention of coastal defence to protect Furadouro. Occasional and limited interventions in the existing structures of protection are ensured, but they are deemed insufficient by the inhabitants. The communication of concerns and critiques, however, is mostly limited to personal initiatives to speak to public officers and political representatives in informal situations. Business owners with beach concessions told us that they have talked about the problems of coastal erosion with institutional agents they happen to come across by chance. One of them also told us he addressed his father-in-law, an ex-municipal councilman, in an attempt to exert some pressure on local and national authorities. One surfer told us he talked to the chairman of the parish council because they had been schoolmates and he was his closest institutional actor. These examples show how, locally, the personalised contact to public representatives and officers is widely considered as the adequate way to bring problems to the attention of public institutions.

Another example is that of one dweller, who is also a business owner. She told us that she commented "in the air" in a store where she saw a councilman in charge of environmental and planning affairs. As for formal contacts with the city council, which she identified as accountable for coastal management, she told us they were useless. As a business owner, she had contacted that institution several times looking for a solution for non-coastal problems, but to no avail.

This last remark shows that public institutions are felt as distant and impermeable to requests coming from the bottom. This is the institutional history of this place, probably reminiscent of the 1926-1974 dictatorship (Rosas, 2012), and it is very important to explain what seems to be a fatalist approach to the relationship with public institutions. By fatalism we mean a mind-set in which democratic participation to public decision is considered as impossible and any effort of collective action meant to influence public institutions is considered as unrealistic.

We often came across this fatalism in our interviews and observations in Furadouro. For example, a bank fisherman told us about his concerns about the safety of the settlement, which is threatened by coastal erosion, criticizing public authorities for their inaction while stating that it was useless to ask them to intervene. He thus recounted that some years before he had presented a complaint to the authorities regarding the pollution on the sand dunes caused by a tractor, to no results or response. For him, "outsiders" would have to take action, for it was useless for "lower class people, such as the population of Furadouro", to approach "state institutions". A business owner who considered the city council to be accountable also gave up contact attempts altogether after having asked for logistical support concerning an event in which he was involved to no avail or even an answer.

Local officials confirmed the lack of organised demands for interventions on coastal erosion risk by the population of Furadouro. Some attribute this fact to what they defined as the individualistic culture of the place and others to the fact that local technicians are seen and approachable *in loco* by the population at any time. There is thus an agreement on the important role of informal contacts based on personal relationships between local authorities and citizens as source of communication about the coastal erosion risk. These unofficial means are in no way related to the "impersonal" instruments designed to "read" the territory "accurately" (Scott, 1998, p. 15) from afar.

A telling case of the way of communicating the problem of erosion in Furadouro is the sign saying "Cavacos' Beach" which appeared at the end of the Summer of 2013 in the south part of the beach. This sign is a reference to the name of the contractor in charge of "putting stones" every time a part of the riprap collapses. The sign shows a locally shared discontent which is not otherwise expressed in any organised and formal way. In fact, during our fieldwork we met several local actors who stated that the contractor, who was by then extending the riprap to the north

part of the beach, was the only one gaining anything with that precarious defence and that there was a lack of political will to build a "proper one". The presence of agents who carry out regular but small repair measures was the only manifestation of coastal management locals referred to.

The only attempt of local collective action on the issue of coastal erosion we found was a call for a demonstration by a surfer on a Facebook page in September 2013. He aimed at gathering the inhabitants and users of the beach in order to coordinate some kind of action to demand a solution for the lack of sand on the beach. This demonstration, however, was cancelled because in conversations between the organiser and other inhabitants prior to the event there was a disagreement on whether the issue of wave conditions for surf should be a central demand. For some of the inhabitants, full priority should be given to protecting the waterfront of the settlement. Fear of potential conflict prompted the cancellation of the event.

In general, during our fieldwork in Furadouro we were often confronted with situations of personal hard feelings between inhabitants that were presented as a reason for the unwillingness to start more coordinated action in order to alert public authorities to the local situation. We were also confronted with the lack of associative life in the village. Many reasons can help to understand the almost complete inexistence of collective actors in the village: the specific seasonality of village life, which is almost deserted during winter, except for Sundays, when people from the nearby inland towns come to the restaurants and coffee houses; the progressive erosion of traditional fishing activities; the difficult integration of migrants, especially from the ex-colonies; the important role of informality in the economy of the settlement that increases the general disaffection of some local groups with public actors.

The lack of a local inquiry on the problem of coastal erosion goes with a clear cut difference in the way in which institutional actors and inhabitants frame the problem. Public actors usually point out local, national and global causes for the problem, while inhabitants and users of the Furadouro coast do not follow such a clear pattern. Among those who claim to know the causes of erosion, all of them referred to the poorly engineered coastal defence of the settlement, while others also mentioned that nearby, up-drift seawalls and groins increase sand depletion. The rise of the sea level was also mentioned, sometimes related to "thaw", an allusion to the melting of polar ice caps. However, the damming of rivers and its influence on sediment transport, essential to natural beach replenishment, was only mentioned by institutional actors, and one of them even referred to the quantity of sediment that is estimated to be retained every year in the dams in the Douro watershed. Another one cited several scientific studies of the Portuguese coast as sources of information on that particular subject. However, this data is not communicated to the local population.

Institutional actors also show a sort of uncertainty as to how to solve the problem. For all of them, it is a complex problem for which science has only provided tentative solutions. On the contrary, local actors focused on personal experience as a source of information about possible solutions. Several actors, namely fishermen and surfers, told us they disapprove of how the groins in Furadouro were built and suggested alternatives for how and where those structures should have been placed instead, citing their knowledge of the sea and coastal dynamics as the basis for their assessment. Their solution involves some kind of heavy coastal defence that prevents the urban environment from being affected. "Having been to Espinho" is cited by several actors as a source of information about the subject. In fact, after a concrete coastal defence was built in 1982 (Dias, 1993), Espinho regained some sand and overtopping ceased to be a serious problem. Moreover, by living down-drift of Espinho, some actors consider they have been negatively affected by that coastal defence: "Here, they only put stones" is an exemplary and recurrent statement about the more rudimentary coastal defence of Furadouro.

This leads to a situation in which inhabitants of Furadouro consider that they should not care about the effects of their coastal defence on other coastal areas. Others, some inhabitants say, didn't care for Furadouro when the decision of building an up-drift coastal defence was taken. In contrast, for institutional actors, all technical action on the coast should be viewed within the scope of integrated policies, taking into account a variety of "common goods" to be preserved. But the construction of such a shared frame is quite distant from the observed reality.

This lack of coordination and communication is confirmed once again when observing the responses to extreme events that hit the coast of Furadouro. The inhabitants are confronted with widespread flooding and some extensive damage to public and private property on the seafront, which had to be temporarily cordoned off several times from 2010 onward. During these events, inhabitants and business owners have taken adaptive measures, such as installing makeshift flood barriers in doors, covering the shop fronts with wooden boards and removing furniture from the restaurant terraces. But these measures were always referred to as individual. These occurrences have not generated coordinated action among inhabitants and with public authorities. For institutional actors, the issue must be solved within the scope of regional and national planning policies or even international environmental awareness programmes. Once again, the envisaged solution is seen as top-down and as coming from "outside".

4. Accounting for the lack of a public for coastal erosion

Coastal erosion in Furadouro shows how far we are from the objective of a global governance of environmental problems that accommodates local differences, while creating institutions that transcend localism. In this article, we analysed how

difficult it is to articulate the local with the global from the vantage point of environmental communication in its relation to the constitution of a public in Dewey's sense.

We underlined how international and national institutions define instruments and tools of environmental management informed by a top-down view of the environment as a space, thus detached from any knowledge of the actual places they are meant to regulate, with their specific ways to define and deal with environmental problems. This accounts for the creation of a formally rational and coherent multi-scale frame of environmental management which relies on the transmission of information to a public, this latter perceived simply as an *audience* and not as a collective agent engaged in a problem-solving activity.

The case-study of Furadouro shows some of the consequences of designing and implementing environmental regulation and communication this way. At the local level, environmental problems are framed as personal troubles with a vague relation to more general, "distant" issues, whose existence is known mainly through the media. What is experienced on an everyday basis as concerns is not considered as a starting point to an inquiry which would include inhabitants, experts, grassroots groups, NGOs, and public institutions. Personal and local concerns are not considered as the possible starting point for a collective exploration of reasonable solutions to shared problems. On the one hand, in the complex web of instruments imposed on the territory from above there is not a clear role for local actors. On the other hand, the specific history and political culture of Furadouro account for the difficulty observed in the building of a collective cause from many disperse and individualised troubles. The kind of local "egoism" we were confronted with in Furadouro is a by-product of the lack of active engagement of public institutions with local communities in communicating – in the sense of creating the conditions to "put in common" – the problem of coastal erosion. Therefore, the ineffective communication in Furadouro is not only the result of a top-down design of incongruous instruments to tackle coastal erosion, but also a reflection of a local culture in which public institutions have been historically experienced as distant and inaccessible, while at the same time omnipresent. For instance, they are constantly repairing the coastal defence, about which the local population was never consulted.

Inhabitants are somewhat trapped between the "untameable" sea and the discretionary state, which is distant but present in ways that cannot be influenced or modified through collective action. Fatalism is thus shown as the product of this experience of ineffectiveness of collective action confronted with overhanging entities that are sources both of threats and of protection. On the one hand, inhabitants are not involved in organised forms of action and mobilisation related to the issue of coastal erosion, or other purposes. On the other hand, the state does not provide mechanisms to promote the participation of citizens or the incorporation of local knowledge into national instruments. Similarly, expert knowledge is not easily

accessible to citizens, since it is usually conveyed in formal events like conferences and requires understanding technical jargon. Institutional actors have direct access to the political and scientific sources of intervention on the coast, but they do not actively promote its communication at the local level, with which they only establish sporadic and informal contact.

The lack of participation in public decision-making is a problem well documented in several policy fields in Portugal and it is especially crucial in cases of environmental controversy (Nunes & Matias, 2003; Delicado, Schmidt, Guerreiro & Gomes, 2012; Ferreiro, Gonçalves & Costa, 2013). Coastal erosion is not an exception. As a result, risk communication, by being imposed top-down and publicly undisputed, is reduced to a mere "risk information" directed towards an audience to be educated. This kind of environmental communication fails to create the conditions for the "uneasy alchemy" (Allen, 2003) involving the diversity of concerned actors in a common effort of inquiry. These "hybrid forums" (Callon, Lascoumes & Barthe, 2001) are necessary in order to deal with the epistemic and normative complexity and uncertainty of the current environmental problems. Hence, a public is a necessary condition to articulate effectively and democratically the existing tensions between the levels of governance at stake in managing environmental problems and, horizontally, between the different policy fields that have an impact on the environment.

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