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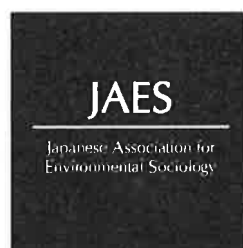
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Environmental problems in Portugal

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Introduction

In recent years, pressing environmental problems of a global nature, such as climate change, have somewhat overshadowed local environmental issues. But even global problems have their more severe impacts at the local level and traditional hazards, such as pollution or threats to ecosystems, are far from solved. And even though global governance is necessary to tackle the most serious challenges, which transverse national boundaries, the way countries address environmental problems in their territories is still crucial. And sociological research plays a very important part in this.

Environmental sociology in Portugal is fairly recent and still very much a niche field in the social sciences. Although Mansinho and Schmidt (1994) can trace its antecedents to the rural studies in the late 19th century, it is only in the 1990s that the first publications of a solid sociological nature emerge. Some of these studies were commissioned and funded by the government agency in charge of environmental issues and conducted by Observa Observatory of Environment and Society, a joint venture of two universities in Lisbon (one of which offered the first courses in environmental sociology in the country) (Machado, 2009). Others were carried out by the Social Ecology Group at the National Laboratory of Civil Engineering (LNEC), a government research institution tasked with the mission of performing "public interest research" (Craveiro and Machado, 1996). Although other smaller research groups emerged in universities throughout the country, the environmental sociology section of the Portuguese Sociological Association has still only a few dozen members, many of whom students.

In order to identify the most significant environmental problems in Portugal, several different sources can be used. On the one hand, public opinion surveys can give an indication of which problems most concern the citizens and how these have evolved over time. On the other hand, media coverage of environmental problems are also an indicator of their significance (Schmidt, 2003; Figueiredo and Fidelis, 2003), even though the media tends to be selective (some problems tend to be highlighted whereas others are neglected in news articles) and this in turn contributes to influence public opinion. In Portugal, a particularly relevant source is the collection of news articles and opinion columns written by L. Schmidt (who is also the leading environmental sociologist in Portugal) since 1980 in the weekly newspaper *Expresso*, brought together in a series of books (Schmidt 1993, 1999, 2007). A third type of source can be the analysis of environmental policies and legislation (Mansinho and Schmidt, 1994; Schmidt, 2008), as an indicator of government concern and acknowledgement of the need for intervention in particular issues. However, since in Portugal environmental policies are strongly dependent on European guidelines and directives, it is difficult to ascertain the role particular environmental problems play.

Public opinion on environmental problems in Portugal

For the purpose of this paper, we will focus our attention on public opinion surveys, which are relatively recent in Portugal. Since the country's adhesion to the European Community in 1986, Portugal has been included in Eurobarometer surveys, which frequently deal with environmental issues. A recently published chapter (Valente and Ferreira, 2014) assessed the responses to the questions regarding the most pressing environmental problems (see Tables 1 and 2). Since Eurobarometer

questionnaires tend to change periodically, it is not possible to analyse complete time series. However, it is possible to see that in the 1980s and 1990s citizens were concerned the most with chemicals released by factories, garbage and sewers (Table 1). This predated the European environmental regulations that placed more stringent controls over industrial activities and the strong investment the country made in waste and sewer management (Schmidt, 2003; Valente, 2013; Pato, 2007).

In the first decade of the 21st century (Table 2) it is noticeable a rise in anxieties over pollution, both water and air. Waste remains a concern and natural and anthropic disasters worry close to a third of the respondents. However, it should also be mentioned that over this decade most of these figures were decreasing (except for concerns with waste increase), which is probably due to a perception of more effective environmental policies, both at the national and European level.

Two national surveys conducted in 1998 and 2000 by Observa Observatory of Environment and Society (Almeida, 2000 and 2004) shows quite similar results. In 1998, when asked in an open question which environmental problems worried them the most, respondents mentioned car pollution first (18%), followed by noise (16%), pollution in general (15%), air pollution (15%) and garbage (12%) (Schmidt et al., 2000). In 2000, when asked which environmental problems most affected them personally, in

Table 1. Problems associated with environmental damage, in Portugal, 1986-1997 (%)

	1986	1992	1997
Factories releasing chemical products	53	67	67
Garbage in the streets, green spaces of beaches	56	37	53
Sewers		28	44
Oil spills in the sea and coasts	24	39	38
Industrial waste	21	35	38
Air pollution (cars)	27	31	26
Global pollution (tropical forests, greenhouse effect, ozone layer destruction)		47	23
Nuclear waste storage		31	20
Acid rain	5	16	9
Noise (construction, traffic, airport)	13	11	7

Source: Eurobarometers 25(1986), 43.1 (1992) and 47 (1997), in Valente and Ferreira 2014: 47

Table 2. Environmental problems that concern the Portuguese the most, 2005-2011 (%)

	2005	2008	2011
Water pollution (oceans, rivers, lakes, groundwater)	57	46	39
Air pollution	55	49	39
Waste increase	22	22	32
Natural disasters	27	34	32
Man-made disasters	48	49	30
Natural resources depletion	25	25	28
Climate change	41	54	27
Impact of chemicals in health	27	28	21
Loss of biodiversity	24	24	17
Farming pollution	31	18	16
Urban problems	18	11	14
GMOs in agriculture	17	13	13
Consumption habits	11	8	11
Transport impacts	6	5	9
Noise pollution	12	9	8

Source: Eurobarometers 66.2(2005), 68.2 (2008) and 75.2 (2011), in Valente and Ferreira 2014: 48

their daily life, respondents referred air pollution (29%), noise (18%), garbage (14%) and urban chaos (10%) (Schmidt et al., 2004: 91). A later survey on environmental risks, also by Observa (Delicado and Gonçalves, 2007), presents a somewhat different picture. Asked to assess a list of risks in Portugal, the respondents show that they are more concerned with water, food and air contamination, but also forest fires (it should be noted, however, the survey was applied at the beginning of summer, when this problem becomes more critical), a nuclear accident (even though Portugal does not have nuclear power, Spain does and several plants are close to the border) and industrial waste.

In 2008, as part of the European Values Survey, a set of questions concerning the environment were included in the Portuguese questionnaire, among them one concerning the most serious environmental problems (Table 3). Again air pollution was chosen by half the sample and deforestation (closely associated with forest fires), climate change and water issues by a third of respondents.

Finally, two years later, the International Social Survey Programme (in which Portugal also participates) included a batch of questions on environmental issues. Once again, air pollution tops the list of important environmental problems, but for the first time resource depletion harnesses a significant number of answers, followed by water pollution and shortage and climate change (Table 4).

Thus, we can identify the most significant environmental problems that have caused concern among the Portuguese population over the last few decades. However, not all of these problems have received a similar attention from sociologists. As mentioned above, environmental sociology in Portugal is still a small field, with a handful of researchers. On the one hand, some issues seem to raise more scientific interest than others. On the other hand, other criteria, such as funding opportunities, publication strategies, personal choices, also play a role in the selection of research themes.

We will focus thus on four major issues: water pollution, air pollution, urban waste, and forest fires. This leaves out other relevant problems, such as climate change, but a recent review article charts the research on this issue in Portugal in various fields, including the social sciences (Carvalho et al., 2014).

Table 3. Most serious environmental problems (choice of three), 2008 (%)

Air pollution	50
Deforestation	35
Climate change	34
Shortage of drinking water	32
Rivers, lakes and water reservoirs' pollution	31
Ocean pollution	20
Endangered animal and plant species	14
Excess of waste production	14
Industrial contamination	11
Nuclear contamination	8
Desertification	7
Shortage of energy	7
Soil pollution	7
Increase of world pollution	6
Unplanned urban growth	4

Source: EVS (2010): European Values Study 2008: Portugal (EVS 2008). GESIS Data Archive, Cologne. ZA4757 Data file Version 1.1.0, doi:10.4232/1.10154.

Table 4. Most important environmental problem for Portugal, 2010 (%)

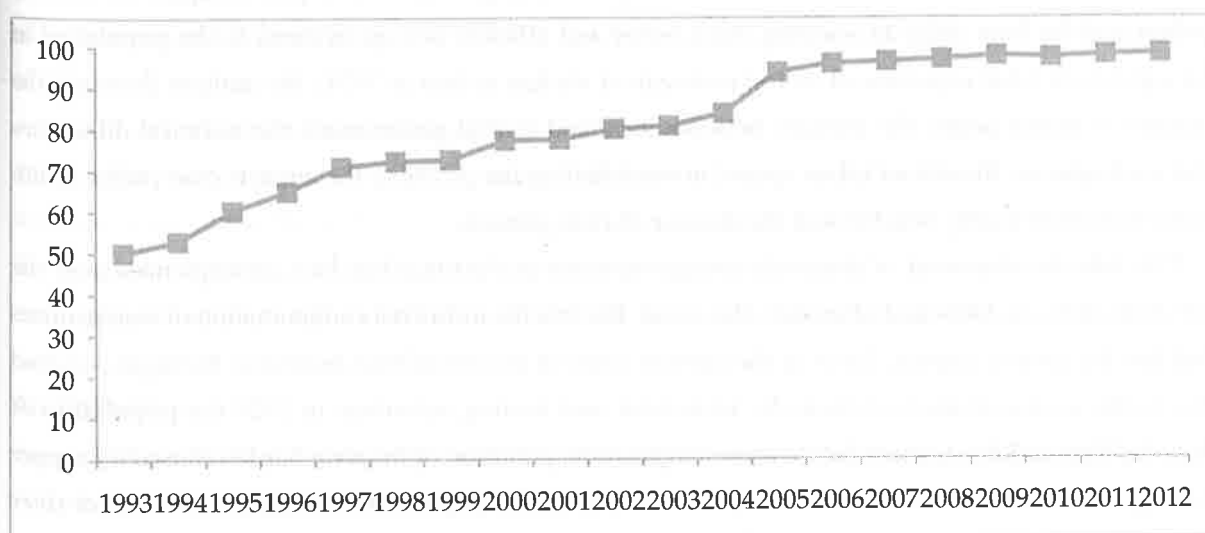
Air pollution	26
Using up our natural resources	16
Water pollution	16
Water shortage	12
Climate change	9
Chemicals and pesticides	7
Domestic waste disposal	6
GMO food	4
Nuclear waste	4

Source: ISSP Research Group (2012): International Social Survey Programme: Environment III - ISSP 2010. GESIS Data Archive, Cologne. ZA5500 Data file Version 2.0.0, doi:10.4232/1.11418

Water pollution

The fears concerning water pollution evidenced by the Portuguese population in opinion surveys are quite justified, since only about 50% of tap water was deemed safe for human consumption (Figure 1) and about 80% of the population was served by public water supply systems and 60% by sewage systems (Figure 2) in the early 1990s. However, great improvements were made in the following two decades and these numbers have increased to 98%, 95% and 84% respectively. Waste water treatment plants now cover about 74% of the population, a major contributor to lessen the pollution of rivers, lakes, groundwater and the ocean. It should be noted that the huge financial investment needed for these infrastructures was only possible through structural funds from the European Union.

Sociological work on water issues has given a good account of this evolution. J. Pato's (2007) PhD thesis on the value of water as a public good provides an in-depth analysis of public policies concerning water between 1848 and 2005, encompassing its economic use (in agriculture, energy, dams and harbours), social needs (supply systems, sewage) and environmental problems (pollution, quality of water, scarcity, floods, droughts). The author builds a sophisticated theoretical framework that combines law and economics theories of public goods, Hajer's (2003) proposals on governance and

**Figure 1.** Safe water for human consumption in Portugal, 1993-2012 (%)

Source: PORDATA, ERSAR/MAMAOT

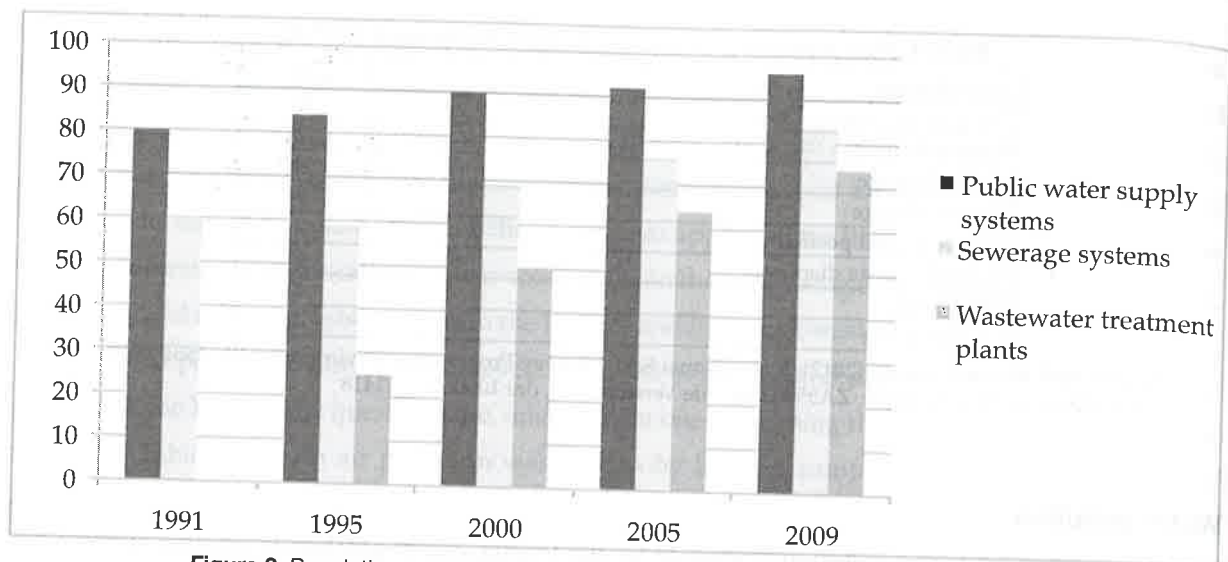


Figure 2. Population connected to public water supply systems, sewerage systems and wastewater treatment plants in Portugal, 1991-2009 (%)
Source: PORDATA, INE, INAG/MAMAOT

the rise of the sustainability paradigm, in response to the "tragedy of the commons" (Hardin, 1968). However, the author finds that actual policy practice in Portugal finds little match in notions of "common good". Up until 1975 (the year after the revolution that ended a four decade-old dictatorial regime and the transition to democracy) policies were driven mostly by economic concerns and only after this period by social justice and environmental protection aims (guaranteeing the population access to clean tap water and efficient sewage infrastructure, protecting water systems from pollution). But even these improvements were marred by difficulties and inefficiencies in public administration. On a later work, Pato (2013) defines this as a transition from a "hydraulic paradigm" (water as economic resource, hydraulics as a techno-scientific domain, public policies focused on infrastructure) to "late modernity" (public policies focused on an efficient, sustainable and socially fair management of water).

Schmidt et al. (2011) analyse the urban water conflicts in Lisbon between 1856 and 2006, relying mainly on administrative sources and media analysis. Tracing the history of public supply of water to Lisbon and the long delay in assuring clean water and efficient sewage systems to the population of the capital city (that experienced its last outbreak of cholera as late as 1974), the authors draw out the changes in public policy, the tensions between local and central government, the technical difficulties and inadequacies, the role of urban sprawl in exacerbating the problem, the impacts over public health and pollution of nearby beaches and the absence of civic protests.

This late development of domestic sewage systems in Portugal has had consequences over the pollution of rivers, lakes and ultimately the ocean. But it is the industrial contamination of watercourses that has the greater impact. Some of the earliest cases of environmental protest in Portugal occurred due to the contamination of rivers by industrial and mining activities: in 1924 the population of Águeda, Rios and Frasqueiros held a protest against the pollution of the river Sardão caused by copper mining at Talhadas; in 1957, after the death of a miller, the population living on the banks of river Alviela signed a petition and sent it to the President of the Council (Prime Minister), protesting against the pollution caused by the tanneries, giving rise to the creation of CLAPA ---Anti-Pollution Fight

Committee--- Popular Ecological Association, the first environmental grassroots movement.

One of the most enduring problems in this domain is the contamination of the river Lis (150 km north of Lisbon), and in particular its poetically named affluent "brook of miracles", by sewage from pig farms (even though other industries in the region are also sources of pollution, such as abattoirs, tanneries, distilleries, olive oil presses). This type of agroindustry is heavily concentrated in this region and is one of the major sources of revenue for the local economy. The problem became more serious since the 1990s, when small family holdings were replaced by medium-sized industrial farms, many of them illegal and without proper sewage systems (Ferreira, 2012). The large number and dispersion of these farms made it very difficult for the authorities to perform the necessary inspections, leading to recurrent episodes of sewage spills into the river (causing foul smells in populated areas, the death of large amounts of fish, contamination of tap water, the interdiction of beaches at the mouth of the river) whose culprits are seldom identified and fined. Local populations, supported by municipal authorities, conducted a string of very vocal protests (including demonstrations, petitions, official complaints, press releases), local ENGOs were created to give more visibility and structure to these actions, politicians recurrently visited the site and made promises to solve the problem. The problem was eventually solved with the construction of wastewater treatment plants by the association of pig industries and more rigorous inspections that lead even to prison sentences. However, the constructions of these treatment plants also caused some local protests against their siting.

This controversy was first analysed in an *Observa* report (Garcia et al., 1999), but a recent PhD thesis in sociology (Ferreira, 2012) offers a very detailed account of this case, focusing particularly on the media coverage and representations of the problem and on the social movement around it, framed by an analysis of the public policies concerning sewage systems in Portugal. The author combines theoretical contributions from the New Environmental Paradigm (Catton and Dunlap, 1980), the Theory of Ecological Modernisation (Mol and Sonnenfeld, 2000; Mol 2010) and several explanatory models on how environmental problems become social problems: public arenas (Hilgartner and Bosk, 1988), the role of the media (Yearley, 1992; Hannigan, 2002; Gamson and Wolfsfeld, 1993), and the role of social movements (Dietz et al., 1989; Oliver and Maney, 2000; Schnaiberg and Gould, 1994; Mertig et al., 2002).

In a costal country, ocean pollution is of course a concern. There have been a few significant oil spillages in the sea in Leixões (1975), Sines (1989), Porto Santo (1990) and Figueira da Foz (1994), but they were not subjected to sociological analysis, other than Schmidt's (2003) examination of the television coverage of these events, very much oriented towards the minimization of their environmental impacts and awarding more relevance to their economic consequences.

Air pollution

Air pollution has not experienced such a favourable evolution in the past decades in Portugal. Although carbon monoxide emissions have declined sharply since the mid-1990s (Figure 3), as a result mainly of banning leaded fuels in 1999 and incentives for replacing older cars with newer, less polluting ones, the reduction in other acidifying gases (nitrogen oxides, sulphur oxides and ammonia)

and gases responsible for photochemical pollution (non-methane volatile organic compounds) has been less substantive. More stringent controls on industrial emissions have had some results, but the problem is still far from being resolved: in 2006 and 2013 an ENGO lodged complaints with the European Commission against the Portuguese government for regularly surpassing the daily limits of airborne coarse particles.

The EuroLifeNet programme, which aimed to test a participative methodology for monitoring personal exposure to particles and to raise environmental awareness and participation among high school students, included a survey of participants for assessing the impact of this initiative over values and attitudes (Gonçalves et al., 2007). This survey drew inspiration from the New Environmental Paradigm proposed by R. Dunlap (see Catton and Dunlap, 1980; Dunlap et al, 2000; Dunlap and Marshall, 2007), using some items of the NEP scale. The results show that participation in this programme did exert some influence over students' environmental values.

Also based on a survey, the sociological task of the RISKAR-LX project (a natural sciences research on risk assessment of air pollution in Lisbon) aimed to gauge the opinions, perceptions and air quality and pollution assessment of residents in the city, including also questions on other environmental problems, daily movements, sources of information, impacts over health and quality of life, regulation and control of pollution (Schmidt and Guerra, 2013). This study did not follow an explicit theoretical framework, though drawing some contributions from the literature on risk and modernity (Beck, 1992; Giddens, 1990) and environmental justice (Agyeman et al., 2002) for explaining some of the results.

Regarding industrial sources of air pollution, several studies should be mentioned. Funded by the European programme LIFE, Sinesbioar (Implementation of a multidisciplinary tool for the evaluation and management of air quality, and the social impacts in the region of Sines) was a multidisciplinary research project, conducted between 2002 and 2004, which involved academic teams from the natural and social sciences, regional authorities and local industries. Focusing on a region affected by air pollution from petrochemical and coal power plants (Sines, in the south-western coast of Portugal), the project comprised the implementation of a network to monitor the quality of the air with physical and bio monitoring devices, the identification of areas of risk and quantification of the risk for humans

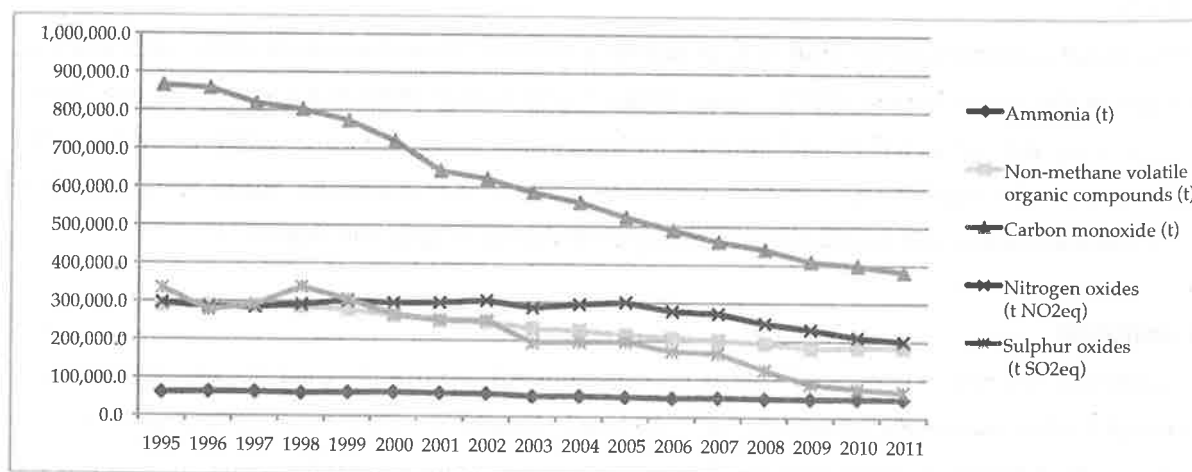


Figure 3. Emissions of acidifying gases and gases responsible for photochemical pollution, in Portugal, 1995-2011
Source: PORDATA, INE - Environment Satellite Accounts

and natural habitats and the evaluation of the social impact of air quality through surveys of the local population. The sociological survey and interviews, whose results were published in a report (Nave and Fonseca, 2004), were steered by two main theoretical approaches: the concept of risk society (Beck, 1992, 1999) and the theories of environmental modernisation (Hajer, 1995; Spaargaren, 2000). The authors conclude that risk perceptions are more affected by the geographical proximity and professional connections to the industrial facilities (which have a bearing on the level of information on risks respondents have) than by classical sociological variables (such as gender or education) and that residents are mainly concerned with air pollution and its health impacts. They point out the deficiencies in the current emergency information system and how it can be improved and the important role mediators should play.

A PhD thesis in sociology developed at the University of Coimbra (Fernandes, 2011) compared two residential areas affected by industrial pollution in Portugal and Brasil. Estarreja is a town in the central region of the country with a heavy chemical industry, living under the threat of an industrial accident and the risks caused by soil, water and air contamination: facilities for treating industrial waste and sewage were only built recently, before that waste was deposited in open air deposits and sewage flowed into local rivers and canals; gas emissions from the chemical plants were severe and still today a noxious smell pervades the town. Based on document and media analysis and interviews with local residents, Fernandes (2011) examines risk perceptions and attitudes, protests and grassroots mobilisation, the perceived health impacts of living in a contaminated area, and the relationships established between industries and the populations. The author draws from a wide array of theoretical contributions, from the literature on technological risks (Beck, 1992; Porto and Freitas, 1996; Porto 2007) to the different conceptualizations of uncertainty in the literature (Funtowicz and Ravetz, 1993; Rowe, 1994; Patt, 2007; O'Brien, 2000), from the notion of toxic culture (Hofrichter, 2000) to the principle of precaution (Thorton, 2000; Leff, 2000; Fischer, 2000), from debates on science, public participation and local knowledge (Callon et al., 2001; Failing et al., 2007; Irwin, 1995) to works on environment and public health (Brown and Mikkelsen, 1997; Brown, 2007).

Probably the most extensively studied environment risk case in Portugal is the co-incineration of hazardous waste, a controversy that spanned over a decade and sparked the interest of several teams of sociologists (Nunes and Matias, 2003; Matias, 2004, 2008; Gonçalves et al., 2007; Gonçalves and Delicado, 2009; Jerónimo, 2010; Jerónimo and Garcia, 2011). In the mid-1990s, the government's proposal for solving the problem of hazardous industrial waste by incinerating it in cement factories (after two attempts of building dedicated incinerators failed because of local resistance) raised a strong opposition from local coalitions of actors (residents, local authorities, environmental organisations), which forced the government to request further expert advice, which was met with mistrust, both from the local actors but also members of the scientific community, acting as counter-experts. This in turn led to successive delays and changes in policy (with each change in government), lawsuits and other forms of resistance, until the procedure was finally implemented in 2009.

The sociologists that addressed this case opted for somewhat different theoretical approaches. Nunes and Matias (2003) interpreted the techno-scientific controversy in the light of Latour's (1992,

1999; Akrich and Latour, 1992) concept of the confrontation between a "programme" and "anti-programme" in "legitimate agonistic spaces": on the one side the government and the scientists it had chosen to assess the risk, on the other the local populations and their various allies. For this first, the "legitimate agonistic space" was the scientific debate and reaching consensus, whereas the second group emphasised the discord among scientists and the need to involve experts from other areas of knowledge, as well as to include the citizens in the deliberation processes. Matias (2004) focused on the popular protest against the co-incineration, examining it against the particular characteristics of the Portuguesa political context diagnosed by Santos (1990, 1993, 1994, 1995, 2000 – weak civic culture, lack of political participation, distance between elected representatives and those they represent, but also a potential for a new political culture, based on participatory democracy, cooperation and socially useful production) and Gonçalves (1996 – centralised administration, not very open to scientific opinion or public debate, fragile status of science) and the confrontation between different types of knowledge, scientific and local (Clark and Murdoch 1997, Scott 1998, Jamison and Wynne 1998).

Gonçalves's team (Gonçalves et al., 2007) included this case of the co-incineration of industrial waste in a research project comprising three other technological risk controversies in Portugal (the two others were mad cow disease and the contamination of soldiers with depleted uranium in the Balkans). The authors focused on four transversal themes: science and risk assessment (drawing mainly from literature on risk, such as Beck, 1992, and scientific expertise, such as Jasanoff, 1990), political management and regulation (based on analysis of the role of the state – Hood et al., 2004; Santos et al., 2004 – and of the European Union – Delanty and Rumford, 2005; Radaelli, 2003), public participation (inspired by Renn et al., 1995; Beetham, 1999), and the role of the media (Schmidt, 2003). Focusing on the particular issue of the use of science in environmental policy and framing it with the concepts of risk regulation regimes (Hood et al., 2001) and regulatory or policy 'styles' of using expertise (Renn, 1995; Doern and Reed, 2001; Halffman, 2005), Gonçalves and Delicado (2009) conclude that though democratisation and participation in the European Union have effected some changes in the politics of risk in Portugal, some remnants of a deep-rooted authoritarian culture still remain.

Jerónimos' PhD thesis, published in book form (2011, Jerónimo and Garcia, 2011), focuses solely on the case of co-incineration and provides a very detailed analysis of the political and scientific intricacies of the process. She situates the issue against the background of the industrial revolution and the rise of waste as a social and political problem but her main theoretical framework is built based on the concepts of risk (Beck, 1992; Luhmann, 1993), uncertainty (Keynes, 1961; Knight, 1957; Funtowicz and Ravetz, 1990; Wynne, 1992; Reddy, 1996) and expert and scientific expertise (Jasanoff, 1990; Roqueplo, 1997; Nowotny et al., 2001; Nelkin, 1971, 1979; Collingridge and Reeve, 1986).

Urban waste

Urban waste has only become a problem with the exponential growth of cities and consumption in Portugal from the 1960s onwards, with the rise of unregulated garbage dumps that contaminated water and soil and the growth of non-organic waste (packaging) (Valente 2013). Open air garbage dumps (numbered at 325 in 1995) were only closed from the mid-1990s onwards (the last in 2002), replaced by

intermunicipal urban waste management systems, such as landfills and processing plants, as a result of dedicated public policies (Schmidt, 2008; Valente, 2013). Based on media analysis, Figueiredo and Fidelis (2003) assessed that over a third of grassroots environmental protests in Portugal between 1974 and 1994 was motivated by complaints about waste management. The case with the largest number of news articles was the complaints against a landfill for industrial waste. Similar conclusions were reached by Schmidt (2003) concerning television coverage of waste issues.

From 2007 onwards, waste public policies were directed chiefly at promoting recycling and selective collection, making an appeal to the responsibility of citizens, but the targets that were set are still far from being met (Valente 2013, Figure 4).

One of the first studies on this issue was conducted in the late 1990s, under the aegis of Observa (Bastos et al., 2000). The research consisted of in-depth semi-structured interviews at two distinct locations in the country, aimed at eliciting the practices and representations of the Portuguese population towards domestic waste. However, the ensuing report is mainly descriptive and offers no theoretical framework.

The local protest against the urban waste landfill in Taveiro was used as one of the case studies conducted by the Portuguese team for the EU funded project "Public Accountability Procedures in Contemporary European Contexts" (Nunes et al., 2003, 2004). According to the authors, whereas for the Government the notion of public accountability only extends to the need for involving local authorities in siting decisions, local populations saw it otherwise and demanded the right to participate in the debate. They joined efforts with national environmental organisations and opposition parties and made use of European environmental legal frameworks to put pressure on the government. However, the pressing need to use the structural funds allocated to solve the waste problem caused that little consideration was given to the concerns of the population and the construction of the landfill went ahead. The authors framed the development and closure of this case study by the theory of world systems (Wallerstein, 1974), placing Portugal as a semi-peripheral country, and by Santo's (1990)

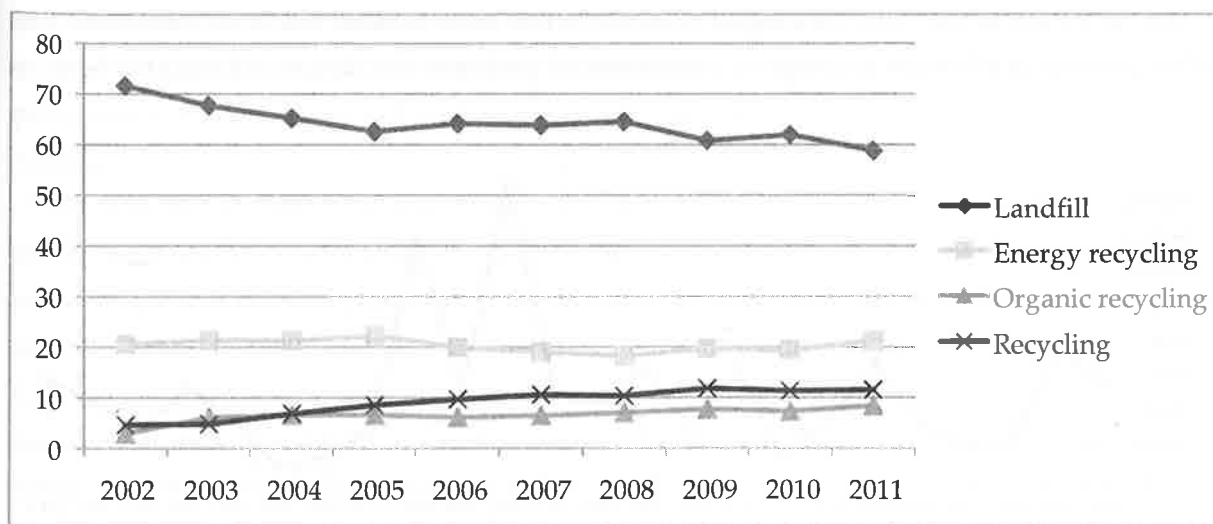


Figure 4. Urban waste by destination in Portugal, 2002-2011(%)
Source: PORDATA, Municipal Waste Statistics

understandings of the gap between legal frameworks and social practices in Portugal.

Valente's (2013) research for a PhD thesis focused on three dimensions: public policies concerning urban waste, citizen's participation in waste management at the local level and daily practices of dealing with trash in the domestic sphere, based on a local case study. This work combines contributions from the sociology of environment with the sociology of daily life and practice theory. Departing from the more general framework of the New Environmental Paradigm (Catton and Dunlap, 1980) and the constructivist perspective (Yearley, 1992; Hannigan, 1999), the author then focus on theories that offer insights into the specific object of waste: the neo-marxist proposal of Schnaiberg concerning environmental problems in general and recycling in particular (1980; Schnaiberg and Gould, 1994), social (in)justice and risk (Beck, 1992), social solutions for environmental problems as proposed by the Theories of Ecological Modernisation (Mol and Sonnenfeld, 2000; Mol and Spaargaren, 2000). Regarding the sociology of daily life, Valente draws mainly from Goffman's (1959) work on dramaturgy and from practice theory, mainly as proposed by Hargreaves (2011) and Shove (2003, 2004, 2010; Shove and Pantzar, 2005; Chappells and Shove 1999). The author also makes use of the contributions of works concerning the specific issues of trash and garbage (Douglas, 1966; Thompson, 1979; Rathje and Murphy, 1992) and recycling (Barr et al., 2003).

Forest fires

Forest fires are undoubtedly a serious environmental problem in Portugal. With 35% of the territory covered by forests and 32% by bush and pastures, green cover makes up almost two thirds of the soil use in the country. For the past three decades and a half (Figure 5), forest fires have become a recurrent problem, whose ups and downs are explained by yearly climate variations and policy intermittencies. In 2003, a particularly hot year (see above) over 7% of the forest and bush area was burnt. The majority of fires is due to human actions and activities but particularly nefarious policies in the 1980s that fostered the plantation of eucalyptus trees (intended for the paper industry) instead of autochthonous species are very much to blame (Schmidt, 2008).

And yet, there is very little sociological research on this issue. Schmidt (2003) includes forest fires in her analysis of television coverage of environmental problems: she detects a distinction between

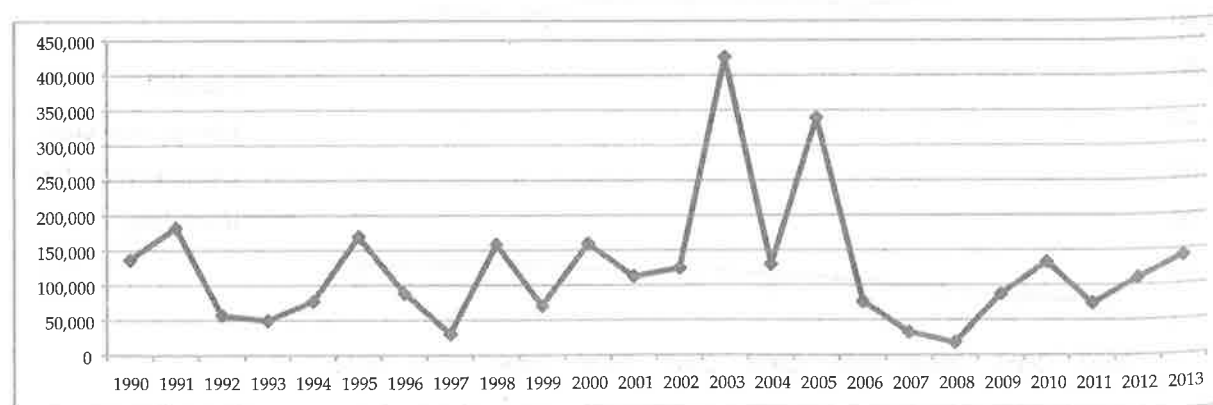


Figure 5. Burnt area in forest fires in Portugal, 1990-2013 (ha)
Source: PORDATA and ICNE, Annual reports on forest fires

the coverage of fires in protect areas (deemed as environmental catastrophes) and in other forests (considered mainly as a threat to economic interests) and a particular attention to the human causes of fires, namely arson.

The Social Ecology Group at LNEC conducted a study that sought to address the motivations and practices that contributed to the persistence (and increase) of forest fires (Lourenço et al., 2002). Focusing on just one area of the country (with a very high number of fires), the authors deployed multiple methodologies (cluster analysis on socioeconomic data, interviews with local actors, including persons convicted for arson, public sessions with local residents) for assessing the causes for the fire risks and vulnerabilities. The authors also performed a detailed analysis of public policies concerning forests and the evolution of soil occupation in Portugal throughout the 20th century. This work relied on a strong theoretical basis, combining contributions from environmental sociology, such as theories of risk society (Fabiani and Theys, 1987; Beck, 1992; Giddens, 1990), the new environmental paradigm (Catton and Dunlap, 1980) and natural economy (Redclift, 1992), with psicosociological models of motivation (Pareto, Maslow, Mucchielli, 1975; Leonard et al., 1995).

A few years later, the government department in charge of this area commissioned a sociological study on the causes of forest fires in 2006 and 2007 (Coutinho, 2009). Relying on interviews with stakeholders and local populations and direct observation in a dozen municipalities, the studies examined the causes by type of activity (agriculture, hunting, etc.) and social attitudes and values. However, no explicit theoretical framework is presented in the publication that resulted from it.

Final remarks

The preceding analysis allows us to conclude that sociological approaches to environmental problems in Portugal tend to pay particular attention to four main dimensions: public policies, media representations, social movements, perceptions and attitudes measured by surveys.

Many of the works mentioned in this paper do not have an explicit theoretical orientation, since they are often developed under a framework of "applied research", commissioned and funded by government agencies and motivated by the need for obtaining sociological data on environmental problems. However, this does not mean that the research did not have an "implicit" analytical perspective: it was just not included in the ensuing publications (mainly reports and conference papers).

The frameworks more commonly used in environmental sociological research in Portugal are, on the one hand, the new environmental paradigm, risk society, and ecological modernisation (highlighted in one of the few theoretical papers on the sociology of environmental published in a Portuguese journal – Schmidt, 1999), and, on the other hand, the contributions of the social studies of science. Catton and Dunlap's NEP were first referenced in Mansinho and Schmidt's (1994: 442) bibliographic overview of the environment in social sciences in Portugal, in the leading social sciences journal *Análise Social*, in which the authors state that "the debate on the emergence of a new paradigm in sociology (...) discussed in other countries, in particular in the United States, has not evoked among us a similar interest or a wide discussion, even in academic circles". This was soon to change, as the NEP

paradigm began to be referred in theoretical overviews (Craveiro and Machado, 1996, Schmidt, 1999) and empirical studies (Schmidt et al., 2000, Schmidt, 2003, Nave and Fonseca, 2004). The NEP scale was then used in several public opinion surveys (see, for instance, Lima and Guerra, 2004; Schmidt and Guerra, 2013).

"Homegrown" theoretical production is scarce in Portugal. One of the few novel-contributions may be the concept of semi-periphery, that encapsulates the particular relations between government, society and science, marked by the tension between 'modern' European legislative framework (that favour scientific advice and public participation in decision making) and the endurance of 'traditional' Portuguese administrative practices (that rely on centralised approaches).

Environmental sociology remains a relatively minor area in sociology in Portugal (the Portuguese Sociological Association has just 34 members in the environmental sociology section), by comparison with other more "traditional" fields, such as sociology of education (151 members), sociology of family (109 members), sociology of health (70 members) and sociology of social classes (70 members). This may be due to the late emergence of environmental concerns and policies in Portugal and the perception of environmental problems as issues to be dealt with by the "hard" sciences rather than the social sciences. But it is also due to the internal structure of the academic field: few bachelor degrees in sociology offer environmental sociology as an optional course and funding opportunities are scarce (whereas scholars that work in more "conventional" social problems are able to apply to specific public programmes and to private non-profit organisations that deal in social issues).

Finally, this paper cannot be considered as a representative portrait of environmental sociology in Portugal. By concentrating on the research on the most pressing environmental problems of the country, many other issues and works have been left out of consideration. A more comprehensive review might have elicited other theoretical and analytical approaches.

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