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**To be seen but not to be heard: scientific rationality versus democratic rationality in the decision-making process on dangerous waste management in Portugal**

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**Resumo/Abstract:**

The decision-making process concerning the co-incineration of industrial dangerous waste in Portugal has most certainly been transformed into a conflict centered on the unequal distribution of risks to the environment and to public health, opposing local population to the government. It is also a good example of the conflict between scientific and democratic rationalities as the government's decision is supposed to receive its legitimacy by science whereas those most affected by government decisions, local people, are impelled by democratic rationality. Based on a case study, the paper concludes that, despite a long period of public involvement there was no real public participation in the decision making process.

**Palavras-chave/Keyword:** Participation, Environmental Equity, Sustainable Development, Risk Management, Democracy, Dangerous Waste

**Classificação JEL/JEL Classification:** Q53, Q56, Z1



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## **1. Introduction**

In 1997, the Portuguese government launched a process which, expectedly, would lead to the implementation of a national system of dangerous waste management, with the purpose of reversing the absence of control that prevailed at the time. This absence was responsible for the illegal dumping in rivers and sites, of non-previously processed dangerous waste, with obvious prejudice for the environment and for the well being of the population. Co-incineration in cement plants was the method proposed by the government and, from the beginning, political parties of the opposition, environmental associations, local population and even some members of the party in office, refused to accept it. In face of this resistance the government appointed a group of scientific experts, which ended up concluding in favour of the co-incineration strategy.

This use of scientific studies to support the decision-making process is more and more frequent and has been often conducive to crowding out common non-instructed, or non-initiated, people from the process of making a decision, despite the fact that it will affect them and their community. It seems, therefore, that there is some sort of conflict between a scientific rationality and a democratic rationality. Science would, thus, appear to be an instrument of exclusion of the people from the policy debate, in contradiction with the basic ethical principle of the use of knowledge in social life, which is the enlightenment of the people.

The purpose of this paper is to discuss the importance of popular participation in the process of decision-making on dangerous waste management, and hopefully to demonstrate the importance of taking into consideration the opinion of the people, however poorly sustainable it may be in scientific terms, in order to implement a successful strategy of environmental management. It should be added that this statement does not mean, whatsoever, that in this or any other case, popular participation and unscientific argumentation should be forcibly synonyms, but simply that the scientific strength of the arguments in confrontation can be considered more or less irrelevant here.

After a long period of public discussion the process was stopped in result of the 2002 early general elections being won by the opposition, and today, after the 2005 early general elections, the former minister of the environment in office from 1999 to 2002, and one of the fiercest defenders of the co-incineration, became Portugal's prime minister and has promised to reopen the process, conferring to the subject of this paper an utmost relevance.

## **2. Survey of the problem**

### ***2.1 About the co-incineration of dangerous industrial waste***

All the substances resulting from a production process that cannot be used or transformed in any other production process are considered waste, which means that the producer is responsible, let us say, for getting rid of them. The dangerous industrial waste (DIW) label applies to all those that can be dangerous to public health and to the environment, meaning that, for instance, they can be flammable, toxic or unchain chemical reactions.

Although the main goal of the European policies of waste management consists in reducing and preventing the production of waste, it is obviously necessary to cope, somehow, with all those that have already been produced, which implies the use of processing methods adapted to their characteristics. There are controlled landfills, biological, physical and chemical treatments and, finally, thermal treatments. Co-incineration belongs to the thermal methods of waste processing and it consists on using waste as an auxiliary fuel to the production of energy or of some other product, like cement.

## **2.2 The conflict around co-incineration**

The need for a specific system for processing dangerous industrial waste has been felt in Portugal for long, but as a consequence of a change in the European Union's classification the Portuguese government concluded in 1997 that the country did not produce enough waste to justify, in terms of economic profitability, the construction of a dedicated waste incinerator. In May 1997, the Ministry of the Environment and the representatives of the cement manufacturers signed a memorandum which would open the way to the possibility of eliminating the dangerous industrial waste through co-incineration in the cement kilns of their plants.

Later that year, as stated in the cabinet's decision nº 98/97 of the 25<sup>th</sup> of June, the government concluded that co-incineration was the most feasible system of waste elimination, both economically and environmentally. The identified advantages of the co-incineration were the following:

- The swiftness of the system's implementation, especially taking into account the urgency in finding a solution for the problem of waste management.
- The energetic valuation of the waste.
- The environmental requalification of the sites where co-incineration would be applied.
- The positive repercussions on public health and on the environment, due to the technology and to the safety procedures that were to be put into practice.

The opponents to the co-incineration, in their turn, signalled the following negative or precautionary aspects:

- Co-incineration should only be acceptable on condition that it would be considered transitory and within the frame of a national policy of dangerous industrial waste reduction.
- Co-incineration is not an incentive to the reduction of neither the production of dangerous industrial waste nor the elimination of illegal dumping.
- There are technological risks.
- There are negative impacts both for public health and the environment in result of the increase in air pollution and prolonged exposure to cancerigenic substances.
- Co-incineration only aims the satisfaction of the economic needs of the cement manufacturers.

The co-incineration implementation process has constantly been accompanied by public demonstrations of disapproval under the shape of street demonstrations, meetings and debates, and more institutionalised procedures such as petitions sent to the parliament or complaints lodged in court. However, none of them seemed to significantly endanger the process.

The decision on the use of co-incineration of dangerous industrial waste in cement kilns limited the choice of the sites where it would be possible to implement this process. Thus, only four hypotheses, from which two would be chosen, were taken into consideration. The sites were Alhandra, near Lisbon, Souselas, near Coimbra, Maceira, near Leiria, and Outão, near Setúbal. In order to pick cement plants belonging to different companies the government had to choose one out of each of the two following groups. Alhandra or Souselas, property of Cimpor, and Maceira or Outão, property of Secil. All of them were established close to important inhabited areas, and the latter had also the particularity of being installed within the limits of the Natural Park of Arrábida. Taking into consideration all the impacts, including environmental impacts, the government selected the sites of Souselas and Maceira to implement co-incineration.

This choice was the object of strong criticism and the government appointed a group of experts under the name of Independent Scientific Commission (ISC) to assess the risks and benefits of co-incineration. The ISC is composed by four specialists in the fields of medicine, air quality and chemistry. Three of its members are designated by the Council of Deans of the Portuguese Universities and one by the Minister of the Environment. After evaluating the expected impacts, the ISC concluded that Souselas and Outão were the sites where co-incineration would be implemented under the most favourable conditions.

This commission also concluded that co-incineration was the best method to process dangerous industrial waste, comforting in this matter the government's arguments (CCI, 2000). The fact that this group of experts overlooked other methods of processing waste and that the conclusions of the report were coincidental with governmental options, aroused suspicions concerning the alleged independence of the experts, and contributed to the discrediting of the entire process, contradicting the purpose of its appointment.

Meanwhile, the opposition in parliament manages to pass a law that suspends the process of co-incineration until another study on the impacts of the co-incineration of dangerous industrial waste on public health is carried out. In order to carry out this study another group of experts is appointed within the ISC, the Medical Work Task (MWT). This group of experts is chaired by one of the members of the ISC and is composed by one professor of each of the public faculties of medicine and one representative of the Medical Association. In December 2000 the conclusions of the study undertaken by the MWT are made public. Despite the fact that the report acknowledges the risks for public health, and also the need for further studies concerning the local conditions of the environment and of the urban settling, it concludes that co-incineration is the most favourable method of eliminating dangerous industrial waste. However, there is no unanimity amongst the group of experts (GTM, 2000). It is interesting to note that the first working group appointed by the government was relatively multidisciplinary whereas the second group was only composed by medical doctors. In this sense one could say that the problem of co-incineration's impacts became a more specialized matter, perhaps as an attempt to give a proper answer to the main concerns of the public, that is to say public health. This narrowing scope represents, nevertheless, a scientific impoverishment in the waste management process.

In Souselas, within the frame of popular epidemiology<sup>1</sup>, the environmental associations and the local population presented two studies on the health conditions of the area. Since the construction of the cement plant in 1974 several complaints about the impacts of pollution had been made, which means that there was a long history of negative impacts experienced by the local population, rendering them particularly cautious with matters concerning the running of the plant. One of the studies mentioned above shows Souselas as one of the Portuguese regions where the most cases of respiratory diseases and breast cancer have been detected<sup>2</sup>. The other study states that, in relation to the whole of Portugal, there are higher percentages of people suffering from chronicle bronchitis, asthma, allergies, diabetes and hypertension in the region (IHMS, 2001). The defenders of the co-incineration project criticize these studies declaring that the relations between the causes and the illnesses are not clearly established. Furthermore, they sustain that the issue at stake is not to discuss the health conditions of the population in present times but to determine if there are any risks of worsening these health conditions as a result of putting co-incineration into practice. Despite the fact that these studies can be scientifically controversial, it is undisputable that the historical record of bad running of the cement plant has contributed to the distrust with which the local population faces all procedures that involve any kind of new risk for their living conditions.

In the beginning of 2001 there is a new stage of public consultation, relative to the reports of the ICS and MWT. Similarly to the first stage of consultation it was characterized by a very strong participation of the local actors (11650 statements were made about the process), criticizing the whole process of decision-making, the absence of a global policy concerning the dangerous waste management, and the unwillingness to take into consideration the principle of precaution. At this time of the process of public consultation, the environmental requalification of the sites, presented by the government as an advantage of the project is considered by the opponents of the co-incineration as an intervention that is due to the population in any case, and not as a counterpart of the co-incineration's implementation.

Despite the large amount of statements presented, the ISC considers that the arguments put forward by the opponents to the project do not contradict the "technical and scientific arguments (...) that sustained the decision to consider co-incineration in cement plants as the most favourable method" (CCI, s/d, p 1). The solution begins to be tested, thus, and only the early general elections of 2002, that brought to power the opposition, will put an end to the process.

### **3. Scientific Rationality versus Democratic Rationality**

The above mentioned citation of the ISC is a very good example of the belief that in the decision-making process on dangerous waste management or any other process involving technological hazard, only scientific arguments should be taken into account. According to this belief any other kind of foundation for decision-making would bear poorer value and, therefore, weaker legitimacy before the community.

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<sup>1</sup> Phenomenon "in which laypeople detect and act on environmental hazards and diseases". "(...) popular epidemiology is more than public participation in traditional epidemiology because it emphasizes social structural factors as part of the causal disease chain" (Brown, 1993, p.18).

<sup>2</sup> "Saúde em Souselas é calamitosa" (Público, 12-01-2001).



Resorting to scientific studies as a means to support decision-making has become very common, especially when there are technological risks involved implying negative impacts on the environment and on public health. For Maria Eduarda Gonçalves, the vulgarization of this process can be explained by the spreading of an "ideology of competence" which favours the authority of science and technique as the main instrument of political legitimating, according to which "only scientific methods can supply objective data concerning reality" (Gonçalves, 1996, p. 121; Gonçalves, 2002, p. 161-162). Nevertheless, when favouring scientific statements in detriment of non-scientific statements, taken as irrelevant or inadequate, the uninstructed majority of the population is diverted from the possibility of debating on matters that concern them. "Ignorance" would, then, be the argument put forward to legitimize their withdrawal from a decision-making process.

In a decision making process two different kinds of rationality come to surface. On the one hand a scientific rationality and on the other hand a democratic rationality. Scientific rationality should be taken as one which rests on the knowledge obtained through the use of rigorous procedures, demonstrable and susceptible of being reproduced, allowing hypotheses to be tested and results to be objectively interpreted. Democratic rationality, in turn, should be taken as one according to which all individuals affected by a decision should have the right to intervene on the decision-making process.

Therefore, it would seem that if resorting to scientific statements supposes better informed, and better sustained, decisions, it also contributes to the "exhaustion of democracy" (Ruivo, 1996, p.9), in other words it seems that an increase in the technical foundation of decisions corresponds to a decrease in the capacity of the common citizen to intervene in a decision-making process. Science would, thus, become an excuse to exclude and a tool to erode democracy. Actually, the assumption of the neutrality of science has been raising more and more objections, essentially because, on the one hand social and contextual influences on scientific work have been recognized, and on the other hand the decision-making processes have been growingly taken as "essentially a ground for negotiation between conflicting interests and less for rational choice amongst alternative options" (Gonçalves, 1996, p. 122). Thence the common manipulation of science carried out by the political power in order to legitimize its speeches and its choices (Gonçalves, 1996).

This fact is not particularly new. Historically there are several examples in which scientific rationality worked as a brake to democratic rationality in the process of extending political participation and implementing the universal suffrage. Albert Hirschman (1991, p 23) declares:

"(...) the undoubted advance of democratic political forms in the second half of the (nineteenth) century took place in the midst of a diffuse mood of skepticism and hostility. Then, toward the century's end, this mood found a more sophisticated expression in social scientific theories, as medical and psychological discoveries showed human behaviour to be motivated by irrational forces to a much greater extent than had been acknowledged before. The idea of basing political governance on universal suffrage could henceforth be exposed as a belated product (...)"

Therefore, universal suffrage was not only illusive but also dangerous considering that the irrationality and ignorance of the masses would most probably conduce to the obstruction of liberty and to despotism, which means rather the opposite of the intended purpose. Economists, like Vilfredo Pareto, participated in this critique of

democracy claiming that universal suffrage would not only be futile but also perverse, and would, thus, worsen the living conditions of the people (Hirschman, 1991).

Roy MacLeod also puts forward some facts that, in the twentieth century, would compromise the symbiotic relation between science and democracy that came from the Enlightenment. As a result of the growing specialization required by the production of scientific knowledge, science became an "exclusive possession of the scientist (...) and there was no room for the rights of the common man" (MacLeod, 1996, p. 39), in colonization, according to this author, science also confronted democracy, "technology was used as an instrument of control and not of liberation, science belonged to the mother country, out of range of the local population" (McLeod, 1996, p. 40).

Regarding the conflict around the decision-making process concerning co-incineration, in making the decision dependent from the statements produced by the ISC and the MWT, the government ended up choosing the scientific rationality as a means of legitimizing political options in detriment of the democratic rationality. The BATNEC (Best Available Technology Not Entailing Excessive Cost) point of view followed by the government is a clear demonstration of the use of scientific rationality. This means that the decision is based upon the verification that the best solution possible, in terms of its adequacy to the Portuguese reality and of the guaranty that the most up to date knowledge and the best technology, is put to practice, and that this can be done under acceptable economic conditions. On the other hand, democratic rationality was motivated by the perception that one was facing an unequal distribution of risks and benefits between the local and the national level. If, at the national level, the benefits clearly outweighed the risks, at the local level, on the contrary, the risks were much more important than the expected benefits.

The fact that the government placed its reliance upon the conclusions of the ISC gave its members a statute of the holders of true science and consequently of indisputability. An example of this can be supplied by the fact that all those who held opinions against the project had been set apart from the discussion concerning the choice of the co-incineration method, even though the ISC was fully aware of the technological risks. The fears of the population, and even uncertainty, were not taken into consideration. Thus, in face of the critiques aroused both by the scientific reports and the distrust concerning the members of the ISC, the government dismissed from the debate.

The so-called NIMBY reactions (Not In My Backyard) usually associated to local protests against a determined action are commonly given low credibility, in result of the presupposition that people are only concerned with its exclusive well-being, despising all the more global impacts of a non-decision. However, if we agree upon the fact that it is ethically correct to accept that each person, or community, has the right to participate in the making of the decisions that affect them, then this kind of apparently selfish manifestation is perfectly justifiable, especially when facing an inequitable distribution of risks and benefits.

Therefore, the way in which science was involved in this process, built a sort of a barrier against the arguments of those who were going to be affected by the decision. Thus, scientific rationality, put forward by the defenders of the co-incineration, was clearly opposed to democratic rationality, as sustained by the opponents to the project, ending up in a flagrant disempowerment of the local population. In the perspective of democratic rationality, the NIMBY phenomenon

should be considered as a response to environmental injustice and, therefore, perfectly legitimate.

#### **4. Participation in the decision making process**

Uncertainty and risk walk side by side with human existence and technological development. Indeed, it is very difficult, and perhaps impossible, to guarantee a zero risk degree to human activity in general. Therefore, it is rather naïf to make an irreducible stand for a risk-free development process. What characterizes and differentiates the technological accidents of the last decades of the twentieth century is:

- Its extension (the implications are more and more global and not only local),
- Its duration (the consequences affect not only the present generation but also future generations),
- A certain short run invisibility (it is not possible to immediately identify the effects of radiation or of pollution on our body),
- Powerlessness of action.

These features make up the new type of risks that characterizes the contemporary world, which Lagadec names major technological risks (Lagadec, 1981). Therefore, a new dimension is added to the definition of risk, which is uncertainty. While the notion of risk refers to an accurately identified prejudice, where the only doubts are the ones concerning the probability of its occurrence, uncertainty refers to the inability of anticipating the consequences of the decisions that are about to be made (EEA, 2001; Callon *et al.*, 2001). Considering that risk is part of our world, acknowledging its potential sources, its impacts and its perception and acceptability by society becomes a strategic element in the decision-making process.

According to Michel Callon, the existence of uncertainty claims for new methods of decision-making, clearly distinguishing amongst the traditional fashions of decision-making and the new fashions that need to be developed. Thus, to a traditional model of decision-making, that we call categorical choice, and which results from an unique act made by a legitimated actor and supported by a scientific or a political authority, Callon opposes a participative model of choice, which is characterized by an iterative activity resulting from an enchainment of second rank decisions, and from a netting of diversified actors open to new information and reformulations (Callon *et al.*, 2001, p. 307).

It is noticeable that, due to the acknowledgment of its potential, public participation in the decision-making process on environmental management issues has progressively been introduced in environmental policies (Clark (a) e (b), 1994; Pinho, 1994; Spyke, 1999). The advantages of participation are:

- The integration of the needs and preferences of the public and the technical and scientific issues.
- Greater credibility of the decision process.
- Lower number of conflicting events,
- Higher legitimacy of decisions,
- Increasing efficacy of the projects implementation.

However, this participation does not always happen in the most efficient fashion. From the point of view of the project's proponents, it is inconvenient to have an excessive participation as it supposes increasing costs and, expectedly, a loss of control over the project. From the public's point of view some degree of frustration

can result from the feeling that their propositions are not taken into account, and that participation in the decision-making process is only a formal requirement with the purpose of legitimizing decisions already made.

Different levels of public involvement can be defined: "public awareness, which merely implies that the public has been told of the projects; public involvement, that means that there is communication in both directions, with exchange of information and dialogue amongst the public and the decision-makers; and public participation properly so called, the most intense mode of interaction between public authority and the citizens, which should imply democratic delegation of power and leadership sharing" (Gonçalves, 2002, p. 166).

According to another typology (Hydro-Québec in Mettan, 1992, p. 81), six different levels of participation can be considered:

- Information: allowing the formulation and the explanation of choices and decisions;
- Education: allowing the increase of the population's level of knowledge and therefore contributing to induce changes in the attitudes;
- Information-retroaction: aiming to bring up reactions and to validate the foreseen options;
- Consultation: aiming to submit different propositions to the concerned public, to assess the reactions and subsequently to make the choices;
- Concerting: aiming to find a solution through the direct participation of the parties involved, considered as partners;
- Negotiation: aiming the search for a consensual agreement amongst the various parties whose interests are potentially or effectively opposed.

Nevertheless, as Nicolas Mettan stands for, we shouldn't refer to participation unless there is a "true possibility of influencing or collaborating in the decision-making" (Mettan, 1992, p. 81). We consider that while the information and education levels correspond to a state of public awareness, and information-retroaction and consultation to some kind of public involvement, only the last two levels truly correspond to modes of public participation.

In result of the information that has been scrutinized above, we can assert that the decision-making process concerning the implementation of co-incineration has privileged scientific rationality in detriment of democratic rationality. This has had strong influence on the participation mechanisms of the process. This can be inferred from scrutinizing the results of the two most important moments of the public involvement.

It should be noted that these moments have only concerned the technical and scientific component of the process (impact studies, reports of the ISC and the MWT). The political component of the decision was never discussed. Indeed, the possibility to decide against the implementation of co-incineration despite the fact that all the technical and scientific studies were favourable to it, or even the possibility of deciding on the basis of non scientific arguments, were never taken into consideration by the public authorities, nor was the possibility to submit the decision to popular suffrage. Once again, and until further notice, the process was stopped only due to the calling of early general elections that brought to power parties in the opposition at the time. This means that even if the project was stopped we can assert that this was not the result of the use of democratic rationality. The local population was never consulted on the specific subject of co-incineration and it would be slightly hasty to pretend that the overthrowing of the government was, even partly, due to the opposition to the co-incineration, even if

one shouldn't exclude this possibility in the minds of local citizens when standing before the ballots.

The first moment of public involvement happens within the frame of the environmental impact study, which is legally required. This moment displays a strong component of elucidation, insufficient, however, to soften the local resistance to the projects implementation. Despite this refusal the decision to implement co-incineration prevails. The fact that at any time along the entire process of public involvement the arguments presented against the project have been taken into account shows that public participation seems to have been considered only as a formal procedure. Unilateral decisions, such as the changing of one of the expected sites for co-incineration, and the discredit thrown upon the arguments presented by the opponents, even when they used the same weapons, in other words when they resorted to technical and scientific studies, carried out by academics, are some of the manifestations of the weakness of public participation in the decision-making process.

The second moment of public consultation, which concerned the reports of the ISC and MWT, also discloses the subordination of the democratic rationality to the scientific rationality, and, therefore the lack of public participation. In this respect the ISC considers that the arguments presented by the opponents to co-incineration cannot be taken as pertinent from the technical and scientific points of view. It is also around this time that the government starts the testing of the system, regardless of the population's protests and of local and national association's opinion.

Therefore, and according to the typology presented above, we are taken to conclude that although there was a strong public involvement in the process, there was no real public participation. The moments of public consultation were either formal, legally imposed, or reactive, resulting from the pressure of the opponents to the project. The problem was only discussed in a partial manner, meaning that only the technical and scientific issues were taken into consideration. It can also be concluded that we faced a categorical type of decision, as it was made by only a legitimate actor, the government, based upon information supplied by scientific authorities (the ISC and MWT). No other actors, either at the local or national level, took part in the decision.

## **5. Conclusion**

Since the government declared the purpose of implementing co-incineration as a solution to the dangerous industrial waste management, the conflict that followed, partly due to an autistic interpretation of public participation by the authorities, was responsible for a delay of four and a half years in actually putting in practice any kind of waste processing (1997-2002). This delay meant that not only there was no solution for the amount of waste produced till 1997 but also that, in the time being, more waste was produced. In this sense the non-decision is also responsible for growing environmental negative impacts.

The absence of decision is, therefore, unsustainable. We could risk saying that a decision like co-incineration, however contestable it may be, could represent a step towards more sustainability in environmental terms. In a democratic society, however, environmental sustainability is not the single issue at stake in a process of decision-making concerning dangerous waste management. In a struggle for

bettering the living conditions of the people there shouldn't be any sort of trade-off, whatsoever, between environmental sustainability and democratic participation. Both are fundamental pillars of a progressive society, and as the popular saying goes, one shouldn't correct a mistake by committing another mistake. In this sense science should play the role it has been called to play since a couple of centuries ago, which is to enlighten and not to override the people.

In relation to the co-incineration project there are some evidences that not only the democratic pillar of the good society was, to say the least, neglected, but also that in doing so the public authorities were co-responsible for a delay in finding a solution to dangerous waste management. The imposition of the project against the will of the affected population, the lack of credibility of the cement plants' environmental behaviour, the distrust regarding the independence of the scientific commissions and the existence of economic interests, have all contributed to the public's refusal of co-incineration. In face of this, deeper public participation, that is to say negotiation, seemed the only path to reconcile macro and micro perspectives, in other words the national and the local needs. Unfortunately, that never happened.

Eight years have passed since the process was launched and there is still no solution in sight. Eight years of delay in processing the waste means an eight years older problem, and in a democracy, public authorities should be accountable not only for bad decisions but also for not producing any decision in matters that deeply concern the living conditions of the demos. We believe that had a true participatory process taken place, the actual situation could have been different. In this sense the novel of implementing a waste management system shows us that practical and acceptable sustainability can only be achieved through cooperation between the scientific rationality and the democratic rationality.

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