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THE ENDLESS SEARCH FOR SCIENTIFIC INFORMATION IN ENVIRONMENTAL DECISION- MAKING: EXAMPLES FROM A NIMBY CASE STUDY

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This paper examines key decision-making aspects of "Brunelli hazardous waste disposal project", a private undertaking in the town of Piracicaba, São Paulo State, Brazil, submitted to the environmental impact assessment process (EIA) established by the National Environment Policy Law of 1981. A major feature underlying this case study is the apparent endless search for different expert reports about the potential environmental impacts, an unusual series of seven reports commissioned to examine one single issue: the risk of groundwater contamination.

An environmental impact statement (EIS) has been filed with the State Secretariat for Environment in December 1992, following guidelines approved in February 1992. A final decision was announced on December 1995, following intense debate within the State Council on the Environment (CONSEMA).

EARLY INITIATIVES

The history of this project starts much earlier. In 1986, wishing to take the opportunity of using an abandoned limestone mine, another proponent intended to establish a hazardous waste disposal site in Rio Claro municipality, some 40 km from Piracicaba. Even if limestone terrains are in principle not suitable for hazardous waste disposal, an expert with the local University prepared a report endorsing the previously chosen site. Opposition soon arose, neighbours and NGOs asked the advice of the same local University. An expert commission prepared a report concluding the previous studies to be insufficient to make a sound decision. Consequently, this site has not been approved by the State pollution control agency (CETESB).

About one year later, a different proponent seeks approval from CETESB for an industrial landfill close to the town of Piracicaba. CETESB granted the environmental license based on a State law of 1976 which established criteria for preventive pollution control. Under this act, any potentially polluting activity must obtain an environmental license prior to any physical construction or civil works. Nevertheless, the law makes no provision for an EIS to be filed or for the public to be consulted. A government decision is made on the basis of purely "technical" information submitted by the proponent.

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Local opposition soon arose and, with the help of a public attorney, took the case to the Courts, which ruled that such an environmental license should not have been granted unless an environmental impact statement had been filed and approved. Indeed, federal regulations on EIA, based on the 1981 National Environment Policy Law, had been issued in January 1986. (These regulations are known as CONAMA Resolution no 01/86, approved by the National Council on the Environment, CONAMA.)

As a consequence, an EIS was filed later. Nonetheless, it had been prepared in only three months and was considered as inadequate by the State Secretariat for Environment. Based on its own analysis, and on an external expert report as well, the Secretariat decided that the site was not adequate for such a project.

THE PROJECT RATIONALE

In spite of these unsuccessful attempts, it was widely recognized that this industrial region was very much in need of a landfill for the final disposal of hazardous wastes. Illegal dumping, interim stockage and high cost incineration are the main methods currently used by most industries to dispose of their wastes, thus a properly designed landfill located in an adequate terrain was viewed by industrialists and local governments as a very satisfactory solution. An estimated 2,800 tonnes of "class I" (toxic) and 125,000 tonnes of "class II" (industrial non-toxic) wastes are generated each year in the region.

In 1989, the Piracicaba newly elected mayor creates an *ad hoc* committee to handle the issue, inviting different stakeholders, including environmentalists and CETESB. The committee considered that even if most industries could adopt waste reduction and recycling technologies, the amount of remaining waste and the projected growth in industrial output, would inevitably require a landfill for final disposal.

As the committee looked for companies interested in a new venture, Brunelli, the proprietary of thousands of hectares in the region, mostly used for sugar cane plantations, decided to pay for an environmental impact study which should be twofold: firstly it had to indicate the best location alternative in an area as big as 3,000 square kilometers; then it should analyse the impacts if an industrial landfill were to be implemented in the preferred place. As an important condition in terms of public acceptance, Brunelli also consented that the studies should select at least three site alternatives, out of which at least two should be located in other estates.

With the technical advice of an association of municipalities sharing the watershed, the Piracicaba-Capivari Intermunicipal Consortium, the committee prepared draft terms of reference for an EIS and filed them with the State Secretariat for the Environment, which issued guidelines in February 1992. A consulting firm was hired to prepare the EIS.

In order to select the best site on a regional basis, a geographical information system was used to help the integration of different environmental attributes such as geology, land-use, vegetational cover, distance to water bodies and legal constraints. The study area of 3,000 square kilometers was divided up in quadrangles of 1 sq.km, out of which seven locations were pre-selected.

The pre-selected sites were then compared in greater detail but finally found to be similar. The final criterium was to choose one area in the Brunelli's estate, thus avoiding negotiation and possible opposition of a landowner. This site was further investigated and drilled to check geological and groundwater characteristics followed by the subsequent activities of an environmental impact assessment.

PUBLIC CONSULTATION

Neither federal nor São Paulo regulations on EIA at this time called for a public consultation to be held at this phase, but only as a public hearing after EIS completion. Nevertheless, the committee felt it would be important to seek public acceptance prior to formal hearings. Also, the committee and the proponent were reportedly prepared to conduct early negotiations if needed.

Hence, after site selection but during EIS preparation, five public meetings were organized, including two locally held open houses. They were called for by the City Council and publicized by the local media. Nevertheless, after filing of the EIS, a group of citizens presented a petition to the City Council arguing against the landfill. Later, a public hearing was held in Piracicaba, in which arguments for and against the project were presented.

THE EIS REVIEW: A CASE OF CONFLICTING VIEWS

At a reported cost of about US\$ 100,000 the EIS was filed in December 1992 (Jaako Poyry Engenharia 1992). Facing a "hot issue" because of the previous history and dealing with well organized local NGOs, the Environmental Impact Assessment Branch (DAIA) of the State Secretariat for Environment took a precautionary approach by asking the advice of the Department of Geology of a nearby University. The report (Cottas 1993a) recommended further site investigations relative to geology, structures and groundwater in order to get a comprehensive site characterization.

On the other hand, the Piracicaba City Council had already asked an expert report from the School of Agricultural Science, situated in the town itself. The author concluded that the impacts were well within the environment's carrying capacity and recommended the adoption of the proposed site (Bazani 1992).

After receiving the Cottas (1993a) report, DAIA decided to ask the proponent to report on further detail about issues related to the geological setting and the suitability of the chosen site. In parallel, DAIA decided to commission another report regarding the adequability of the site to receive a landfill. A State research institute was invited, its report (IPT 1994) recommended further investigations as well.

Further field studies were conducted by the consultant and their results reported, but these were considered to be still not detailed enough to support a sound decision. To support its review, DAIA asked once again the advice of the Department of Geology, whose report (Cottas 1993b) once again pointed to the divergences between the University studies and the consultants data, recommending that the EIS should not be accepted.

Then, Piracicaba City Council commissioned its second expert report, this time to the School of Agricultural Engineering of another University. This report (Boni and Paula Jr. 1993) concluded that field investigations made so far, as well as the approach chosen to select the area were sufficient, urging the State government to approve a proposal that would represent better environmental conditions for the region.

Later on, DAIA receives the IPT report, whose recommendations are similar to those made by both Cottas (1993a, 1993b) reports. Furthermore, IPT criticizes the methodology adopted for site selection and considers the field investigations not to be enough to fully characterize the site.

By early 1994, that is more than one year after the EIS had been filed, DAIA analysts had been exposed to five different expert reports: three (Cottas 1993a, 1993b, IPT 1994) were "against" the project, while two (Bazani 1992, Boni and Paula Jr. 1993) were "for". Coincidentally, the favourable expert reports had been prepared by scientists with an agricultural and soil science background and had been commissioned by the City Council. On the other hand, the three critical experts reports were prepared by geologists and had been commissioned by the Environmental Impact Assessment Branch, which had to make a final recommendation on the acceptability of the EIS. (Earlier, during the controversy around the first location proposed by another proponent - the limestone mine - two opposing reports had been prepared by different scientists within the same Department of Geology of UNESP, a University in Rio Claro.)

At this time, DAIA decides to commission two more reports. Firstly it asked the assistance of the Civil Engineering Department of a third University. Differently from all the previous expert reports, which focused on the natural conditions of the three sites (under the three different proponents), this analysis (Mello 1994) focused on the technological aspects of the project. It concluded that the technological option, i.e., three protective layers and soil compaction services would provide even better security than the system officially recommended by the pollution control authority (CETESB).

The second expert report was commissioned to the Department of Geology of this third University. It concluded that there were several uncertainties about the geological structures of the proposed site (Riccomini 1995).

Finally, taking into account all seven experts reports, a final statement was prepared by the Environmental Impact Assessment Branch of the State Secretariat for Environment, recommending project approval (DAIA 1995). This report has been submitted to the State Council on the Environment, which met three times to discuss the project. Again, local opponents were active arguing that they were not against the principle of building and operating an industrial landfill in their region, but against the location, a typical NIMBY - "not in my backyard" situation. Nevertheless, the project was approved and, as a consequence, license was granted.

Following the three-tier approach adopted by Brazilian legislation for environmental permitting, a detailed engineering project, including further site investigations, has now to be filed with CETESB. However, no formal public participation is allowed at this phase.

THE WAR OF EXPERT REPORTS

We could learn several lessons from this case. But the above description typified a "war of expert reports". Such a conflict puzzled participants, both proponents and opponents, as well as government officials and members of CONSEMA, who represent different stakeholders in the environmental arena. Conventional wisdom spells that scientists are, or should be, "neutral"; when doing their business, they do not spouse a political cause or become partisans. Their only guide is supposed to be the search for the Truth of the knowledge. Lawyers, on the other hand, naturally advocate for one side, even if the Courts also look for the Truth. Society seems to accept such a behaviour on the part of lawyer, but seems not prepared to accept that scientists could dissent.

Scientific disagreement stems from values and beliefs spoused by a scientist, but these values and beliefs are not only moral or ideological in a narrow sense. They are also epistemological and the very advancement of science depends on these different views. A controversy in the Brunelli case arose when two opposing opinions have been declared by colleagues in the same University department and the stakeholders wanted to know which was the "official position of the University". In this case it had one, against the project, and made it public, but should Universities have official positions in these matters? Isn't diversity of thought the very essence of an University, the necessary environment for the advancement of science?

More and more studies could have been conducted, in an endless sequence. This is typical of natural scientists, who deal with very complex systems, and most experts involved in this case were natural scientists, mostly geologists. On the other hand, it is very symptomatic that the report which made possible a solution was prepared by an engineer. It took a very different perspective, it did not look at the natural constraints or environmental carrying capacity, but at the technological fixes. This stress between natural scientists and engineers in the EIA process has been called by Beanlands (1993) as "the ecologists's dilemma", as ecologists and other natural scientists need an apparently huge amount information to get to "small" conclusions, while engineers get "big" conclusions from an apparently tiny set of data.

These differences should be seen as normal, since natural scientists are dealing with very complex natural systems, whose understanding is imperfect. On the other hand, engineers deal mostly with artificial systems, usually build by themselves, so that as "creators" they supposedly know well their "creature". But one of the reasons why we make environmental impact assessments is that purely engineering solutions traditionally did not take account of environmental impacts!

EIA is neither science nor engineering. The EIA process has not been designed to enhance our knowledge of the natural world or to provide us with a better picture of social organization of affected communities. The focus of EIA are the *interactions* that take place between a human undertaking and its environment, i.e. its impacts. Moreover, EIA is not especially concerned with the study of these interactions *per se*, its focus is how should decision-making take account of such interactions. Thus EIA is about politics and policy-making. Conflicting expert reports should be viewed in this context.

Society, on the other hand, faces another dilemma: who should one trust? the official (government) scientists? the "independent" expert? Parenteau (1988) points out that in such cases, "the assessment is inevitably oriented toward objective, technical discussions, that the proponents and their experts open and pursue. With this type of orientation (...) lay citizens are disqualified by the experts and counter-experts. Counter-experts may claim public legitimacy or claim to represent the public (...) Their position as counter-experts; however, their analysis, their approach, their arguments all tend to set them apart from the general (...) social debate in which they are participating. In addition; as counter-experts, they pursue their own scientific, professional, social, and economic goals, whether these are connected or not."

This process occurs at the expenses of public debate and community involvement in decision-making. "There are many clear indications that some types of public consultation may be displaced by restricted panels of experts. The agencies responsible for conducting these public consultations have cultivated the need for private counter-experts, most often attached to major organizations, universities, research centres, or even consulting firms." (Parenteau 1988.)

Besides threatening the very basis of the public consultation principles underlying the EIA process, the excessive reliance on external experts inevitably leads to contrasting their conclusions and recommendations, thus shifting the focus from the method (scientific) to the persons and their motives to spouse one or another position. In the worst case, this leads to the advocacy of the "adversary method for the settlement of disputes about the truth - a method which is ascientific not only in its procedure, but in its greater commitment to victory rather than to truth." (Hammond and Adelman 1976.) This actually began to happen in the Brunelli case, when some participants asked for clarification as to which was the "official position of the University" but fortunately did not develop further. (On the other hand a recent controversy about the environmental and health risks posed by a pesticide reached the press when an University expert was publicly accused of spousing vested interests in assessing the risks - Amaral and Seixas 1996. This point of personal suspicion has not been reached in the Brunelli case.)

An equilibrium between the search for scientific information and public debate is the difficult key for environmental decision-making. "On the whole, much of environmental assessment is mistakenly perceived as a scientific endeavour - that is, objective and value-free. It can be more accurately described, however, as a creative, culturally-based mix of science and art. While the process is inherently value-based, informed by values derived from the biophysical and cultural setting, data that are considered scientific and objective are frequently used. Evaluators must be able to recognize and consider both facts and values. The very concept of information - particularly information related to the environment as a biological and cultural milieu - is necessarily selective and frequently manipulated to suit the objectives of the actors involved." (Jacobs et al. 1993.) Hence the important role of the EIA process manager requires special skills as he or she is expected to move fastly between scientific hard facts and culturally based perceptions.

CONCLUSIONS AND RECOMMENDATIONS

Dissent is an intrinsic characteristic of scientific activity. When seeking external expert advice, EIA managers should keep this feature in mind. While recognizing that many issues arising from a proposal likely to have significant environmental impacts are technical in nature, temptation to displace the field of dispute from the public arena to a scientific forum should be avoided. The latter is not necessarily less controversial than the former. The ability of finding the delicate balance between public (although lay) and scientific (although elitist) input, adjusted on a case by case basis, is a much sought-after skill required of a successful EIA process manager and arguably a major prerequisite for improving EIA effectiveness.

REFERENCES

- Amaral, O. and C.A. Seixas. 1996. "Carta aberta ao MD Reitor da Universidade de São Paulo - USP". *Folha de São Paulo* 28 January 1996.
- Bazani, G. 1992. "Central de tratamento de resíduos sólidos industriais." Piracicaba, 5 p. /unpublished./
- Beanlands, G.E. 1993. "Forecasts, uncertainties and the scientific contents of environmental impact assessment". In *Avaliação de impacto ambiental: situação atual e perspectivas*, edited by L.E. Sánchez, 59-66, São Paulo: Escola Politécnica da Universidade de São Paulo.
- Boni, N.R. and D.R. Paula Jr. 1993. "Avaliação do Estudo de Impacto Ambiental da Central de Tratamento de Resíduos Sólidos Industriais elaborado pela Jaako Poyry Engenharia Ltda." Campinas, 6 p. /unpublished./
- Cottas, L.R.. 1993a. Letter to DAIA, 15 March 1993, 3 p.
- Cottas, L.R.. 1993b. Letter to DAIA, 25 November 1993, 3 p.
- DAIA, Departamento de Avaliação de Impacto Ambiental. 1995. "Parecer técnico referente a análise de EIA/RIMA da Central de Tratamento de Resíduos Sólidos Industriais - Brunelli S/A Agricultura". Report no. 16/95, 58 p. /unpublished./
- Hammond, K.R and L. Adelman. 1976. "Science, values and human judgement". In *Judgement and decision in public policy formation*, edited by K.R. Hammond, 119-141, Boulder: Westview.
- IPT, Instituto de Pesquisas Tecnológicas do Estado de São Paulo S.A. 1994. "Avaliação do Estudo de Impacto ambiental - EIA e Relatório de Impacto Ambiental - RIMA relativos ao processo para obtenção de licença de

instalação de Central de Resíduos Sólidos Industriais da Brunelli S.A., no município de Piracicaba, SP." Report no. 32029, 24 p. /unpublished./

Jaako Poyry Engenharia. "Estudo de impacto ambiental. Central de Tratamento de Resíduos Sólidos Industriais, Brunelli S/A Agricultura." São Paulo, 3 vol.

Jacobs, P., P.R. Mulvihill, and B. Sadler. 1993. "Environmental assessment: current challenges and future prospects". In *Law and process in environmental management*, edited by the Canadian Institute of Resources Law, 13-26, Calgary.

Mello, L.G.F.S. 1994. Letter to DAIA, 11 April, 1994, 5 p.

Parenteau, R. 1988. *Public participation in environmental decision-making*. Hull: Federal Environmental Assessment and Review Office. Available from the Minister of Supply and Services Canada, Cat. No. En 106-12/1988.

Riccomini, C. 1995. "Parecer Avaliação das condições geológicas da área preconizada para implantação da Central de Tratamento de Resíduos Sólidos Industriais da Região de Piracicaba". São Paulo, 11 p. /unpublished./