

Evolution of IA practice in São Paulo State

Luis E. Sánchez¹, Edgard O. Rinaldi²

Introduction

Since its inception, in the 70's, EIA has evolved and changed in response to drivers such as experiential learning, scientific advances and technological developments. While some aspects of practice seem to have improved (Landim and Sánchez, 2012), there are persistent shortcomings: poor data quality (Landim and Sánchez, 2012); low commitment level (Morgan, 2012); difficulties in applying best practices (Kågstrom, 2016); process streamlining (Bond et al, 2014); late public participation (Steinemann, 2001).

Enquiring at 30 years of EIA practice in São Paulo State, Brazil, this research aims to identify changes in EIA practice and explore its possible drivers. Considering the stock of 887 EIAs in the files of Cetesb, the State Environmental Agency, since EIA was adopted in 1987, mining projects were chosen for review because they represent a significant share of the total (36.3%) and are well represented across the whole time frame.

Methods

The research employed a qualitative approach, based on document review using content analysis. Out of the EIA database maintained by Cetesb, featuring 322 files related to mining projects, six cases were selected for review. For the selection of cases, the complete Cetesb EIA database was consulted to extract information on the files relative to mining projects. A spreadsheet was prepared containing data on proponent, year of filing, municipality, mineral, status (approved/rejected) and location. A two-stage filtering was used to select the cases. Firstly, only approved quarry projects were considered. Quarry projects were chosen because they represent an important class of projects assessed over the study period, are larger than other frequent projects (mostly sand and clay pits) and have more significant impacts. Although we use the term 'mining', there is virtually no metal mine active in the State, the extractive industry being represented by industrial minerals and aggregates. From this subset (quarries), the cases were selected to cover (1) the longest time spectrum possible; (2) different rocks; and (3) different locations and settings (urban or rural).

For each case, the whole series of EIA documents was reviewed. They comprise: (1) terms of reference (ToR), (2) environmental impact statement (EIS), (3) its supplements, (4) records of public hearings, and (5) review report. The non-technical summary was not included.

For each kind of document, a script containing questions was developed. Guidance for reviewing the EIS was adapted from literature (Lee et al., 1999; EC, 2001), using criteria employed by Landim and Sánchez (2012) for content analysis. For public hearing records, the questions prepared by Duarte et al. (2016) were adopted. For the other documents, a list of questions was prepared by the authors. The set of five scripts was tested in one case, modified as needed, and applied to the six cases.

For this research, content analysis was used to check text documents against research hypothesis about its contents. The reduction of the complexity of a text to a number of categories of analysis allows for replicable inferences (Krippendorff, 2004). Data collected was tabled and compared aiming at detecting regularities, temporal changes or innovations, in a longitudinal approach, in order to do comparisons over a long period, restricted to a particular context (Bauer, 2000).

Hypothesis about possible drivers of changes were drawn from the reviewed EIA literature and from the authors' experience with Brazilian EIA system. Furthermore, some suggestions for potential improvements were provided.

¹University of São Paulo, Escola Politécnica - PMI, Av. Prof. Mello Moraes, 2373, 05508-900, São Paulo, Brazil

²Companhia Ambiental do Estado de São Paulo – Av. Prof. Frederico Hermann Jr., 345, prédio 1, 9º andar, 05459-900, São Paulo, Brazil

Results

From June 1987, when the first EIS was filed, up to December 2015, Cetesb records 322 files of mining projects. Considering the filtering criteria, 54 files passed the first filter and six were intentionally chosen. The main results from each of the documents reviewed were summarized and are shown in tables 2 to 6.

Table 1: Cases selected for research

#	Year	Proponent	Municipality	Rock	Setting	ROM (t/yr)
1	1990	Paupedra	Guarulhos	Granite	Urban	2,000,000
2	1992	Horizonte Novo	Ribeirão Branco	Limestone	Rural	360,000
3	1998	Índice Mineração	São Paulo	Granite	Urban	1,400,000
4	2003	CCRG	Ribeirão Grande	Limestone	Rural	1,450,000
5	2012	Votorantim Cimentos	Salto de Pirapora	Limestone	Rural	7,400,000
6	2013	Leão Engenharia	Jardinópolis	Basalt	Rural	1,200,000

R.O.M.: run of mine

ToR Results

Table 2: Main results from the analysis of Terms of Reference

Question	Case					
	1	2	3	4	5	6
Are there ToRs for the EIS?	No	No	Yes	Yes	Yes	Yes
How many pages does it have?	n.a.	n.a.	10	3	17	25
Were ToR prepared with public input?	n.a.	n.a.	No	?	No	No
Did any other public agency contribute to the ToR?	n.a.	n.a.	No	Yes	No	No
Do ToR feature guidelines for the baseline?	n.a.	n.a.	No	No	Yes	Yes
Do ToR feature guidelines for determining impact significance?	n.a.	n.a.	Yes	No	Yes	Yes
Do ToR feature guidelines for mitigation?	n.a.	n.a.	No	No	No	No
Do ToR require the assessment of cumulative impacts?	n.a.	n.a.	No	Yes	Yes	Yes
Do ToR feature guidelines for environmental management plans?	n.a.	n.a.	No	No	Yes	Yes

n.a. not applicable ? unknown due to incomplete records

Public Hearing Results

Table 3: Main results from the analysis of Public Hearings Records

Question	Case					
	1	2	3	4	5	6
Did a public hearing take place?	?	?	Yes	Yes	Yes	Yes
Did the public hearing bring new information about the project?	n.a.	n.a.	Yes	No	Yes	No
Is there evidence of public opinion expressed at the hearing being considered in the EIS review?	n.a.	n.a.	Yes	No	Yes	Yes
Did it result in any project change, complements to the EIS or further commitment in Review Report?	n.a.	n.a.	No	No	Yes	Yes

n.a. not applicable

EIS Results

Table 4: Summary EIS contents

Question	Case					
	1	2	3	4	5	6
Number of professionals in the team	19	12	23	47	61	23
Number of pages of the EIS	189	47	411	815	729	505
Are there comparisons of locational and technological alternatives?	No	No	No	Yes	Yes	No
Is the project and its operational activities described?	Yes	Yes	Yes	Yes	Yes	Yes
Are the criteria used to determine the study areas in accordance to what is asked in the ToR?	n.a.	n.a.	n.a.	Yes	ToR cites legal requirements	
Are the topics of the physical environment described in accordance to the ToR?	n.a.	n.a.	No	No	Yes	Yes
Are there primary data for physical environment baseline?	Yes	Yes	Yes	Yes	Yes	Yes
Are there primary data for fauna baseline?	Yes	Yes	Yes	Yes	Yes	Yes
Are there primary data for vegetation baseline?	Yes	Yes	Yes	Yes	Yes	Yes
Is there an integrated landscape analysis?	No	No	No	No	Yes	No
Does the EIS identify and locate the protected areas located inside the study area?	No	No	No	Yes	Yes	Yes
Were surveys (e.g. questionnaires, interviews) undertaken with affected communities?	No	No	Yes	Yes	Yes	No
Does the baseline identify vulnerable people?	Yes	No	Yes	Yes	Yes	No
Is there information on archaeological sites?	No	No	No	Yes	No	Yes
Are there formal impact predictions (e.g. modelling)?	Yes	Yes	Yes	Yes	Yes	No
Are baseline data explicitly used in support of impact prediction?	Yes	Yes	Yes	Yes	Yes	No
Does the EIS consider cumulative and synergic impacts?	No	No	Yes	Yes	No	No
Does the EIS assess impact significance?	No	No	No	Yes	Yes	Yes
Are the most significant impacts scheduled to be monitored?	n.a.	n.a.	n.a.	No	Yes	No
Do environmental management programmes state intended outcomes and indicators to evaluate achievement of goals?	No	No	No	No	No	No
Does the proposed monitoring include parameters, procedures, schedules, etc.?	No	No	No	Yes	No	No

n.a. not applicable

EIS Supplement Results

Table 5: Main results from the analysis of the EIS Supplement

Question	Case					
	1	2	3	4	5	6
Did the Agency require the EIS to be supplemented?	No	Yes	Yes	Yes	Yes	Yes
Did the Agency require supplemental data, in addition to what was requested in the ToR?	n.a.	n.a.	No	No	Yes	Yes
Did the Agency reiterate the request of EIS Supplement due to unsatisfactory information presented?	n.a.	No	Yes	Yes	Yes	Yes

n.a. not applicable

Review Report Results

Table 6: Main results from the analysis of the EIS Review Reports

Question	Case					
	1	2	3	4	5	6
How many pages does it have?	15	12	37	71	44	35
Does it request any commitment from the proponent due to the public hearing?	n.a.	n.a.	No	No	Yes	Yes
Are there technical requirements about alternatives?	n.a.	n.a.	n.a.	No	No	No
Was any impact considered as significant in the EIS not reviewed?	n.a.	n.a.	n.a.	No	No	No
Does the Review Report recommend any additional mitigation as compared to those proposed in the EIS and its supplement?	No	No	Yes	Yes	Yes	Yes
Does the Review Report recommend any additional environmental management programme?	No	No	No	Yes	Yes	Yes
Does the Review Report establish conditions for project follow-up?	Yes	No	Yes	Yes	Yes	Yes

n.a. not applicable

Discussion and conclusions

The preparation of ToR became mandatory in December 1994. In the reviewed cases, their structure and contents are not uniform and their size varies from 3 to 25 pages. The more detailed ToR set forth guidelines for baseline, impact significance determination and environmental management. Besides regulatory change, accumulation of experience may have influenced these changes (Morgan, 1998).

Public hearings became more important and influential over time in the reviewed cases. Opinions and requests from the public were explicitly considered in the EIS review in the more recent cases, evidenced by the finding that the Review Reports requested commitments from the proponent resulting from questions raised at the public hearings. Examples include, in case 5, support to traditional communities, additional environmental management programmes for monitoring air pollution and noise, and its follow-up, and a programme for supporting local labor. In case 6, it includes biodiversity offsets. Despite improvements, the documents contained no evidence of more advanced stakeholder engagement (IAP2, 2007).

The research also documented changes in the contents of EIS. Over time, they became larger and a higher number of professionals took part in their preparation, confirming findings of Landim and Sánchez (2012). The most recent EIS, however (case 6), is an exception, as it does not comprise advances observed in other recent EIS, especially case 5. Some observed advances can be attributed to legislation, like the consideration of potential impacts on protected areas located in the project surroundings (due to a law passed in 2000) and archaeological studies (due to new regulations in 2003), both found from case 4 onwards. Other advances, like surveys (mainly interviews) undertaken with affected communities, found from case 3 onwards (except case 6, as described before), may be due to mandatory ToR, more regulation (Landim and Sánchez, 2012) and experience accumulation (Morgan, 1998).

Project description, use of primary data on physical and biotical baseline, methodologies of impact assessment and use of data from baseline in support of impact prediction and assessment were recurrent practices, but became more detailed since ToR were adopted and as a result of more detailed guidelines over time.

Some sporadic evolutions, like landscape analysis, were found (case 5), but did not become recurrent practice and cannot be considered as advances, with baseline remaining descriptive with no new approaches (Landim and Sánchez, 2012). Other changes, like,

consideration of cumulative impacts (cases 3 and 4), monitoring of significant impacts (case 5) and more detailed environmental programmes (case 4, but without statement of goals and indicators) were also sporadic.

The Environmental Agency required all EIS, except case 1, to be supplemented. The driver of such request is either deficiencies found during EIS review or gaps identified in the public hearing or during the site visit conducted by the Agency's officers.

Review Reports also became larger and more detailed over time and include more commitments from the proponents, as well as recommend additional mitigation and environmental programmes. Conditions for project follow-up were usual practice. Experience accumulation may also be cited as a possible reason for such changes (Morgan, 1998, 2012).

Considering the findings, potential improvements of current practice comprise: changes of Agency procedures, such as early public consultation and mandatory site visit during the scoping phase; adoption of guidance procedures for scoping and EIS review; development of guidance on cumulative impact assessment and requiring systematic use of indicators for outcome-based environmental programmes.

References

BAUER, M.W. **Qualitative researching with text, image and sound: a practical handbook**. London: Sage. 2000.

BOND, A.; POPE, J.; MORRISON-SAUNDERS, A.; RETIEF, F.; GUNN, J.A.E. Impact assessment: Eroding benefits through streamlining? **Environmental Impact Assessment Review**. v. 45, pp. 46-53. 2014.

EC, European Commission. **Guidance on EIA: Scoping**. Luxembourg: Office for Official Publications of the European Communities, 2001.

DUARTE, C.G.; FERREIRA, V.H; SÁNCHEZ, L.E. Analisando audiências públicas no licenciamento ambiental: quem são e o que dizem os participantes sobre projetos de usinas de cana-de-açúcar. **Saúde e Sociedade**. v. 25, n. 4, pp. 1075-1094. 2016.

IAP2 – INTERNATIONAL ASSOCIATION FOR PUBLIC PARTICIPATION. **IAP2 Spectrum of Public Participation**. 2007. Available: https://c.ymcdn.com/sites/www.iap2.org/resource/resmgr/imported/IAP2%20Spectrum_vertical.pdf. Access on 06/23/2016.

KÄGSTRÖM, M. Between 'best' and 'good enough': How consultants guide quality in environmental assessment. **Environmental Impact Assessment Review**. v. 60, p. 169-175, 2016.

KRIPPENDORFF, K. **Content analysis: an introduction to its methodology**. Thousand Oaks, CA: Sage. 2004.

LANDIM, S.N.T.; SÁNCHEZ, L.E. The contents and scope of environmental impact statements: how do they evolve over time? **Impact Assessment and Project Appraisal**. v. 30, n. 4, pp. 217-228. 2012.

LEE N., COLLEY R., BONDE J., SIMPSON J. Reviewing the quality of environmental statements. **Occasional Paper** 55. Department of Planning and Landscape, University of Manchester. 1999.

MORGAN, R.K. **Environmental impact assessment: a methodological perspective**. Dordrecht: Kluwer Academic. 1998.

MORGAN, R.K. Environmental impact assessment: the state of the art. **Impact Assessment and Project Appraisal**, v. 30, n. 1, p. 5-14, 2012.

SÁNCHEZ, L. E. **Avaliação de impacto ambiental: conceitos e métodos**. 2nd ed. Oficina de Textos, 2013.

STEINEMANN, A. Improving alternatives for impact assessment. **Environmental impact**

Assessment Review. v. 21, p. 3-21, 2001.