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Does size matter? An evaluation of length and proportion of information in environmental impact statements

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ABSTRACT

For decades, authors and institutions have argued that the quality of Environmental Impact Statements (EISs) is somehow affected by the volume of information they contain. Both too little and too much information can be a problem. However, very few academic studies have addressed the issue of EIS length in detail. The objective of this article was to systematically analyze the volume of information presented in EISs, using Brazil as the empirical context. More specifically, this study evaluated the volume and proportion of information disclosed in 49 Brazilian EISs. This study also tried to identify sectorial variations and whether variables such as project size and number of pages in Terms of References are likely determinants of information volume. > 146 thousand pages of EIS information were scrutinized in two rounds of content analysis. Data were organized in spreadsheets and then coded and analyzed through various descriptive and inferential statistical techniques. Overall, findings corroborate the fact that EISs are now significantly longer than the early ones, and still heavily loaded with baseline information. The average number of pages in EISs and in Non-technical Summaries was found to be 2993 and 94, respectively. Kruskal-Wallis and linear regression tests indicated that EIS length is likely affected by a combination of variables, including project size, territorial and sectorial characteristics. Such findings suggest that the historical approach of setting page limits to EISs through regulations and Terms of References is no longer appropriate for EIA practice in connection with large enterprises in Brazil, and arguably elsewhere. The article discusses its practical and academic implications, and highlights the need to further investigate the actual impacts of EIS length on decision-making.

1. Introduction

Environmental Impact Assessment (EIA) has become one of the world's most influential environmental policy tools. Virtually every country on Earth use some form of EIA in the decision-making processes of projects and strategic undertakings (Morgan, 2012). While the practice of EIA has gone through significant changes since it was first regulated in the United States in 1969, many of its early challenges still occupy scholars and analysts all over the world (Lawrence, 2013). EIA, as Sadler (1996, p.13) put it, is "a systematic process of evaluating and documenting information on the potentials, capacities, and functions of natural systems and resources in order to facilitate sustainable development planning and decision making in general". Such information, which is usually presented in a document entitled Environmental Impact Statement[1] (EIS), is expected to inform authorities to make better decisions (Glasson et al., 2005). The realization of this scenario, however, is complicated by various problems in the generation and review of EISs (Morrison-Saunders et al., 2014).

Among the most frequently debated issues in connection with EISs is 'lack of quality', which can significantly affect the overall effectiveness of the EIA process (Ross et al., 2006). While the concept of quality has been loosely defined in the EIA literature, as Bond et al. (2018, p. 50) recently noted, in the context of positivist/rationalist theory, where better information means better decision-making, "(…) the quality of the information underpinning and presented in the environmental impact report, has been assessed as the key quality measure in a number of studies (…)". In the early 1990s, Wathern (1990) had already pointed out that the quality of information in EISs had been investigated since the mid-1970s. Since then, numerous studies have revisited this issue, often based on the Environmental Statement Review Package

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[1] The documents that carry information related to the impact assessments studies (e.g. project description, baseline information, impact prediction, mitigation measures, etc.) can be described in a variety of terms and acronyms. This paper adopts the term Environmental Impact Statements (EIS), as it is often used in grey and academic literature. Other common terminology includes Environmental Impact Report, Environmental Statement and Environmental Impact Study.

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developed by Lee and Colley (1991). The Lee and Colley Review Package is basically a checklist of quality criteria that were originally developed to assist in assessing the quality of EISs submitted to the United Kingdom (UK) authorities. It has been inspiring many studies in various jurisdictions worldwide. A study by Anifowose et al. (2016) found that the Lee and Colley Review Package underpinned the methodology of 26 out of the 47 articles (55%) on EIS quality that they had identified in the literature.

The Lee and Colley Review Package and many other checklist-based frameworks for assessing quality in EIS, as Põder and Lukki (2011, p. 35) argue, "(…) do not reflect the quality of EIS at large, but only one quality component, namely completeness of relevant information", that is, the degree to which a particular EIS addresses a list of topics. Various other factors may affect EIS quality. For example, a study by João (2002) found that scale choices (both in terms of spatial extension and geographical detail) can significantly affect the quality of EISs. Another factor that may affect quality is the length or amount of information presented in EISs. This factor was particularly emphasized by the Institute of Environmental Management & Assessment (IEMA) in its review of EIA practice in the UK:

> *IEMA's research has found that EIA practitioners recognise the fact that generally the length of a typical UK ES* [terminology for impact assessment statement in UK] *acts to reduce the value of the EIA's findings it contains to the majority of audiences. It is clear that action is needed by EIA practitioners and all those involved in practice to begin to produce more proportionate ES that provide clear and focussed information.* (IEMA, 2011, p. 87).

While practitioners and analysts usually agree that the volume of information can somehow affect the quality in EISs as well as the overall effectiveness of the EIA process (Lyles, 2017), very few academic studies have evaluated this issue in detail. In fact, quite often, studies on EIS quality completely overlook the length or volume of information in EISs (e.g. Kabir and Momtaz, 2014; Veronez and Montaño, 2017). This is to a great extent a consequence of the methodologies of these studies, which tend to target quality mainly through the aforementioned lenses of 'completeness of information'. The shortage of studies on volume of information in EIS is worrisome, as the increasing availability of data and growing societal expectations of content are creating incentives for lengthy EISs. The effects of this trend on decision-making need further and continuing investigation, particularly in contemporary Brazil, where pressures are mounting for streamlining its EIA system (Fonseca and Rodrigues, 2017; Fonseca et al., 2017).

The objective of this article was to systematically analyze the amount of information that is being presented in EISs, using Brazil as the empirical context. More specifically, this study evaluated the volume and proportion of information that were presented in 49 Brazilian EISs, and discussed implications to decision-making. This study also tried to identify sectorial variations and whether variables such as Project Size and number of pages in Terms of Reference are likely determinants of information volume in EISs. Although addressing the Brazilian empirical context, this study is likely to be relevant to a broad international audience concerned with EIS quality and EIA effectiveness. This study is arguably the most thorough empirical analysis of length and volume of information in EISs to date. More than 146 thousand pages of EIS information were systematically evaluated by the authors through descriptive and inferential statistics. Findings may inspire future research and underpin policy-making in a variety of contexts.

This article is organized in five sections, including this introduction. The next section reviews previous studies and regulations that addressed the issue of EIS length. The third section explains the methodology used to collect and analyze data in connection with Brazilian EISs. Findings are presented and discussed in section four, and concluding remarks are finally drawn in section five.

2. EIS length: a puzzling quality dimension

EIS quality has a variety of dimensions, such as completeness, reliability, comprehensibility, clarity, accessibility, and length. The latter, while not always realized by practitioners and regulators, affects not only the shape/form of EISs; it can affect several aspects of the whole EIA process, such as cost, time, decisions and participation. One of the first peer-reviewed studies to shed light on the link between EIS quality and EIS length was the one by Lee and Brown (1992). This study, while reviewing the content quality of a sample of 83 UK EISs, realized that the high-quality statements tended to be the long ones (with > 100 pages), whereas the low-quality statements were found to be the shortest (< 25 pages). A similar relationship was found the next year in a study that compared that UK sample with another sample of 40 Irish EISs (Lee and Dancey, 1993).

The relationship between EIS quality and EIS length had already been addressed in early EIA regulations. For example, in 1978 the United States Council of Environmental Quality (CEC) changed the NEPA regulations, so agencies were "(…) directed to write concise EISs, which normally shall be less than 150 pages, or, for proposals of unusual scope or complexity, 300 pages" (CEC. National Environmental Policy Act, 1978, p. 55978). The CEC regulation encouraged agencies to prepare analytic rather than encyclopedic EISs, and set page limits not only for the whole statement but also for its cover (< 1 page) and its summary (< 15 pages). According to Wathern (1990, p. 26), this regulatory change was driven by fear of litigation: "approximately a 1 in 10 chance of a suit being filed against an EIS encouraged agencies to adopt an 'encyclopedic' approach to EIA, particularly in the early years of EIA". That 150-page limit was later endorsed as a guideline by UK's Department of the Environment, Transport, and the Regions, which recommended the following:

> *For projects which involve a single site and relatively few areas of significant impact, it should be possible to produce a robust ES of around 50 pages. Where more complex issues arise, the main body of the statement may extend to 100 pages or so. If it exceeds 150 pages it is likely to become cumbersome and difficult to assimilate and this should generally be regarded as a maximum. Any additional information should be incorporated in appendices* (Department of the Environment Transport and the Regions, 1995, p. 35).

Interestingly, the 150-page limit, as a maximum threshold for EIS length, has been endorsed in other peer-reviewed studies. Glasson et al. (1997), for example, in their review of EIS quality in the UK, concurred that length could be used as a proxy of EIS quality, as statements longer than 150 pages tended to have undesirable effects on the decision-making process. The World Bank, in the early 1990s, also encouraged submissions no longer than 100 pages (World Bank, 1991, p. 8).

However, burgeoning empirical data in the mid-1990s exposed a more complicated picture of the relationship 'length versus quality'. One of the most cited EIA studies of that period (Sadler, 1996) included a survey of EIS reports that classified them into three length categories: small (< 50 pages); medium (51–400 pages); and long (> 400 pages). The survey found that many EISs were longer than 150 pages, but without any discernible pattern. Interestingly, in that survey, a 'long statement' was perceived to be those documents longer than 400 pages, rather than 150 pages.

In the 2000s, studies continued to argue that EIS length is somehow related to EIS quality (e.g. Cashmore et al., 2002; Lawrence, 2003; Morrison-Saunders et al., 2006). In the US, a NEPA Task Force (2003) found that EISs were becoming significantly longer than the early ones, reaching up to 2000 pages-long documents. Some jurisdictions in Europe (e.g. IEMA, 2011; and The Scottish Government, 2013) started to emphasize the need for 'proportionality of information', rather than a fixed number of pages, as EISs tended to carry too much baseline information without relevant implications to decision-making (Anifowose et al., 2016). More recently, Landim and Sánchez (2012) found that, in