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Many roads may lead to Rome: Selected features of quality control within environmental assessment systems in the US, NL, CA, and UK

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ABSTRACT

As there is no one-and-only concept on how to precisely define and establish quality control (QC) or quality assurance (QA) in the making of environmental assessments (EA), this paper presents selected features of international approaches that address quality in EA systems in the USA, the Netherlands, Canada, and the United Kingdom. Based on explanative case studies, we highlight the embedding of specific quality control features within the EA systems, the objectives and processes, and relevant transparency challenges. Such features of QC/QA approaches can be considered in cases where substantial quality control and assurance efforts are still missing. Yet further research needs to be conducted on the efficacy of these approaches, which remains beyond the scope of this study.

1. Introduction

The quality of Environmental Assessment (EA)[1] documents and processes has been an ongoing topic since its implementation in the US National Environmental Policy Act (NEPA) and the spread of its fundamental idea worldwide. Based on the positivist/rationalist theory as clearly expressed by NEPA's founding fathers (e.g., Caldwell, 1988), the idea was that good-quality EAs would provide a sound basis for decision makers in formulating rational decisions (known as "speaking truth to power") (Weston, 2010; Cashmore et al., 2008; Nilsson and Dalkmann, 2001). Since the 1970s, many contributions have focused on the review of the quality of Environmental Impact Statements (EIS)/Environmental Reports (ER) (Glasson et al., 1997; Ross, 1987; Scholten, 1995) and the quality of the EA process (Commission of the European Communities, 1993; Wende, 2002). Empirical findings suggest that better environmental reporting does not necessarily lead to rational decisions (Cashmore et al., 2008; Dalal-Clayton and Sadler, 2005; Deelstra et al., 2003). Others argue that high-quality EA documents might lead to more environmentally sound and rational decision making (Hildén et al., 2004; Glasson et al., 1997; Lee et al., 1994).

To assess quality in EA, there have been approaches that involve the development of checklists and comprehensive guidelines for quality evaluation and quality control. For example, Lee and Colley (1992) developed a comprehensive E(I)S Review Package, aiming at assistance in quality review, containing advice for reviewers, a list of review criteria, and collation sheets. Colley and Raymond (1994) adapted the EIA Review Checklist, which later influenced the EIS Review Guidance by the European Commission, designed to assess the quality of EIS for re-search, monitoring or as a basis for decision making (European Commission, 2001). These and other instruments were used to compare EA quality in various EA systems (cf. Barker and Wood, 1999; Sandham and Pretorius, 2008). Derived from findings about EA process and report quality, several contributions suggest the application of quality control mechanisms for EAs in order to support high-quality assessment outcomes (Beanlands and Duinker, 1983; Lee et al., 1994; European Commission, 1996; Glasson et al., 1997; AG Qualitätsmanagement der UVP-Gesellschaft, 2007; Sandham et al., 2013; Therivel, 2010).

In the field of project management, Quality Control (QC) is an integral part of quality management strategies. Results obtained during quality control shall provide information about how well-targeted quality goals have been met (Rose, 2005). Quality control shall "[…] identify causes of poor process or product quality and recommend […] action[s] to eliminate them" (Project Management Institute, 2008: 206). Quality assurance (QA) is a way of preventing mistakes or defects in products and avoiding problems when delivering services to customers. In the field of Environmental Monitoring, Batley (1999) states that "*QA refers to all of the actions, procedures, checks and decisions undertaken to ensure the representativeness and integrity of samples, and accuracy and reliability of analytical results. QC comprises those actions that monitor and*

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[1] The term EA is used in this context to consider Environmental Impact Assessment (EIA) as well as Strategic Environmental Assessment (SEA).

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measure the effectiveness of QA procedures with respect to defined objectives." Ibe and Kullenberg (1995) share a similar understanding of the connection between quality control and quality assurance: "*Quality Assurance refers to the total sum of activities employed […] to ensure that the data […] meets the quality desirable for decision making. It consists usually of 1. Quality Control, defined as the set of procedures undertaken […] for continuous monitoring of operations and results in order to ensure that the results are good enough to be released; […].*" These definitions have their roots in other scientific fields, but we can adopt their basic ideas, even though quality assurance in EA is not only concerned with providing sufficient data for decision making.

In the field of environmental assessment, specific definitions of the terms "quality control" and "quality assurance" are rare. Contributions like Lee and Colley (1992), Lawrence (1997), Fuller (1999), and Pölönen (2006) discuss the topic quality control but, in some cases, fall short in providing a definition of the term. Fuller (1999) relates quality in Environmental Impact Assessment (EIA) to aspects of information quality, transparency, and opportunities for public involvement, cost-effectiveness, and methods used for impact analysis. He understands quality in EIA as being "concerned with the goal of ensuring that EIA maximizes its potential as an environmental management tool," while quality control is concerned with methods employed to ensure delivery of these quality aspects (Fuller, 1999). Quality control in E(I)A therefore performs the task of analyzing quality aspects in EA systems, processes, methods, and documents providing recommendations to improve the quality if necessary (Fuller, 1999). What seems missing is often a clear distinction of the terms "control" and "assurance," however.

Ortolano et al. (1987) describe control mechanisms for EIA with a focus on effectiveness with reference to organization theory. Based on this concept from Ortolano et al. (1987), Leu et al. (1996) described nine quality control mechanisms, providing examples of what quality control in E(I)A can cover. Besides points like "procedural control," "professional control," and "administrative control," the authors include aspects of "legislative control," "judicial control," or "international control," which head into the direction of EA effectiveness, too.

Lawrence (1997) draws a basic distinction between "EA quality" and "EA effectiveness." An EA quality analysis is concerned with the *inputs* of an assessment (documents, methods, processes, institutional arrangements) while EA effectiveness analysis is concerned with the *outputs* (direct and indirect consequences of an impact assessment). Lawrence (1997) also proposes levels on which each step of an analysis can take place, breaking down into the "micro-level" and "macro-level." A quality analysis of the institutional arrangement in an EA system would target the "macro-level" (systems perspective), while an analysis of processes, methods, and documents takes place on the "micro-level" (of an individual EA).

Fuller (1999) gives an overview of the types of quality control and assurance approaches. He divides them into "systemic measures" and "foundation measures." "Systemic measures" are described as "features of EIA systems that are designed to deliver quality assurance in the practice and administration" (Fuller, 1999). In contrast, "foundation measures" are "features which promote good practice and underpin the successful application of the systemic approaches" (ibid.). The measures assigned to these types do not have to be exclusively designed only for quality control or assurance, but contribute to these objectives nevertheless. Table 1 lists examples for these two types.

Prominent examples for systemic measures are technical or public reviews. They usually incorporate an analysis of the document quality followed by recommendations to lead agencies or consultancies on how to improve the quality of the EIS/ER. This can be done in a formal or informal way by actors within agencies or by independent actors or other stakeholders, based on a prescribed set of criteria and/or based on the scope of individual EAs. Besides reviews, this category contains other procedural approaches like screening or scoping, or more project-related approaches like project management techniques.

Table 1
List of quality control and quality assurance approaches and exemplary measures for EA (based on Fuller, 1999).

Types of QC and QA approaches	Exemplary measures
Systemic measures	• Technical EIS/ER review: ○ Informal review ○ Formal review within government or the decision--making authority ○ Formal review by independent authority ○ Informal review by an independent authority • Public EIS/ER review • Application of formal process elements, which help to control and ensure quality through "good practice," e.g., ○ Screening ○ Scoping ○ Monitoring and follow-up • Project management (e.g. personnel, strategies, communication, et al.) • Environmental acceptability criteria (e.g. standards not to be exceeded, guidelines to be adhered to, precedents, strategies et al.)
Foundation measures	• Guidelines/guidance • Capacity building • Training • Learning exchange • Professional recognition • Process review

Besides systemic measures, there are also features that promote and enhance "good EA practice" which Fuller (1999) calls "foundation measures" that contribute to quality assurance. These measures have a less direct effect on EA quality than systemic measures, at least for individual proposals, but promote and enhance good practice in a professional system. Several authors have recommended approaches regarded as "foundation measures" for EA quality assurance, such as dissemination of good practice guidelines, accredited EA training, certification of EA consultants, capacity development activities (e.g. Sandham et al., 2013; Glasson et al., 1997).

If we combine the concepts of Lawrence (1997) and Fuller (1999), we can discuss "systemic" and "foundation" measures at both the "micro-" and the "macro-level." "Systemic measures" on the "micro-level" would mostly focus on the quality and relevance of documents, processes, and methods. On the "macro-level," they would deal with institutional arrangements like organizational structure, organizational capacity, policies, or legislation. In the field of EA, the review of Environmental Impact Statements/Environmental Reports, be it by the public or by authorities, is by far the most common QC feature (Fuller, 1999). Arguably, in many EA systems, these public reviews represent a basic feature for quality control. Following the classification of Lawrence and Fuller, this represents, for example, a systemic measure at the micro-level.

Even in developed EA systems, such as in Germany and other EU countries, there is still a lack of proper implementation and good practice of quality control or assurance approaches that go beyond agencies' and public review. To integrate features of quality control in these developed EA systems, it would need a window of opportunity. One possible window would be the recent EU EIA Directive Amendment of 2014. The amendment contains elements of quality assurance. For example, authorities have to ensure competence and objectivity of their staff as well as developers being required to ensure the competence of consultants who prepare the environmental documents (Art 5 Directive 2014/52/EU). This sets requirements for EU member states to put forth ideas about quality control when implementing the amended EIA Directive until 2017. Unfortunately, a debate on national level about ambitious ideas, for example, in Germany, is still underdeveloped, and therefore, this window of opportunity might elapse unutilized. At the same time,

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