

The State-of-Art Environmental Impact Assessment: An Overview

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Abstract—The research on the effectiveness of environmental assessment (EA) is a milestone effort to evaluate the state of the field, including many contributors related with a lot of countries since more than two decades. In the 1960s, there was a surge of interest between modern industrialized countries over unexpected opposite effects of technical invention. The interest led to choice of approaches for assessing and prediction the impressions of technology and advancement for social and economic, state health and safety, solidity and the circumstances. These are consisting of risk assessment, technology assessment, environmental impact assessment and cost-benefit analysis. In this research contribution, the authors have described the research status for environmental assessment in cumulative environmental system. This article discusses the methods for cumulative effect assessment (CEA).

Keywords—Cumulative effect assessment, Environmental impact assessment.

I. INTRODUCTION

ENVIRONMENT in collective environmental fluctuation has risen since several years. This intensified concentration is associated with the scientific and the institutional basis of EIA (environmental impact assessment). Present scheme of regulative requirements, in USA and the Canada, necessity that EIA generated knowledge to recognize, examine and assess accumulative effects. The desire of EIA technology has stimulated to progress towards the knowledge of theoretical growing environmental effect and to build techniques for CEA. Ideas and explanations of enlarging effects are beginning to be matured [1]-[3]. Frameworks mostly obey a causal pattern containing of three primary components:

1. Sources of cumulative environmental change, suggesting that cumulative effects may emanate from single or multiple activities, similar or different in kind;
2. Pathways or processes of accumulation, inferring that environmental changes accumulate over time and across space in an additive or interactive manner; and
3. A typology of cumulative effects, implying that cumulative environmental changes can be differentiated, generally according to temporal and spatial attributes.

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Coinciding with the hypothetical work, methodological implements for CEA are being advanced and carried out after tested. Of specific interest are approaches that have been developed or used particularly to merge into conceptual pattern. As instance, some methods insist on multiple causes of environmental change [4], [5]. Others strain pathways of accumulation [6], and still other's concentration on one or more kinds of cumulative effects [1].

This paper categorizes methodological accesses to cumulative effect assessment and appraises the benefit of preferred techniques with study and review on cumulative effects. The purpose is not to invent approaches and policies but review and evaluate existent methods. This review will cooperate for development in approaches and the choice for exact accumulative effect's problems. The method of traditional techniques of environmental impact assessment for diagnosis of cumulative effects has been referred [1], [7]. The concentration here is on methods particularly assigned to CEA, or developed for it. The range of approaches considered is broad than that typically acknowledged in the EIA process. This broader perspective shows the possible contribution of other methodologies (e.g., district arrangement, threshold indicator examination, additive programming), generally external to traditional EIA practice, to the diagnosis and consideration of cumulative effects. These methods are not investigated exhaustively, but are grouped into wide classes with typical examples considered from severally. The estimation is based on principles derived from the conceptual structure described previously and its key characteristics, especially the notions of temporal and spatial accumulation.

II. OVERVIEW OF THE CUMULATIVE EFFECT

Cumulative effects assessment (CEA) is the process of systematically analyzing cumulative environmental change [8], [9]. A schematic diagram for CEA methods are shown in Fig. 1. The accumulation of multiple stressors (e.g., urban development, pulp and paper mills, oil sands developments, chemical industries, hydroelectric dams, agriculture, and mining) has created cumulative effects [10], [11]. In Environmental assessment one of the most enduring challenges is the assessment of cumulative affect. Although it has been mandatory in Canada for all project based EAs under the Canadian Environmental Assessment Act since 1995, cumulative effects assessment (CEA) remains something of an enigma. Despite best efforts, CEA is said to be "inadequately distinguished from (project-based) EA" [12] and constrained by the scale of project-based impact assessment practices [13].

Much of the CEA literature highlights the inadequacies of project by project CEA. It is difficult to address cumulative impacts within a project level assessment because traditional project level EIA does not normally address concerns associated with gradual environmental change from a range of activities and multiple stresses [14]. A recent review was carried out on the assessment of cumulative effects within UK environmental statements [15]. The review examined 50 UK environmental statements submitted between 1989 and 2000 and recognized that although the assessment of cumulative effects has been required since the EC Directive (85/337/EEC) was issued, they are still inadequately addressed in most environmental statements.

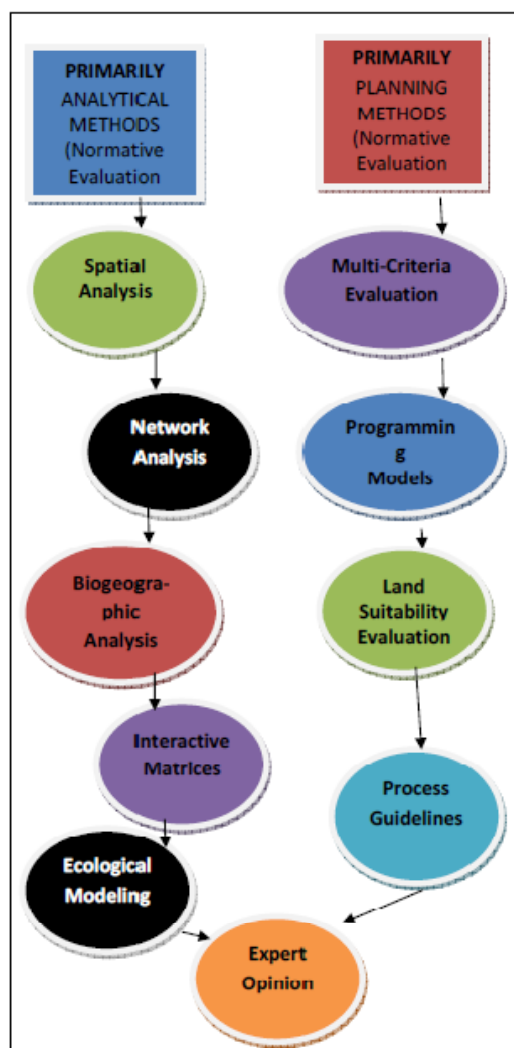


Fig. 1 Schematic classification for CEA methods

However, the inadequacies of the assessments of the cumulative effect are due to a number of issues concerning the consideration of cumulative effects in EIAs. First, there is no accepted definition of cumulative effects and no specific requirements in the legislation as to how cumulative effects

could be addressed. Second, the guidance to the procedures (Texas Department of transport; 2010, Washington State Department of Transportation; 2008, US Council on Environmental Quality, 1994, 1997; Lane and Wallace, 1988; Cumulative Effects Assessment Working Group and AXYS Environmental Consulting, 1999) do not mention methods or frameworks for the assessment of cumulative effects. However, the above guidance, although helpful, which give mechanism to assess the cumulative effect.

III. ENVIRONMENTAL RISK ASSESSMENT

Attenuate after occur of the old pollution sources due to the rapid economic development, environmental issues have become increasingly prominent, has ceased to adapt to the requirements of environmental management, there is an urgent requirement of pollutants into the environment. The implementation of effective management, forecasting after it enters the environment harm caused by the pollution. Environmental risk assessment is to evaluate the mortal environmental risk. Forecast the probability of occurrence of adverse events caused by mortal activities, and the seriousness of the consequences of different probability event, and decided to take appropriate measures. The basic content consisting of five aspects, which are the environmental risk assessment, risk identification, source term consequences computing, risk calculation and evaluation of proposed environment, risk prevention measures and environmental emergency's contingency plans, etc.

IV. ENVIRONMENTAL IMPACT ASSESSMENT

The proposed construction projects are systematic identification of impacts of regional development plan, policy of country environmental cause, prediction and assessment. Encourage the consideration of environmental factors in the planning and decision making achievement is more compatible with the environment of human activities. The ideal environmental impact assessment process shall meet the following conditions:

1. Applicable to all may have a significant impact on the environment of the project basically, and can make the identification and evaluation of the effect of all.
2. The various alternatives (including project without building or area without development, science and Technology) management, mitigation measures are compared.
3. Generation of environmental impact report clearly, so that the experts and non-experts can understand the possible effects of the characteristics and importance of environmental impact assessment method.
4. Extensive public participation and strict administrative review procedures.
5. Timely and clear conclusions are in order to provide information for decision making.

A. Mitigation and Enhancement

Mitigation of environmental effects is very important if the strategic environment assessment (SEA) directive is to meet

its objective of providing for a high level of protection of the environment. The SEA Directive states that an environmental report should provide information on “the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programmed”. For example, the North Carolina Wildlife Resources Commission (2002) proposed the following mitigation measure to reduce cumulative effect: For the protection of streams water to the pollutants, the further the intervention occurs from the source, mitigation of impacts consisted of establishment of a minimum 100-foot native forested buffer along each side of perennial streams and 50-foot native forested buffer along each side of intermittent streams and wetlands throughout the present and future service areas or the entire municipal jurisdiction [16]. We additionally encourage the implementation of buffers on ephemeral streams due to the important functions that they provide as headwater streams [17]. Buffers should be measured horizontally from the edge of the stream bank, which may result in wider buffers on higher gradients, and must be provided over the entire length of stream, including headwater streams. Further, the commission recommended leaving 30% of the development area as green space, which would include buffers and wetlands and ensure that the green space is connected to natural resources.

V. CONCLUSIONS

This study shows an irregular and conflicting treatment of cumulative effects in Environment impact statements reviewed and highlights the limitations of EIAs in addressing cumulative effect. In some of the constraints to CEA recognized to the EISs themselves were the uncertainties in regulatory requirements. This review elucidates the different past academic literature and guidance documents on the assessment of cumulative effect. The majority of the literatures of cumulative effect are inconsistent treatment of cumulative effect according to environmental planning assessment Guideline. This review describes a framework for the assessment of cumulative effect that could improve CEA and its ability to better monitor and assess sustainable development. There are following challenges are dispute in this review papers.

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