



Cumulative Impact Assessment: Is It Just a Fancy Way of Identifying and Managing Risk?

What is cumulative impact assessment? This is a good question but also one that is hard to answer – which, perhaps, is part of the problem. On their face, the words mean:

- Cumulative: increasing or increased in quantity, degree, or force by successive additions.
- Impact: the action of one object coming forcibly into contact with another.
- Assessment: the evaluation or estimation of the nature, quality, or ability of someone or something.

The current working definitions of cumulative impact assessment (CIA) include the following:

“any cumulative environmental effects that are likely to result from [a] designated project in combination with other physical activities that have been or will be carried out”¹;

“cumulative effects are the combined effects of past, present and foreseeable human activities, over time, on the environment, economy and society in a particular place”;² and,

“a cumulative impact is an impact on the environment [that] results from the incremental impact of the action [under review] when added to other past, present and reasonably foreseeable future actions”³.

All of these are linear definitions and so if we take a Cartesian view of the world, one that is relatively simple, mathematically oriented, and fairly predictable, it is easy to build a picture of CIA as additive, and then to design a logical

stepwise process that enables data gathering and engages stakeholders to varying degrees. This is exactly how we have gone about CIA to date, with generally unsatisfactory results. Most methods described in handbooks and guides around the world, whether for domestic or international audiences, follow a predictable, project-by-project review within a site-specific environmental impact assessment (EIA) process, usually in a way that considers the component parts of each project individually rather than at a systems level. However, “practically speaking there is really no way that EIA, because of its site-specific, single development orientation, can do the job of CIA”.⁴ This illustrates why the practice of cumulative impact assessment is still a mystery to most “practitioners”⁵.



The main challenges of CIA are that it:

- Is a form of pattern analysis not easily assessed from the perspective of an individual project.

¹ Canadian Environmental Assessment Act, S.C. 2012, c. 19

² Alberta Environment and Sustainable Resource Development, also adopted by BC in its current working version of their CIA framework

³ US National Environment Policy Act of 1969

⁴ Cumulative Effects: A Binational Perspective, W. James Erckmann, Institute for Environmental Studies, University of Washington, 1986

⁵ Impotence of Cumulative Effects in Canada: Ailments and ideas for Redeployment, Peter N. Duinker and Lorne A. Greig, 2006

- Is best done at a scale larger than the individual project level, to add meaning to the word cumulative.
- Is envisioned as a threshold-oriented exercise. However, thresholds are “very difficult to identify ... in specific ecosystems” and it’s difficult “to incorporate their dynamics in management or predictive models”⁶ – which begs the question about how best to establish baselines, and what government’s responsibility is in this regard.
- Requires the articulation of a broader set of economic, social and environmental objectives (commonly referred to as valued ecosystem components) that are different from narrower business-specific objectives, which is also an issue for EIA generally.
- Depends on the gathering and use of information that is often not available to an individual project proponent (i.e., business plans and competitive information from other companies who may or may not be active).
- Involves trade-offs based on a synthesis of information from a multitude of different players who engage in a multitude of activities within a geographic area, and which may not be within the purview of an individual project proponent’s decision-making framework.

As well, CIA is not a grand action or “magic bullet” that can solve the kinds of natural resource development problems that we now face. It is really an exercise in incremental understanding, constant learning and adaptation. It means conducting transparent risk assessment within a structured and deliberate trade-off analysis framework that

⁶ Ecological Thresholds: the Key to Successful Environmental Management or an Important Concept with No Practical Application? Peter M. Groffman et al, 2006

clearly talks about uncertainty, and that considers projects within descriptions of realistic future scenarios covering a geographic place that extends beyond the footprint of a single project.

The above approach is antithetical to the current model, which puts the responsibility for the CIA primarily on businesses inside a narrow project-oriented environmental assessment and impact process. The Business Council sees CIA as more properly being the job of government given its broader economic, environmental and social responsibilities and its unique role to articulate the ‘public interest’.

Our view is that the main focus of CIA should be regional, with efforts directed to how best to deal with risk and uncertainty using clearly articulated and measureable objectives. Project proponents and the business community generally should be considered as partners in the CIA process; they can contribute data from project-specific monitoring programs (rather than being responsible for leading the definition of baselines) and collectively participate in the dialogue, along with other stakeholders, about the social choices surrounding economic development.

Why is Cumulative Impact Assessment Important?

Why is CIA important? It is really quite simple. There are 7 billion people on earth today, projected to rise to 8 billion by 2027 and 9 billion by 2045⁷. Our planet is finite in physical space (only 148 million km² or 30% of the surface area), and ecosystem integrity is critical for meeting our needs – food, water and air – and for providing the things we “want” including a high standard of living for North Americans and Europeans (among others). For

⁷ British Columbia’s population has grown 83 fold since 1851 and is expected to expand a further 30% to 5.9 million by 2036.

developing nations who aspire to have what the West enjoys, the resources and innovations required to get them there are enormous. Collectively, we can neither maintain the quality of what we have nor expand opportunities without considering the cumulative effects on the basic systems that provide the means for sustaining economic activities and human well-being.

Let's be clear: all human activity is cumulative, and all humans are part of ecosystems, not separate from them. We explore, extract and transform the resources in our environment to derive a benefit. Therefore, the objective under any assessment framework is to find ways of accommodating what we want to do in a manner that makes explicit the consequences of our choices and decisions – or to say no, if the impacts are judged to be too large. Completing CIAs correctly can raise awareness about how close we are from thresholds deemed to be important, create space for innovation, identify ways to use resources more efficiently, maximize benefits, and reduce social friction.

History of Cumulative Impact Assessments

In 1952, philosopher George Santayana said “those who cannot remember the past are condemned to repeat it”. This is a useful perspective when looking at this issue – what can we learn from what has already been done, and what tools can we access that have been used before.

Silent Spring by Rachel Carson in 1962 raised the flag about human relationships to the natural world. While more a documentary of observations than a scientific analysis, it came out at a time when governments gave little attention to environmental management. There was no process for considering the environment in economic decisions, and before 1964, in the United States, the Food and Drug

Administration was the only agency that had a role in regulating consumer-oriented health and safety issues. The birth of the “regulatory state”, which began in the mid-1960s, saw a significant increase in the capacity of governments worldwide to address broader social, consumer, environmental and health and safety considerations.

In 1969, the US *National Environmental Policy Act* included the idea of EIA, but it was not until 1978 that regulations were promulgated requiring federal agencies to conduct EIAs as well as incorporate CIA in decision-making. While the practice of the former is fairly well established, the implementation of the latter has been difficult, plagued by a considerable lack of understanding and very slow progress.⁸

Following the US initiative, several other countries began to develop EIA systems - Australia (1974), Thailand (1975), France (1976), Philippines (1978), Israel (1981) and Pakistan (1983)⁹ with mixed results. The OECD's “Declaration on Environmental Policy” (1974) was the first international document to incorporate EIA. The European Union issued a directive relating to EIA in 1985, with adoption by member countries still progressing.¹⁰

Canada was behind, using an ad hoc process under some general guidelines, but with no legislation in place until 1992, with sections of the *Canadian Environment Assessment Act* creating the Canadian Environmental Assessment Agency coming into force in December 1994.

⁸ History of the Cumulative Effects Analysis Requirement Under NEPA and Its Interpretation in U.S. Forest Service Case Law, Courtney A. Schultz, 2012

⁹ History of EIA Systems and Measures taken around the World, Government of Japan, 2001

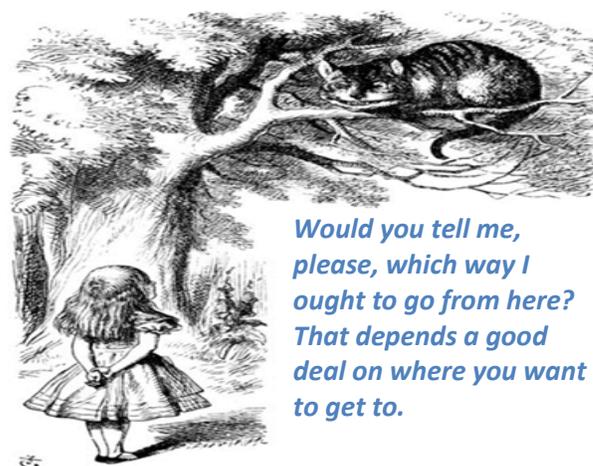
¹⁰ European Commission, DG ENV, Study concerning the report on the application and effectiveness of the EIA Directive Final report, June 2009

In BC, much of our large economic infrastructure was built in the 1950-1980 period with one main objective in mind - enabling economic development, with relatively little consideration of environmental or social impacts. In 1995, BC adopted its first EIA legislation. At the time the province was ahead of Canada in some respects, as it had two legislated and integrated review processes - one for mines and another for energy projects, as well as an ad hoc process for industrial project review – all established in the 1980s. These enabled and required the integrated review of large natural resource development projects. The processes were subsequently rolled into the *Environmental Assessment Act* of 1994, which came into force in 1995.

While CIA is noted as a requirement in most Canadian environmental assessment legislation, it has not been fully implemented – in part because most provinces struggle to deliver basic assessment processes let alone ones complicated by the dynamic systems thinking required in a CIA. British Columbia's EAO User's Guide devotes half a page to "how to" do a CIA. Embedded within the Canadian Cumulative Effects Assessment Practitioners' Guide is a long winded and wandering description of what it means to do CIA. The World Bank makes reference to CIA as one element of the project assessment criteria, but provides no guidance on the "how to". In fact, it can be argued that "at this time the promise and the practice of [CIA] are so far apart that continuing the kinds and qualities of [CIA] currently undertaken in Canada is doing more damage than good".¹¹

The key point is that although we pretend to have a firm grasp on how to do both EIAs and CIAs, in the scheme of things both practices are still fledgling – barely 20 years of experience in Canada – with CIAs being the least well

understood. Compounding this is that CIA in its current form is often seen as the "great hope" and ultimate solution for dealing with difficult choices about a specific project. The reality is threefold: (1) decision-making in the real world is inherently complex, and decision-makers must come to conclusions with imperfect information; (2) CIA is not a panacea but a tool; and, (3) any management choice will ultimately be better or worse, not true or false.¹²



*Would you tell me,
please, which way I
ought to go from here?
That depends a good
deal on where you want
to get to.*

Indeed, where do we want to get to? We argue that collectively we want systems, whether ecosystems or markets (markets are human ecosystems based on the exchange of goods and services), to be able to continuously produce the things that we "need". Systems, however, are based on a group of interacting, interrelated or interdependent elements forming a complex whole.¹³ As a result, we argue that CIA needs to be done regionally, and that it is really a form of risk assessment embedded within a scenario analysis framework. There is no need to invent a new process or approach, just to adapt what we have.

¹² *Wicked Environmental Problems, Managing Uncertainty and Conflict*, Peter J. Balint, Ronald E. Stewart, Anand Desai and Lawrence C. Walters, 2011

¹³ Webster's Dictionary

¹¹ See footnote #5

Scenario analysis and risk assessment are “powerful tool[s] for asking ‘what if’ questions to explore [the] consequences of uncertainty”.¹⁴ Scenario analysis focuses on systematically developing plausible alternatives of future environments and how particular activities might affect the outcomes of those futures. Conducting a risk assessment on each scenario generates risk estimates – perceived, qualitative and quantitative – and makes explicit the critical underlying assumptions and associated uncertainties.

“By working with scenarios of quite different futures, the analytical focus is shifted away from trying to estimate what is most likely to occur toward questions of what are the consequences and most appropriate responses under different circumstances”.¹⁵ Governments’ role is to balance the larger interests of society with those who have narrower interests and concerns.

While we will not take the time, here, to walk through the process of building scenarios, the starting point is to undertake a deliberative process of describing probable, possible and preferred futures of a place. As William Blake famously said, “what is now proved was once only imagined”. Having scenarios that are specific to a place (i.e., geographically defined/confined) with sharp contrasts allows us to compare expectations, strategies and possible decisions. Another critical element of scenario planning is to have an explicit articulation of objectives and thresholds. These must transcend scenarios and be specific rather than simply describe vague hopes. Without crisp objectives and thresholds, decisions have no reference points, and success or failure

cannot be measured. Often this part of any planning process is poorly done.



In terms of risk assessment, which seeks to measure the probability and magnitude of an event or its impact, the US Environmental Protection Agency’s “Framework for Ecological Risk Assessment and Guidelines for Ecological Risk Assessment” is a good starting point for adaptation. The BC Ministry of Environment also has a useful reference document entitled “Environmental Risk Assessment (ERA): An Approach for Assessing and Reporting Environmental Conditions”.

The final component of such a framework is access to and use of spatial data. We are primarily visual beings, and if a picture is worth a thousand words, then geographic information is critical to enable a representation of the present and future potential states of a place.



¹⁴ Scenario Analysis in Environmental Impact Assessment: Improving Exploration of the Future, Peter N Duinker and Lorne A Greig, 2007

¹⁵ Ibid

Pictures transcend language, convey a message faster and more easily than numbers or words, and are summarized and absorbed more quickly by the receiver. Geographic Information Systems (GIS) pictures are data-rich, requiring good science and monitoring programs to complete. GIS, as a tool, is therefore another key element of CIA, as it provides a method for assessing spatial overlaps of different attributes and spatial distributions of environmental change. GIS can be manipulated to help explore the attributes of “what-if” scenarios.

Conclusion

From the available literature, the Business Council concludes that part of the paralysis of CIA is that we are looking for something new when we don't need to. We have also tried to conduct CIA in the context of evaluating individual projects – clearly this isn't working very well. Fundamentally, CIA is not the responsibility of an individual project proponent but more appropriately of government bodies, as it involves the assessment of impacts and issues that are beyond the evaluation of specific sites or single projects. Trying to shoehorn CIA into project environmental impact assessments will continue to lead to frustration and lack of results.

We support the role of businesses as gatherers and providers of relevant information using rigorous monitoring programs, and as participants in an overall framework that is: regionally based, focused on evaluating scenarios, deploys a strong risk assessment approach and incorporates spatial analysis.

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