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Going Beyond Cumulative Effects Assessments Through Effective Decision Making

Abstract: The advancement of cumulative effects assessments has been hampered by a lack of understanding and development of the decision makers role. The decision makers, who review such assessments to determine the fate of a project or plan, may go beyond the information provided to engage a broader consideration of acceptability. Based on experience with project assessment and review in Western Canada, opportunities available to decision makers to do this are discussed, thus moving the practice and use of such assessments beyond their current limitations.

Key Words: cumulative effects, acceptability, regulatory review, decision makers, public interest

Project Review

Resource development in Canada continues to be a major part of this country's economy. Particularly energy projects. Western Canada, for example, has responded to the global demand for hydrocarbons. Conventional oil and gas has been supplemented by the unconventional oil sands. Transmission pipelines carry the products to refining or upgrading in Canada, the U.S., or to the coasts for shipment overseas.

In Canada, proponents of such resource development may, seeking approval, be required to submit an Environmental Impact Assessment (EIA). These assessments may include an assessment of cumulative effects. All such assessments are then reviewed by government or appointed regulators. These reviews may be conducted by Independent Administrative Tribunals, commonly referred to as "Boards" or "Panels". In Alberta, for example, we have the Energy Resources Conservation Board *(ERCB)*, which reviews some energy projects along with the provincial government's Alberta Environment.

Nationally, the National Energy Board may review some northern and off-shore projects, and pipelines that cross provincial or international borders. The federal government's Canadian Environmental Assessment Agency acts as a coordinator of federal reviews, some which may include a "Panel".

For some especially large, complex or contentious projects, the Board or Panel will hold a hearing, a quasi-judicial and public review of the project's application for approval.

Decision Makers and the Public Interest

In all reviews there are people involved whose responsibility is to make a decision, or advise government, on the fate of the project application. The decision will take into consideration various forms of evidence. This evidence includes the environmental impact assessment provided in the proponent's application and statements by stakeholders.

Some of this evidence is provided within a "cumulative effects assessment" (CEA). This assessment may include the mapping of the project within an environmental setting at relatively large regional scales and an analysis of its potential contribution to effects within that area. The assessment will also conclude as to the likely degree of environmental consequence of those effects, or significance as more commonly known. The CEA may use all manner of analysis, including physical-numerical models and spatial calculations of change. The CEA may investigate effects on a variety of valued components or indicators.

Much has been said and written on how to do the above, on how to do a "good CEA" However, not as much has been said and written on how to "make a good decision", representing the other side of the "CEA coin". That decision, the basis of that decision, and the process by which that decision is made, is the other and almost neglected aspect of cumulative effects assessment. This neglect has contributed to the current poor showing of CEA practice.

Decision makers, in the development of their decision, do have available some help in the form of precedents from other similar decisions, information from other similar assessments, application of good science, and the options allowed under their formal mandate. But this is not necessarily enough.

Important to this, and a notion not commonly recognized for its importance, is that evidence provided (such as in a CEA) is also accompanied by other considerations. With Alberta's ERCB, for example, this is referred to as the "public interest test".

The concept of "public interest" introduces the possibility of many considerations in the rendering of a decision, including issues larger than may be directly presented as evidence. This is especially true for addressing information provided in a CEA. Such assessments typically encompass large geographic areas and long time periods, which inevitably means that the effects of a single project can be overshadowed by the effects of many projects. And the larger the area and the longer the time the more uncertain the conclusions about effects become.

Also, from this lack of clarity by the public on what is entailed by decision making, there can arise a false and misguided expectation of what CEAs can accomplish. Stated another way, understanding and establishing the "limits of the possible".

The many projects caught within the CEA's "net" are themselves the result of many business, public and government decisions that ultimately reflect not on the project at hand, but on a confluence of decisions unassociated with the project. In western democracies, this is the result of due process, that notwithstanding its ambiguities, biases and varied motivations, is nonetheless the model by which development meets the needs of a growing human population. Cumulative effects assessment, once released beyond the narrow technical confines it currently inhabits, ultimately is an attempt to describe environmental change driven by forces far larger than the project itself. As such, the current practice of CEA, and the decision making processes they are subject to, cannot make progress until the very basis of

that decision making is made clear. And from that, then finally also will come clarity on a meaningful basis of conducting CEAs.

Projects are proposed because there is a demand for what the projects do. And decision makers have responded by approving, with conditions, many projects in recognition of this need. Therefore, ultimately, CEAs are tested not just by the merits of their technical content and argument, but by how compelling the weight of that evidence is given the costs, risks and benefits involved.

In the case of the dominant force of energy (oil and gas) projects in Canada's West, if we don't need the energy, then assumedly we don't need the projects. If we have real alternatives, with less of an environmental burden, then let us pursue those projects. But one hundred years of industrial development has created a dependency on carbon-chains that we cannot, yet, free ourselves of. That time will come, should come, but that time is not now.

The recognition and engagement of this larger context is what is meant by "going beyond CEA". The future of CEA therefore needs to reflect this; in effect, the future of CEA is the future that we all are collectively moving towards as a society.

But how can decision makers more effectively contribute to this?

Effective Decision Making for CEA

What is Needed

There are two kinds of information that can assist decision makers:

1. information about the consequences of alternative courses of action
2. information that helps define the public interest

Availability of that information can be improved in the following ways:

1. Defining how to evaluate the importance of an effect by defining a level of acceptability.
2. Using the past, or historical trends, to forecast the future, or at least to understand the place or context of a proposed project framed within a larger historical progression.
3. Obtaining reliable information.
4. Recognizing underlying societal need that drives the project.
5. Using various assessment tools to gain further insight into effects.
6. Reducing ecological complexity to become simpler but understandable.

Acceptability and Certainty

Acceptability is the key to good environmental management. Beyond CEA means coming up with methods to define or reach agreement on what is acceptable. CEA is a tool that if properly used can contribute information to any debate on acceptability. Up to now, acceptability has been defined (usually

implicitly rather than explicitly) by Boards and regulators, or municipal/provincial officials and politicians for some projects and in planning objectives.

Too much CEA is attached to individual project approvals, tries to be too detailed and precise, and is hampered by the lack of certainty that effects can be significant. What would be more useful to politicians, regulators and the general public would be something more generalized.

Acceptability is not “significance”, which in Canada has become polarized into a black-and-white world between two opposing and often indefensible extremes. Significance focuses attention on the kind of forecasting that generally cannot be performed with great confidence and distracts us from longer term and, in the end, more important issues. Except for the clear occasions when for air and water quality there is a predicted exceedance *of* some guideline or other, little is available to unequivocally state “significant” or “not significant”.

Acceptability however brings into this debate a more pragmatic soft spot between these extremes through the admission of some degree of effect as an inevitable consequence of development given what need that development is to satisfy. What is needed therefore is to define the public interest and determine whether something is consistent with it.

The challenge is educational and it is not going to be met by those making claims that cannot be substantiated and will not necessarily be borne out by the future state of the environment. Information fed into the debate by the environmental science community has to be reliable or it will eventually be discounted and future contributions from the same source will be ignored. And with reliability comes certainty and, when appropriate, admission that we do not know what the consequences of some actions would be.

Observing Historical Trends

Information about the larger public interest comes from issue identification. Some issues are specific to individuals or property and can be addressed directly. Broader issues affecting society as a whole at a larger scale are more difficult to address yet they have the larger consequences. CEA can throw light on such broader questions as how much development is acceptable by, for example, providing a progressive historical assessment of cumulative effects throughout the period since European settlement in North America or parts thereof.

There is a lot of information about the progress of agricultural, forestry, residential and industrial development in North America. It should be possible to come up with some broad conclusions about the cumulative effects of progressive levels of development on a regional (or perhaps ecosystem) basis. These could provide the basis for some indicators or thresholds. Such thresholds don't need to be exact and they don't need to be 100% probable. What they should illustrate is what sort of thing can happen if development reaches this level or intensity. They could be very useful for policy makers and also provide a starting point for traditional CEAs to help ensure those are focussed on the most useful questions. There is a more urgent need for this with respect to terrestrial systems.

Thresholds as Tools for Acceptability

And so with all its possible environmental risks, what is the test of reasonableness if there is no clear evidence of unequivocal severe environmental consequences? Shall it be some loss of boreal habitat, or much loss of boreal habitat and displacement of a caribou herd? Is that enough? Apparently for some, and not for others? Perhaps if we add the removal of water from a river. Is that by now enough, or along with loss of forest habitat? The fact that something has to give if we want more of something else is to some a difficult consequence to accept.

The assumption has been that the cumulative effects answer to this question is thresholds, also referred to as limits of change or carrying capacity. But thresholds, as numbers, can be difficult to derive and even more difficult to apply. Exceptions are those, as mentioned earlier, based on the relatively simple physical and chemical properties of air and water, as opposed to the more complex way in which organisms interact with that physical environment.

At least in terrestrial ecosystems, it is not realistic to expect cumulative effects assessors to determine significance. In Canada, a large amount of research has, for example, been necessary to bring our understanding of grizzly bears — an icon of the Canadian wilderness — to the point where a quantitative attempt at assessing effects can be made with even a relatively low level of confidence. Professionals conducting cumulative effects assessments in a typical two year period and with limited resources, cannot hope to duplicate that for other species. Nevertheless that is what CEAs, where determination of significance is the end point, try to do. And it is not done well because expectations usually surpass what science can offer.

Acceptability is a way out of this dilemma. Reviews of project applications and more general regional cumulative effects assessments should be focussed on acceptability rather than significance. The difference between the two is one of context. Significance is a measure of an effect when the effect is measurable, scientifically, as best can be done in a conventional assessment. But such conventions are quite limiting, however hard we try. Acceptability takes that significance and places it within the broader lens of public inquiry, thus subjecting analysis of the effect to the forum of public debate…and mandate. Only in this fashion can matters of cumulative effects ultimately be addressed, as the answers being sought cannot be found within the confines of CEAs as currently practiced.

For example, we know that removing and altering habitat will eventually result in extirpation. Do we need to know exactly how much can be removed before extirpation is inevitable and, by extension, how big an increment of additional disturbance will tip the balance? The focus on significance would suggest that we do but is that really the case?

Focussing on acceptability could mean, for example, that we agree through the political/government process, or as a result of a specific review or inquiry, that extirpating grizzly bears from a region is unacceptable. We could then have recourse to our historical analysis of how grizzly bear populations and ranges are known to have changed during the years since European settlement and how that relates to the course of agricultural, municipal and industrial development. From that we should be able to come up with a rough idea of how much farther development can go without making extirpation a likely outcome. We do not have to be precise. An approximate idea is enough to allow decision makers to set limits conservatively, giving reasonable confidence that goals will be met.

Future Scenarios

If we wish, we can then take that history and project it ahead in a future scenario forecast. Such forecasts offer various simulated futures that vary depending on the degree of human disturbance. These may be accomplished by mapping conceivable futures over time, and for *each* such moment discerning possible effects on selected environmental features. However sophisticated these may be, they fundamentally help answer the question “what if?” as decision makers ponder the implications and acceptability of increased human activity.

Such analysis, however attractive for its apparent depiction, must be approached with caution and used appropriately. Cumulative effects assessment is like forecasting weather or climate. The system under examination is complex and inherently difficult to forecast in the short term or in detail. However some longer term forecasting is possible. We know it will be colder in the winter even if we can’t say with any confidence exactly how cold and exactly when. Similarly we know that if we keep removing or altering habitat, populations of plants and animals that depend on it will decline and, eventually, disappear. Forecasting *when* they will disappear is more difficult.

Also, both natural and human systems demonstrate remarkable periods of stability marked by equally remarkable periods of instability. This can throw future forecasting for a loop and predicting hypothetical or induced futures into the universe of error bars greater than its originating data.

Nonetheless, such an approach is only one example of an analytical tool available to decision makers. In the pursuit of effective decision making, all options need to be considered and recognized for what they can do, and perhaps more importantly, what they cannot do.

Conclusion

There are deep philosophical questions at issue. Is man a part of nature? What is man’s responsibility for nature? Normally it would be unrealistic to expect public policy in even the most enlightened countries to address these matters but the unmistakable evidence now emerging about world demand for food and fuel may force the issue. The scientific community must be better prepared to provide reliable information.

Choices have to be made, choices that no computer simulation, statistical analysis, habitat analysis, air quality analysis, mapping, cumulative effects assessment, is going to do. Namely, on balance, what is the acceptability of a project, or the geographic use of a region by a number of projects, to let industry proceed. An industry driven by market demand with all its economic multipliers.

In conclusion, the future of CEA requires a context that goes beyond current CEA practice to support decisions. Decision makers need to exist in a forum that provides them the opportunity to accept evidence, explore options and be empowered to do so unfettered by current limitations. Going beyond CEA then culminates in a decision based on acceptability that examines that evidence in light of human need.