

Baselining in the Anthropocene: Vulnerability of the EIA process to the climate crisis

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Summary:

The climate crisis is making it harder to clearly identify project effects and the rapid rate of environmental change is disrupting the usefulness of traditional baselines. The EIA process must adapt.

Abstract

The climate crisis is having profound impacts on the environment and will have consequences to the EIA processes. It is becoming increasingly difficult to distinguish project effects on the environment from effects resulting from the broader climate crisis - separating the signal from the noise. This is further confounded by the rate of change in the environment caused by climate change, which is rendering traditional baselines less effective, or obsolete, at predicting the future environmental conditions that will likely exist when predicted project effects will occur. These observations require the EIA processes to adapt to the realities of the climate crisis.

Introduction

What we choose to do in environmental impact assessment (EIA) depends on our understanding of the problems we are facing. This is essentially the intent of this paper, to highlight some of the problems the climate crisis will cause to the EIA system. This paper presents observations and ideas primarily on how the climate crisis will influence:

- what baselines conditions are and how they are used in EIAs
- impact predictions
- the significance of impacts

For certain areas of the planet that are experiencing the effects of the climate crisis to greater extents, such as northern regions, ecological shifts will occur that will diminish the value of historical baselines for predicting future conditions. Understanding these shifts is important for evaluating project effects (Kopf, 2015). As historical baselines become less relevant the EIA process will need to rely on climate projections to a greater extent to make impact predictions. This will likely lead to less precision of impact predictions. As the climate crisis accelerates, the environment will become increasingly anthropogenically dominated with rates of change not seen before. This will influence the relative significance of project effects and the values that decision makers use to determine the significance of impacts.

Baselines and Climate Crisis

To fully grasp the challenges that the climate crisis is causing to baselines used in EIA a brief historical context is needed. The EIA process is essentially about predicting and mitigating harm caused by human developments on the environment (Aagaard, 2011). This is accomplished largely by comparing predicted project effects against historical baselines to evaluate project effects, determine their significance, and make decisions to eliminate, reduce or offset these effects. This method of comparing project effects to the environment using baselines arose during the early 1970s when the EIA system was formalized

(Noble, 2013). The environment that existed during the 19th and 20th century was relatively stable. This led to the idea of using historical conditions, the baseline, as a proxy for future conditions, “a knowable past and predictable future” (Ureta, 2020). This concept has its flaws, but it did allow for reasonable prediction and evaluation of project effects.

Now there is a growing realization that baselines using historic data may not be sufficient for impact predictions because future conditions will significantly deviate from these historic conditions.¹ Some EIA agencies are starting to realize this and state that future conditions must be anticipated and included in baselines. This raises several issues. Firstly, it disrupts the predominant view that baselines are historical conditions only. Many EIA agencies explicitly state that baseline conditions are the conditions that exist before the project or activity proceeds. Secondly, there is inadequate guidance on how to best include future conditions in baselines. There are also significant limitations to predicting future conditions based on climate change projections with sufficient detail to allow for meaningful impact predictions (Helmuth, 2014).

This paper focuses on the climate crisis and how it is influencing the EIA system and baselines, but the influences of other human impacts are also important to consider and include habitat destruction, overexploitation of natural resources, pollution, invasive species, diseases, and more. These impacts can also alter baselines in ways that detract from their usefulness in EIA and include (Rodrigues, 2019; Salah, 2022; Surprise, 2020; Ureta, 2020; Hirsch, 2020; Barandiaran, 2020; Kopf, 2015):

- oversimplification of complex environments
- normalizing human impacts on the environment, referred to as ‘shifting baselines’
- unrealistic idealizing of nature
- underestimation of human influences on the planet and its historical extent

Nor should the ways the climate crisis is continuing the colonization of Indigenous lands be overlooked and how this is normalized through baselining (Suprise, 2020; Salah, 2022).

[Making sense of a climate changed future](#)

There is a growing recognition and need for projections of future conditions that have sufficient precision to allow for impact predictions. Climate projections tend to provide long-term averages of climatic conditions that may provide a false picture of the future. This is due in part to conflating climate with weather. Long-term averages of climate conditions are not the same as weather and these averages are not terribly helpful for impact assessment. The effects of weather, and the range of extremes in weather events, matter when considering project effects and predicting future environments (Helmuth 2014). For instance, projections of average arctic warming on their own may allow for a rough understanding of what habitat will be like in the future but will likely not provide a sufficient understanding of wildlife distribution and abundance to allow for accurate impact predictions. To predict abundance and distribution of wildlife an understanding of weather and its extremes is

¹ However, for certain geographic areas, and for projects that have a shorter lifespan the use of historic baselines may suffice for impact assessment predictions and significance determinations.

critical because short-term events like a heat wave or icing² event could have dire consequences for species survival or distribution.

To get a better understanding of how wildlife will respond to environmental changes caused by the climate crisis the species vulnerability must be evaluated and efforts are being made to do this. However, this must be followed with an assessment of the capacity of wildlife to adapt to expected future conditions. This type of analysis is rare and is not present for most species in northern Canada. Without this type of analysis making predictions of project effects on wildlife will be problematic.

The climate crisis presents a unique dilemma for EIA. There is certainty of large-scale changes in the future, but uncertainty about exactly what these changes will be. This dilemma is made worse by the above issues associated with how to separate project effects from the vast changes that are resulting from the climate crisis. This is discussed briefly below.

Separating the signal from the noise

Predicting project effects and attributing causation to observed environmental changes is central to the EIA process, yet has proven difficult. Both predicting effects and attributing causation to observed changes in the environment are made more difficult by the climate crisis, and will likely become more difficult.

The difficulty with attributing causation can be seen using historical examples where given empirical data a consensus cannot be reached regarding causation of observed changes in the environment. Attempting to make predictions about effects using climate change projections is even harder. For instance, recent reports have noted that the effects of the climate crisis may be so severe that they will overwhelm the effects of a project. This may result in situation where project effects are not detectable (Helmuth, 2014; Kavik-Stantec, 2020). How will the EIA process deal with a situation where project effects are not detectable, or 'drowned out' by effects caused by the climate crisis? What will this mean for determining the significance of effects (discussed below)?

Deciding if effects are acceptable

Accurate predictions are needed for decision makers to make wise decisions about projects undergoing EIA. This is the ideal that EIA strives for but is rarely the reality. The climate crisis is rendering the ability to make accurate predictions about future environmental conditions increasingly difficult. Without the ability to have accurate future baselines, how can we make accurate predictions and how can decisions about the significance of effects be made?

This is further complicated by the societal values that decision makers use for deciding if impacts are acceptable (*i.e.* significant) and ideas around harm to the environment (Ehrlich & Ross, 2015). These values can be tied to historical baselines and notions of 'natural' environments that are free of industrial/modern human influence. These baselines are often used as a benchmark for evaluating environmental harm but are being disrupted given the environmental trajectory that humans have brought about.

² Icing is when snow is capped by a layer of ice, usually from warming and then refreezing. It inhibits browsing or grazing by wildlife.

This idea of 'harm' requires, for many people, separating humans from the environment and formulating concepts about 'natural' environments that exist without human impacts. The climate crisis is blurring this separation. There are essentially no more untouched or 'natural' environments. Where human destruction of environments occurred from overexploitation, habitat destruction and pollution there remained an ideal that, with careful management, environments could return to a 'natural' state. The climate crisis is rendering this type of thinking less realistic and casting serious doubts that, in any meaningful time frame, a return to a stable environment is attainable. What this means for the EIA process requires careful consideration. Ideas of how impacts are deemed acceptable (not significant) will need to shift from historic notions of nature found in baselines to forward looking goals and aspirations of what is possible given the realities of the climate crisis.

Conclusion

Like ecosystems and species, the vulnerability of the EIA process to the climate crisis needs to be assessed. This adaptation will need to consider the use of baselines and how they are set, to impact predictions, and how we determine if project impacts are acceptable. The climate crisis means there is no going back to idealized states of nature. This means we must also critically look at how we determine if project impacts are acceptable and what values we use to do this. To adapt, the EIA process will need focus on better understanding future conditions and focusing on objectives for what we want as our future, while understanding the profound limitations the climate crisis will have on what we can achieve. Through the EIA process projects must be assessed against these objectives, with an ever-diminishing place for historic baselines.

Note: The above is based on observations of how the climate crisis may impact the environmental impact assessment process for project specific environmental assessments, based on my work at the Mackenzie Valley Environmental Impact Review Board, my life in the North of Canada, and research on the topic. However, these observations are not necessarily shared by the Review Board.

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