Adding Organized Reasoning into Impact Assessment to Support Key Decisions

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Glenn Brown & Graham Seagel*

Abstract

A flowchart and guidelines demonstrate how and where to integrate organized reasoning and argument into the steps of a typical impact assessment (IA) project to support decisions that affect project approvals, such as scoping, impact identification and significance determinations. Doing so can have benefits in decreased project risk, enhanced communications among stakeholders, increased project efficiency, improved social license and greater transparency. This paper provides the rationale behind the process and ideas embodied in the original flowchart, presented as a conference poster, and includes a section of it as an example.

Introduction

This paper complements a poster from IAIA 2016, available at www.glennbrown.ca > Information Access > IAIA 2016. The poster is dominated by the graphic display of a flowchart of steps within IA. (A portion is shown in Table 1 below.) Although readers have seen flowcharts of the IA process before, the green column on the left is unique to this one. The flowchart is to help IA project managers increase their success and reduce their risks by integrating ideas and tools of argument within typical IA project steps. This document backs up the poster by explaining the nature and significance of organized reasoning to justify key decisions. It also provides the background rationale behind the steps and tools mentioned in the poster. The ideas shared here have been tested with IA practitioners working in Canadian jurisdictions and have proved helpful to them. It is designed as a generic process for all IA.

Add Organized Reasoning and Support for Key Decisions to Reduce Risks and Benefit Participants

Logical argument, also called organized reasoning, is the careful presentation of reasons, leading to a conclusion, for a particular audience. Organized justification is a similar concept, emphasizing the transparent justification of key decisions. For our purposes, 'argument' and its synonyms do not mean 'quarrel' but mean the systematic and thoughtful presentation of evidence to support conclusions. In that sense, a great deal of what practitioners do during IA—for example, gather and analyze data, determine significance and recommend actions—is argument. Although often not recognized as such by its authors, Lawrence (2007 p. 745) points out that "[Reasoned argumentation] is evident in all EIA documents".

Our key point is that using steps and tools of organized reasoning carefully and early in an IA process clarifies key decisions and benefits proponents, practitioners, regulators, stakeholders and the public.

Practitioners and proponents know that events they call 'surprises', perhaps even 'disasters,' sometimes arise late in the IA process. Such events could be a public demand for evidence that

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has not been gathered, a regulatory requirement that was not foreseen, confused interpretation of regulations and policies, weak and late integration of public, stakeholder and aboriginal input, or a remediation cost calculation that is greatly over initial estimates. Such unhappy events can put the practitioner's professionalism in question and the proponent's project in jeopardy. The factors that become disruptive were present early in the project, as 'risks' that were missed or not adequately recognized. They eventually became real negative influences affecting project risk, social license and project costs. The process we offer is designed to reduce such project risks by better identifying key factors and permitting more informed key decisions. It does so much earlier than is often the case.

There are other benefits from our procedure. Practitioners can better direct their efforts and use time more efficiently. Regulators can contribute earlier in the process and have more effective input. Stakeholders and the public benefit from increased transparency of the process and better understanding of the arguments, which permits more effective and timely input. You might ask: can all these benefits arise from organized reasoning and justification of decisions? Can they be diagramed by a flowchart? We say yes! and yes!

Five Steps of Argument and Decision Making can help the IA Process

The practices of argument, reasoning and decision making have been considered for centuries. The current understanding of these practices is unfortunately not found in one place but is addressed in a variety of contemporary professional fields, including informal logic, speech communication, rhetoric, prose composition, cognitive psychology, and decision analysis (E.g., respectively, Sinnott-Armstrong & Fogelin 2014, Inch & Warnick, 2010, Perlman 1982, Williams & Colomb 2007, Hastie & Dawes 2010, Goodwin & Wright 2014). We have extracted five key procedures, or steps, from these fields that can be applied to IA and describe them briefly here. These steps are particularly practical because they can be directly linked to the IA practices of screening, scoping, identifying VCs (valued biophysical or socio-economic components), predicting impacts, determining significance and discussing cumulative effects, avoidance and mitigation.

The text below briefly describes the key approaches and their linkage to practices in the IA process. We outline how they work in the iterative process displayed on the simplified flowchart below and in the detailed original document online. The ideas can be first applied early in the IA process, and then be refined and improved through iteration in later phases of an IA. The five key steps of argument leading to decisions are:

> 1 Distinguishing the hierarchy of reasoning,
> 2 Taking more care to define key terms, and
>   Applying topic-appropriate steps of reasoning for three kinds of argument:
> 3 Arguments of fact,
> 4 Arguments of evaluation, and
> 5 Arguments (Decisions) for action.

Each of these steps is discussed in the literature cited above as being commonly weak or absent in public discussion and debate. Research by Hicks (2011) showed that these specific practices

are also missing, or are weakly addressed, in the professional IA documents he reviewed. The five steps are described more below.

Distinguish the hierarchy. When making arguments, people often do not clearly identify the separate elements of reasoning needed to make clear and complete reasoning. They can be distinguished as a hierarchy with four levels. In the many arguments within an IA report, the final *conclusion* can be supported by one or more *reasons*, each of which relies upon often empirical *evidence*, which is justified by various kinds of *support*. However, some of these steps can be unintentionally left out, even in vital parts of a report's reasoning. Leaving out key parts of a logical sequence does not necessarily mean that the final conclusion will be wrong. It can be quite fair and reasonable. But leaving out parts does make the IA argument weaker and potentially less convincing to others. Such incomplete arguments can leave the audience (stakeholders and the public) confused or suspicious. Such situations can make for longer and more expensive interactions with regulators and the public. Our flowchart provides explicit places for applying the different elements of the hierarchy of reasoning.

Clear definition is an important element of sound argument. Hicks (2011) found very few definitions in the IA documents he reviewed. Specifically, definitions of 'significance' were almost completely absent, even though there were clearly different kinds of significance considered in the reasoning for the IAs he analyzed. Explicit definitions are needed at early stages in IA, especially in considering attributes of VCs and considerations of significance. We provide places to consider those features in our flowchart.

Discussion of public argumentation often recommends explicit consideration of three different kinds of argument. All three are components of IA, but practitioners often do not recognize their different properties. Further, the specific guidelines that exist for making each kind of argument are also not well known. The first kind is an argument of fact, in which the major conclusion is a factual claim: e.g. the falcon population is declining, or, the mine will impact regional air quality. Baseline studies and impact projections involve many arguments of fact.

The second kind of argument is the evaluation argument. These are arguments that conclude with a judgment of merit, worth or value of some kind. Discussions of ecological merit, economic worth or any kind of significance are evaluation arguments. They usually involve a mixture of subjective and objective elements and can be quite tricky. Evaluation arguments are central to such tasks as considering the importance of VCs, doing economic cost-benefit analysis, determining significance, and picking criteria for monitoring programs. However, the reasoning and assumptions about evaluation are often passed over and not mentioned in documents. It is not that IA practitioners are intentionally deceptive in avoiding these key arguments. It is common that people tend to make tacit assumptions about evaluative arguments without recognizing that they are doing so. To improve IA practice, such arguments should be introduced explicitly and early in the IA process. We identify key steps in our flowchart.

The third kind of argument is known as the decision argument or the recommendation argument. Their final product is conclusion for a decision or recommendation that an action should take place: implement these steps, monitor those factors, build this road, etc. Decisions are often the final conclusions that people are most interested in. However, decisions about actions involve much background information and reasoning.

We identify these three kinds of arguments in an ordered sequence. While practitioners need to make each kind of argument in different parts of the IA process, it is always the case that final decisions are contingent upon fact and evaluation arguments. Facts and evaluations provide the logical input for decisions. However, steps of the reasoning process leading to decisions are often left out. Such deficiencies lead to unclear reasoning and the potential for errors or surprises in IA. Hence to minimize project risk they should be avoided. Our process provides places for all necessary steps, so they are less likely to be missed.

These argument steps are part of normal IA documents. But note that they usually occur during the IA report-writing process that takes place late in the project (Phase 4 in our flowchart). That is after initial plans are made, data gathered and meetings with regulators, stakeholders and the public are well advanced. Hence these important reasoning steps are often completed when the cost of surprises and errors has become high, and potential harm from risks is already high.

It is therefore both practical and important for the proponent and the practitioners to develop each of these lines of argument earlier in the IA process, well before the risks affect the project. Our flowchart shows the outlines of arguments beginning in Phase 1. That creates an initial logical framework of reasoning and decision-making that forces the early recognition of most, if not all, of the main factors of a given IA project and builds them into early decisions. Using steps of reasoning early in the process reveals what data is needed and identifies concerns, priorities and potential costs earlier. Producing such a framework of reasoning and decision making can be integrated into an IA process, and specifically can be integrated in a repeated and predictable way.

Note that we have described these five important steps. But each step actually involves quite a number of specific tools that we do not have the space to describe here. On the flowchart in several places we describe the creation of an 'argument framework'. That term refers to a specific combination of steps and tools that is appropriate at the particular place in the process.

The flowchart shows how the different tools of argument can be integrated into an iterative process

The full flowchart in our poster displays five Phases of steps, data analysis, argument and decision making that can be considered to make up the IA process. They are:

1   Concept—Problem Definition by the Proponent
2   Development—Project Planning by the Proponent
3   Development—Project Planning
4   Implementation—Data Collection & Engagement
5   Implementation—Analysis & Documentation

The main messages can be understood by looking at a diagram of Phase 1 from the original flowchart on our poster, in Table 1 below. Broadly speaking, the far right (orange) column represents steps by the proponent and the grey (middle column) represents tasks by IA practitioners. The green column on the left identifies the argument and reasoning steps. The hexagons in the right column indicate the major decisions that come from the reasoning and analysis. The boxes with dual shading denote shared actions or decisions involving practitioners, regulators or proponents. The far left column indicates both the risks that have

potential to harm a project and the actual consequences of those risks to the project. In Phase 1 the risk potential is high but no negative impacts have yet occurred. The potential to incur risks is highest at the beginning. That is why initiating the argument process early is essential, to identify the factors that can control and reduce the risks and their impacts on the project.

There is a counter-clockwise logical loop in the process shown in the flowchart for Phase 1. A similar loop is repeated in each of the following Phases 2-5, although the specific details vary in each phase. The loops starts as a proponent's needs and interests, in the first orange box, drive actions by practitioners. The flowchart shows how practitioners can frame their actions by explicitly identifying the key parts of the five steps of argument mentioned above. The green boxes show how the key elements of the argument, definitions and steps in the argument process can be initiated in Phase 1. The work is not at all complete then. But major elements can be identified, so the needed background work is begun early. Doing so alerts practitioners, proponents and other participants of pending issues and of the tasks needed to address them, such as data gathering, analysis, public engagement or interactions with regulators.

Setting up an argument framework early, and then fleshing it out further in each following Phase, permits a complete, transparent and careful identification of all key factors of an assessment. These steps of reasoning justify the key decision in each Phase, shown in the hexagonal boxes. That decision leads the project on to the next Phase.

Most of the steps of reasoning and decision making can be repeated in a procedurally similar way in subsequent Phases. Practitioners will address additional key points and build more details into the early framework of reasoning.
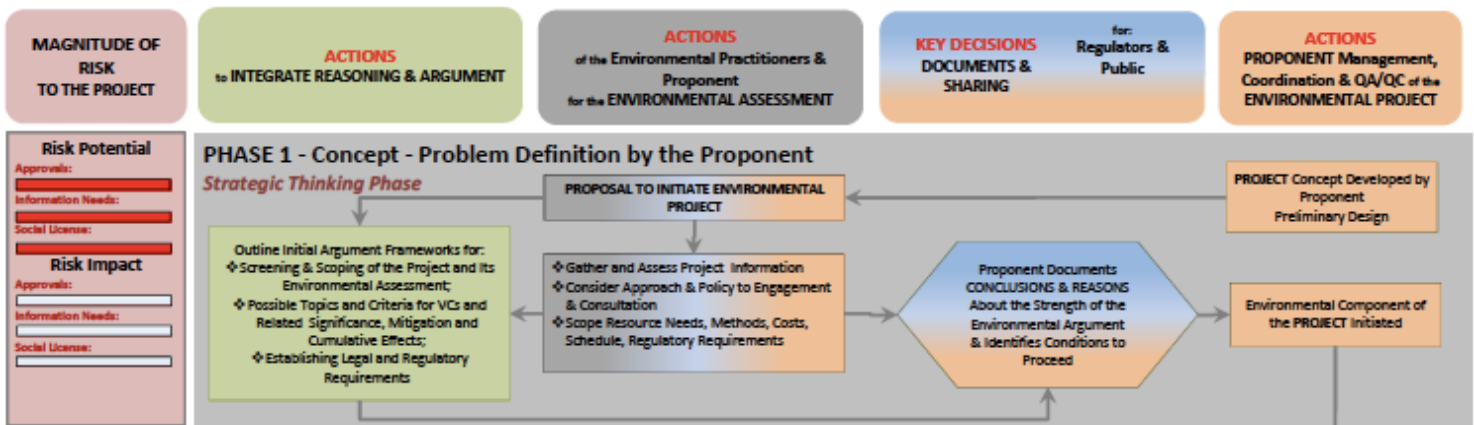

Figure 1: Phase 1 of Argument and IA Flowchart, extracted from the original (available online)

Conclusion

Clear thinking is essential to good decision making. The world of argumentation has developed specific guidelines that are not well known to IA practitioners. We document how practitioners can identify applications of five major steps of organized reasoning. We show in a flowchart how they can be used explicitly and iteratively during IA, in a process that identifies and justifies key decisions and the essential information that they require. Doing so in the manner shown on the flowchart can help reduce project risks and make all steps in the process clearer for practitioners, proponents, regulators, stakeholders and the public.

To review the knowledge and skills of argument that are needed to complement a practitioner's technical skills, see any of the items in the list of Literature Cited. There is a longer list of resources on the website mentioned at the end of this page. It might be most helpful to start with Weston (2009) for a short overview of argument, Williams and Colomb (2007) and Rottenberg and Winchell (2014) for approaches based on writing skills and Herrick (2015) for an approach based on understanding the structure of arguments.

Literature Cited

Goodwin, P. & Wright, G. 2014. *Decision Analysis for Management Judgment*. 5th edition. Padstow, CON: Wiley.

Hastie, R. & Dawes, R. 2010. *Rational Choice in an Uncertain World: The Psychology of Judgment and Decision Making*. 2nd edition. Los Angeles CA: Sage Publications.

Herrick, J. 2015. *Argumentation: Understanding and Shaping Arguments*. 5th ed. State College PA: Strata Publishing.

Hicks, T. D. 2011. *Exploring the Use of Argument in Impact Assessment: A Case for Impact Significance Arguments.* MA thesis, Royal Roads University, Victoria, Canada.

Inch, E. & Warnick, B. 2010. *Critical Thinking and Communication: The Use of Reason in Argument*. 6th edition. Boston MA: Pearson.

Lawrence, D. 2007. Impact Significance Determination—Designing An Approach. *Environmental Impact Assessment Review* 27: 730-754

Perlman, C. 1982. *The Realm of Rhetoric.* Notre-Dame IN: University of Notre-Dame Press.

Rottenberg A. & Winchell, D. 2014. *The Structure of Argument*. Boston MA: Bedford Books.

Sinnott-Armstrong, W. & Fogelin, R. 2014. *Understanding Arguments: An Introduction to Informal Logic*. 9th edition. Belmont CA: Wadsworth Cengage Learning.

Weston, A. 2009. *A Rulebook for Arguments*. Indianapolis IN: Hackett Publishing Company.

Williams, J. & Colomb, G. 2007. *The Craft of Argument*. 3rd edition. NY: Pearson Longmans.

*Author's Contact Information

Glenn Brown
glenn.brown@telus.net
Royal Roads University
Vancouver, Canada

Graham Seagel
gseagel@shaw.ca
Sutek Services
Vancouver, Canada

Copies of the poster, this paper and a list of resources about organized reasoning can be downloaded at www.glennbrown.ca > Information Access > IAIA 2016.