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Impact tracing

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Abstract

Impact tracing communicates graphically, in concise diagrams, the cause-and-effect arguments of impact assessment documents — for instance, in EIA and/ or SEA. Hence, these arguments can be easily checked and edited through the respective causal pathways. Impact tracing can be carried out with a variety of diagramming options, including the specially designed descriptive causal diagrams (DCD), paving the way for a graphical culture.

1 Introduction

Respecting its causality premise, impact assessment — for instance, EIA and/ or SEA — communicates cause-and-effect arguments (Perdicoúlis and Glasson, 2009). This information can be registered in any medium, but impact maps can provide a notably easy visualisation so that impacts can be *traced* from their origins to whatever they are changing — for instance, environmental factors. The relationships between the proposed action and its impacts may include complex dynamics such as impact interactions, cumulative impacts, and indirect impacts (Perdicoúlis and Glasson, 2009, 2006; Perdicoúlis and Piper, 2008).

Impact maps constitute a special kind of causal diagrams. They can be constructed (a) from original ideas, as the primary means of expression, or (b) from already existing means of expression, such as text — Figure 1.

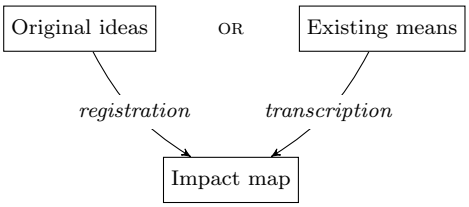

FIGURE 1 Impact maps can be created either as originals or as transcriptions

When registering ideas directly into impact maps, any processing (that is, thinking) takes place in a visual medium. Thus, arguments must be constructed and verified directly in the conventions of the selected (graphical) medium, which implies learning a new 'technical language'.

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Transcribing ideas from an existing medium — for instance, text — faces the additional challenge of 'adaptation': most likely the available information will include uncertainty (Perdicoúlis and Glasson, 2012, 2009, 2006), in which case additional information will be needed in order to produce the impact map — hence, the original source (e.g. text) cannot be followed strictly, and would have to be modified.

2 Impact maps

The visual style, or the 'look' of impact tracing maps follows the conventions of the chosen diagrammatic technique, perhaps with an opportunity for adjustments in the sense of improvement. Indeed, there are plenty of 'box-and-arrow' techniques to choose from (Perdicoúlis, 2010), and some are more efficient than others — for instance, in order to protect from ambiguity or uncertainty, some rigorous or 'demanding' techniques comprise strict rules. Descriptive causal diagrams, or DCDs, belong to this group of techniques, and have been designed specially for impact assessment (Perdicoúlis, 2010, 2011). As an illustration, let us consider the impact tracing map presented in Figure 2.

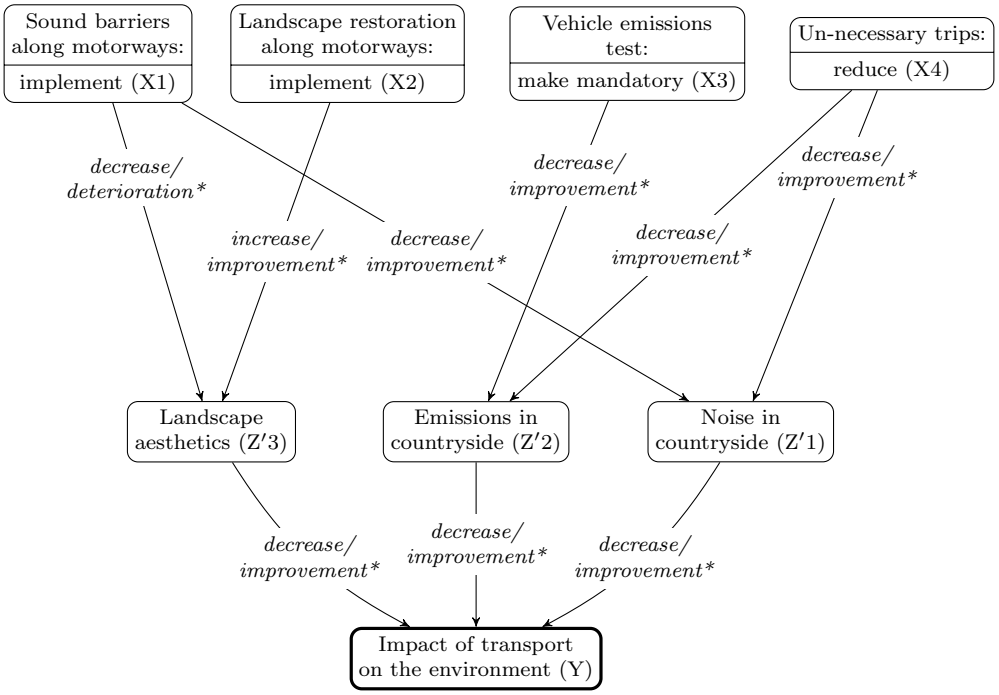

FIGURE 2 The impacts of selected mitigation actions of a transport plan (Perdicoúlis, 2010, p.151) are shown as changes, following the conventions of DCD (Perdicoúlis, 2011), both as forecasts and as assessments (marked with asterisks)

The impact map of Figure 2 represents a 'manual' simulation of the proposed actions — mitigation actions, in this case — and shows how these are likely to reduce the 'impact of transport on the environment', which is the main concern (Y). This is a mental model that could reside in the mind of one or more specialists, but now is made explicit by drawing and thus it can be communicated, debated, and altered if necessary.

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It is worth noting that the impact map of Figure 2 does not reveal *why* the particular mitigation measures were proposed. We may suspect that they were conceived in order to reduce the 'impact of transport on the environment', within the scope of the plan, but the exact mechanism is not part of the impact map since it represents only a simulation. A full mental map of the plan would include the complete reasoning (Perdicoúlis, 2010, p.151), but this would belong to the transport plan, and not to the impact map.

3 Discussion

The regard of current impact assessment practice to causality is sub-optimal (Perdicoúlis and Glasson, 2006; Perdicoúlis et al., 2007), and this reflects on the techniques employed for its registration and communication (Perdicoúlis and Glasson, 2006, 2012). Efficient impact tracing requires appropriate diagramming for direct and unambiguous visualisation of the causal arguments, and there is no lack of techniques that could serve for impact tracing (Perdicoúlis, 2010) — including the specially designed descriptive causal diagrams, or DCD (Perdicoúlis, 2010, 2011). It is crucial that impact assessment professionals learn to think more clearly regarding causality, more efficiently, and more 'light'. The advance from 'texting' to 'diagramming' is very important, but implies a whole new culture, with its own rules to appreciate, follow, and re-shape — for instance, regarding semantics, syntax, and aesthetics.

Causality — and hence its registration through impact tracing — is cornerstone for impact assessment. Considering the causal relationships between action and impacts (or between impacts) not only pays respect to the fundamental premise of causality, but in practice helps the impact assessment teams to consolidate the scoping information, forecast the likely significant impacts, and conceive effective mitigation measures. It also helps the readers — both statutory reviewers and the general public — to understand more clearly what is being considered in the background of the technical documents (Perdicoúlis and Glasson, 2009).

A number of known 'complaints' are often presented against employing a graphical representation of cause-and-effect information in impact assessment. One of these 'classics' is the large dimensions that impact maps may attain, and another one is the time required to produce them — which is inversely proportional to the familiarity with the software used. Learning a graphical language appears to be yet another drawback, even though it is not 'politically correct' to take a stance against learning. These may be signs of resistance to an upcoming 'graphical' culture. However, younger generations are becoming familiar with graphical expressions through their computers, and it is perhaps in these generations that we may finally see the take-off of impact tracing. These generations must ensure, though, appropriate rules for their 'graphical culture' — perhaps with some help from the older generation.

4 Conclusion

Impact tracing helps the visualisation of cause-and-effect relationships in impact assessment documents. Professionals have many alternative techniques to experiment with, such as the DCDs, and their choice should reflect their technical background and/ or culture of graphical communication. Hence, more important than impact tracing itself stands a 'graphical culture' for efficient communication — let us say, from 'texting' to 'diagramming'.

References

Perdicoúlis, A. (2012) How clearly is causality communicated in EIA? *Journal of Environmental Assessment Policy and Management*, **14**(3):1250020 (25 pages).

Perdicoúlis, A. (2011) Application manual for the 'Systems Thinking' book. *Systems Planner*, **2**.

Perdicoúlis A. (2010) *Systems Thinking and Decision Making in Urban and Environmental Planning*. Cheltenham: Edward Elgar.

Perdicoúlis, A., and J. Glasson (2009) The causality premise of EIA in practice. *Impact Assessment and Project Appraisal*, **27**(3):247–250.

Perdicoúlis, A., and J. Piper (2008) Network and system diagrams revisited: satisfying CEA requirements for causality analysis. *Environmental Impact Assessment Review*, **28**:455–468.

Perdicoúlis, A., M. Hanusch, H. Kasperidus, and U. Weiland (2007) The handling of causality in SEA guidance. *Environmental Impact Assessment Review*, **27**:176–187.

Perdicoúlis, A., and J. Glasson (2006) Causal Networks in EIA. *Environmental Impact Assessment Review*, **26**:553–569.