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Hybrid CPD–DCD diagrams

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Abstract

Processes and related impact analyses can be visualised and studied jointly in hybrid diagrams, with added organisational advantages. The arrangement requires appropriate technical preparation, such as homogenised semantic conventions.

1 Introduction

Implementation or operational views of projects compel a process perspective, calling for the use of concise process diagrams (Perdicoúlis, 2010, CPD, pp.67–70), extended process diagrams (Perdicoúlis, 2013a, EPD), or personalised process diagrams (Perdicoúlis, 2013b, PPD).

On the other hand, consideration of projects in a wider context such as the environment of their implementation or operation, often raises questions about interactions that transcend the boundaries of the project — e.g. environmental and social impacts. Such interactions can be described *generically* in reverse blueprints (Perdicoúlis, 2010, RBP, pp.104–106), or *specifically* for each particular project in descriptive causal diagrams (Perdicoúlis, 2010, DCD, pp.70–74).

A more complete view of a project naturally merges two types of diagrams (e.g. a CPD and a DCD) into a hybrid diagram. While this brings advantages for the organisation and study of the project, it presents technical issues such as the homogenisation of representational conventions.

2 Process perspective

Action is best perceived in relation to its requisites ('upstream') and achievements ('downstream') — or, respectively, inputs and outputs (ISO, 2008). In two consecutive actions, the output of the first one becomes a unique or partial input for the second one (Figure 1). Thus, a sequence of several related actions, together with the intermediate states they produce and/ or require, defines a *process* (Perdicoúlis, 2010, pp.67–70).

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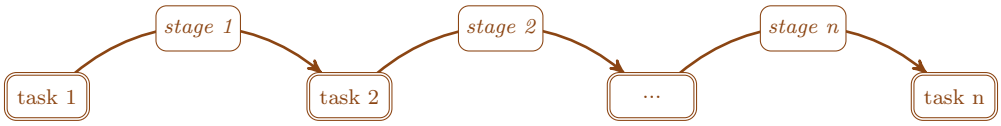

FIGURE 1 Generic concise process diagram (CPD)

The (abstract) action of processes is often organised in executable 'tasks', while the intermediate (and often perceivable) 'states' are also known as 'stages' or 'steps' of the process. Processes can also be divided into larger segments known as 'sub-processes', 'phases', or 'routines'. These aggregation levels create different 'zoom levels' for the process view.

3 Causality perspective

Impact analysis can be carried out either (a) in a general, 'theoretical' approach, implemented with reverse blueprints (RBP) in relative terms (e.g. with causal relations expressed as '+' or '−'), or (b) in a concrete approach with descriptive causal diagrams (DCD) in specific terms (e.g. with causal relations expressed with commitment: objectively as 'increase' or 'decrease', and subjectively as 'enhancement*' or 'hinderance*') for any given case study.

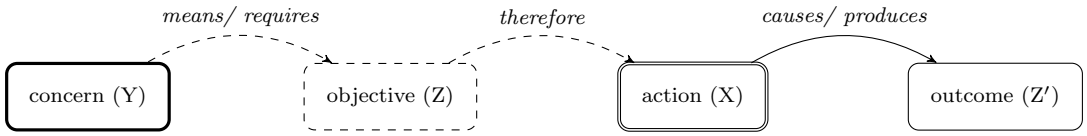

FIGURE 2 Generic descriptive causal diagram (DCD)

Descriptive causal diagrams (DCD) employed in environmental impact assessment do not involve all the steps of the 'full problem' DCDs (Figure 2). Commonly, they are likely to include the action (X), as well as the unintended outcomes or impacts (Z′). In exceptional cases, a feedback loop could be involved, linking the impacts to one or more principal concerns (Y).

4 Example

Let us illustrate the joint diagramming of a process and related impact analysis with the case of an environmental impact statement (EIS) regarding the project proposal of a hydroelectric power plant[1].

The hybrid diagram takes selected tasks and stages of the process as the starting points for impact analysis (Figure 3). The CPD and DCD maintain their identities and functions, and employ compatible semantic conventions — for instance: throughout the hybrid diagram, rectangles with a thin border represent states, double-border rectangles represent actions, and the unique thick-border rectangle represents a global concern of the impact analysis.

[1] Disclosure of the project and EIS identities is un-necessary in this case.

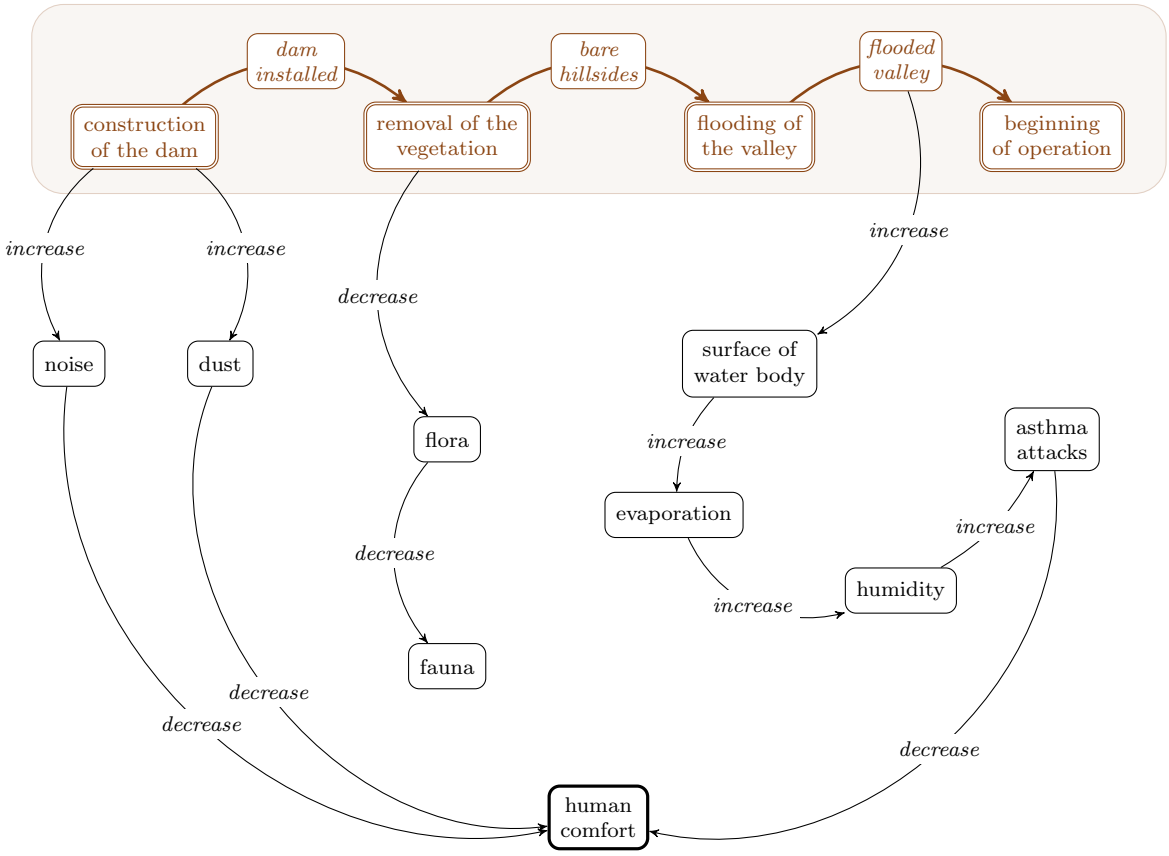

FIGURE 3 Hybrid diagram with the project CPD in the upper part (boxed, in colour), and the impact analysis DCD in the lower part (in black)

5 Discussion

In the hybrid diagram, the CPD should appear first: it does not make any sense to carry out an impact analysis of unknown actions. The description of the process (e.g. an engineering project) may come in text, as is often the case, and this should be deciphered into a diagram. If the project also includes a process diagram such as a Gantt chart, then the two sources should be well matched; otherwise, any conflicts should be resolved — for instance, by contacting the authors of the project proposal.

The impact analysis may be carried out as an original study with the CPD as the source, or can be imported from an EIS — i.e. transcribed from text into a DCD. It is not very likely that the impact analysis exists in a diagrammatic form, as this is quite rare (Perdicoúlis and Glasson, 2006). The CPD helps in the organisation of the inputs to the impact analysis, which otherwise would have to rely on 'loose' (i.e. un-related) and perhaps un-verified inputs. This is one main strength of the hybrid CPD–DCD diagram.

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6 Conclusion

Hybrid CPD–DCD diagrams turn impact analysis more organised, relating and verifying all the inputs from the leading process. This may be an invitation to the project teams for presenting verifiably coherent proposals. The main technical challenge of the CPD–DCD hybrids is the coherence of semantics conventions, which requires some preparation as illustrated.

References

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