Diagnostic Questions on Moving Beyond Engineering

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When it is necessary to consider the social context and move beyond engineering? What are the characteristics of Building with Nature design problems that make this necessary? When is it sufficient to adopt a standard engineering design process and when not?

These issues lie at the heart of this course. In addressing them, we turn to a paper by de Bruijn and Porter (2004) in which they develop a situational analysis decision tree to determine whether and what type of a process to engage stakeholders is appropriate. They suggest that by answering five questions you can diagnose when more than traditional disciplinary science and engineering is required, that is when the involvement of a wider range of people and consideration for the social context is necessary. Here we use the adapted version of the questions proposed by Enserink et al. (2010), modified slightly to suit the Building with Nature application. Note that an actor is an individual or group with the power to act or make decisions in a Building with Nature problem situation.

The five diagnostic questions that you are encouraged to ask in each situation are:
1. Can the problem be solved and the solution decided upon essentially by one actor (i.e. authoritarian) or by a consensual process of multiple actors (i.e., network)?
2. Are the interests and objectives of the actors involved closely aligned?
3. Is there consensus on the scientific and engineering knowledge?
4. Is the issue considered vitally important to the people affected by the problem and potential solutions?
5. Is there agreement that the decision is urgent?

These 5 questions can also be portrayed as the decision tree in Figure 1.

De Bruijn and Porter (2004) associated five generic strategies or approaches with the different situational diagnoses that could arise (potentially $2^5 = 32$ diagnoses). These include:

1. Undertake traditional disciplinary science or engineering to solve the problem and design solutions, in support of decision making
2. Institute mediated, participatory interactive analysis to negotiate shared knowledge upon which the solutions can be based
3. Initiate good communication, serving to clarify the values and arguments which the designed solutions are based and their knowledge basis
4. Identify the solution space. This strategy is applied when the issue is important and urgent. There is no time for extensive interactive analysis. There are diverse knowledge sources and interest and although not closely aligned must be taken into account. The only option is to collaboratively identify the potential solution space without closing off options too early.
5. No action is required, the issue is neither important nor urgent.

This analysis reveals the situations in which stakeholder engagement represents a sound strategy – represented by the shaded areas in Figure 1.

De Bruijn, H., Porter, A.L. (2004).The education of a technology policy analist – to process management. *Technology Analysis & Strategic Management* 16(2): 261-274.
Enserink, B, Hermans, L., Kwakkel, J., Thissen, W., Koppenjan, J., Bots, P. (2010). *Policy Analysis of Multi-Actor Systems*. Lemma, The Hague, Netherlands. ISBN 978-90-5931-538-9
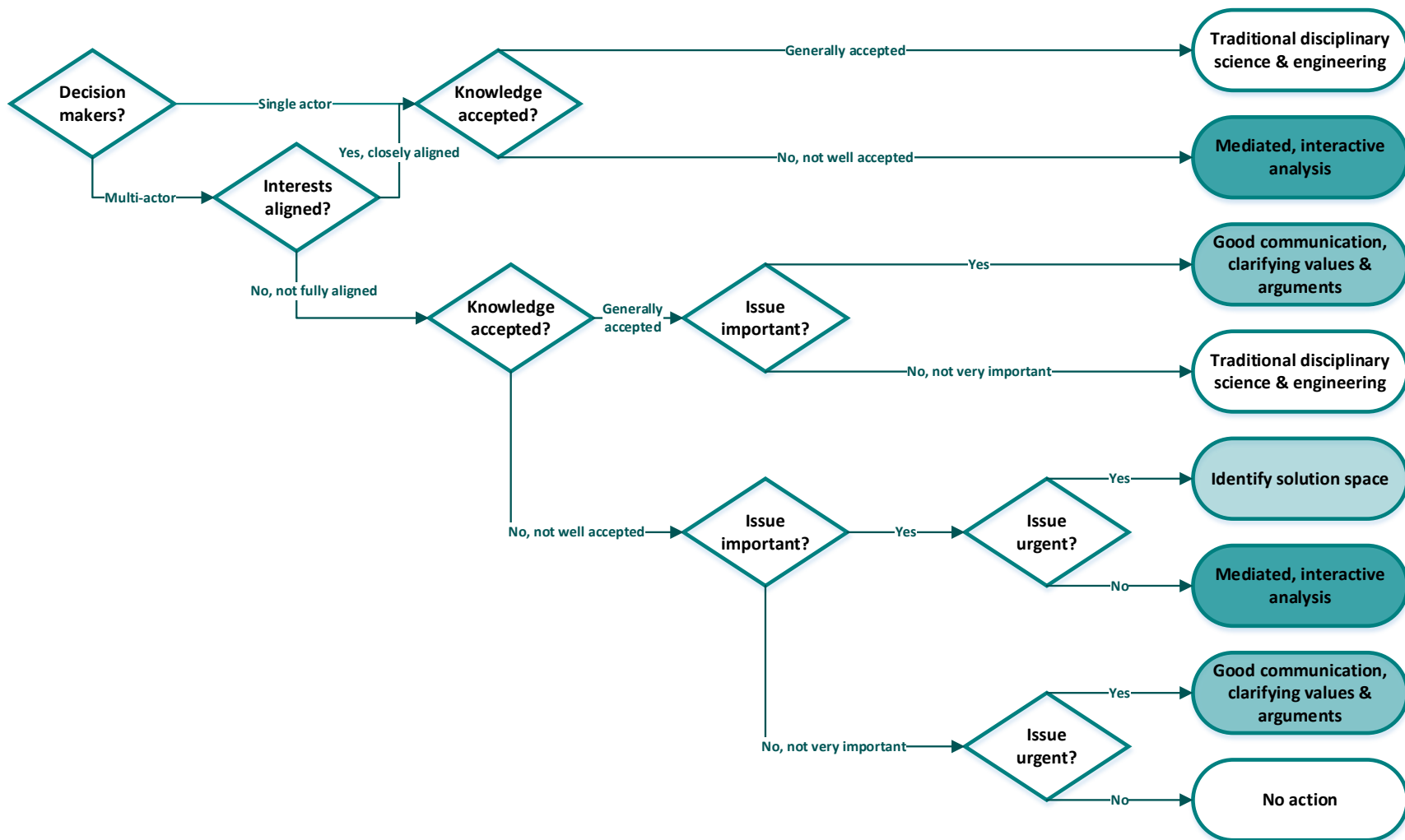
Figure 1: Decision tree to diagnose whether a situation requires stakeholder engagement (after de Bruijn & Porter, 2004; Enserink et al. 2010).

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