ROOM FOR UNCERTAINTY IN INFRASTRUCTURE PLANNING

HOW CONTINUOUS CERTAINIFICATION BY DECISION MAKERS RESULTS IN MORE UNCERTAINTY

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Dealing with uncertainty: a struggle for decision makers

Infrastructure planning is increasingly confronted with a dynamic environment and an engaged society. This necessitates decision makers to interact with their environment, resulting in the adoption of adaptive and participative planning approaches such as combined infrastructure and (organic) area development (De Roo et al., 2020). Giving room to stakeholders and to unforeseen developments implies incorporating uncertainty in planning and decision making and increases the complexity of planning. In current infrastructure planning, decision makers seem to struggle to find a balance between giving room to uncertainties on the one hand, and keeping the decision-making process manageable on the other hand. This often results in attempts to reduce uncertainties, in 'certainification' (Van Asselt et al., 2007; Klijn & Koppenjan, 2016). This focus on certainification prevents adaptive and participative approaches in planning from reaching full maturity (Hajer et al., 2010; Albrechts, 2012).

This paper is based on a recent study (Veenma, 2021) and aims to provide a better understanding of how decision makers in practice deal with uncertainty in their interaction with other actors. The term 'decision makers' refers to elected administrators as well as policy officers who support these administrators in the preparation and implementation of policy. This paper focuses specifically on area-oriented infrastructure planning – i.e., infrastructure projects explicitly designed to improve the quality of a local area (Arts et al., 2016; Heeres et al., 2012). By studying the planning and decision-making process in area-oriented infrastructure projects in practice, insight is gained into the process of interaction between relevant actors in the decision making. Based on this, the research provides recommendations on how to achieve a better embedding of adaptive and participative planning approaches – and thus more 'room' for uncertainty – in planning practice.

Influencing decision making by dragging the policy problem

In our study, uncertainty is about the extent to which actors involved in a decision-making process *perceive* uncertainties. In line with Friend and Hickling (2005), three forms of uncertainty are distinguished – cognitive, normative and strategic uncertainty, i.e.: "uncertainties about the working environment"; "uncertainties about guiding values"; and "uncertainties about related decisions". For practical reasons, we assumed in the study that individual actors belong to a group of like-minded actors, *advocacy coalitions* (Sabatier & Jenkins-Smith, 1993). These advocacy coalitions attempt to influence decision-making based on their shared values, causal assumptions and problem perceptions, their *policy beliefs* (Howlett

et al., 2009; Sabatier & Jenkins-Smith, 1993). The advocacy coalitions influence planning and decision-making by either reducing uncertainties (*certainification*), increasing uncertainties (*decertainification*), or accepting uncertainties, using one or more available instruments (their *policy mix*, Howlett et al., 2009). A *policy mix* consists of 'substantive instruments' (e.g., research) or 'procedural instruments' (e.g., participation). Based on Howlett (2018), a further distinction can be made between 'authority instruments' (e.g., political-administrative agreements) and 'organizational
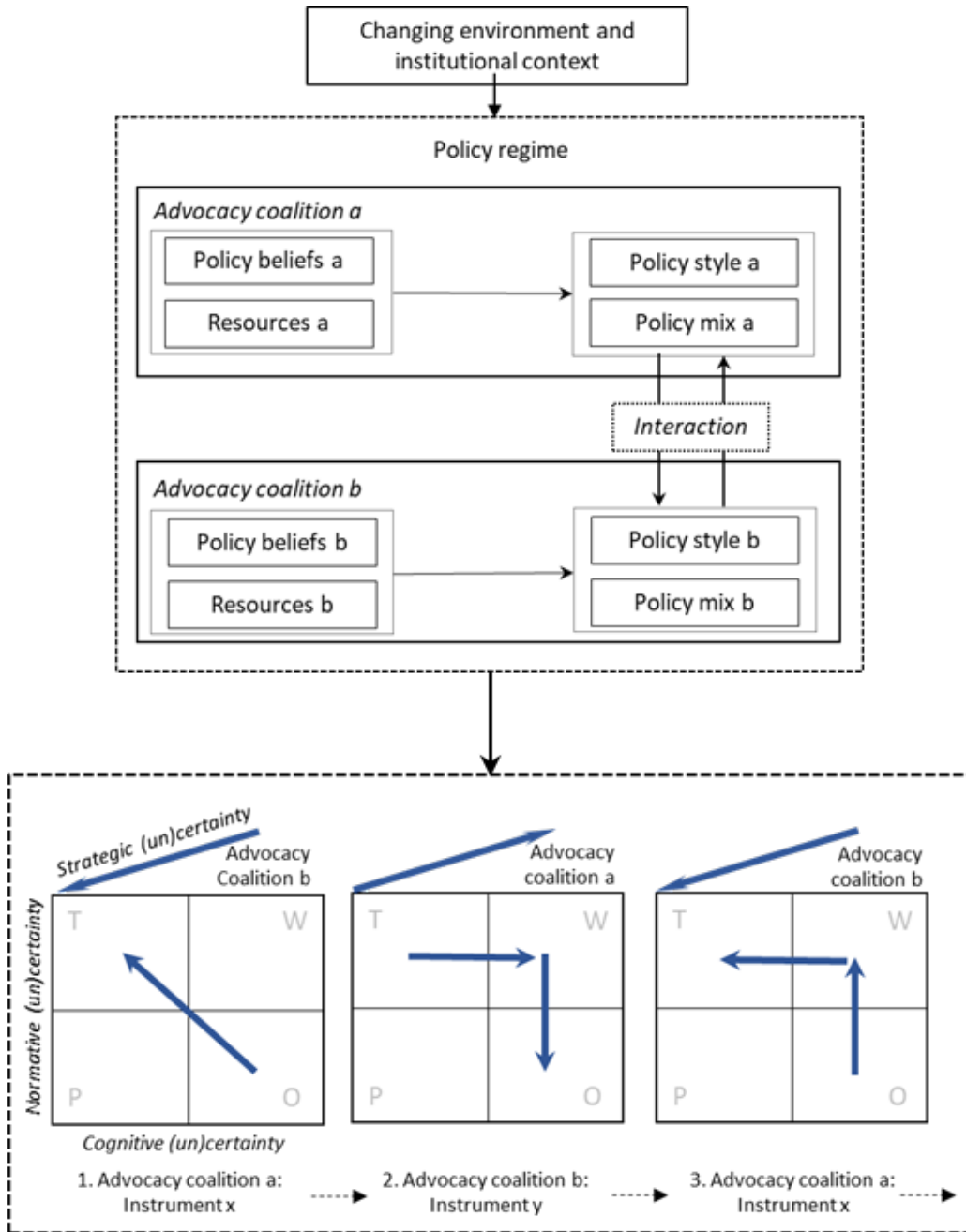

Figure 1   The theoretical perspective using an example with two advocacy coalitions
(T, W, P and O respectively represent a technical, scientific, political and untamed policy problem)

instruments' (e.g., area development). In the present study, it is assumed that the policy style and policy mix of an advocacy coalition are determined by the policy beliefs and *resources* (available instruments) of that advocacy coalition. The policy

beliefs, resources, policy mixes and policy styles of all advocacy coalitions in a policy area are called the *policy regime* (see top part of Figure 1), after Howlett et al.'s (2009) concept of 'policy regime' and Sabatier and Jenkins-Smith's (1993) 'Advocacy Coalition Framework'.

To analyse the dynamics in the decision-making process, a 2x2-matrix of four types of policy problems (see, for example, Christensen, 1985) was used. In line with Klijn and Koppenjan (2016) and Veenman and Leroy (2016), cognitive and normative (un)certainty were used as the dimensions (axes). To also place strategic uncertainty, a third dimension to the matrix was added. Actors (and their advocacy coalitions) may have an interest in presenting an issue as a technical, scientific, political or untamed policy problem in order to steer towards a specific approach of the policy issue (Turnhout et al., 2008). The attempts of actors (and their advocacy coalitions) to use their policy mix to increase, decrease or accept perceived uncertainties results in the 'dragging' of a policy issue within the 2x2 matrix (see for an example the lower part of Figure 1).

During the lengthy decision-making processes in infrastructure planning the environment will often change. This involves: *external developments*, such as an economic recession or climate change; and a changing *institutional context*, such as changing policy rules or an altered political constellation. Such changing environment may lead to a different approach in dealing with uncertainty by the actors and their advocacy coalitions (change of policy style and policy mix; see Figure 1).

A multi-case study research approach

To gain the aimed insight into the process of interaction between relevant actors and how they deal with uncertainty in the decision making in infrastructure planning, three cases were studied in-depth. According to Flyvbjerg (2001), the essence of social scientific research is to consider practice within the context in which it takes place. To this end, different perspectives – 'narratives' – on practice must be collected with an open mind, through interaction and dialogue with those involved. This has been elaborated in this study through a large number of stakeholder interviews (130) and validating focus group discussions. The interviews and discussions were complemented by an in-depth analysis of reports and recordings, policy documents, research reports and newspaper articles related to the cases.

For generalizing the research findings based on a limited number of cases, Flyvbjerg (2001, p. 77) recommends the study of 'critical cases'. Based on the criteria 'information-oriented selection' and 'maximum variation cases' (Flyvbjerg, 2001, pp. 78-79), the following three cases in the province of Overijssel in The Netherlands were selected (see Figure 2):

1. The upgrade of the provincial road N340 between Zwolle and Ommen. This upgrade originally started as part of the national 'Sustainable Safety' program (Duurzaam Veilig). Nowadays the upgrade of the N340 is presented as part of the Vechtdal Connection (Vechtdalverbinding), which also includes public transport and cycle paths.
2. The redevelopment of an airport runway and site as part of the area development Airport Twente. This redevelopment first focused on civil aviation and nowadays on realising a high-tech business park called Technology Base Twente.
3. A bypass of the river IJssel near Kampen as part of the national Room for the River programme, as well as part of the area development IJsseldelta-South, also including nature development and housing.

The decision-making process for these three area-oriented infrastructure projects was studied over a protracted period of 20 years, between 2000 and 2020. To analyse the interaction between decision makers and other actors in their dealings with uncertainty, the decision-making process was 'split' into a number of phases and, within that, into a number of steps. In each step, an actor (and his advocacy coalition) attempts to increase, decrease of accept perceived uncertainties using his policy mix: the policy issue is being 'dragged' within the 2x2-matrix.
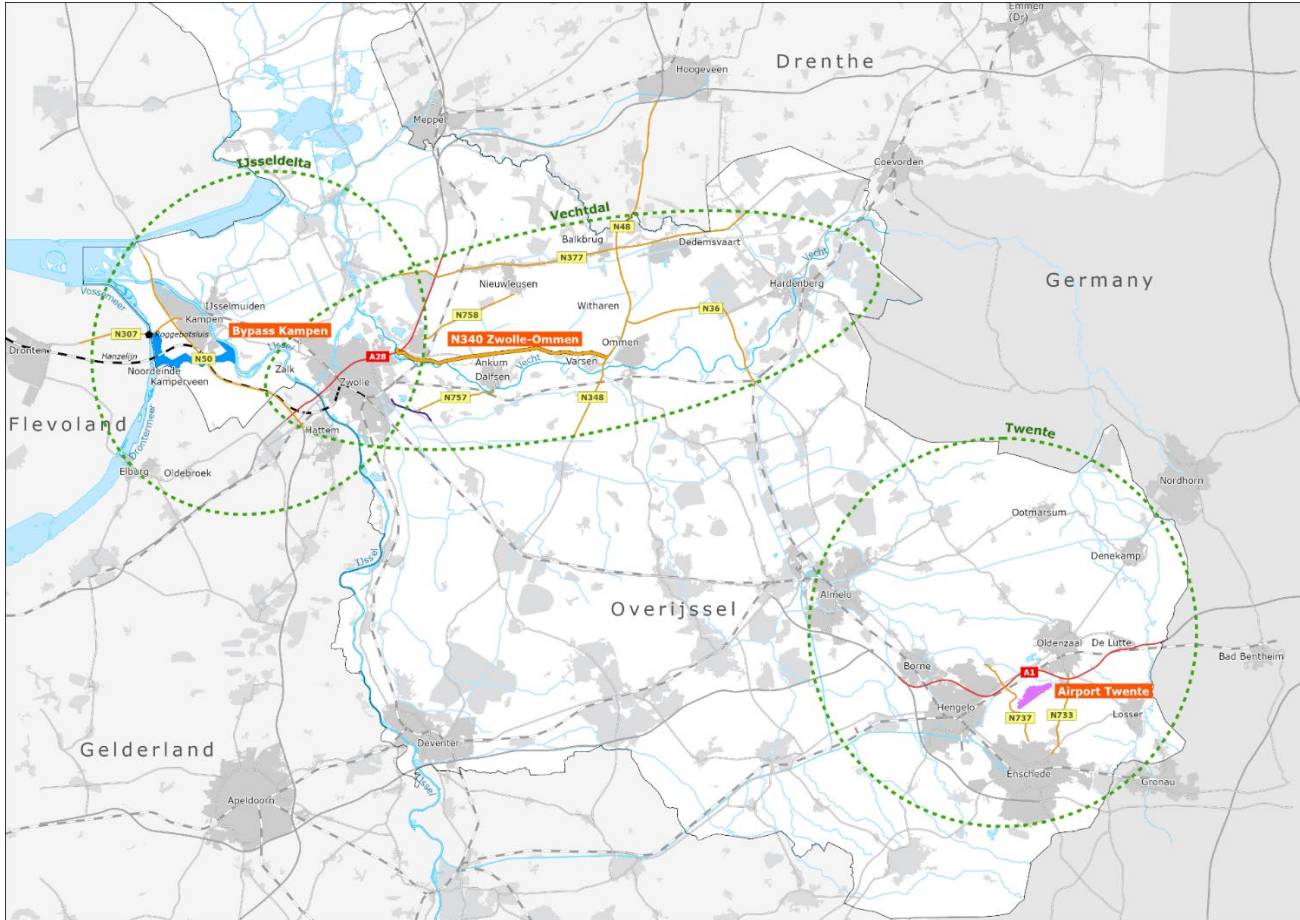
Figure 2   Overview map of the cases Bypass Kampen, N340 Zwolle-Ommen and Airport Twente

Patterns in dealing with uncertainty

In the decision-making process of all cases studied, three distinctive advocacy coalitions can be distinguished: an 'economic' advocacy coalition with policymakers who focused on economy and employment; a 'green' advocacy coalition of actors opposed to the proposed plan because of its environmental impact ('opponents'); and an 'ambivalent' advocacy coalition of actors seeking a balance between economy and environment. In all cases, no agreement between these advocacy coalitions about the implementation of the infrastructure plan existed. As such, they all formed a *contested community* (Howlett et al., 2009). In this contested community actors and their advocacy coalition attempted to steer the decision-making process in the direction they wanted by using a dedicated mix of instruments: the policy issue was being 'dragged'. The study reveals four main patterns in the interaction between decision makers and other actors (and their advocacy coalitions) in the 'dragging'.

1.   Certainification by decision makers leads to decertainification by opponents

Decision makers continuously strive for certainification during the (protracted) decision-making process, in particular by deploying authority-based, substantive instruments, such as institutionalized research. By this, as actors in the economic advocacy coalition, they especially intent to influence public representatives in the ambivalent advocacy coalition. From literature, however, it was expected that decision makers would also use process instruments, such as participation (see

e.g. Howlett, 2018), but in practice that proved not to be the case. Contrary to decision makers, actors in the green advocacy coalition ('opponents') attempted to increase the uncertainties that decision makers had reduced, in order to allow (their) alternatives to emerge. So, the action of certainification resulted in a reaction of decertainification. The harder decision makers tried to reduce uncertainties, the harder opponents tried to increase those uncertainties again. This was true for all the three cases. Various scholars have observed a similar action-reaction mechanism (see, for example, Klijn & Koppenjan, 2016).

The green coalition also seemed to focus on public representatives in the ambivalent advocacy coalition. So, in the studied cases both the economic and green advocacy coalitions competed for the favour of the ambivalent coalition to strengthen their respective positions. Interestingly, opponents used the same instruments as decision makers to increase uncertainties. Our study shows that this 'mirroring' of instruments occurs for all types of instruments, also for instruments such as area development (see point 2 below) and lobbying.

In the cases, decision makers did not seem to be aware of the potential impact of their choices in dealing with uncertainty. For example, the choice to use further research to reduce uncertainties, mostly led to a more severe discussion about figures and further polarization (a 'report war', Klijn & Koppenjan, 2016), even in the political arena. In the case of Twente Airport this ultimately led to a political-administrative crisis.

2.   A boomerang effect leads to problematic decision-making
Our study shows that decision makers in their pursuit of certainification sometimes achieved the opposite – i.e. that uncertainty increased. This 'boomerang effect' occurred, for example, when decision makers initially included a restricted number of alternatives in the decision-making process (such as only 100km/h-variants for the provincial road N340), and public representatives or the EIA Commission decided that *the scope* was *narrowed* too soon. Widening the scope led to the problem that the arena of supporters and opponents of alternatives was then already set. As a result of this polarization, uncertainty increased and the decision-making process took extra time.

In using research as an instrument to reduce uncertainty, decision makers were also confronted with a boomerang effect. As stated in point 1, polarization was reinforced by the fact that more research led to more discussion about data. One of the underlying problems is that decision makers failed to take sufficient account of the *interrelatedness of the different kinds of uncertainty*. For example, policymakers failed to reduce cognitive uncertainty on the viability of an airport in Twente through research, because of the strong dependence with strategic uncertainty about the arrival of market parties.

Not only the interrelatedness between different kinds of uncertainty, but also the *interrelatedness between plan components* created a boomerang effect. In all three cases, decision makers tried to increase the support for their infrastructure plans – and thus to reduce uncertainties – by means of combining the infrastructure plan with area development. Or as Woltjer (2002) argued, area development as a 'public support machine'. However, the addition of area development increased the complexity of the decision-making, and hence increased uncertainty. For example, in the area development IJsseldelta-South opponents tried to prevent the bypass from becoming navigable by using nature regulations, in order to ultimately prevent a planned housing development.

3.   Decision makers strive for certainification over and over again
When policymakers encountered difficulties with the use of authority-based instruments in their attempts to reduce uncertainty, they also deployed other instruments – in particular organization-based ones such as participation, area development and a more adaptive approach. By using these more 'open' instruments it appeared that more room for

uncertainty was created. However, in practice, decision makers also seemed to use these instruments to reduce uncertainties. For example, when stakeholders were allowed to have their say through participation, this occurred within strict conditions. In the IJsseldelta-South, participants were allowed to contribute with ideas about *variants* for the location of the bypass, but they were not allowed to introduce their own *alternatives* (like higher dikes). Conditions were set to control the participation process and ultimately to prevent uncertainties to increase. Participation was more focused on 'reaching consensus' instead of 'mapping out diversity' (Van Asselt & Rijkens-Klomp, 2002).

In line with this, also the concept of 'area development' was not used for an open planning process involving all relevant stakeholders. Instead, area development was added to the infrastructure plan to reach a package deal in the political arena (see point 2 above). In all three cases, the use of area development as instrument led to an 'area-oriented infrastructure plan' instead of an '(integrated) area development' (Leendertse, 2020). As a result, the decision-making process became more difficult, because of disappointed stakeholders and public representatives.

Even when policymakers explicitly incorporated uncertainties in their plans through an adaptive approach, they appeared to be prompted more by a quick start of the realization of the plan – and thus to reduce uncertainty, and less by the underlying philosophy of adaptive planning. For example, policymakers presented the bypass near Kampen as a 'robust, no-regret measure' in order to *directly* realize the bypass as part of the area development IJsseldelta-South.

4. An adaptive approach by decision makers leads to certainification by other actors

Interestingly, when decision makers actually did give room for uncertainties through an adaptive approach, *other* actors demanded more clarity and therefore less uncertainties. With an adaptive approach, policymakers gave leeway to respond to uncertain developments. Other actors were not always content with that leeway and preferred to have more clarity on the plan. For example, when the national government chose for a spatial reservation for a bypass near Kampen, in the future to be constructed depending on uncertain climate change effects (a nice example of an adaptive approach!), regional decision makers wanted more clarity on the consequences of that spatial reservation – especially for the planned housing construction in that area. Another example is the organic area development of Technology Base Twente. There were 'only' certain conditions within which this area development was given substance. Local residents wanted more clarity in advance about the type of companies that would establish themselves because of the consequences (such as noise pollution), and surrounding municipalities because of potential competition with their own business parks.

These findings are in line with Van der Pas et al. (2012), who stated, that "adaptive policy is less transparent, more vague, and harder to explain to all stakeholders" (p. 321). The resistance of other actors to an adaptive approach often resulted in decision makers once again opting for certainification (see point 1 and 3 above).

Getting out of the certainification-decertainification loop

Decision makers strive – and keep striving – for certainification throughout the decision-making process of infrastructure projects. They find it hard to make room for uncertainties and at the same time keeping the planning and decision-making process manageable. This explains their persistent preference for the use of authority-based instruments, such as (institutionalized) research and political-administrative agreements. Although planners are discussing participative and communicative planning approaches (De Roo et al., 2020), this way of dealing with uncertainty still strongly resembles a more traditional rational planning and the underlying technical planning paradigm (De Roo et al., 2020) in infrastructure planning.

The environment in which decision makers in infrastructure planning operate changes during the protracted decision-making process, which forces decision makers to adapt their planning approach. Although decision makers adapt to this

changing environment – for example by using more 'open' instruments like participation – they only do so gradually and mostly when they are forced to do so or to get out of an impasse. Even when there appears to be more room for uncertainty through the use of these more 'open' instruments, decision makers mainly opt for control and certainification. In practice, using more 'open' instruments means, that decision makers *add* elements of the communicative planning paradigm and the complexity planning paradigm to the technical planning paradigm. For instance, when policymakers choose for stakeholder participation, there is still an important role for research in this participation process, and participation is within strict conditions.

In their strive for continuous certainification, decision makers awaken a reaction of decertainification. In other words, certainification creates decertainification by opponents. In their pursuit of certainification, however, decision makers, take (too) little into account responses of other actors. Opponents can increase uncertainty by mirroring their use of instruments on that of decision makers. Interestingly, the same instruments can be used differently by both decision makers and opponents. This is particularly evident when research is used, prompting a discussion on data or a 'war of reports'. In all cases the pursuit of certainification led to a futile certainification-decertainification loop, polarization, and a cumbersome and protracted decision-making process. A possible explanation for the persistent attempt of decision makers for certainification, even when this leads to a more problematic decision-making process, is that they seem to feel able and confident that they can reduce uncertainties, and underestimate the ability of opponents to increase those uncertainties once again.

Based on our study, we argue that decision makers need to get out of their uncertainty reduction reflex, knowing that this will cause opponents to increase uncertainties resulting in a problematic planning and decision-making process. Decision makers should give more room for uncertainty by embedding adaptive and participative approaches in their planning practice. The challenge is to create an arena and institutional setting in which actors from different advocacy coalitions are involved in open dialogue, with enough leeway to bring in one's points of view and ideas. For this, decision makers should not try too rapidly to reduce the leeway given to stakeholders – and therefore uncertainties –in the planning process. They need to seek a balance between certainty and uncertainty in stakeholder participation. This means, that decision makers should offer scope for alternatives, ideas and plans of other actors, and should not 'funnel' too quickly on basis of on their own alternatives. Further, given the differing views of stakeholders and different perspectives on uncertainty about (for example) future developments (such as economic growth or political-social priorities), stakeholders should be included in joint fact finding. A stronger 'fact base' may result in enhanced trust and support.

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