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ROOM FOR UNCERTAINTY IN INFRASTRUCTURE PLANNING

HOW CONTINUOUS CERTAINIFICATION BY DECISION MAKERS RESULTS IN MORE UNCERTAINTY

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Abstract

An increasingly dynamic environment and engaged society necessitates decision makers in infrastructure planning to adopt adaptive and participative planning approaches and give room to uncertainty in planning and decision making. In planning, individual actors belonging to a group of like-minded actors may attempt to influence decision-making about planning proposals. They do so by using a mix of instruments such as research, participation, agreements, and so on. To gain greater insight into the processes of interactions between decision makers and other relevant actors in planning, the planning of three infrastructure cases – a road upgrade, an airport runway redevelopment, and a river bypass in the Netherlands – was studied in-depth each covering a period of 20 years. Interestingly, a couple of overarching patterns regarding dealing with uncertainty in planning and decision-making appeared from the study. Decision makers continuously strive for 'certainification', and do so by deploying authority-based instruments. Indeed, they keep doing so, even if the the result obtained is opposite of that which was desired. Certainification i.e., decision makers striving for reducing uncertainties, often results in a reaction of 'decertainification' from opponents. It seems as if decision makers strengthen the latter's own opposition. And when decision makers actually do give room for uncertainties through adopting an adaptive approach, other actors often demand less uncertainty; driving decision makers back to their thirst for certainification. To overcome this continuous loop, an arena and institutional setting should be created in which actors from different advocacy coalitions are involved in open dialogue to better balance the perceived uncertainties of all stakeholders.

Keywords

infrastructure planning, decision making, advocacy coalition, policy belief, certainification, participation , uncertainty

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Dealing with uncertainty: a struggle for decision makers

Decision makers in infrastructure planning have to deal with an increasingly dynamic environment and engaged society, which necessitates them to adopt adaptive, collaborative, and participative planning approaches such as combined infrastructure and (organic) area development (De Roo et al., 2020). Interacting with multiple stakeholders and taking unforeseen developments into account, however, implies giving room to uncertainty in planning and decision making. Within current infrastructure planning, decision makers seem to struggle to give both room to uncertainty and keep the decision-making process manageable. In practice, decision makers seem to strive to reduce uncertainties – 'certainification' (Van Asselt et al., 2007; Klijn & Koppenjan, 2016). However, this focus on certainification seems at odds with the more adaptive and participative approaches needed in current planning practices (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 deal in practice with uncertainty in their interactions with other actors. The term 'decision makers' refers to elected administrators as well as policy officers who support those elected administrators in the preparation and implementation of policies. This paper focuses specifically on area-orientated infrastructure planning – i.e., infrastructure projects which have been explicitly designed to improve the quality of a local area (Arts et al., 2016; Heeres et al., 2012). By studying the in-practice planning and decision-making process in area-orientated infrastructure projects over a long period, i.e. 20 years, insight is gained into the processes that take place with regard to the interactions between relevant actors in 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. Following 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 belonged to a group of like-minded actors, *advocacy coalitions* (Sabatier & Jenkins-Smith, 1993), and that these coalitions attempt to influence decision-making based on their *policy beliefs* – i.e., on their shared values, causal assumptions, and problem perceptions, (Howlett et al., 2009; Sabatier & Jenkins-Smith, 1993). The advocacy coalitions can influence decision-making: by reducing uncertainties (*certainification*); by increasing uncertainties (*decertainification*); or by accepting uncertainties. These coalitions may use one or more instruments available (their *policy mix*, Howlett et al., 2009) including, for instance: 'substantive instruments' (e.g., research); or 'procedural instruments' (e.g., participation); or, after Howlett (2018), 'authority-based instruments' (e.g., political-administrative agreements) and 'organizational instruments' (e.g., area development). In this study, it was 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. After Howlett et al.'s (2009) concept of 'policy regime' and Sabatier and Jenkins-Smith's (1993) 'Advocacy Coalition Framework', the combined total of policy beliefs, resources, policy mixes and policy styles of all advocacy coalitions in a policy area is called the *policy regime* as shown in the top part of Figure 1.

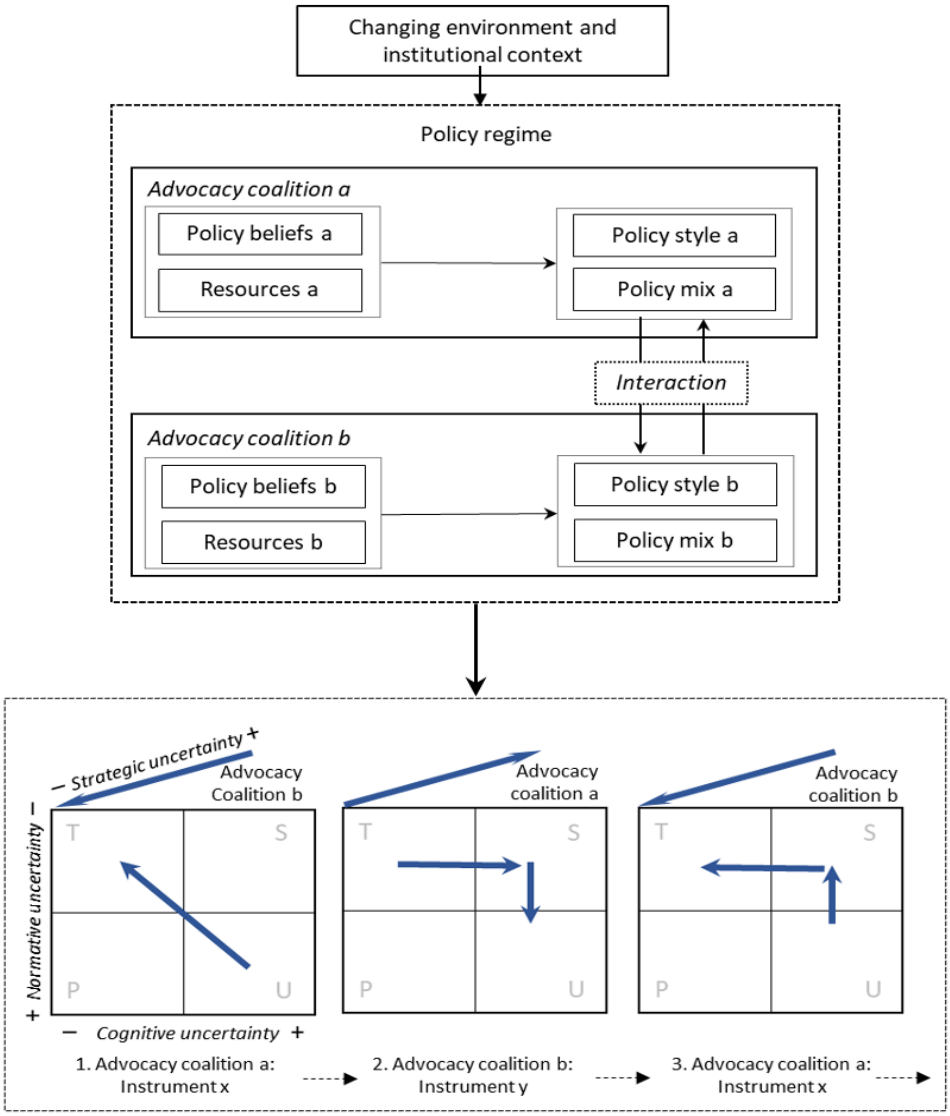

Figure 1: The theoretical perspective and the dynamics of the decision-making process using an example with two advocacy coalitions. (T, S, P and U respectively represent a technical, scientific, political and untamed policy problem)

To analyse the dynamics in the decision-making process, a 2x2-matrix of four types of policy problems was used. In line with Klijn and Koppenjan (2016) and Veenman and Leroy (2016), cognitive and normative (un)certainty were both used as dimensions (axes). To also place strategic uncertainty, a third dimension to the matrix was added. Actors (and their advocacy coalitions) can present their perspective on a policy issue as technical (T), scientific (S), political (P) or untamed (U) by using specific instruments and thereby (try to) steer the issue away from the perspective of another actor (or advocacy coalition) as shown in the lower part of Figure 1 (Turnhout et al., 2008). In Figure 1, the upper part of the figure thus shows the theoretical perspective and the lower part shows the dynamics of the decision making process through an example.

Our frame of analysis was based on a combination of the above-mentioned theories (see Figure 1, upper part). During the (often) lengthy decision-making processes that are involved in infrastructure planning, the environment will often change. This may involve *external developments*, such as an economic recession, or a changing *institutional context*, such as changing policy rules or an altered political environment . Such changing environments may lead to different approaches being used by the actors and their advocacy coalitions when it comes to dealing with issues of uncertainty. The actual dealing with uncertainty is materialized through the employment of instruments – i.e., the policy mix. The type of instruments that advocacy coalitions employ depends on their policy style. Both the policy style and the policy mix of an advocacy coalition are determined by their policy

beliefs and available instruments. Through the ways in which they deploy their policy mix, advocacy coalitions can increase, decrease, or accept perceived uncertainties by presenting the policy issue at hand as technical, scientific, political or untamed. In this way an advocacy coalition can move or 'drag' a policy issue within the 2x2 matrix (see for an example the lower part of Figure 1) and thus influence decision making based on their perceived uncertainty.

A multi-case research approach

To gain insight into the process of interactions between relevant actors and how they deal with uncertainty in decision making in infrastructure planning, the planning process of three cases was 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 achieved in this study through the undertaking of a large number of stakeholder interviews (130) and validating focus group discussions. The interviews and discussions were complemented by in-depth analysis of reports and recordings, policy documents, research reports and newspaper articles related to the cases.

To enable the generalization of research findings based on a limited number of cases, Flyvbjerg (2001, p. 77) recommends the study of 'critical cases'. Based on his critical criteria 'information-oriented selection' and 'maximum variation cases' (Flyvbjerg, 2001, pp. 78-79), three cases in the province of Overijssel in the Netherlands were selected because they all involve infrastructure planning, though from different perspectives (road, airport runway and river). The three cases evidence unique decision-making information over a period of 20 years and offer, therefore, the possibility to study the evolution of the planning and decision-making process over a long time and across different infrastructures. The three selected cases are (see Figure 2):

1. The upgrade of the provincial road N340 between Zwolle and Ommen. In 1998, the Provincial Council of Overijssel decided that the provincial road between Zwolle and Ommen in the region Vechtdal should be upgraded to a 100 km/h road as part of the national Sustainable Safety program ('Duurzaam Veilig'). Right from the beginning there was much debate about the desirability of this upgrade, especially when variants with four lanes and new routes came into play. Later on, the upgrade of the N340 was presented as part of the Vechtdal Connection ('Vechtdalverbinding'), which also includes public transport and cycle paths. In 2018 the actual realization of the upgrade of the N340 was started. The total investment in the upgrade of the N340 was around 200 million euro.

2. The redevelopment of an airport runway and site as part of the area development Airport Twente. When the Dutch Ministry of Defence announced the departure of its military airbase in the region of Twente in 2003, decision makers from the province of Overijssel and the municipality of Enschede wanted to repurpose the site as a civil airport. There has been much debate about the desirability and feasibility of the restart. The redevelopment initially focused on civil aviation but later shifted to realising a high-tech business park called 'Technology Base Twente'. Total investment in the area development Airport Twente has been around 100 million euro.

3. The bypass of the river IJssel near Kampen. In 1996 the Dutch government decided that rivers in the Netherlands should be given more space, resulting in the Room for the River program ('Ruimte voor de Rivier'). A bypass near Kampen was one of the options to improve water safety in the IJsseldelta as part of the national Room for the River program, as well as part of the area development of IJsseldelta-South, which also included nature development and housing. There has been much debate about the necessity of the bypass for the water safety of the IJsseldelta and about how plans could be combined with nature development and housing. The total investment ran to around 400 million euro.

To analyse the cases, we followed the frame of analysis presented in the previous section. The decision-making process for the three area-orientated infrastructure projects was studied over a protracted period of 20 years, between 2000 and 2020. To analyse the interactions between decision makers and other actors in their dealings

with uncertainty, the decision-making process was 'split' into a number of phases and steps according to the 'rounds model' presented by Teisman, Klijn and Koppenjan (Teisman, 2000; Klijn & Koppenjan, 2016). Each phase marked a move in dealing with the policy issue (major decision) due to a change in the environment or an institutional change. For each step we studied how actors (and their advocacy coalition) attempted to increase, decrease or accept perceived uncertainties using a policy mix. By comparing the results of the three cases overall patterns in dealing with uncertainty could be discerned.

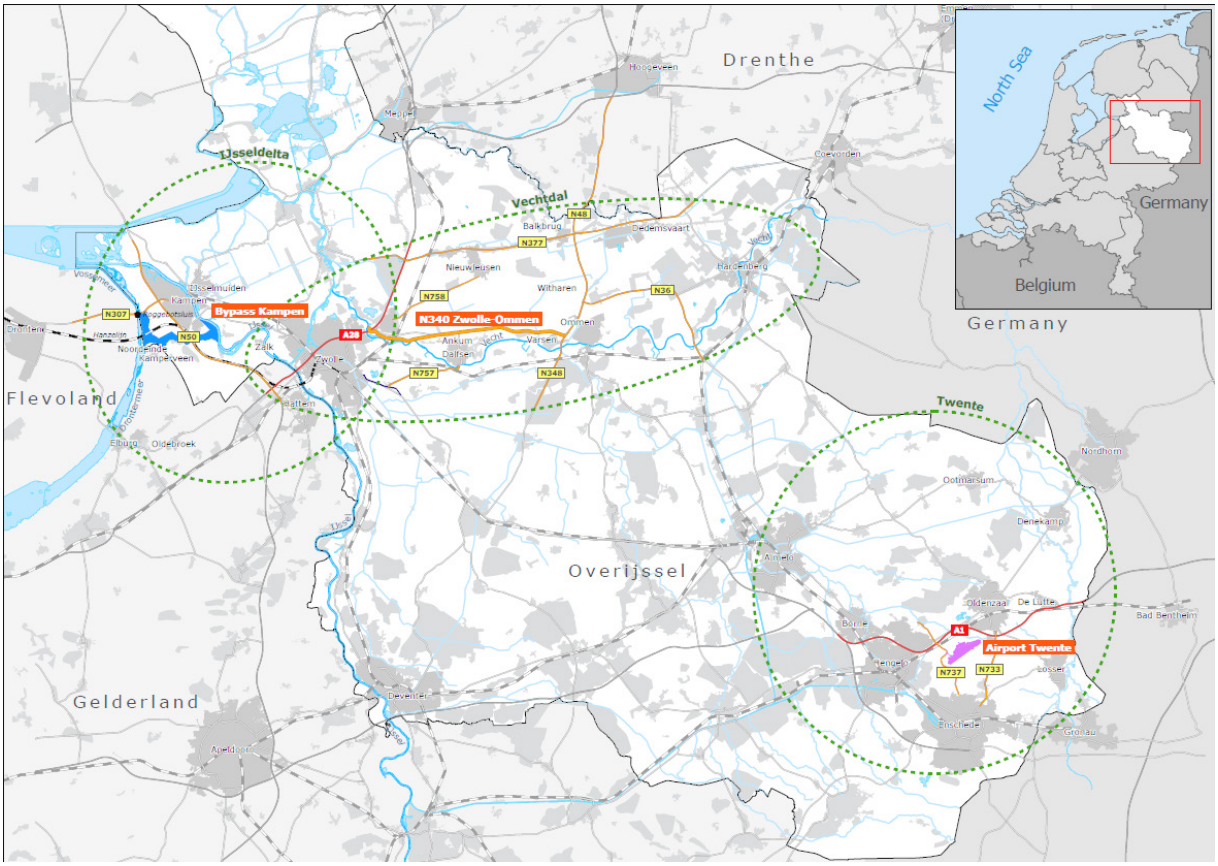

Figure 2 Overview map of the cases Bypass Kampen, N340 Zwolle-Ommen and Airport Twente

Cross-case patterns in dealing with uncertainty

In the decision-making processes of all cases studied, three distinctive advocacy coalitions were distinguished: an 'economic' advocacy coalition with decision makers who focused on economy and employment; a 'green' advocacy coalition of actors opposed to the proposed plans because of their 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 plans existed. As such, they all formed a *contested community* (Howlett et al., 2009). In this contested community actors and their advocacy coalitions attempted to steer the decision-making process in the direction they wanted by using a dedicated mix of instruments. The study reveals that there were four main patterns which were present in all three cases in the interaction between decision makers and other actors (and their advocacy coalitions), despite their differences in terms of content and context.

1. Certainification leads to decertainification

Decision makers continuously strived for certainification during the (protracted) decision-making process, and did so in particular by deploying authority-based, substantive instruments, such as institutionalized research. By so doing actors in the economic advocacy coalition especially intended to influence (public) representatives

in the ambivalent advocacy coalition to support their initial decision. From our review of 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 was hardly ever the case. As a reaction to the policy mix used by 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. From this it can be seen that the action of certainification by decision makers resulted in a reaction of decertainification. The more the decision makers tried to reduce uncertainties; the more the opponents tried to increase those uncertainties again. This was true in all three cases. Various scholars have observed similar action-reaction mechanisms (see, for example, Klijn & Koppenjan, 2016).

Parallel to the decision makers, the green coalition also focused on public representatives in the ambivalent advocacy coalition for support. 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, in this process of action and reaction, opponents tended to use the same instruments as decision makers to increase uncertainties. In their reactions, they respectively 'mirrored' the policy mixes. This 'mirroring' of instruments occurred for all types of instruments, including area development (see point 2 below) and lobbying. In each case, decision makers did not seem to be aware of the consequences of this. For example, the choice to use further research to reduce uncertainties tended to lead to more severe reactions about figures and to further polarization (a 'report war', Klijn & Koppenjan, 2016).

2. Longer and problematic decision-making as a consequence of a boomerang effect

Our study shows that decision makers in their pursuit of certainification sometimes achieved the opposite – i.e., uncertainty increased: a 'boomerang effect'. 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), the public representatives or the Netherlands' Commission for Environmental Assessment decided that *the scope was narrowed too soon*. Through this, a widening in the scope was forced, however, the arena of supporters and opponents of alternatives had already been set. As a result, uncertainty increased, the decision-making process took extra time, and it also became more problematic.

In using research as an instrument to reduce uncertainty (see point 1 above), 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 the generation of more opposing research and to further discussions about data. In this way, makers failed to take sufficient account of the *interrelatedness that exists between the different kinds of uncertainty*. For example in the case of the airport Twente, decision makers tried to reduce cognitive uncertainty by focussing their research on the economic viability of an airport in Twente, underestimating the strong dependence with the strategic uncertainty about the willingness of market parties to settle on the airport which was essential for economic viability of the airport.

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 support for their infrastructure plans – and thus to reduce uncertainties – by means of combining the infrastructure plans with area development. As Woltjer (2002) argued, they used area development as a 'public support machine'. However, the addition of area development considerations increased the complexity of the decision-making process, and thus also increased uncertainty. For example, in the area development IJsseldelta-South opponents tried to prevent the bypass from becoming navigable by using nature regulations to prevent a planned housing development.

3. Decision makers keep striving for certainification

When decision makers encountered difficulties with the use of authority-based instruments in their attempts to reduce uncertainty (see points 1 and 2), they started to deploy more 'open' instruments, in particular organization-based instruments such as participation, area development, and more adaptive approaches. By deploying these 'open' instruments it appeared that more room for uncertainty was created. However, in practice, decision makers seemed to use these instruments to reduce uncertainties. For example, when stakeholders were allowed to have their say through participation in the cases, this always occurred within an environment that had strict conditions. With regard to IJsseldelta-South, participants were allowed to contribute about *variants to* the location of the bypass, but they were not allowed to introduce their own (new) *alternatives* (such as higher dikes). Conditions were set to control the participation process and to prevent further uncertainties arising. It seemed that participation was more focused on 'reaching consensus' instead of 'mapping out diversity' (Van Asselt & Rijkens-Klomp, 2002).

Similarly, the concept of 'area development' was not really used for an open planning process involving all relevant stakeholders, but instead added to the infrastructure plans as a means by which to reach a package deal in the political arena (see point 2 above). As a result, the use of area development as an instrument led to an 'area-oriented infrastructure plan' instead of an '(integrated) area development' (Leendertse, 2020). This made the decision-making process in all three cases more difficult because of the existence of disappointed stakeholders and public representatives.

Even when decision makers explicitly incorporated uncertainties into their plans through adaptive approaches, this appeared more to be a means to just start the realization of (parts) the plan and less by the underlying philosophy of adaptive planning. As an example, decision makers 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. Certainification in reaction to an adaptive approach by decision makers

Interestingly, when decision makers actually gave room for uncertainties through an adaptive approach, *other* actors demanded more clarity and, as a result, less uncertainty. Using adaptive approaches, decision makers created leeway to respond to uncertain developments. Other actors were not always content with that leeway and preferred to have more clarity on the plan. An example was the 'organic' area development of Technology Base Twente (an adaptive approach). Local residents wanted more clarity in advance about the type of companies that would be attracted because of the consequences (such as noise pollution) that some companies might bring, whilst surrounding municipalities wanted more clarity in advance because of the possibility 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, vaguer, and harder to explain to all stakeholders" (p. 321). The reaction of other actors to the use of adaptive approaches often resulted in decision makers once again opting for certainification (see also points 1 and 3 above).

Discussion: finding a balance in perceived uncertainties of all stakeholders

In all three cases decision makers strived – and kept striving – for certainification throughout the decision-making process of the individual infrastructure projects, despite the attempts of others (and especially the green coalition), to increase uncertainty by rephrasing the policy issue or dragging it away from the decision makers' frame. The persistent preference of the decision makers to use authority-based instruments (a consistent policy mix), such as (institutionalized) research and political-administrative agreements was remarkable. Indeed, despite current infrastructure planning being discussed in terms of participative and communicative planning approaches (De Roo et al., 2020), the practice in infrastructure planning encountered in the cases herein analysed strongly resembled a more traditional rational planning approach with an underlying technical planning paradigm (De Roo et al., 2020).

We studied the decision and planning process over a long-protracted period in three different (infrastructure) cases. The environment in which decision makers operated changed during the decision-making processes, and this forced them to adapt their planning approaches. This became clear in the different rounds of the decision-making processes in all three cases. Although decision makers adapted to changing environments – for example by using more 'open' instruments such as participation – they only did so gradually and mostly when they were forced to do so or to get round an impasse. Even when there appeared to be more room for uncertainty in the processes through the use of more 'open' instruments, decision makers still opted for control and certainification. In practice, using more 'open' instruments meant that the decision makers *added* elements of the communicative planning paradigm and the complexity planning paradigm to the technical planning paradigm. However, they did not really shift to a collaborative or complexity paradigm. For instance, when decision makers choose stakeholder participation, there was still a predominant role for research in the participation process, and participation was only allowed within a framework of strict conditions.

In all three cases we distinguished three main advocacy coalitions, economic, green, and ambivalent. Especially interesting was the interaction between the economic and green advocacy coalitions. In their striving for continuous certainification, decision makers awoke a reaction of decertainification by the green coalition. Thus certainification created decertainification by opponents. However, in the studied cases, the decision makers seemed not to be aware of the action-reaction phenomenon and continued to strive for certainification. Another explanation for this may be their strong beliefs in the strength of authority-based instruments. Remarkably, most opponents increased uncertainty by mirroring their use of instruments on those of the decision makers. The same instruments were used differently by both decision makers and opponents. This was particularly evident when research was used, and prompted discussions on data or a 'war of reports'. In all three cases the pursuit of certainification by decision makers led to polarization, and the creation of a more cumbersome and protracted decision-making process. A possible explanation for the ongoing and persistent attempts of decision makers to pursue certainification, even when it led to a more problematic decision-making process, is that the decision makers felt able and confident that they could reduce uncertainties, and underestimated the ability of opponents to increase those uncertainties once again.

Conclusion

To conclude, we argue that decision makers need to get out of their uncertainty reduction reflex, because not doing so will cause a reaction by opponents which may increase uncertainties and result in more problematic planning and decision-making processes. Decision makers should give more room to uncertainty by embedding adaptive and participative approaches in their planning practices. The challenge is to create an arena and institutional setting in which actors from different advocacy coalitions are involved in open dialogue, that also possesses enough leeway to bring in a range of points of view and ideas. For this to be achieved, decision makers should not too rapidly 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 balance should be a result of that participation, not a condition placed in advance. This means that decision makers should be open to alternatives, ideas and plans of other actors, and should not 'funnel' too quickly towards only their own alternatives. Given the differing views of stakeholders and different perspectives on uncertainty about (for example) future developments (such as economic growth or political-social priorities), participation should include a process of joint fact finding. A stronger 'fact base' may result in enhanced trust and support, and may also help to overcome the observed certainification-decertainification loop. Only then can a better balance between the perceived uncertainties of all stakeholders be achieved.

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