



UvA-DARE (Digital Academic Repository)

From flood safety to risk management

The rise and demise of engineers in the Netherlands and the United States?

Bergsma, E.J.

Publication date

2017

Document Version

Other version

License

Other

[Link to publication](#)

Citation for published version (APA):

Bergsma, E. J. (2017). *From flood safety to risk management: The rise and demise of engineers in the Netherlands and the United States?* [Thesis, fully internal, Universiteit van Amsterdam].

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

2. Research design

2.1 Focal area: From safety to spatial planning measures in flood governance

When policies in a policy domain substantially shift, the division of costs and responsibilities in that domain usually shifts as well. This is well demonstrated by the turn from safety to spatial planning measures in flood governance. Therefore, the empirical analysis of this thesis focused on the turn to spatial planning measures in flood governance.

Traditionally, floods are governed through a “safety approach” in which technical flood defense works are built to ward off the risk of flooding. However, despite these defense works, the damage done by flood events has increased substantially over the last couple of decades (Bouwer 2010: 105) and more damages are expected in the years to come (Swiss Re 2012: 6). For this reason, floods are at the top of the United Nations Office for Disaster Risk Reduction’s ranking list of most disastrous natural hazards (UNISDR 2015) and water-related risks are identified as one of the biggest future threats for humanity by the World Economic Forum’s Global Risks Assessment (World Economic Forum 2015). Policymakers now face the difficult question of how to deal with this increased flood risk. They generally have two options in this regard.

On the one hand, they can reinforce flood protection to continue to ensure safe living and working conditions in coastal and riverine areas. Although the importance of such traditional safety measures continues to be underlined, the limitations of this approach have also been outlined (Sayers et al. 2002, Hartmann 2009). Levees and floodwalls foster a feeling of safety that attracts new developments to vulnerable areas. As climate change brings forward more extreme weather conditions, levees will need to be built even higher to continue to protect these settlements. At the same time, levee failures will only cause

more damage because there are more people and there is more value at risk to flooding. Under a safety approach, national governments have to keep investing in flood protection to continue to avert these costs.

On the other hand, policymakers can use spatial planning measures to control the risk of flooding. Spatial planning measures accommodate floods rather than build against them. Their goal is to reduce the impact of a flood by making sure floodwater can enter and leave the physical landscape without causing (much) damage. This is usually done through a combination of land-use planning regulations such as creating space for natural overflow areas, limiting development in flood-prone areas, and flood-proofing buildings in high-risk areas (e.g., by elevating buildings, using water-resistant construction materials, and raising important utilities within buildings above expected water elevations) on the one hand and financial incentives to encourage damage-mitigation in individual location and building choices on the other hand. Because spatial planning measures do not build up the flood risk as safety measures do, they are often presented as a cost-efficient alternative to traditional safety measures, especially in light of the increased flood risks caused by climate change and the continued urbanization of delta regions (Sayers et al. 2002, Botzen and Van den Bergh 2008, De Vries and Wolsink 2009, Liao 2012).

Over the last couple of decades, national governments of many flood-prone countries have expressed the aim to work toward a more “risk-based” flood governance strategy that is not only targeted at reducing flood probabilities but also at reducing the impacts of floods (Bubeck et al. 2012, Van Buuren et al. 2012, Hegger et al. 2014). Spatial planning measures fit this new strategy. In many flood-prone countries, spatial planning measures have already been implemented. This transition is motivated by operational arguments regarding the effectiveness of spatial planning measures vis-à-vis that of traditional safety solutions in flood governance. However, this shift has important distributive

implications (Butler and Pidgeon 2011). Spatial planning measures rely on a different understanding of the problem of floods, in which floods are no longer seen as an “external threat” but rather as an anthropogenic-driven risk caused by human development of floodplains (Wiering and Arts 2006, Immink 2007). Responding to this new understanding of floods, spatial planning measures decentralize responsibility for dealing with floods to the regional and local level, where land-use decisions are made; they tend to emphasize local governmental responsibilities, regional planning, and individual responsibilities for choosing where and how to build (Wolsink 2006, Meijerink and Dicke 2008, Johnson and Priest 2008, Rijke et al. 2012, Bergsma et al. 2012). This has implications for how costs and benefits are distributed as well; as a result of the decentralization of responsibilities, costs also shift more to the regional and local level (Merz et al. 2010, Penning-Rowsell and Pardoe 2012, Paudel et al. 2015).

While this shift to spatial planning measures in flood governance and its distributive impacts have been mapped out in the literature, up to now little attention has been paid to the (political) processes through which this shift was produced. This means that there is relatively little information to fare on for conducting an analysis of the role of expert-knowledge in the policymaking process underlying the turn to spatial planning measures and its effects on distributive decision-making.

2.2 Two national case studies on the Netherlands and the United States (US)

To collect information on the policymaking process underlying the turn to spatial planning measures, a case-study approach was used. Case study research is particularly useful for analyzing phenomena of which the causes or effects are still unclear (Yin 2003: 13). It has the advantage of making this phenomenon tangible by positioning it in a concrete and bounded research context. Because prior research did not much dig into the policymaking processes underlying the

implementation of spatial planning measures in different countries, let alone into the influence of experts on these processes and the effect of this influence on distributive decision-making within these processes, a case study approach could be used to reconstruct and analyze these policymaking processes in a confined empirical context.

For this thesis, a comparative case study design was set up. The pitfalls of case study research usually lie in the generalizability of its outcomes. Multiple case studies create room for comparison, which helps to identify both context-specific and general conclusions (Yin 2003: 40).

Two national case studies were selected, one that focused on the turn to spatial planning measures in Dutch flood governance and one that focused on this turn in flood governance in the United States (US). While in both countries a turn to spatial planning was made, this shift occurred at a different time and to a different degree. The Netherlands has a long tradition in flood prevention. This delta-country partly came into existence by reclaiming land from the sea. Over the years, the Dutch national government built impressive levee systems to continue to ensure safe living conditions within its territory. Dutch flood governance institutions have therefore always been strongly characterized by a safety approach. It is only recently, since the mid-1990s, that spatial planning measures have been implemented in the Netherlands as a strategy to better cope with the impacts of climate change. In the US, a transition to a spatially oriented flood governance strategy was already made in the 1960s. Practically embodied in a federal flood insurance program, this spatial planning approach institutionalized over time and still functions as the framework policy through which floods are governed in the US.

Dutch and US flood governance are “extreme cases” in the wider international trend toward spatial planning measures in flood governance. They represent two different stages of this turn, as a spatial planning approach was institutionalized

in the US in the mid-1960s while in the Netherlands the first steps in this direction have just been taken. Extreme cases do not provide a reliable picture of the whole spectrum—which in the case of this thesis comprises all countries in which spatial planning measures have been implemented—but are well-suited for a first exploration of a new research problem because they can “reveal insights about normal processes” that are harder to detect in “typical” cases (Yin 2009: 52, see also Flyvbjerg 2006). By analyzing the effects of expert-influence in these two cases, both context-specific and general conclusions may be drawn that could be relevant for other countries that are currently seeking to integrate spatial planning measures in their standard governance approaches to floods (Seawright and Gerring 2008: 298).

2.3 Research question and conceptual clarifications

This thesis aims to contribute to a better understanding of the effects of expert-influence on the distributive aspects of policymaking on floods. It focuses on the turn from safety to spatial planning measures in the Netherlands and the US, which brings about new divisions of costs and responsibilities for dealing with floods. To analyze how experts influenced the policymaking process through which these new divisions of costs and responsibilities were shaped, the following research question has been formulated: **How has expert-influence been constituted in the policymaking process underlying the turn from safety to spatial planning measures in Dutch and US flood governance, and how has this influenced distributive decision-making in this process?**

This research question requires two points of conceptual clarification. First, it is good to specify use of the word “policymaking” in this thesis, especially in relation to the related concept of “decision-making”. In traditional democratic models, political “decisions” are made by democratically elected bodies that warrant an equal consideration of different views and interests in the decision-making process (Bovens 2006). These decisions are translated into “policies” by

independent state administrators in the executive branches of government. However, the boundaries of this politics-administration dichotomy have become blurred. Under the shift from government to governance, political decision-making has “relocated” to areas outside official democratic decision-making institutions and has now been conceptualized as taking place in all stages of the “policymaking process”, from agenda-setting to policy implementation (Sabatier and Jenkins-Smith 1988, Hajer and Wagenaar 2003, Hupe and Hill 2006). Drawing on these insights, this thesis uses “policymaking” to refer to the whole process through which policy problems are identified, put on the agenda, and addressed through the formulation of public policies. When “decision-making” is used, this will refer in a more classical sense to the narrower process through which policymakers reach a decision on the distribution of burdens and benefits, and the allocation of costs and responsibilities, in flood governance.

Second, the use of the term “expert” should be explained. Existing studies on expert-influence often use pre-labeled categories to indicate which actors count as “expert-actors” or which knowledge counts as “expert-knowledge” in their analyses (e.g., Maasen and Weingart 2005 look at scientific advice committees). At the same time, this research continuously demonstrated that the boundaries between “politics” and “expertise” are very thin and inherently contested. The broader concept of “merit” also provides no answer in this regard; merit has been defined as “capabilities plus effort” (Young 1958), but it has also been argued that evaluations of capabilities and efforts vary across social contexts (Daniels 1978). Therefore, this thesis builds on the more empirically-grounded understanding of expertise brought forward by authors like Jasanoff (2004), Hajer (1995), and De Swaan (2004), which accepts that claims to expertise can be organized by actor-groups to highlight the relevance of their expertise in public policymaking and that these claims have to be recognized by other groups in order to be of influence in the policymaking process.

2.2 Theoretical and analytical framework

2.2.1 Institutional theory and institutional change

In this thesis, the turn to spatial planning measures in flood governance is grasped in terms of a process of institutional change. It uses institutional theory to understand this process. Institutional theory is an umbrella theory. At a very basic level, institutions refer to patterns that structure social life. German sociologist Max Weber (1978: 23-31) described them as “social orders”; by setting out shared norms for and expectations of social behavior, institutions generate a level of predictability that enables social actors to interact. As Giddens (1984) famously argued, institutions not only structure social interaction, but they are also structured by social interaction because they are reproduced every time they are acted upon. March and Olson (1989) have emphasized the structuring power of institutions in different social domains (e.g., cultural, political, economic); especially when routinized practices become part of the formalized organizational structure within these domains, they become considerably invariant to human agency and external-contextual pressures and have an autonomous influence of their own. North (1990: 3) has therefore defined institutions as the “humanly devised constraints that shape human interaction”.

As Clemens and Cook (1999: 442) explain, the core theoretical insight of institutional theory is that “[t]he patterning of social life is not produced solely by the aggregation of individual and organizational behavior but also by institutions that structure action”. Starting from this basic understanding, different strands of institutional theory have been developed within different scientific disciplines and research fields. Historical institutionalism, for example, focuses on explaining the durability and change of large-scale socio-political systems such as communism or certain forms of democracy (Skocpol 1979, Lijphart 1999). Institutional economics or rational-choice institutionalism typically analyzes patterns in rational-economic behavior (Hindmoor 2010). Sociological institutionalism aims to understand how

institutions are shaped and reshaped in their particular (political, cultural, economic, etc.) context (Lowndes 2010).

This thesis builds on the sociological strand of institutionalism. It understands institutional change as a process that is embedded in a wider political, cultural, economic, and physical context. Institutions emerge from this context and are reproduced in this context. The turn to spatial planning measures in flood governance is seen as a “policy institution” (Hajer 1993, 1995, 2005). According to Hajer (2005: 300), public policymaking is structured by policy discourses, which he defines as the collection of “ideas, concepts, and categories through which meaning is given to social or physical phenomena and which is produced and reproduced through an identifiable set of practices” (2005: 300). With this definition, Hajer explicitly notes that policy discourses are more than the mental maps that actors use to grasp a policy problem; they transpire into practice as people act upon them. When these practices become standardized or even formalized routines in a policy field, Hajer refers to these discourses as “institutionalized”. A policy institution can be thus understood as the dominant way of thinking about and dealing with a policy problem. As such, it brings forward a standard set of policy measures and a related distribution of costs and responsibilities in a policy domain.

Policy institutions tend to be path-dependent. Policy discourses are reproduced through routinized governance practices, which create robust structures in public governance. However, policy institutions can change. Whereas policy change refers to minor adjustments in the regulatory framework used to govern a policy problem, institutional change implies a deeper-lying transformation, as not only policies but also the underlying “rules of the game” change (North 1990: 1). In this process, people’s complete understanding of policy problems can be altered, bringing about new governance practices and new divisions of costs and responsibilities in the policy field (Van Tatenhove et al. 2000). For example, if

floods are understood as an external risk, it makes sense to collectively guard against this risk through a national flood defense system. If, however, floods are understood as being caused by irrational building choices, it makes more sense to target this behavior with policy regulations and price incentives. In the first case, costs and responsibilities are assumed at the national level, whereas in the latter case, costs and responsibilities are borne by regional and local actors.

Institutional change is usually explained from contextual factors that challenge the “logic of appropriateness” underlying existing institutions (March and Olsen 1989: 22). These factors can appear suddenly, in the form of shock events such as a war or a flooding disaster that challenge the existing institutional framework all at once (Birkland 1997). But institutional change has also been explained from shifts in the external-political context, such as shifts in the international world order or the political party system (Skocpol 1979, Kingdon 1995). In recent years, institutional scholars have increasingly underscored the importance of agency factors in explanations of institutional change. Shock events or contextual changes can be strategically used by actors with an interest in changing the institutional context to challenge existing institutions (Clemens and Cook 1999, Arts and Van Tatenhove 2004).

While most theories on institutional change now incorporate external-contextual and agency factors, there is still quite some ambiguity on how external and agency factors relate to each other in processes of institutional change (Hodgson 2007, Kingston and Caballero 2008, Brousseau et al. 2011, Fuenfschilling and Truffer 2014). This has resulted in a general call for a new focus in institutional theory, targeted to better understanding the micro-processes that underlie institutional change (Hall and Hall 1993, Taylor 1996, Mahoney and Thelen 2010, Gray et al. 2015). In this “micro-perspective”, institutional change is understood not so much as “big shifts”—although they can occur—but rather as a long-term

process of gradual “institutional adaptations” to changing context and agency factors, which constantly “push against” the force of existing institutions.

The policy arrangements framework developed by Van Tatenhove et al. (2000), Arts and Van Tatenhove (2004), and Arts et al. (2006) provides the conceptual tools for such a micro-perspective on institutional change. In this framework, policy institutions as defined by Hajer are further elaborated on as “policy arrangements”. Policy arrangements are defined as “temporary stabilizations in the content and organization of a policy domain” (Arts et al. 2000: 54). The content of a policy arrangement is formed by the policy discourse. As this policy discourse is enacted in the policymaking practice, it structures the organization of a policy field as well. This organizational arrangement is further specified in terms of an actor, a rule, and a resources dimension. These organizational dimensions determine which actors are involved in the policy field, which rules (both in procedural terms as well as in terms of the existing policy framework) guide their interactions, and which resources are available to these actors through these rules. Figure 1 depicts the policy arrangements framework schematically.

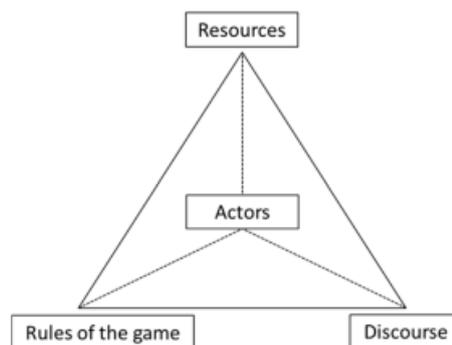


Figure 1: The policy arrangements framework (Arts et al. 2006: 99)

In a policy arrangements perspective, change can originate at each of the dimensions of the policy arrangement. But because all dimensions are interrelated, change brought about at one dimension can prompt shifts at other dimensions as well. Institutional change is thus conceptualized as a gradual

process where the different dimensions not necessarily change all at once but gradually and in response to each other. At the same time, the structural features in the policy arrangement determine the opportunities for and directions of change at each dimension (Arts and Van Tatenhove 2004: 5).

In this thesis, the policy arrangements framework is used to grasp both how expert-influence was constituted in the turn to spatial planning measures in Dutch and US flood governance as well as how this impacted distributive decision-making in this process. Expert-influence is linked to the actor dimension of this framework that determines which actors are involved in public policymaking and governance practices. As this dimension is related to the other dimensions of the policy arrangement, this means that expert-influence is understood as being constituted in this broader institutional policy context that grants authority to specific types of expertise. This structure can be actively upheld through existing power relations by actors who have an interest in defending the status quo of science-policy relations combined with contextual developments that highlight the relevance of institutionalized expertise for public policymaking. At the same time, this institutionalized structure can continuously be challenged by changing external conditions and/or the strategic agency of actors who want to change this status quo. By specifying different dimensions of a policy arrangement, the policy arrangements framework can help to understand how structures of expert-influence at the actor dimension are (re)established as part of an ongoing process in which different dimensions of a policy institution adapt to changes inside and outside the policy arrangement, at a speed and in a direction that is determined by the structural features at each dimension of the policy arrangement.

When it is understood how expert-influence is constituted through the “micro” processes that underlie institutional change, the effects of expert-influence can also be analyzed. For this, the policy arrangements framework also provides a

good starting point. By distinguishing between different dimensions of the policy arrangement, this conceptual framework can be used to analyze how new structures of expert-influence at the actor dimension impact other dimensions in the policy field: how it affects the policy discourse, how it impacts the policies and regulations that guide governance practices, and what (new) distributions of resources are produced in the policy field. The distribution of costs and responsibilities is part of this resources dimension.

Figure 2 depicts the theoretical framework used in this thesis. The conceptualization of a policy arrangement in the inner box is adapted from Arts et al. (2000: 56) and shows the interconnections between the policy discourse and the different organizational dimensions in a policy field. The outside box depicts the factors that drive institutional development (stability or change). On the left-hand side, the external drivers are shown. The right-hand side shows the agency factors; they are part of the policymaking and governance processes that are at the same time structured by the policy arrangement. The arrows denote directions of their influence. These relationships of influence should be understood against the background of the conceptualization of institutional change not as a singular moment in time but as a continuous and gradual process in which the structuring forces within institutions constantly “fight against” external and agency pressures for change. The bold arrows indicate the focal area of this thesis. It is interested in understanding how changes in the constitution of expert-influence at the actor dimension of the policy arrangement in Dutch and US flood governance influence distributive decision-making in the policymaking process underlying the turn to spatial planning measures in both countries, but it understands this relationship in the broader context of institutional change, which occurs gradually and is shaped by the interplay between internal structures, external drivers, and agency factors.

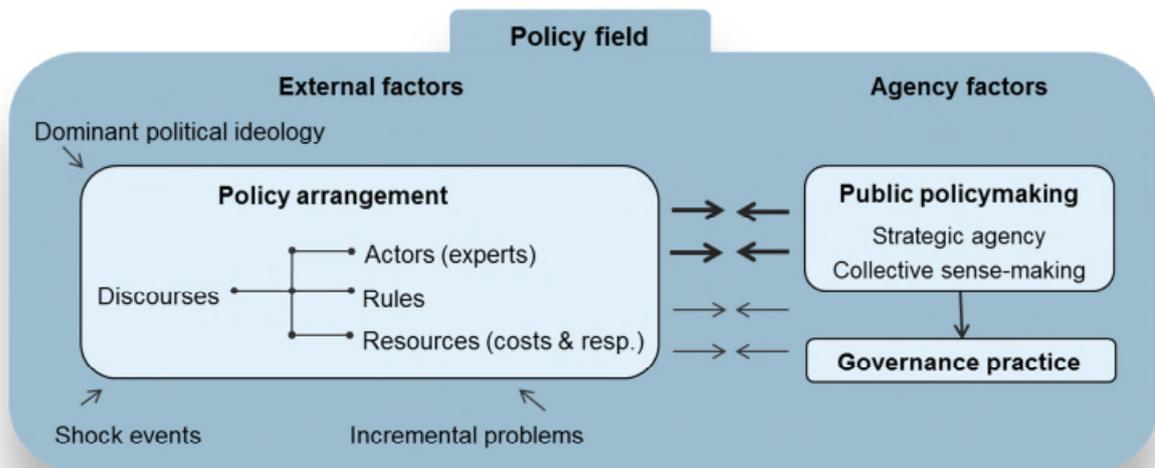


Figure 2: A conceptualization of the theoretical framework used in this thesis

2.2.2 The analytical perspective of framing

To trace back the mechanisms underlying “micro-processes” of institutional change, the analytical perspective of framing can be used. The concept of a frame finds its origins in the field of individual psychology, where frames are seen as representations through which individuals make sense of the world around them. Generally, a distinction is made between cognitive and communicative framing theories (Van Hulst and Dvora 2014). In cognitive approaches, frames are located in the individual’s mind. They are built up from past experiences and change when the individual incorporates new understandings gained from new experiences. In communicatively-oriented variants, frames are “shared” collective entities. They are the “primary frameworks” that people draw on to make sense of a situation and their own role in it (Goffman 1974).

In a public policymaking context, policy frames help actors grasp and deal with the complexity under which public problems often present themselves. Policy frames reduce some this complexity by identifying the causes and specifying solutions in relation to these problems, transforming “fragmentary or incidental information into a structured and meaningful policy problem” (Verloo 2005: 20,

see also Hajer 2006: 67). As such, policy frames can create shared ground between policy actors, which enables them to act in complex governance situations (Maussen 2009). However, policy frames are also seen as powerful instruments in public policymaking (Gamson and Modigliani 1989). As actors communicate their views about a policy problem—an activity also referred to as “framing”—they shape the understandings of other actors about the nature of the problem and the appropriateness of certain policy solutions (Rein and Schön 1993). Depending on the internal and external “strength” of the frame, their views may become leading in the policy field (Benford and Snow 2000).

In the political sciences, the analytical perspective of framing has often been used to reveal hidden power structures in public policymaking. Scholars who use this perspective usually draw on Sabatier and Jenkins-Smith’s (1988: 158) often-cited insight that public policies “are based upon (often implicit) causal theories of how the world operates, and [...] much of the policy debate can be understood as disputes over the validity of those causal theories”. They adopt Hajer and Wagenaar’s (2003) conceptualization of public policymaking as a discursive competition between ideas and meanings that influence how actors interpret policy problems and their solutions. These scholars typically try to deconstruct power in this process by revealing the “discursive politics” behind seemingly uncontested policy discourses (Rein and Schön 1993, Verloo 2005, Maussen 2009). The external context comes into play in these accounts of framing, mostly as one of the resources actor-groups (also referred to as “frame sponsors” or “discourse coalitions”) can draw on for their framing activities. Expert-knowledge is usually also considered this way. In frameworks such as Sabatier and Jenkins-Smith’s (1988) Advocacy Coalition Framework or Hajer’s (1995, 2005) Argumentative Discourse Analysis, it is explicitly recognized that expert-knowledge is always contested and that different actor-groups can make claims to different forms of knowledge to support their views (see also Dunn 1998, Cuppen et al. 2010).

While these political accounts of framing have generated much insight into the hidden power mechanisms that underlie (the constitution of expert-influence in) public policymaking, criticisms have also been raised against this traditional account of framing. Entman (1993) and Steinberg (1998) have emphasized that framing does not occur in a cultural vacuum but that it rather takes place in a very situated context in which existing discourses and ideologies not only impact the frames produced by actor-groups but also how these frames are received by other actors. In their view, traditional framing accounts tend to see policy frames too much as endogenous belief systems held and managed by stable actor-groups. Recently, a more “interactional” view on framing has been developed that sees framing less as a discursive battle between actor-groups and more as a joint and interactive process in which political agency and collective sense-making meet as actors encounter new policy situations (Dewulf et al. 2004, 2005, 2007). As actors start to communicate with each other about this situation, the arguments provided by one actor may be reinterpreted by other actors, and through this, new “shared” understandings of the policy problem may emerge (Dewulf and Bouwen 2012: 169). This interaction takes place in a situated policy context where political agency and external-contextual factors are closely entwined (Van Hulst and Dvora 2016: 7). Policy frames are understood as emerging “co-constructions of meaning” that actors produce while being in interaction (Dewulf et al. 2009: 160).

This thesis does not set out to reveal the hidden power structures behind expert-influence in the turn to spatial planning measures in flood governance. Rather, the aim is more empirical, to analyze the way in which expert-influence has been constituted in this turn, and how this has impacted distributive decision-making in this process. For this aim, the actor-centered accounts of Sabatier and Jenkins-Smith and Hajer are less useful. This thesis therefore builds on the more nuanced understanding of framing developed by Entman, Steinberg, and the “interactional” framing scholars, because this perspective is better able to grasp

all the different mechanisms behind institutional change. It allows for a more careful analysis of how experts, through their interaction with policymakers, shape the policy discourses in and through this organization of flood governance, including its distributive components.

By placing this analytical perspective in a wider context of institutional change, political agency and external contextual factors can be taken into account as well. This perspective assumes that in the interplay between contextual and agency factors in public policymaking, new arguments may be forwarded about a policy problem. As these arguments start to interact with existing (“institutionalized”) views, a new interpretation of the policy problem may emerge. This new understanding translates into practice as policy actors start to act upon this understanding (formally by changing policies and laws, or informally by following different procedures), further embedding this understanding in the governance practice (cf. Hajer’s explanation of discourse institutionalization). However, the degree and direction of change is dependent upon the structuring forces within existing institutions. The influence of experts in this process can be traced back through reconstructions of the policymaking process (cf. Van de Graaf et al. 1996: 125), as was done in this thesis for the two national case studies. The next section explains how the data for these reconstructions was collected.

2.3 A three-step approach to data collection

Policy change—institutional change in particular—often is a lengthy process (Hajer and Laws 2008: 264, Van Hulst and Dvora 2016). To fully apprehend the changes underlying the turn from safety to spatial planning measures in Dutch and US flood governance, the case studies covered over a century of policymaking on floods, from about 1900 up to 2015. This way, the role of experts in traditional safety approaches to floods could be grasped, based on which changes in this role under the Dutch and US turn to spatial planning measures

were investigated and the implications for distributive decision-making were analyzed.

In the collection of data for the analysis, a three-step approach was followed. First, a literature review of policy and institutional developments in Dutch and US flood governance over the course of the 20th to 21st century was made in order to grasp the major developments in these policy fields. Based on this review, certain periods in the evolution of Dutch and US flood governance were selected for further analysis. These periods marked an important formative moment in the development or change of policy institutions in Dutch and US flood governance.

As a second step, the policymaking process was reconstructed for these periods. Based on these reconstructions, the influence of experts on the distributive aspects of policymaking was traced back. For these reconstructions, transcripts of parliamentary debates and committee hearings were used as a primary source of data. This data was supplemented with secondary materials, such as reports and statements from key actors involved in the policymaking processes or the monitoring of these processes (e.g., watchdog organizations like the US Governmental Accountability Office (GAO) or research organizations focused on flood governance).

The overall conclusions of the case study analyses were checked and fine-tuned through stakeholder interviews and discussion meetings in the third step. The aim and setup of these interviews was somewhat different in both case studies. In the US, the interviews were used to gain more insight into the contextual background characteristics at play in a recent case of policymaking on floods (laid out in chapter 6). Whereas the analysis of Congressional records provided much insight into the internal dynamics of this process, it was difficult to get a good overview of the external developments that influenced this process being based in the Netherlands. The interviews held with stakeholders and actors who closely

followed this policymaking process helped to better understand the influence of external factors.

In the Netherlands, external factors were easier to grasp. Here, a difficulty rather lay in capturing the full scope of the policymaking process. In contrast to the US where the legislative action is publically documented (connected to the congressional committees in which this action takes place), in the Netherlands the process through which laws are formulated and amended takes place behind closed doors. For the Dutch case study, these aspects of the policymaking process, and the influence of experts on this process, were reconstructed based on an analysis of (policy) documents issued by relevant Ministries and other governmental bodies in Dutch flood governance, in combination with the parliamentary records that discussed (or not discussed) these documents. To check the findings, discussion meetings were set up with two key Dutch governmental bodies (the Ministry of Environment and Rijkswaterstaat) whose involvement in the policymaking process is not directly documented in parliamentary records.

Unfortunately, the interviews could not be used to check the findings of historical analyses of policymaking processes in Dutch and US flood governance (laid out in chapters 3 and 5). However, some valuable data sources were available that well-documented the external factors at play in US flood governance and the full policymaking process in Dutch flood governance. In the US, the books of Arnold (1998) and Barry (1997) were very insightful in this respect (see chapter 5). In the Netherlands, the energetic documentations of the Zuiderzee Society provided much insight (see chapter 3). Table 1 provides an overview of data sources used in this thesis.

Step	Data sources in the Dutch case	Data sources in the US case
1. Literature review	Review of the scientific and policy literature on the evolution of Dutch flood governance in the 20 th -21 st century.	Review of the scientific and policy literature on the evolution of US flood governance in the 20 th -21 st century.
2. Reconstruction of policymaking process in selected periods	Primary sources: Parliamentary proceedings and committee reports. Secondary sources: Policy reports, scientific reports, policy statements of key stakeholders.	Primary sources: Congressional records of House and Senate meetings, committee action (hearings, legislative mark-up sessions and reports). Secondary sources: Policy reports, scientific reports, policy statements of key stakeholders.
3. Interviews and discussion meetings	Discussion meeting at the Dutch Ministry of Infrastructure and the Environment with representatives from the flood safety and policy and management departments in October 2015; Discussion meeting at Rijkswaterstaat's Water, Transport and Living Environment Department in January 2016.	Interviews with the Federal Emergency Management Agency (FEMA), National Association of Realtors, Research for Institute Resources for the Future, the American Association of State Floodplain Managers, US Government Accountability Office (GAO), National Association of Mutual Insurance Companies in April 2014.

Table 1: Overview of data sources

2.4 Structure of this thesis

This thesis is built of seven chapters. The introduction and this theoretical chapter are followed by four case study chapters (chapters 3-6). There are two chapters for each case study, which are chronologically ordered for each case. The case study chapters zoom in on one or more different time periods that characterize

an important moment in the institutionalization or change of policy institutions in Dutch and US flood governance.

Chapters 3-4 deal with the Dutch case study. Chapter 3 starts out with an analysis of the policymaking process underlying the construction of the Zuiderzee Works (1890-1932), which represents a formative moment in the development of the Dutch safety approach to floods. In chapter 4, the policymaking process underlying the implementation three key spatial planning policies in Dutch flood governance are analyzed: the Room for the River project, attempts to implement flood insurance, and the Second Delta Program.

The results of the US case study are presented in chapters 5 and 6. Chapter 5 begins with an analysis of the turn to spatial planning measures in US flood governance, which roughly covers a time period from 1900 to 1960, and proceeds with an analysis of the evolution of this spatial planning approach over time. Chapter 6 looks at a recent case of policymaking in US flood governance. It studies the process leading up to recent reforms of the US spatial planning policy in 2012 and 2014, which were instigated by the occurrence of hurricane Katrina in 2005.

The thesis ends with a concluding chapter in which the case study findings are comparatively analyzed. This chapter draws general and context-specific conclusions with respect to the effects of the involvement of experts in the policymaking process underlying the turn to spatial planning measures in Dutch and US flood governance and discusses its theoretical and practical contributions and limitations.

One of the chapters has been accepted for publication in the journal *Environmental Values*. Two other chapters are currently under review by peer-reviewed academic journals. References to the publications and journals can be found in the different chapters of this thesis.