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From flood safety to risk management

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

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4. Engineering space: Integrated flood risk management in the Netherlands*

Abstract

The previous chapter concentrated on the formation of the safety approach in Dutch flood governance. This chapter starts out with a brief overview of the institutionalization of this approach over time, to then analyze the shift to spatial planning measures in the 1990s and 2000s. The analysis focuses on three measures with an important spatial planning component: Room for the River, flood insurance, and the Second Delta Program, which were with the exception of flood insurance implemented in the Netherlands. This chapter reconstructs the policymaking processes underlying these measures. Using the policy arrangements framework as a guideline, the role of experts is analyzed in relation to knowledge requirements for distributive decision-making. What new knowledge requirements emerged in the process of turning from safety to spatial planning measures in Dutch flood governance and to what extent have these knowledge requirements been met? The chapter concludes that new knowledge requirements did emerge but that they have not been sufficiently addressed in the policymaking process underlying the turn to spatial planning measures in the Netherlands. An important explanation for this is linked to the fact that Dutch policymaking on floods continues to rely on institutionalized engineering expertise, which implies a national-level focus that is ill-equipped to highlight local-level policy implications brought forward by the implementation of spatial planning policies.

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4.1 Introduction

Internationally, spatial planning measures are gaining popularity as part of a more “integrated” or “risk-based” approach to flood governance, in which no longer only the chance of flooding but explicitly also the impacts of floods are taken into account (Hall et al. 2003, Klijn et al. 2008, Bubeck et al. 2012, Hegger et al. 2014). Integrated flood risk management aims to find an optimal balance between “hard” protection and “soft” spatial planning measures. The objective is to create a robust and resilient policy framework that is well equipped to deal with future challenges like climate change and the continued urbanization of delta regions (Vis et al. 2003, Biesbroek et al. 2009, Hegger et al. 2014).

Incorporating spatial planning measures under a safety approach has major implications for existing arrangements in flood governance (Wiering and Immink 2006, Ward et al. 2013). Scholars already drew attention to the discursive shifts underlying this policy transition, because of which floods are now no longer seen as a pure external threat but rather a problem with anthropogenic causes (e.g., Wiering and Arts 2006, Immink 2007). They have pointed to changes in governance responsibilities, which have shifted from the central to the regional and local levels (e.g., Meijerink and Dicke 2008, Johnson and Priest 2008, Rijke et al. 2012), and have studied the different allocations of costs and benefits that result from this transition (e.g., Merz et al. 2010, Butler and Pidgeon 2011, Penning-Rowsell and Pardoe 2012, Paudel et al. 2015).

Up to now, little attention has been paid to the role of knowledge in the transition from safety to integrated approaches. Most analyses underscore the fact that integrated flood risk management requires new forms of knowledge to support integrated organizational arrangements in flood governance (e.g., Macdonnell 2008, Birkmann and Von Teichman 2010, Herk et al. 2011, Vink et al. 2013). However, a detailed account of what new knowledge requirements actually emerge in this process has not yet been made. Consequently, possible

obstacles connected to the role of knowledge in the transition to integrated flood risk management may not be recognized. This chapter focuses on knowledge requirements for distributive decision-making in particular. Does the evaluation of distributive implications of spatial planning policies require other forms of expertise than standardly incorporated under safety institutions?

This chapter analyzes this question within the case study on the turn to spatial planning measures in the Netherlands. As will be described in section 4.3, the safety approach that emerged with the development of the Zuiderzee Works further institutionalized over the course of the century in Dutch flood governance. In the 1990s, a “turn” was made to spatial planning measures. This chapter studies the policymaking process underlying three key spatial planning policies that have been discussed under this turn. The first is the Room for the River program, which started in the late 1990s and aims to create more space for (flood)water in the Dutch national landscape. Second, attempts to set up an insurance scheme for flood damage will be discussed, as they reflect the intention to place more emphasis on flood-resilient spatial planning at the local level. The third is the adoption of the concept of “multi-layered safety” in the Second Delta Program, which was implemented in 2008 and highlights the importance of flood-proof spatial planning in Dutch flood governance. What type of knowledge supported the development of these three policy measures and what did this imply for the evaluation of their distributive impacts in the policymaking process?

The chapter is structured as follows. Section 4.2 provides a recap of the policy arrangements perspective, which is forefronted as an analytical framework in this chapter. Section 4.3 briefly sketches the evolution of the safety approach in Dutch flood governance over the course of the 20th century. Section 4.4 provides the analyses of the three selected policy measures. For each of these policies, the policymaking process is reconstructed based on an analysis of parliamentary records and additional documentation that provided insight into the role of

knowledge in this policy transformation. Section 4.5 reflects on the findings and draws conclusions.

4.2 The policy arrangements perspective

In this chapter, the transition from a safety to an integrated flood risk management approach is analyzed from a policy arrangements perspective as developed by Van Tatenhove et al. (2000) and Arts et al. (2006). As explained in chapter 2, these authors defined a policy arrangement as a “temporary stabilization of the content and organization of a policy domain” and distinguished four dimensions of policy arrangements: policy discourses, actors, resources, and rules (Van Tatenhove et al. 2000: 54). Policy discourses structure the content of a policy arrangement. They set forward a common framework through which a policy problem is interpreted and dealt with (cf. Hajer 2005: 300) and as such influence the organization of governance practices in a policy domain. Actors, resources, and rules are the dimensions that structure this governance organization. They determine which actors are involved in policymaking and governance activities in a policy field, how costs and responsibilities are distributed between those actors, and which formal and informal rules structure their (inter)actions.

In a policy arrangements perspective, change is caused by the interplay of external and internal factors. It usually originates at one dimension, for example at the rules dimension when new policies are implemented or at the actor dimension when new actors are involved in the policymaking practice. But because all dimensions in the framework are interrelated, change at one dimension causes the other dimensions to shift as well. For example, when new actors are involved in the policymaking practice, the policy discourse may be altered, which can lead to the implementation of new rules that set forward another division of costs and responsibilities in the policy domain. However, the policy arrangements framework also recognizes structural elements in such

processes of change. The institutionalized structures at the different dimensions determine the opportunities for and directions of change (Arts and Van Tatenhove 2004: 5).

The policy arrangements framework is helpful for understanding the dimensions and dynamics underlying institutional change. As such, it is well suited to analyzing changed knowledge requirements in policy transitions. However, the policy arrangements framework makes no explicit notice of the role of knowledge in policy change. While the importance of (scientific) knowledge in policy change is generally stressed (e.g., Arts et al. 2006: 102), knowledge is usually incorporated under the dimension of resources, where it is construed as one of the strategic resources actors can use to influence public policymaking (Wiering and Immink 2006: 425). With this, the framework builds the science-policy literature that emphasizes the close relationship between knowledge and power in processes of discourse formation underlying policy change (Nowotny et al. 2001, Jasanoff 2004, Hajer 2005). While this literature has provided great insight into the constitutive factors of knowledge in public policymaking, a policy arrangements perspective can help broaden such analyses by also incorporating an investigation of the impacts of science-policy interactions on governance arrangements. It can help to identify what new knowledge requirements emerge in processes of policy change and to what extent existing dimensions of the policy arrangements framework allow organizing these new forms of expertise in the policymaking process.

Using the schema outlined in figure 3 below, this chapter hopes to contribute to an elaboration of the policy arrangements framework with a knowledge component that is recognized as a distinct factor in the process of policy change. In this elaborated policy arrangements framework, knowledge is recognized as a separate dimension subject to institutionalization and change. Knowledge can be “institutionalized” as part of an existing policy arrangement, but it can also be

pressured for change. This may directly result from the development of new (scientific) insights, whose inclusion may trigger changes in the policy discourse and the other dimensions of the policy arrangement. But pressures for change may also come from variations at the other dimensions, which may place new requirements on knowledge. For example, if a policy discourse changes and new rules are forwarded, new forms of expertise may be necessary to support the development and implementation of these rules. In this chapter, this schema is used to analyze how the interaction between experts and policymakers in the turn to spatial planning measures in Dutch flood governance shifted the policy discourse, what new knowledge requirements emerged in this process, and how these requirements were dealt with through the existing policy arrangements structure in Dutch flood governance.

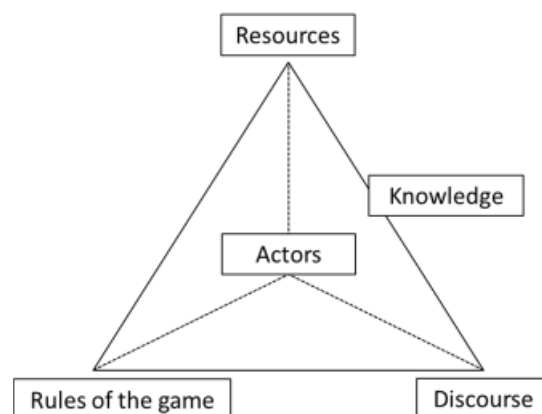


Figure 3. Knowledge in the policy arrangements framework, adopted and adapted from Arts et al. (2006: 99)

4.3 The evolution of Dutch flood governance over the course of the 20th century

Being at the basis of the early development of the Dutch safety approach, engineers continued to play an important role in the further evolution of Dutch flood governance. One of the major organizations in the field was Rijkswaterstaat. Established at the end of the 18th century under French influence as part of the military apparatus responsible for centralizing Dutch water management,

Rijkswaterstaat transformed from a military to a civil-engineering organization in the 20th century and developed as the expert body on Dutch water management (Lintsen 1980). Under the leadership of Rijkswaterstaat engineers, the safety approach was further institutionalized in Dutch flood governance.

An important factor in this development was the disastrous 1953 flood. That year, a major storm surge breached the levees protecting the southeastern delta of the country. More than 200,000 hectares of land were flooded, over 1,800 people were killed, and the total damage loss equaled 5.2 billion euro (Van Dijke 2013: 215). This event reinforced the focus of Dutch flood governance on technical flood protection. After the 1953 flood, Rijkswaterstaat was handed the responsibility to develop and implement a new flood protection system for the Netherlands. Rijkswaterstaat set up a “Delta Committee” to work on a “Delta Plan” for Dutch flood protection. Most importantly, this Delta Plan encompassed the embankment of estuaries in the flooded southeastern areas (also known as the “Delta Works”). But their plan went further and also included measures to raise and strengthen other parts of the coastal levee system. As a guiding principle, the Delta Committee adopted so-called “exceedance norms”, which specified the maximum height of storm surge elevations that coastal levees should be able to stand. These norms were based on an evaluation of the expected costs involved with a levee failure. For the most economically vital areas of the Netherlands, the norm of 1/10.000 was adopted, meaning that levees should be able to ward off storm surge elevations with a statistical chance of occurring once every 10.000 years. This meant that coastal levees should provide protection against water level elevations of up to five meters above average. Taking into account that levees would not immediately fail when such high water levels occurred, the actual protection these norms provided was thought to be higher. For 1/10.000 norm areas, the protection standard was, for example, estimated at 1/125.000 (denoting a flood change of no more than once every

125.000 years). For other coastal levees, norms and safety standards were set lower, depending on the expected damage that would result from a flood.

This method for establishing safety norms was adopted for riverine areas as well. In the 1970s, the Becht committee setup to develop these norms—which besides Rijkswaterstaat deputies also included engineers employed at regional water management authorities and provincial water management units (Heezik 2007: 219)—used the probability of increased river runoff as the basis for developing riverine safety norms. Based on a cost-benefit analysis, this committee concluded that a norm of 1/1.250—i.e., the norm that river dikes should be able to stand discharge extremes that occur with a probability of no more than once every 1.250 years (Heezik 2007: 220-221)—was most cost efficient.

Based on the coastal and riverine safety norms, the national government invested heavily in structural flood protection in the second half of the 20th century. With more than 50 percent of the national surface below sea level and about 70 percent of all properties located in these areas (Van der Brugge et al. 2005: 164-176), the Dutch are highly dependent on technical protection for safety against floods. Water management evolved as a technically planned and heavily regulated governmental responsibility in the Netherlands (Gupta et al. 2015).

Engineering expertise forms the dominant source of knowledge within these Dutch safety institutions (Heezik 2007). Engineers usually closely collaborate with macro-economists to produce national cost-benefit analyses that allow policymakers to weigh the costs of investing in flood protection against the socio-economic benefits created by increased protection against floods. Since the 1970s, ecological expertise has been included as an additional source of knowledge in Dutch flood governance. Since the so-called “ecological turn”, Dutch flood governance has not only been known for its ground-breaking technologies, but also for its “polder-model” of decision-making in which

different (economic, safety, and ecological) stakes have been made part of the process (Disco 2002, Van den Brink 2009).

With this strong national-planning tradition in Dutch flood governance, damage compensation was also largely a national state responsibility. At first, governmental damage compensation mainly targeted the direct impacts of structural defense works. As the previous chapter demonstrated, compensation was offered to the Zuiderzee fishermen for the losses they suffered as a result of the construction of the Afsluitdijk. The 1958 Delta Act, which implemented the Delta Works, also arranged for damage compensation to different groups. Article 5, section 4d, arranged compensation for groups directly affected by the Delta Works (e.g. communities that had to make way for levee construction, article 7 dealt with compensation for value reductions of property and article 8 set up a specific arrangement for the fisheries industry (Stb. 1958, 246). Before 1953, flood damage could be insured in the private market. After the 1953 flood, insurers decided to stop covering flood damage, as the risk had become too great. Their decision to leave the flood insurance market created a void in responsibilities for flood damage compensation. In practice, this void was filled by central-governmental institutions. Over the years, a generous damage compensation practice emerged in which the national government not only compensated for the negative effects of flood protection works, but increasingly also for the damage done by flood events themselves (Kuks 2004: 96). Every time a major flood struck, different administrative arrangements were set up that offered damage compensation to specific groups. For example, the Ministry of Agriculture arranged damage compensation for farmers, the ministry of Economic Affairs compensated the damage of private businesses, and individuals were usually compensated with the money collected through public fundraising actions and/or directly from the national treasury by the Ministry of Interior.

4.4 The implementation of spatial planning measures in the Netherlands

While reinforcing flood protection remains a key strategy to deal with flood risks in the Netherlands, since the late 1990s, spatial planning measures have been incorporated in the policy framework on floods, mainly in response to the expected impacts of climate change (Vis et al. 2003, Van Leussen and Meijerink 2014). After more than a century of building against floods, the accepting attitude toward floods implicit in spatial planning measures marks a major break with existing governance practices (Jong and Van den Brink 2013). This shift has brought significant changes to the organization of responsibilities in Dutch flood governance (Meijerink 2005, Van Buuren et al. 2012, Bergsma et al. 2012). This section reconstructs the policymaking process underlying the (near) implementation of three key spatial planning measures in order to analyze (changes in) the knowledge base underlying the development of these measures and the implications this had for the evaluation of the distributive impacts of these measures in the policymaking process.

4.4.1 Room for the River

In the 1990s, the Dutch were caught by surprise by a series of (near) flooding incidents. In 1993, the Meuse River burst through its banks in the southern province of Limburg, flooding one-fifth of the provincial surface. The floods put more than 700,000 properties underwater, of which many were built in unembanked areas in the river's winter bed. Similar circumstances occurred in 1995. While a large flooding disaster was prevented, its anticipation led to one of the largest evacuation projects ever undertaken in Dutch history. In the late 1990s and early 2000s, a series of rainfall extremes caused multiple instances of flooding throughout the country, which resulted in a substantial amount of crop and property damage.

The immediate reaction to the 1993 flood event was a “typical” Dutch one. In parliament, the event was referred to as an “environmental disaster” that called for “national solidarity” with its victims (Kamerstukken II 1993/1994a: 5). In 1995, a Delta Act Large Rivers was enacted to speed up dike reinforcements in riverine areas. Especially after the 1995 floods, however, this standard governance response was also criticized. Rijkswaterstaat and regional water management authorities were increasingly faced with the difficult task of fighting off floods for a society that continued to allow spatial developments in flood-prone areas. While throughout history Dutch engineers had always called for building stronger levees to keep the water out, they now started arguing that more space should be reserved for floodwater to better deal with the impacts of climate change. This vision was, for example, present in an influential report of the Advisory Committee on Water Management in the 21st Century, an engineer-led committee appointed to explore the future challenges of Dutch water management (Commissie WB21 2000).

The view that flood protection had reached its limits in a new context of climate change started to prevail in parliament as well. Dike reinforcement was criticized for only building up the value at risk to flooding, and the prolongation of this “unsustainable” practice was seen as uneconomical (Kamerstukken II 1996/1997a: 3). In 1996, a Room for the River Policy Guideline was adopted that, for the first time, diverted Dutch flood governance away from its protection doctrine (VROM and VenW 1996). The guideline restricted building activities in the winter bed of some of the country’s major rivers. It arranged that economic activities were only allowed if they were riverine-tied (e.g., shipping) or represented a major national-economic interest, and it required constructions in the winter bed to meet a certain safety standard to minimize flood damage. To reimburse foregone revenues lost because of these Room for the River planning restrictions, a special damage compensation arrangement was erected (Kamerstukken II 1996/1997b).

Over time, and in absence of large-scale flood events, the planning restrictions imposed by the Room for the River Policy Guideline were experienced as too burdensome. Under the leadership of a conservative-liberal government in 2006, Dutch parliament amended the 1996 guideline with a new Large Rivers Policy Guideline. This new guideline permitted more developments in the winter bed by letting go of safety requirements for damage mitigation (VenW and VROM 2006). It also emphasized the individual responsibility of project developers and users of winter bed areas to deal with the impacts of flood events. The damage compensation arrangement erected in 1996 was dismantled, and instead, the 2006 guideline stated that development initiators and residents would themselves be held responsible for taking sufficient precautionary measures to mitigate flood damage and to shoulder the costs of flood damage in the event of a flood (idem.: 7). Flood insurance was proposed as a means to assist citizens and businesses in acting on this new responsibility (Kamerstukken II 2005/2006a).

In 2007, Room for the River projects were incorporated under a structural planning decision that gave river-widening measures a more definite status in Dutch flood governance. The national government also strengthened its competences in this field. The new Spatial Planning Act adopted that year granted the national government a right to specify the ground conditions for and overrule municipal spatial plans to achieve national water goals (Needham 2005).

The development of the Room for the River policy described in this section reveals a gradual change in the Dutch policy discourse on floods. In this new policy discourse, the understanding of floods as a natural hazard was replaced by a focus on floods as an environmental risk partly driven by unwise location choices. This implied that floods could no longer be tackled through collective state protection and that measures were needed to address the anthropogenic causes underlying the risk. The spatial planning measures that were implemented shifted the attention from reducing the chance of flooding to reducing the

impacts of flood events. These changes were instigated by “institutionalized” experts in Dutch flood governance: engineers and macro-economists. These experts were also prominently involved in the development of new spatial planning measures, whose national cost-benefit analyses were now also used to identify economically efficient land-use options to create more space for water in the Netherlands. Consequently, the organizational structure in Dutch flood governance did not change much at first. Floods were still dealt with through top-down (river and landscape) engineering solutions, for which key responsibilities were assigned to the national government, which designated and financed Room for the River projects, specified the building conditions in project areas, and compensated the damage of those negatively affected by its planning decisions. These changes in the discourse on floods did, however, create openings for the implementation of new costs and responsibility structures in flood governance. When a more conservative-liberal cabinet rose to power, a decentralization of responsibilities was legitimized through this discourse. While flood insurance was initially seen as a means to help these actors cope with their new responsibility in flood governance, the following section demonstrates the difficulties encountered in this area.

4.4.2 Flood damage compensation

In contrast to many other (European) countries, flood insurance is generally not available in the Netherlands. Instead, the Dutch government always covered private losses after a major flood event. It often used different administrative arrangements to compensate the damage of different actor-groups affected by a flood (Duin and Mesu 1995). For example, the Ministry of Agriculture arranged damage compensation for farmers, the Ministry of Economic Affairs compensated the damage of private businesses, and individual flood losses were usually reimbursed by the Ministry of Interior. This was generally accepted as a reasonable and fair way to tailor governmental damage compensation to the

specific needs of affected groups (Kamerstukken II 1993/1994*b*, 1994/1995*a*). However, the recurrent character of flooding in the 1990s and 2000s challenged this practice. On the one hand, the arbitrary character of the arrangements was called into question, with different levels of damage compensation being offered to different groups (Kamerstukken II 1995/1996). On the other hand, this practice was seen to assert a moral pressure on the Dutch government to pay out every time a flood struck, an obligation that was no longer deemed tenable under the increased flood risks posed by climate change, not only because it would become unaffordable, but also because it reduced incentives to mitigate flood damage at the local level (Kamerstukken 1994/1995*b*).

In policy discussions on damage compensation after the 1993 and 1995 floods, flood insurance has often been proposed as a means to improve the existing damage compensation practice (Kamerstukken II 1994/1995*c*, 1994/1995*d*). Flood insurance would not only provide a more systematic method of damage compensation, as it operates under fixed rules, but it would also incentivize the implementation of loss reduction measures at the local level because people could lower their insurance premiums by taking these measures. However, flood insurance has always encountered much resistance in the Netherlands. When in 1995 a bill was drafted that would set up a public-private flood insurance scheme, this bill was sharply criticized by the Council of State for conflicting with the national government's constitutional duty of care for sustaining the quality of the Dutch living environment (Kamerstukken II 1995/1996). Among policymakers, the general feeling also was that flood damage compensation involved questions of national solidarity that should not be left to the market but should be settled in parliament instead (*idem.*).

With insurance being a no-go area, Dutch policymakers in 1998 adopted a "Disasters and Serious Accidents (Compensation) Act". The law intended to balance the goals of legal security, national solidarity, and individual responsibility

(Kamerstukken II 1996/1997c). Legal security was provided by specifying the conditions under which the law could be activated by the Minister of Interior, which was in the case of a large-scale riverine flooding or a flood event with a similar magnitude. National solidarity was ensured by preserving the minister's freedom to determine the specific compensation rules on a case-by-case basis. Individual responsibility was addressed by only arranging for partial compensation of flood damage and by excluding losses that were reasonably insurable or could be attributed to careless actions.

Applications of this law have been much contested. While the law has been activated for different kinds of events, it has not always been activated under recurrent circumstances because of the structural character and therefore predictability of the problem that actors can anticipate. In addition, compensation rules have been amended on a case-by-case basis (Kamerstukken II 1998/1999, 2000/2001). Because of this, the law has been criticized for failing to provide financial security as well as incentives for damage mitigation (Faure and Hartlief 2001, Botzen and Van den Bergh 2008). In 2004, an advisory committee concluded that the division of responsibilities for flood damage compensation in the Netherlands remained unclear under the new compensation act (Commissie Tegemoetkomingen bij Rampen en Calamiteiten 2004). In an official reaction to this committee's report, the Dutch government emphasized that citizens are primarily responsible for shouldering their own damage in the event of a flood and that the national government only has a legitimate role in cases of large-scale, socially disruptive flooding disasters (Kamerstukken II 2005/2006b: 1). Since that time, opportunities to implement an insurance scheme for flood damage have again been explored (Kamerstukken II 2005/2006b, 2013). In 2003, an agrarian rainfall insurance scheme was successfully implemented and several attempts have been undertaken to launch a general insurance scheme for private flood losses (Kok et al. 2014).

Under the traditional damage compensation regime in the Netherlands, policy decisions were evaluated based on a national-level consideration of harms and injuries suffered from a flood event. The national government assumed a large part of the costs for damage compensation. This damage compensation practice fit in well with the policy arrangements of a safety approach to floods, which already assigned a key role to the national government in flood protection. However, as responsibilities for protection shifted to the local level under Room for the River projects, this traditional flood damage compensation practice lost its natural appropriateness. While a wholesale conversion to an insurance system was always resisted in the Netherlands because of conflicts with underlying normative beliefs and traditions in Dutch flood governance, elements of flood insurance have gradually been incorporated in the rules-dimension of the institutional arrangement in Dutch flood governance. They were discussed as a logical consequence of the spatial planning approach implemented through Room for the River projects, which continued to be justified based on its national cost-benefit balance. Because of this, the implications of shifts in responsibilities produced by implementing flood insurance were not specified in the policymaking process and did not generate much attention in the decision-making process. In parliamentary discussions on flood insurance between 1998 and 2014, the question of what individuals could actually do to reduce their exposure to flood risks was raised only once. This question was answered by a simple reference to the option to “upscale” buildings, but this left aside a whole bunch of questions relating to how individuals would do this, whether this was even allowed in the strictly regulated spatial planning structure of the Netherlands, and who would pay for such measures.

Strikingly, little new expertise was brought into the policy discussions on flood insurance, though especially in the last two decades, knowledge on the relationship between flood insurance and spatial planning measures quickly developed in the Netherlands. Scholars connected to geography and spatial

economy departments of Dutch knowledge institutions have, in particular, analyzed and discussed the prospects and drawbacks of using insurance as a policy instrument under a risk-based approach to flood risk management in the Netherlands (e.g., Vrijling et al. 2008, Botzen et al. 2010, Aerts and Botzen 2011, Seifert et al. 2013, Kok et al. 2014, De Moel et al. 2014, Jongman et al. 2014, Paudel et al. 2015). While the expertise is available, this knowledge has not found its way into the policymaking process.²⁰ Because of this, the distributive consequences of emphasizing local responsibilities for dealing with the impacts of floods largely remained unspecified in the policy discussions on flood damage compensation.

4.4.3 The Second Delta Program

In 2007, a Second Delta Committee was appointed to analyze the state of the Dutch flood protection system. Seating, amongst others, an economist, a civil engineer, a climate expert, a landscape architect, and the director of a large dredging company, this committee concluded that the Dutch flood protection system not only failed to meet its current standards, but that these standards were too low to adequately prepare the water system for the impacts of climate change in general. When the committee published its findings in 2008, the report functioned as an alarm bell in Dutch flood governance (Verduin et al. 2012).

In response to the findings of this committee, a Second Delta Program was erected in 2008, which has since then been updated every year. Through this program, the Dutch government outlines its water goals and specifies its policy strategies. A principle that guides this program is that of “multi-layered safety”. Developed by water management professionals, this principle distinguishes between three safety layers to function as the pillars of policymaking on floods: a

²⁰ Discussion meeting at the Dutch Ministry of Infrastructure and the Environment, October 12, 2015, The Hague.

first layer of flood prevention, a second layer of climate-proof spatial planning, and a third layer of emergency management (Meijerink and Dicke 2008). With the Second Delta Program, the Dutch government formulated so-called “delta decisions” that together embody this principle of multi-layered safety.

The first delta decision concentrates on water safety, which is seen as the primary pillar of Dutch flood governance (VenW, VROM, LNV 2009). With this decision, the Dutch government calls for a reevaluation of the costs and benefits involved with national flood protection. The performance of this reevaluation was delegated to a group led by economists at the engineering agency Deltaris, an organization where many former Rijkswaterstaat employees have been employed since Rijkswaterstaat underwent several reorganizations that aimed to transform it from an engineering agency to a more diverse group of specialist working on water management.²¹ The Deltaris group developed a new method to calculate what they termed “economically efficient flood protection standards” for the Netherlands—defined as the point at which further investments in dike reinforcement exceed the gained benefits of mitigated flood damage (Eijgenraam et al. 2014). Justified in reference to their cost-efficiency (Kamerstukken II 2010/2011, 2011/2012, 2013/2014, 2015/2016), this new norm-setting method was adopted by parliament in 2015. The new norms that will be calculated through this method will provide an equal basic level of protection to each Dutch citizen, expressed as an annual chance of being killed by a flood of no more than 1/100.000. This standard is matched by no other country in the world. In addition, safety norms will be set higher in certain (mainly riverine) areas while they are lowered for other areas. The logic behind this is an economical one; according to the Second Delta Program, safety standards will be set higher in areas where there are a lot of people or where there is a lot of value at risk, because the

²¹ Discussion meeting at Rijkswaterstaat, February 15, 2016, Lelystad.

benefits of flood protection outweigh the costs of strengthening flood protection (Delta Program 2015: 16).

Another delta decision focuses on spatial adaptation. With this decision, the Dutch government outlines spatial planning measures as a means to address the second (climate-proof spatial planning) and third (emergency management) safety layers. While spatial planning measures are described as a sensible policy strategy in general, their importance is specifically underscored for areas where the cost of reinforcing flood protection are unreasonably high compared to the value protected. In these areas, the Delta Program calls for so-called “smart combinations” in which spatial planning measures are implemented instead of dike reinforcement (Kamerstukken II 2015/2016). Because spatial planning is locally organized in the Netherlands, spatial planning measures require “shared ownership” and “self-regulation” (Delta Program 2014: 8). The search for “smart combinations” in low-risk areas means that the Dutch government places more responsibility for taking precautionary measures against floods and for mitigating flood damage on the shoulders of individuals and businesses in low-risk areas than in high-risk areas, as high-risk areas continue to be protected through collectively funded protection works. However, this policy implication was not recognized at all in the policy discussions on the Delta Program. In reaction to an assessment of the Organization for Economic Co-operation and Development (OECD 2014), which concluded that Dutch citizens were not well aware of and therefore ill-prepared for the flood risks they face, there has been some discussion on the role of citizens in Dutch flood governance. However, these discussions concentrated on the need to inform citizens about the emergency relief measures they can take during a flood rather than on their role in preventing flood damage through spatial planning measures (Kamerstukken II 2013/2014, 2015/2016).

With the Second Delta Program, elements of an integrated flood risk management approach have been incorporated under a single policy framework. These are generally accepted as innovative elements in the Dutch polder-model for flood governance that will help prepare the country for climate change. While as part of this approach the expertise base within important water governance authorities such as Rijkswaterstaat has been diversified, the policy choices underlying this program continue to depend on institutionalized engineering expertise, which is now “outsourced” to organizations like Deltaris where many former Rijkswaterstaat engineers have been employed. The choice to protect an area with protection or spatial planning measures is based on the national cost-benefit analysis performed by the Deltaris group. Under this national-level focus, however, the local-level implications of these policy choices have not always been clearly recognized in policy discussions.

4.5 Conclusion

This chapter analyzed the transition from a safety to an integrated approach in Dutch flood governance. The aim was to scrutinize what new knowledge requirements emerged in this transition, to what extent these new knowledge requirements were dealt with, and what this implied for distributive decision-making. To this end, the policymaking processes underlying three key spatial planning policies in Dutch flood governance were reconstructed. These reconstructions were analyzed through a policy arrangements perspective, to which a separate knowledge dimension was added. Based on the analysis, three conclusions are drawn.

First, the analysis shows that the transition to integrated flood risk management in the Netherlands originated at the knowledge dimension, where a new type of knowledge entered into the policymaking process. This knowledge constituted insights about the future effects of climate change on flood risks in the Netherlands. These insights were, however, not brought in by a new type of

expert. Rather, the impacts of climate change were highlighted by institutionalized engineering experts who, under the safety approach, were trusted with the responsibility of protecting the Netherlands against flooding but who felt this responsibility was increasingly at jeopardy by the unwarranted development of flood-prone areas and climate change. The new spatial planning policies they devised aimed to tackle these problems (e.g., the Room for the River Program), but they did so in a way that largely followed a “safety logic”; spatial planning measures were justified through economic cost-benefit analyses and were implemented top-down. However, by highlighting the importance of adjusting spatial planning to new flood risks, a new policy discourse gradually developed in which human settlement choices were identified as an additional cause underlying flood risks. This new discourse opened up possibilities for change at the other dimensions of the policy arrangement as well. Notably, with the identification of anthropogenic causes, new rules that emphasized local-level responsibilities for flood protection and damage compensation could be justified.

Second, the analysis demonstrates that new knowledge requirements emerged in this process. As the previous chapter also demonstrated, under safety institutions, flood governance strategies were justified based on a national consideration of their costs and benefits while their local-level impacts were always dealt with through additional democratic decision-making. But because spatial planning measures transfer responsibilities (and associated costs) for flood governance to the local level, they require an up-front evaluation of local-level distributive implications. For this evaluation, new forms of knowledge are required that provide insight into the local-level distributive implications of spatial planning measures. For example, what measures are actually available to local actors to make flood-resilient location choices or to flood-proof their buildings, and what are the costs involved with taking such measures?

Third, the case study shows that in Dutch flood governance, such “localized” policy knowledge was not part of the policymaking process in which spatial planning measures were developed. In the Netherlands, spatial planning measures were developed in close interaction with institutionalized engineering experts. Therefore, their national-level costs and benefits were spelled out quite well. However, information on the responsibilities and costs that shifted to local-level actors as a result of the implementation of spatial planning measures remained unspecified in the expertise of Dutch engineers, as engineering expertise in Dutch flood governance has not evolved to accommodate such local-level policy effects. While insights about the local-level implications of spatial planning measures have been developed within geography and economy departments of Dutch universities, this knowledge did not find its way into the policymaking process. A major cause behind this can be linked to the actor dimension of the policy arrangement in Dutch flood governance, where the institutionalized relationship between engineers and policymakers blocked the incorporation of new types of experts and new types of expertise in the policymaking process.