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Jong, Pieter; van den Brink, Margaretha

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Between tradition and innovation: developing Flood Risk Management Plans in the Netherlands

Pieter Jong¹ and Margo van den Brink²

¹ Faculty of Architecture and the Built Environment, Delft University of Technology, Delft, The Netherlands

² Department of Spatial Planning and Environment, University of Groningen, Groningen, The Netherlands

Correspondence

Delft University of Technology, Faculty of Architecture and the Built Environment, Julianalaan 134, Delft, The Netherlands
Tel: +0031-6-21207052
Email: p.jong@tudelft.nl

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Flood risk management; Flood Risk Management Plan (FRMP); institutions; spatial planning; the Netherlands.

Abstract

Traditionally, governmental authorities in the Netherlands have a strong focus on the construction and maintenance of flood defences, such as dikes and dams. The last decades, however, there has been a growing awareness of the importance of spatial planning for flood risk management. With the arrival of the Floods Directive (2007), it is likely that even more attention will be paid to sustainable spatial planning to reduce flood risks. From an institutional perspective, this paper explores the way in which the Netherlands is now attempting to further integrate water management and spatial planning in the preparation of its first Flood Risk Management Plans. The current internal policy debate centres around five important issues concerning the required measures, instruments, rules, governance styles and time perspectives. Maintaining its strong, engineering-based water management tradition, and at the same time institutionalising a framework for a more holistic flood risk management that comprises not only rules and regulations for probability reduction but also for impact reduction through sustainable spatial planning turns out to be a challenging task. The recently established national Delta Commissioner (2012) could be an important stimulus for the further integration and innovation of water management and spatial planning.

Introduction

The European Floods Directive, published in 2007, can be considered a major incentive for improving the integration between water management and spatial planning. In two Considerations in the preamble, it is explicitly stated that Member States (and the Community) should consider the potential impacts that water and land use policies might have on flood risks and the management of flood risks (European Parliament and European Council, 2007, Considerations no. 2 and no. 9). The Floods Directive prescribes no specific results for the Member States, except Flood Risk Management Plans, Flood Hazard Maps and Flood Risk Maps. At the moment, the Member States are preparing the Flood Risk Management Plans, which have to be finalised in 2015. In particular, these plans should take into account 'soil and water management, spatial planning and land use' aspects. These aspects are even an obligatory part of the Flood Risk Management Plans (European Parliament and European Council, 2007, Articles 4 and 7).

Considerations in a preamble of a European Directive are however not legally binding. These Considerations only

clarify the intentions of the European legislator. How spatial aspects should be taken into account in (the preparation of) Flood Risk Management Plans is for the Member States to find out and decide. An interesting country in this respect is the Netherlands, a densely urbanised country situated in the delta of the Rhine, Scheldt and Meuse rivers, thus receiving a continuous stream of rainwater and melt water from a substantial part of Western Europe (see for more information Huisman, 2004; van de Ven, 2004). To stimulate cooperation with neighbouring countries, in 2004, the Dutch government proposed to develop a European Union (EU) flood prevention programme, an initiative that eventually resulted in the Floods Directive in 2007 (Ministry of Transport, Public Works and Water Management, 2008b, p. 23). As it was a Dutch initiative that paved the way for the Floods Directive, and as the Netherlands has a long history of coping with water safety issues (Lintsen, 2002), the expectations are high about the way in which it is now trying to implement this directive. The Dutch Flood Risk Management Plans are being developed by the national government in close cooperation with the regional Water Authorities (Ministry of Infrastructure and the Environment, 2012, pp. 50–51, 102).

From an institutional perspective, the main objective of this paper is to examine the way in which the Netherlands is integrating water management and spatial planning in the preparation of its first Flood Risk Management Plans. We define institutions as the formal and informal rules and regulations that structure social behaviour (North, 1990; Scott, 2008). Formal institutions include laws and official policies, and informal institutions include routine practices and ways of doing things (March and Olsen, 1989; North, 1990). In this paper, we particularly focus on the formal institutional framework for flood risk management and spatial planning especially because the implementation of the Floods Directive occurs in this formal institutional framework. Given the national policy freedom in particular in the field of spatial planning, the Dutch government can choose from a variety of ways to implement the guidelines of the Floods Directive. Nevertheless, it is likely that a close connection will be made with existing formal institutions, thus existing plans, responsibilities and legislation regarding the integration between water management and spatial planning.

The structure of this paper is as follows. First, we give a brief historical overview of flood risk management in the Netherlands, after which we discuss the existing formal Dutch institutional framework for flood risk management and spatial planning. Against this background, we reflect on the current policy debate about the implementation of the guidelines of the Floods Directive. Five persistent issues structure the discussion, concerning the required measures, instruments, rules, governance styles and time perspectives. We also present a brief preview on the future, as the establishment of the national Delta Commissioner in January 2012 could be an important stimulus for the further integration and innovation of water management and spatial planning. We end this paper with a conclusion.

Flood risk management in the Netherlands

The Netherlands has a long history of coping with water safety (see e.g. Lintsen, 2002; van de Ven, 2004). The ongoing centralisation and technocratisation of flood protection made possible the construction of various large-scale coastal engineering projects, including the damming of the Zuiderzee and the Delta Works (Lintsen, 2002). Recent high water events and the potential impacts of climate change raised social awareness of flood protection issues, as well as awareness among water management experts and policymakers of the limits of coping with high water levels just by building higher dikes (van den Brink *et al.*, 2011). As opposed to simply 'fighting the water', new modes of flood protection were developed to create more space for water, and to try to 'live with the water' and 'accommodate the

water' instead. In addition, the recent high water events prompted a fundamental reconsideration of the way in which the Netherlands was protected against floods, namely the development of a flood risk approach. 'Flood risk' was defined as the probability of a flood times the potential impact of flooding. Until then, water managers had concentrated almost entirely on reducing the probability of flooding by taking technical or spatial measures. Now, they also tried to develop policies to reduce the potential impacts of flooding, for example by developing early warning systems and careful planning of evacuation routes, or by adapting houses and infrastructure to prepare urban areas better for flooding. If a flood occurred, there would be fewer victims and less economic damage (van den Brink *et al.*, 2011; see also Meijerink & Dicke, 2008).

The flood risk approach was introduced formally in the 'Policy Document on Water Safety', which was published in 2009 (Ministry of Transport, Public Works and Water Management, 2009b). It was for the first time that the whole safety chain was addressed: from pro-action and prevention to preparation, response and even aftercare. Consequently, in the same Policy Document on Water Safety, the concept of 'multilayered safety' was introduced to make a distinction between three different safety layers (see also van den Brink *et al.*, 2013). The first and most important layer was flood protection: the reduction of the flood probability and the implementation of the legal safety standards by taking technical and spatial measures. The second safety layer involved sustainable spatial planning on the basis of for example flood risk maps. The third and final safety layer involved disaster management. Despite flood protection and sustainable spatial planning, a flood disaster always forms a threat that has to be anticipated. To reduce the number of casualties and the economic damage, it was therefore necessary to also develop strategies of disaster management.

Although with the introduction of the flood risk approach and concepts such as the 'safety chain' and 'multilayered safety', a large variety of potential solutions and measures has been developed, in the Netherlands, flood protection is still considered the most important safety layer (van den Brink *et al.*, 2011). Up to now, measures to reduce flood vulnerability and flood exposure have hardly been implemented. The flood protection layer is referred to as the 'corner stone' of Dutch water safety policy (Ministry of Transport, Public Works and Water Management, 2009a). Even the State Committee that designed the second Delta Plan to make the country 'climate-proof' for the long term stated explicitly from the beginning that it would primarily focus on flood protection as that had proven to be the most effective strategy in the past (Deltacommissie, 2008). Measures to reduce the impacts of flooding were viewed merely as supplementary or additional solutions, that is, as alternative back-up measures (van den Brink *et al.*, 2011). It can be concluded

that in the Netherlands, the focus on the development of technical engineering measures for probability reduction is persistent.

Institutional framework for flood risk management

The Floods Directive refers to floods in general. A 'flood' is described as the temporary covering by water of land not normally covered by water (European Parliament and European Council, 2007, Article 2, subsection 1). Dutch water policies make a distinction between 'big floods', also referred to as flooding, and 'small and local floods', also referred to as waterlogging. This distinction is more practical than fundamental. Whereas municipalities are responsible for the prevention of waterlogging, the national government (in particular *Rijkswaterstaat*, the policy-implementing agency of the Ministry of Infrastructure and Environment) and the regional Water Authorities are responsible for flood prevention. In describing the formal institutional framework for flood risk management, we focus on flooding rather than waterlogging.

Division of water management responsibilities

Preventing flooding requires a joint approach of several governments (Dutch House of Representatives, 2011, p. 2). The responsibilities regarding flood risk management are divided between (a) national government, (b) regional Water Authorities, (c) provinces and (d) municipalities. The national government and the provinces have the most important role (Dutch Coalition Agreement, 2012).

National government

The national government manages the so-called 'main water systems' (the big rivers, the IJsselmeer Lake, the Amsterdam-Rhine Canal, the North Sea Canal, the Wadden Sea, the Eems-Dollard estuary, the Delta waters and the territorial part of the North Sea). Legal safety norms and policy frameworks for the primary flood defences (3400 km in total) have been set by the national government. National water plans and national spatial plans (structure visions) have also been established by the national government.

Water authorities

All other waters than the national waters – i.e. the *regional* and *local* waters – are in principle managed by the regional Water Authorities. Water Authorities are public bodies just like municipalities, provinces and the national government (Jong, 2007, p. 204). The Netherlands has 26 Water Authorities, all of which are regional authorities that exclusively

perform tasks related to water management (Association of Regional Water Authorities, 2011). The key tasks of the Water Authorities are the maintenance of flood defences, care of water quality, water quantity and groundwater.

Provinces

The provinces play a key role, both in spatial planning and in water management, as these regional authorities have been assigned the task of 'area directors' (in Dutch: 'gebiedsregisseurs') that establish policy frameworks for spatial planning as well as policy frameworks for the regional water systems. In addition, the provinces have a legal responsibility as supervisors of the Water Authorities. For instance, the project plans of the Water Authorities concerning flood defences and regional waters have to be approved by the provinces (Water Act, 2010, Article 5.7). The provinces also formulate safety norms and regulations for the flood defences of the regional water systems (13 000 km in total) – the regional or secondary flood defences.

Municipalities

Although in the Netherlands, the municipalities possess the most important spatial planning powers (for instance, they develop the legally binding land-use plans), as far as water management is concerned, municipalities are not the most important player. Municipalities have been assigned the following three specific responsibilities concerning water management. One 'old' existing municipal responsibility concerns the collection and transport of wastewater (Environmental Management Act, 2004, Article 10.33). In addition, since January 2008, municipalities have two new responsibilities, which concern storm water run-off and groundwater (Water Act, 2010, Article 3.5 and 3.6). Especially the management of storm water run-off is relevant to prevent local flooding (waterlogging).

Spatial planning rules and instruments

Now, we have more clarity about the division of responsibilities in the area of flood risk management; it is possible to relate these responsibilities to existing spatial planning rules and instruments, which can be used to link spatial planning and water management, and thus develop and implement flood risk management measures. An overview is presented in Table 1.

In the Netherlands, most spatial planning rules are procedural rules that facilitate spatial planning procedures. An important procedural instrument to link spatial planning and water management is the Water Assessment. The Water Assessment has been introduced formally in 2001 and since then has been used to guarantee that water interests are taken

Table 1 Spatial planning rules and instruments that can be used to improve the link between spatial planning and water management

Scale	Government authorities	Rules and instruments to link spatial planning and water management
National	Cabinet and parliament	Plans: National Water Plans (have the status of Structure Visions), National Spatial Plans (Structure Visions). Structure Visions are only self-binding for the government that develops these plans; they are not legally binding for others. Legislation: Water Act (2010), Spatial Planning Act (2008), general rules based on the Spatial Planning Act, etc. Important part of the Water Act: rules about primary flood defences (including substantive safety standards formulated in an appendix of the Water Act). Policy documents (guidelines etc.). Specific procedural instrument: Water Assessment.
Provincial	12 provinces	Plans: Provincial Structure Vision, Provincial Water Plan. Again, Structure Visions are only self-binding for the government that develops these plans; they are not legally binding for others. Legislation: provincial ordinances. Important part of the provincial ordinance about flood defences: rules concerning the regional or secondary flood defences (including safety norms). Specific procedural instrument: Water Assessment.
Regional	26 Water Authorities	Operational Water Plan. Water Board Ordinance. Policy documents. Specific instrument: Water Advice (in the context of the Water Assessment, advice of Water Authority to spatial planning authority such as municipalities).
Local	415 Municipalities	Land-use plan (is the only legally binding spatial plan), including zoning and land-use regulations.

into account in spatial and land-use planning, so that negative effects on the water system will be prevented or compensated for elsewhere. From November 2003, the Water Assessment is obligatory for all formal spatial plans, such as municipal land-use plans and provincial spatial policy plans (Ministry of Transport, Public Works and Water Management, 2004).

Characteristic of the Water Assessment is that it entails an obligation for municipalities and Water Authorities to cooperate. In a joint effort these local and regional authorities have to study the possible negative effects that new spatial plans might have on the water system (surface water, groundwater, etc.). The Dutch legal framework does not contain specific rules that prescribe a particular outcome (for example, it is not allowed to build houses in a particular area, etc.). The cooperation between municipalities and Water Authorities therefore mainly implies an interactive process; the Water Authorities give advice about the possible effects of a spatial plan on the water system, whereas the municipalities give advice about the possible effects of new water policies on spatial planning. A municipality cannot easily disregard the advice of a Water Authority. First, the advice of the Water Authority has to be taken into account in the explanation of the final decision. When the Water Authority gives a negative advice (e.g. do not build in this flood-prone area) the municipality is not obliged to conform to this advice but has to deal with it in the reasoning of the

decision. Second, Dutch spatial planning law contains the norm to strive for 'proper spatial planning'. Although this norm is mainly interpreted as a requirement of spatial relevance, it can also be regarded as 'proper' when a municipality takes the advice of other public authorities seriously into account (Jong, 2007, p. 210).

Only recently some substantive rules have been added to Dutch spatial planning law. For instance, in December 2011, binding general provisions have been formulated for the primary flood defence structures and riverbeds in the great rivers (General Spatial Planning Rules, 2011). Lands that contain a primary flood defence structure or that have the function of primary flood defence structure should be designated in land-use plans as 'flood defence structure' (General Spatial Planning Rules, 2011, Article 2.3.3). Article 2.3.4 of the General Spatial Planning Rules provides more clarity about the specific spatial implications of the obligatory inclusion of flood defence structures in land-use plans. Land-use plans can be adopted that contain a change compared with a previous land-use plan in as far as the realisation will not hinder (a) the maintenance or strengthening of the sandy part of the coast foundation, or (b) the maintenance, the safety or the possibilities to strengthen the primary flood defence structure. The General Spatial Planning Rules also contain provisions related to the great rivers to ensure for example that there is no actual hindrance to the enlargement of the discharge capacity of the river.

It can be concluded that the Dutch institutional framework contains several formal rules and instruments to improve the link between spatial planning and water management. However, from this formal institutional perspective, the implementation of the guidelines of the Floods Directive turns out to be a rather challenging task.

Developing Flood Risk Management Plans

The formal institutional framework for flood risk management existed before the implementation of the Floods Directive started. Most existing formal institutions still represent traditional Dutch flood risk management, which is based on probability reduction. For the Netherlands, the Floods Directive therefore presents a major paradigm change in addressing floods, from the protection of negative flood effects towards an increased importance of prevention measures and preparedness of the population (Cassel *et al.*, 2013, this special issue). In what follows, we reflect on the current policy debate about the development of its first Flood Risk Management Plans and analyse why realising this paradigm change in the Netherlands is such a challenging task. In this context, first, a distinction has to be made between the foreign policy debate and the domestic policy debate.

With regard to the foreign policy debate, generally speaking, the Dutch government seems to have chosen the following two roles in worldwide water management: the role of the merchant or trader and the role of the missionary. The Dutch merchant is looking for foreign clients to sell innovative Dutch water management, both his knowledge and experience. Recently, the Minister of Infrastructure and the Environment showed this commercial attitude in a letter to parliament (Dutch House of Representatives, 2013, p. 3). Interestingly, in English publications about the Dutch ambitions concerning the Floods Directive especially this foreign policy function of the Floods Directive is emphasised (see e.g. Ministry of Transport, Public Works and Water Management, 2008b, p. 23). The reason for this emphasis is that the Netherlands are indeed *Les Pays Bas*, the Low Countries, which are vulnerable to floods from upper stream European countries. In addition, the national government is of the opinion that the Netherlands is the safest and best protected delta in the world. This high level of protection is a result of the fact that the Netherlands has the world's most stringent safety requirements geared to preventing flooding (Ministry of Infrastructure and the Environment and the Ministry of Economic Affairs, Agriculture and Innovation, 2012, p. 83). Here, we recognise in particular the role of the missionary. The Dutch government tends to think that the Netherlands is the best protected delta in the world and expects neighbouring countries to make a substantial effort to reduce flood risks in the Netherlands.

In the domestic policy debate, however, the Dutch government seems to have chosen quite a different role, namely a role that matches more with the Dutch cultural attitude at home. Traditionally, the national government is modest and leaves much policy room to decentralised local and regional authorities (the provinces and municipalities). Because of the current economic crisis, the government even more and more strives for austerity. Also, in the actual preparation of its first Flood Risk Management Plans, we recognise this more conservative, moderate, sober and efficient profile of the Dutch government. Recent research (van Eerd, 2013, Chapter 5 and Section 6.9.1) also points to the sober implementation level in the Netherlands. In the remainder of this section, we reflect in more detail on the current domestic policy debate by discussing five important issues that have to be dealt with in the preparation of the Flood Risk Management Plans. The position of the Dutch government with regard to these five issues seems to indicate that traditional flood risk management is still seen as the corner stone of Dutch water safety policy – the Dutch government seems to be reluctant to develop innovative flood risk management in line with the intentions of the Floods Directive.

Technical engineering – sustainable spatial planning

Although in the Netherlands, a variety of new strategies and measures has been developed to reduce flood risks, the focus on probability reduction by taking technical-engineering measures is persistent. The Dutch approach has been successful so far. However, a key question is: to what extent will this technical-engineering approach also prepare the Netherlands for the potential impacts of climate change? In this context, it is remarkable that Europe and the Netherlands use different conceptualisations of the notion of flood prevention (Stowa Deltafact, 2012). In the Floods Directive, prevention is defined as follows: preventing damage caused by floods by avoiding the construction of houses and industries in present and future flood-prone areas, by adapting future developments to the risk of flooding, and by promoting appropriate land-use, agricultural and forestry practices (Commission of the European Communities, 2004, Paragraph 2.2; see also Consideration no. 5 of the Floods Directive). By contrast, in Dutch water policies, the term flood prevention up till now solely refers to probability reduction by taking either technical or spatial measures regarding flood defence structures. Hence, the Dutch interpretation of the term prevention corresponds more with the definition of the term protection in the Floods Directive (Commission of the European Communities, 2004), taking measures, both structural (defence structures) and non-structural, to reduce the likelihood of floods and/or the impact of floods in a specific location. In the recently published Delta Programme

2014, the words 'prevention' and 'protection' are both used in relation to the first safety layer regarding the flood defence structures; spatial planning is clearly no part of the Dutch interpretation of 'prevention' (Ministry of Infrastructure and the Environment, Ministry of Economic Affairs, 2013, pp. 41, 83). To conclude, whereas in Europe climate-proof planning is part of prevention, in the Netherlands, flood prevention is conceptualised as probability reduction, which is even considered the most important safety layer. Up to now, measures to reduce flood vulnerability and flood exposure have hardly been implemented (see also van den Brink *et al.*, 2011, 2013).

Existing instruments – new instruments

Another important issue that has to be dealt with in the preparation of the Flood Risk Management Plans is related to the instruments that are needed to further improve the link between spatial planning and water management. The key is to find a balance between the traditional status quo (existing instruments, see Table 1) and the development of new instruments. However, as the national government is of the opinion that the Dutch way to protect a delta is the best way (Ministry of Infrastructure and the Environment and the Ministry of Economic Affairs, Agriculture and Innovation, 2012, p. 83), it is unlikely that new instruments and policies will be developed. There is also not a real sense of urgency: the Floods Directive does not contain quantified objectives and measures, and the Member States have much policy freedom in the development and implementation of the directive. Although the national government has not yet published an official opinion about this, in publications of decentralised governments, it already has been stated that no new policy will be formulated and that the existing responsibilities of administrative bodies will remain unaffected (House of Information on Water, 2012, p. 19). The choice to use existing instruments is also consistent with the strive for deregulation in times of economic crisis. However, the question remains if the existing instruments, such as the Water Assessment, are sufficient to realise enough prevention and preparedness (Cassel *et al.*, 2013, this special issue).

Procedural rules – substantive rules

As we described previously, Dutch spatial planning law and policies mostly contain procedural rules to facilitate the planning process. One important question therefore is: are procedural rules sufficient, or do we also need more substantive rules for a successful implementation of the guidelines of the Floods Directive? Very important substantive rules are the safety standards for the primary flood defences laid down in the Water Act. Other important substantive rules in the context of Flood Risk Management Plans are the rules

that have been formulated in the General Spatial Planning Rules. More substantive rules are conceivable, for example rules concerning building levels (Jong and Hobma, 2012); given the specific spatial and hydrological circumstances, a sensible building and living level can be prescribed in land-use plans. The land-use plan cannot refer to a specific water level (as legal requirement) because it is not the municipality but the Water Authority that determines the water level. However, it is possible that in the regulations of the land-use plan a specific building or street level is required, related to an objective and clear criterion (for example, at least x metres above or under the so called NAP, that is, the Normal Amsterdam Level). In this context, it is possible to prohibit living on the ground floor if there is a possibility of flooding.

The discussion about procedural rules versus substantive rules also relates to a more general difference between spatial planners and water managers. Spatial planners in general prefer procedural rules because these rules give maximum of policy freedom and flexibility (Hartmann and Juepner, 2013, this special issue). Water managers in general prefer more substantive rules – for example, prohibitions to build – because these rules offer more clarity and prevent building in flood-prone areas (Hartmann and Driessen, 2013, this special issue).

Central governance – interactive governance

The implementation of the Floods Directive in Dutch legislation and policy requires a coordinated effort of various governmental authorities on different levels (national, regional, local) and in relation to various policy areas (e.g. spatial planning, water management). Whereas in international talks about cross-border flood risk management, most of the times, one minister has the lead, the implementation of the Floods Directive in domestic policy involves multi-actor- and multilevel-governance (Hartmann and Driessen, 2013, this special issue). The internal challenge in the Netherlands is huge: how can more than 400 municipalities, 12 provinces, 26 regional Water Authorities and several national ministries (especially the Ministry of Infrastructure and Environment and the Ministry of Economic Affairs) work together to reduce flood risks by (inter alia) sustainable spatial planning? The first generation of Flood Risk Management Plans are being prepared under the coordination of the Ministry of Infrastructure and the Environment, in close cooperation with several other government authorities (for example the national associations of municipalities, provinces and Water Authorities). Because of the uniqueness of each region, it is difficult to develop a national and unequivocal sustainable spatial planning approach. The development and implementation of measures for reducing flood vulnerability and flood exposure therefore mainly has

to take place at the local and regional level by spatial planning authorities. On the other hand, flood prevention is a national public task, for which the Ministry of Infrastructure and the Environment carries the main responsibility. In line with the tradition in Dutch water management, its steering philosophy is based on norm setting. Water managers consider flooding risks as measurable norms based on technical-engineering knowledge about cause-effect relations, that is, the probability of the occurrence of peak discharges and the strength and height of the dikes.

Given the number of governments and organisations active in the field of flood risk management in the Netherlands, interactive governance probably will result in a slow implementation of the Floods Directive, whereas more central governance will probably evoke resistance. This is also shown by recent research, which confirmed that hindering factors that have played a role in the implementation process are (inter alia): the complex division of responsibilities, low willingness of regional organisations, low cooperation of municipalities and restricted coordination of the national government (van Eerd, 2013, p. 6).

Short-term perspective – long-term perspective

A well-known dilemma of politicians is that they tend to focus on the short-term (to ensure their next election), whereas flood risk problems are usually related to long-term processes. The incongruence between long-term processes of climate change and short-term horizons of politicians and policies is an important barrier for climate-proof planning (Biesbroek *et al.*, 2011). When there is no memory of recent floods, it is much more difficult to have enough sense of urgency for major projects to reduce flood risks. Without a sense of urgency, governments tend to put plans on paper but are not inclined to give much priority to the implementation of these plans. This will easily lead to delay. Unfortunately, there are some indications that the integration of flood risk management and spatial planning in the Netherlands will delay indeed. First, the multilayered safety concept was already introduced in 2009 but until now has hardly been implemented in spatial planning practice. For instance, it has not been applied in the major Room for the River project because this project would already be in an advanced state of implementation. This is remarkable, as the multilevel safety concept will be one of the building blocks of a formal decision in 2015 about the future safety norms for the primary flood defences (Dutch House of Representatives, 2012, p. 2). We can therefore conclude that the multi-level safety-concept – that has been introduced in 2009 with much enthusiasm – has to wait many years before serious implementation. Second, already in 2008, in the draft National Water Plan (December 2008), an Order in Council on Vital Functions and Vulnerable Objects (e.g. utilities,

chemical companies and hospitals) was announced. The regulations in this Order in Council would be formulated on the basis of flood risk zoning and would be directly binding to spatial plans of municipalities and provinces (Ministry of Transport, Public Works and Water Management, 2008a, pp. 5, 40, 78). Unfortunately, also these policy intentions have not been realised yet.

A preview on the future: the establishment of the national Delta Commissioner

In the context of the implementation of the second Delta Plan, on the 1st of January 2012, the Delta Act entered into force, inducing a major change regarding the formal Dutch institutional framework for flood risk management and spatial planning. The Delta Act forms the legal basis of the Delta Programme, the Delta Fund and the Delta Commissioner – instruments to support the implementation of the second Delta Plan (the first Delta Plan was developed after the flood disaster of 1953 and led to the construction of the large-scale Delta Works). The second Delta Plan aims at guaranteeing that also in the 21st century, the Netherlands remains a safe and attractive country to live and invest in. For the implementation of the second Delta Plan, a Delta Programme has been introduced (Ministry of Infrastructure and the Environment and the Ministry of Economic Affairs, Agriculture and Innovation, 2011). The task of the Delta Commissioner is to direct and realise the Delta Programme. The Delta Commissioner acts under the direct responsibility of the coordinating cabinet minister, the Minister of Infrastructure and the Environment, and provides advice to all cabinet members that are involved and may participate in the advisory council of the Council of Ministers. Every year (since 2011), the Dutch Delta Commissioner presents an updated version of the Delta Programme to Parliament.

In the context of the Delta Programme, the Delta Commissioner is preparing a Delta Decision on Spatial Adaptation, which will be published in 2014. Based on the multilayered safety concept, this Delta Decision will include proposals for making the spatial design of the Netherlands more ‘water robust’. Although the Delta Commissioner considers ‘flood protection’ as the cornerstone of the Dutch approach towards flood risk management, at the moment, a research team of the Delta Commissioner is studying ‘smart combinations’ of flood protection, sustainable spatial development and disaster management – thus combinations of the three different safety layers (Ministry of Infrastructure and the Environment and the Ministry of Economic Affairs, Agriculture and Innovation, 2012, pp. 37–38). The resulting policy and guidelines for spatial adaptation will also give special attention to vital and vulnerable functions (e.g. utilities, chemical companies and hospitals). According to the

Delta Commissioner, tools are needed to determine whether locations are suitable for new housing to be built.

The question arises as to how the Delta Decision on Spatial Adaptation will relate to the Flood Risk Management Plans. Both documents will be published in 2014/2015 and are in relative isolation being prepared at the moment. It therefore could be that the Delta Decision on Spatial Adaptation (2014) will only lead to a solid spatial chapter in the second generation of Flood Risk Management Plans in the Netherlands (expected in 2021).

Conclusion

The main objective of this paper was to examine the way in which the Netherlands is integrating water management and spatial planning in the preparation of its first Flood Risk Management Plans. For this purpose, we explored the formal institutional framework in the Netherlands for flood risk management, and we reflected on five important issues that have to be dealt with in the preparation of these plans. Although the institutional framework contains several rules and instruments to improve the link between spatial planning and water management, in practice, there seem to be some hindrances to realise sustainable spatial planning on a larger scale.

Based on our analysis, we can tentatively give the following summary of the current domestic policy debate regarding the implementation of the Floods Directive in the Netherlands: a tendency to stick to a technical-engineering approach, a point of view that existing policies and responsibilities are sufficient, a preference for procedural rules, complex multi-actor and multilevel governance, and a tendency not to focus on the long-term perspective. Instead of striving for innovation – i.e. further development of sustainable flood risk management – Dutch governments involved in flood risk management are inclined to stick to tradition. We saw that the technocratic preference determines the elaboration of the so-called multilayered safety approach; there is a persistent focus on probability reduction (protection). An important reason is the path-dependent development of water safety institutions. This implicates that preceding steps in a particular direction, especially those with high expenditures, direct further movement in the same direction. Rational considerations of profit and loss often lead to the decision to continue the same practice. In this way, decisions are limited by decisions made in the past (van den Brink *et al.*, 2011). The implementation of the Floods Directive in the Netherlands offers many opportunities to improve Dutch flood risk management. The Dutch Delta Commissioner can be regarded as a substantial innovation, which can help to deal with the hindrances in the direction of more sustainable flood risk management.

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