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## Climate proofing social housing in the Netherlands: toward mainstreaming?

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Climate vulnerabilities of the built environment are increasingly recognised. Mainstreaming adaptation concerns in urban development and redevelopment projects is commonly propagated as an effective policy strategy. Adaptation mainstreaming research often studies public actors. This article investigates the adaptation practices by housing associations, in the institutional and discursive developments of the social housing domain in which they are embedded. The analytical concepts of mainstreaming and adaptation barriers are combined with the discursive-institutional policy arrangement approach to answer the question: what factors influence the mainstreaming of climate change adaptation measures in development and renovation projects in the social housing domain in the Netherlands? We conclude that anticipatory and deliberate adaptation action to date was very scarce and attention limited in the social housing domain. On the project implementation level, factors that hampered adaptation mainstreaming in housing development were limited awareness, low priority in relation to other issues, financial constraints, regulatory constraints, lacking cooperation, and no materialisation of adaptation concerns in procedures and performance agreements. On the level of the policy arrangement, adaptation is weakly institutionalized in the Dutch social housing domain. The institutionalisation of a competing ‘core activities’ discourse hampered the legality of climate adaptation measures and eroded financial resources, dispersing the power to mobilise them over the arrangement. Uncertainty over the meaning of the new regulations, in combination with the absence of a comprehensive regulatory framework for adaptation and the self-identified culture of risk aversion by housing associations, delimits adaptation action becoming a standard operating procedure of social housing associations.

**Keywords:** climate adaptation; housing associations; built environment; mainstreaming; Policy Arrangement Approach; barriers

### 1. Introduction

The vulnerabilities of the built environment to climate change impacts (Hunt and Watkiss 2011; Wilby 2007) are increasingly recognized by policy-makers at all levels (EEA 2016). Cities take the central stage in the climate change adaptation (henceforth:

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adaptation) discourse because of continued urbanization, the influence of the urban design on local climate impacts, and the concentration of vulnerable people and infrastructure in cities (Carter *et al.* 2015). While moving from infancy to adolescence, urban adaptation policy is still predominantly focused on awareness raising and impact studies (EEA 2016; Patterson 2018), with low spending on measures (Georgeson *et al.* 2016) and only about a quarter of the European cities having an adaptation plan (Reckien *et al.* 2014). Responses to adapt the built environment to predicted future climate impacts were observed to be extensions of existing policies, with only few larger or costly actions (Burch 2010; Kates, Travis, and Wilbanks 2012).

Adaptation research increasingly addresses climate governance at the city level, recognising its multi-level, multi-sector and multi-actor characteristics (Bulkeley 2013). As many concrete responses take shape and are implemented at the local level, institutional environments influenced by other governmental levels are key for local adaptive capacity (Corfee-Morlot *et al.* 2011). The issue of multi-sector governance is central to the debates on mainstreaming, focusing on how adaptation policies are normalised in ongoing sectoral planning practices (Klein *et al.* 2007; Wamsler, Luederitz, and Brink 2014), and resonating broader ideas on environmental policy integration (Jordan and Lenschow 2010). While considered an important enabling condition for effective adaptation policy (Eisenack *et al.* 2014), and adopted as an important leitmotiv in governance, critical evaluation of mainstreaming practices is limited (Uittenbroek *et al.* 2014, 29). In addition, while stressing the multi-actor dimension of adaptation, current mainstreaming research predominantly targets governmental organizations (Boezeman 2016; Den Exter, Lenhart, and Kern 2015; Rauken, Mydske, and Winsvold 2015), with less studies addressing private actors (but see Klein, Juhola, and Landauer 2017; Shearer *et al.* 2016; Storbjörk, Hjerpe, and Isaksson 2018). However, as private actors largely develop and/or own urban real estate, understanding how they integrate adaptation concerns in their long-term investment and development practices is key to understanding progress in urban adaptation and experienced adaptation barriers (Hertin *et al.* 2003).

Housing associations are important actors in the built environment in many European cities, owning, maintaining and operating 19% of the housing stock in Denmark and 32% in the Netherlands (Scanlon, Fernández Arrigoitia, and Whitehead 2015). Despite some of the inherent characteristics of housing associations, e.g., their long-term orientation, combination of development and ownership, and care for the public interest, the scarce literature shows adaptation progress to be low (Hoogvliet *et al.* 2015; Roders and Straub 2015). This study aims to add to the understanding of how adaptation is mainstreamed in private actors' decision-making, via a qualitative case study of the practices of providing social housing by housing associations in the Netherlands. Our choice for a case study approach is twofold. First, as literature on private actors in adaptation is scarce, the study of this paradigmatic case (Flyvbjerg 2006) allows for a rich understanding of the housing association's practices in their context. Second, while formal generalization of cases is limited, the approach allows for analytical generalization (Yin 2013), comparing findings to various literature. Housing associations in the Netherlands are a particularly interesting case as adaptation mainstreaming itself is an important steering principle of the Dutch state, e.g., via its Spatial Adaptation Incentive Programme which supports public and private actors in the built environment. Therefore the case adds to the understanding of policy strategies directed at mainstreaming (Wamsler, Luederitz, and Brink 2014).

The concept of barriers (Biesbroek *et al.* 2013; Eisenack *et al.* 2014; Moser and Ekstrom 2010) is a dominant perspective to describe the obstacles that hinder adaptation planning and implementation. In the built environment, this resulted in lists of reported barriers. However, the barrier literature is criticized for treating them in a simplistic and isolated manner, overlooking the complexities of adaptation decision making, misunderstanding the processes leading to adaptation outcomes, and therefore providing inadequate suggestions for intervention (Biesbroek *et al.* 2015). Understanding the institutional context is critical to understanding how adaptation planning decisions are made (Lorenz *et al.* 2017), as well as path dependencies of that institutional context (Burch 2010). Therefore, attention for interrelatedness, interdependencies and dynamics are considered important for studies of barriers to adaptation (Eisenack *et al.* 2014). In order to understand the adaptation practices of housing associations in relation to the institutional and discursive developments of the policy domain in which they are embedded, we use the policy arrangement approach (Arts, Leroy, and van Tatenhove 2006). This approach is particularly directed at the gradual institutionalization of new stories in a policy domain (Kaufmann, Priest, and Leroy 2016; Wiering and Arts 2006), stresses the interconnectedness of its dimensions, with particular attention for the multi-actor, multi-sector and multi-level aspects of the institutional context in which decisions take place.

The main question of this paper is: What factors influence the mainstreaming of adaptation measures in development and renovation projects in the social housing domain in the Netherlands? This article proceeds as follows. Section 2 introduces a conceptual framework to analyse adaptation mainstreaming in the social housing domain, by building on the policy arrangement approach and the literature on barriers to adaptation. The methodology to understand the case is discussed in section 3. Section 4 provides a brief overview of Dutch national adaptation policy and the characteristics of the Dutch social housing policy arrangement. The section thereafter presents the observed adaptation mainstreaming progress in social housing and barriers therein. Section 6 concludes and discusses the observations in relation to the academic literature on barriers. Potential policy strategies are highlighted.

## 2. Conceptual framework

### 2.1. The Policy Arrangement Approach

The policy arrangement approach considers both the substantial and organisational characteristics of policy domains, and their mutual interaction. Policy arrangements are defined as the temporary stabilization of the content and organization of a policy domain (Arts, Leroy, and van Tatenhove 2006). To analyse policy domains, such as social housing, as well as the changes therein, the policy arrangement approach proposes four inter-related dimensions (Liefverink 2006): “actors”, “resources” and “rules” comprise the organization of the policy domain and the dimension “discourses” its substance.

The actor dimension refers to the involved individual actors and their strategic coalitions. Coalition patterns develop if actors can more effectively achieve their interests when working together. The resources dimension refers to means such as knowledge, physical goods, human capital, financial resources and trust at the disposal of involved actors. Actors mobilise resources to establish their role and reach their goals within policy arrangements and in adjacent domains. The rules dimension includes both formal and informal rules. Rules may be formalized in laws and

regulatory documents. Informal rules are codes of conduct, norms and conventions, modification of formal rules in practice and hence cultural heritage (North 2005). The discourse dimension refers to the policy content of policy arrangements. Within the context of policy arrangements, discourses can be defined as “a set of ideas, concepts, buzzwords and stories which combined give meaning to a certain phenomenon in the real world” (Hajer 1995 quoted in Wiering and Arts 2006, 349).

Configurations in terms of actors-, resources-, rules- and discourses are only temporarily stable. Over time, actor behaviour within a particular policy domain can gradually solidify in more or less fixed patterns, but is also dynamic (Arts, Leroy, and van Tatenhove 2006). A change in one of the dimensions of a policy arrangement can invoke change of the other dimensions within the particular policy arrangement as dimensions are inherently interdependent (Liefferink 2006). Recognising path dependencies in institutional evolution (North 2005), a distinction between “shallow” and “deep” changes is proposed to study developments in the arrangement (Wiering and Arts 2006). The former referring to discursive change only, the later to changes in the organisational dimensions of the arrangement.

## **2.2. Barriers to climate change adaptation**

According to Eisenack *et al.* (2014, 868) a barrier “is an impediment to specified adaptations for specified actors in their given context that arise from a condition or set of conditions. A barrier can be valued differently by different actors, and can, in principle, be reduced or overcome.” Many lists of barriers circulate, as well as classifications. While the IPCC categorises barriers according to type, i.e., institutional, social, informational, financial and cognitive, Moser and Ekstrom (2010) categorize barriers by the phases of a policy process. They consider the “understanding phase”, the “planning phase” and the “managing phase”. Studies found specific barriers relating to the urban context (Carter *et al.* 2015; Runhaar *et al.* 2012), to adaptation mainstreaming by city governments (Burch 2010; Den Exter, Lenhart, and Kern 2015; Keskitalo *et al.* 2016; Rauken, Mydske, and Winsvold 2015) and relating to private actors in the built environment (Klein, Juhola, and Landauer 2017; Roders and Straub, 2015; Shearer *et al.* 2016; Storbjörk, Hjerpe, and Isaksson 2018). However, Eisenack *et al.* (2014) conclude that the burgeoning literature has found conflicting evidence and is inconclusive about how barriers arise.

## **2.3. Conceptualizing barriers to mainstreaming of climate change adaptation**

Mainstreaming has different meanings in the adaptation literature. It can refer to a governance strategy, as opposed to creating a dedicated policy domain for adaptation (Uittenbroek *et al.* 2014). Mainstreaming can also simply mean coupling (‘piggybacking’) of climate concerns in ongoing development projects or policy measures, a version observed in policy documents. In more theoretical terms, mainstreaming is sometimes conceptualised as normalisation, i.e., “deliberate perturbation in the natural order of things” (Wamsler, Luederitz, and Brink 2014, 190). In literature drawing on environmental policy integration (Jordan and Lenschow, 2010), mainstreaming means comprehensive integration of climate concerns in sectoral planning in an aggregated and consistent manner (Rauken, Mydske, and Winsvold 2015). We draw on both ideas and conceptualise mainstreaming as the stabilisation of an adaptation discourse in the arrangement and its solidification in all dimensions of the policy arrangement, enabling adaptation to become a routinized practice.

Table 1. Common reported barriers in urban property development related to policy arrangement approach dimensions.

Dimension	Common reported adaptation barriers in the built environment
Actors and coalitions	Horizontal and vertical cooperation Tenant demand Actor awareness Dependencies on other actors Leadership
Formal and informal rules	Regulatory complexity Comprehensive adaptation policy framework Absence of climate concerns in laws, procedures and standards Norms for appropriate roles Organisational routines Risk culture
Resources	Financial risk of long term developments Funds Administrative capacity Technical capacity Tools and information carriers
Discourses	Framing of adaptation Low awareness (Relative) low urgency/competing discourses

Following this understanding, barriers to adaptation in social housing result from the incompatibility of the adaptation discourse with the existing dimensions of policy arrangements, and/or in the interaction of those dimensions. That incompatibility prevents the adaptation discourse from institutionalising into the four dimensions of the policy arrangement and becoming dominant. Also, barriers may result from other external competing discourses which, like the adaptation discourse, also fight for dominance in the policy arrangement leading to “overload” (Wamsler, Luederitz, and Brink 2014). Such barriers could therefore also be characterised as priority and urgency related barriers.

Table 1 synthesises common reported barriers to adaptation in urban property development by studies of either public (e.g., Burch 2010; Den Exter, Lenhart, and Kern 2015; Rauken, Mydske, and Winsvold 2015; Runhaar *et al.* 2012) or private actors (e.g., Klein, Juhola, and Landauer 2017; Roders, Straub, and Visscher 2013; Shearer *et al.* 2016). For analytical purposes, these barriers are categorised according to the dimensions of the policy arrangement approach. While some of the barriers fit one dimension, others are to be located at the intersection of more than one dimension. For example, the roles actors have in the arrangement are specified in discourses and are institutionalised in formal responsibilities or informal conventions of appropriate behaviour.

### 3. Method

To understand adaptation mainstreaming in social housing in the Netherlands we opt for an embedded case study approach (Flyvbjerg 2006; Yin 2013). Three different qualitative methods allow for methodical triangulation: a content analysis of housing association documents, a desk study using primary and secondary literature on the social housing policy domain and in-depth semi structured interviews with housing association policy-makers and other experts in the domain. These parts consecutively inform each other.

As a first step, building on Roders, Straub, and Visscher (2012), we conducted a content analysis of housing associations' strategic policy documents. The content analysis enabled an impression of the current state of adaptation practices by housing associations in the Netherlands and served as a starting point for the interviews. Given our interest in the dynamics within the social housing policy subsystem as a whole, we randomly selected 30 out of the 377 Dutch housing associations. We differ slightly from Roders, Straub, and Visscher (2012), who purposively selected the 25 largest Dutch housing associations to quantify their awareness of adaptation. 11 of the 12 Dutch provinces were represented in the sample, with the maximum number of 4 per province. The selected housing associations together owned approximately 200 thousand dwellings, around 8% of the Dutch total. The smallest association owned 22 dwellings and the largest 55,364. For the selected sample, publicly available strategic policy documents (digitally searchable) were collected. Documents included annual reports, annual policy plans, multi-annual policy plans and visions for the future, and multi-annual business plans. Six associations were excluded, because documents were publicly unavailable at the time of the research. The 24 others provided 37 documents (all had annual reports and most multi-annual business plans). The availability of other policy documents differed greatly. Using ATLAS.ti "word cruncher" function we made a list of all words used in the acquired documents and their frequency. This yielded 28,168 unique words. Next, the output was studied for indications of "knowledge of climate change", "climate change effects" relating to water or heat, "climate change adaptation" and/or actual "climate change adaptation measures". The output was queried using key words belonging to either of these categories, based on Dutch adaptation websites (e.g., <http://nl.urbangreenblue-grids.com/design-tool/>) and compared with the ones used in the study by Roders, Straub, and Visscher (2012). The passages with the identified adaptation references were closely read in the documents to understand the context.

Table 2. List of interviewees.

	Position	Organisation	Size of portfolio
	<i>Housing associations</i>		
1	Project manager	Havensteder, Rotterdam,	Major
2	Board advisor	Stichting Trivire, Dordrecht	Large
3	Project manager	Stichting KleurrijkWonen, Geldermalsen	Large
4	Project supervisor	Stichting KleurrijkWonen, Geldermalsen	Large
5	Project manager	Woningstichting Eigen Haard, Amsterdam	Major
6	Supervisor/auditor	Woningstichting SWZ, Zwolle	Medium
7	Manager Real Estate department	Woningstichting Openbaar Belang, Zwolle	Small
	<i>Other experts</i>		
8	Coordinator / Advisor	Authority Housing Associations	n/a
9	Advisor Housing Act 2015	Netherlands Enterprise Agency (RVO)	n/a
10	Policy advisor	Ministry of Infrastructure and the Environment	n/a
11	Accountholder social housing associations	Amsterdam Rainproof	n/a
12	Social housing lawyer	STIJL Advocaten	n/a



Second, a desk study was conducted to gain an initial insight into the substantive and organisational characteristics of the social housing policy domain in the Netherlands. This enabled an understanding of the shifts in discourses, rules, actors and resources in the policy domain over time. Documents included academic literature, adaptation policy documents and legislation, websites and media articles.

Third, to gain an in-depth understanding of factors that influence adaptation decisions, we conducted 11 interviews with 12 interviewees during spring 2016 (see [Table 2](#)). Roders, Straub, and Visscher (2013) also did interviews with housing associations, yet focusses on their perception of potential measures, instead of barriers in the policy domain. Therefore, the interview guide was informed by the four dimensions of the Policy Arrangement Approach (questions on dimensions), the identified barrier categories, the content analysis and desk study, and tailored to the specific interviewee. Six housing associations (seven practitioners) were purposively selected based on four criteria: geographical distribution, whether they had prior experience with the effects of water nuisance for their real estate portfolio and/or adaptation measures, size of the real estate portfolio, and the position of the housing association contact person. The selection criteria were assessed based on the list of all Dutch housing associations, news articles on real estate damage due to extreme weather events, and connections of the Spatial Adaptation Incentive Programme at which this research was carried out. This selection meant all interviewees, all senior practitioners, were at least aware of adaptation. This made it possible to study mainstreaming factors when at least barriers related to unknowingness were overcome. Also, selection aimed to vary on geographical spreading and diversity in the size of the associations. To study and clarify particular aspects in more detail, five additional interviews were organized with specific relevant experts (a lawyer, social housing authority representative, government practitioners). The interviews lasted over an hour, were audio recorded, transcribed, and coded in ATLAS.ti based on the conceptual framework to analyse the data for barriers to climate change adaptation resulting from the (changing) context of the social housing policy subsystem.

Furthermore, a three month visit in 2016 to the Spatial Adaptation Incentive Programme of the Delta Programme at the Dutch Ministry of Infrastructure and the Environment allowed for observations. Observations were made during conferences where water boards, municipalities, consultancies, real estate organisations, and housing associations discussed challenges. Also, observations were made of the actions of the ministry to incentivize actors in the field to mainstream adaptation in policy and projects (described in paragraph 4.4).

In a last step, draft results and conclusions were member checked (Yin 2013) with the interview participants and presented to policy makers at the Spatial Adaptation Incentive Programme. Some comments were received on details, while the general conclusions were recognized.

#### **4. The Dutch social housing policy arrangement**

This section first presents the key organisational and substantial characteristics of the social housing policy arrangement in the Netherlands. For the sake of brevity, the actors and resources dimensions are collapsed. Afterwards, Dutch adaptation policy relevant to the built environment is briefly sketched.

#### 4.1. Actors and their resources

At the national level, the key actor is the *Ministry of the Interior*. The ministry implements amendments to national social housing legislation and monitors the implementation of obliged annual municipal performance agreements between municipalities, housing associations and residents' associations. The ministry establishes housing market regions on municipal request and functions as an arbiter. The *Authority Housing Associations* reports to the ministry, and is involved with the monitoring of financial continuity, integrity, legality and governance of housing associations. The Authority is also involved with the approval or exemption of particular activities by housing associations, as set out in the Housing Act, and monitors compliance. The *Social Housing Guarantee Fund* enables housing associations to obtain loans at favourable terms, by securing low interest rates and providing financial guarantees to the housing association financiers. Also, the Fund restructures financially troubled housing associations.

Other important social housing actors at the national level are the National social housing tenants' association (*Woonbond*), the National social housing providers' association (*Aedes*), and the municipalities' association (*VNG*). These advocacy organizations represent the interests of their members in national decision making.

At the regional and local level, the key actors involved in social housing include, but are not limited to, municipalities, residents' associations and private social housing providers. A principal role of *municipalities* is to develop a strategic municipal social housing policy, setting qualitative and quantitative goals for housing associations. While municipalities are not obliged to make strategic housing policy, developing and agreeing annually on performance agreements with housing associations and residents' associations is mandatory.

In theory, social housing in the Netherlands can be provided by anyone, yet in practice the providers are non-profit *housing associations* and a limited number of commercial actors. Their roles are regulated by the housing act (see paragraph 4.2). Housing associations do not receive subsidies for their projects, but receive state aid via guaranteed capital market loans and rent-price regulation (Scanlon, Fernández Arrigoitia, and Whitehead 2015). Every housing association has a *residents' association*, which has legal rights to nominate commissioners to the board of supervision of housing associations, and receives annual corporate reports. Residents' associations are a formal consultant partner of municipalities.

#### 4.2. Rules of the game

The Dutch constitution (art. 22 lid 2) explicitly stipulates that fostering the provision of sufficient housing is a governmental concern. Housing policy has been in place in the Netherlands since 1901. The Housing Act, the Social Rented Sector Management Order, and the Regulation Allowed Institutions Social Housing together comprise national regulation. Since 2015, the housing act has been revised. Only houses rented below the liberalisation threshold, €710.68/month max (2018), are regulated as social housing under the act. The act determines that housing associations should focus on their core responsibility, described as: "The housing of people who, because of their income or because of other circumstances, experience difficulties with finding appropriate accommodation." (Housing Act art. 46 lid 1). Under the act, housing associations are: to construct, to maintain and operate homes, to develop social real

estate in the vicinity of social housing such as community centres, to contribute to the liveability in the immediate vicinity of its properties, and to develop commercial property (Housing Act art. 45 lid 2). Commercial activities are separately regulated. A distinction is made between activities that are 'services of general economic interest' (Housing Act art. 47 lid 1) and those activities that are not. Activities that are not services of general economic interest should be administratively separated or legally detached from the core activities of the housing association (Housing Act art. 49, 50a), to prevent the commercial activities from receiving state aid. Engagement in such commercial activities is only possible after authorization by the Authority Housing Associations. The new act is thus more restrictive about the activities in which housing associations can be engaged. Accountability and supervision measures are intensified, resident participation strengthened and measures included to control housing association size. The Housing Act furthermore regulates social housing target groups. The provision 'appropriate allocation' furthermore maximises rents for low income groups at a level even below the liberalisation threshold (Housing Act art. 46 lid 2).

Besides specific social housing legislation, housing associations are also bound to rules that apply to housing construction in general, and to environmental law and spatial planning law. In the Netherlands, such legislation includes among others: the building code, zoning, construction permits, municipal cost recovery, environmental impact assessments and water board impact assessments and permits. Specific national adaptation legislation relevant to social housing does not exist. However, at the local level, municipalities can use the social housing performance agreements and spatial planning legal instruments to require adaptation type measures in area (re)developments.

### 4.3. Discourses

The Dutch social housing arrangement can be characterized by competing and partly conflicting policy discourses on the role of housing associations (Boelhouwer 2007). We distinguish three in our analysis. The first is the *Level playing field* discourse. Since the late 1950's, there have been discussions about the desirable proportion and role of Dutch housing associations in relation to market parties. An increasing critique developed that housing associations distort the level playing field on the Dutch housing market (Elsinga and Lind 2013). Drawing on EU state aid regulation, the European Commission in 2005 concluded that the Dutch government provided prohibited state aid to housing associations in a number of ways. As housing associations are also involved in commercial activities, the state distorted the housing market. In response, Dutch political discussions arose about limiting the allowed activities of housing associations in relation to their target groups (Elsinga and Lind 2013).

The second and third discourse relate to the scope of the housing associations' tasks. In the 1990's, under neoliberal influence, housing associations in the Netherlands became financially independent from the government. Besides financial privatization, decentralisation and deregulation aimed to reduce government spending on public housing and promoting homeownership (Buitelaar and De Kam 2012). In 1995, these changes materialised and future object subsidies and current debts were balanced-out (Buitelaar and De Kam 2012). From that moment on, the construction, renovation and redevelopment of social housing had to be financed using the associations' own resources. However, already in 1997, politicians wanted to regain more control over the financially independent housing associations. A *Liveability*

*discourse* materialized, which saw an important task for the housing associations for social policies and investment in neighbourhoods (Boelhouwer 2007). Continuing well into the 2000s, this discourse on the one hand required associations to invest in more than just houses, and also granted associations a broader role as a social entrepreneur to develop profitable commercial programmes to finance economically viable social investments.

The global financial crisis of 2009 showed that some housing associations were involved in financially high-risk activities and got into a financially troubled position. Discussions in Dutch politics arose about what activities housing associations should be engaged in and what not, and to what extent housing associations should be restricted to core activities: providing houses for low income groups. This *Core activities* discourse, in relation to the level playing field discourse, is largely materialised in the 2015 housing act.

#### **4.4. Climate change adaptation policy in the Netherlands**

Mainstreaming is an important principle propagated in Dutch climate change adaptation policy (Dewulf, Boezeman, and Vink, 2017) as can be observed in Dutch national adaptation policy documents grouped together under the Delta Programme (e.g., Ministerie van *et al.* 2015; Synthesedocument Deltaprogramma Nieuwbouw en herstructurering 2014; Brugge *et al.* 2015; Manifest Klimaatbestendige Stad 2013). “The programme chooses explicitly for mainstreaming in the programme’s implementation, as spatial adaptation or climate change adaptation is never the sole objective of spatial development.” (Deltaprogramma 2016, 22). The Delta Decision on Spatial Adaptation initiated a Spatial Adaptation Incentive Programme (SRA). This programme supports governmental and non-governmental actors from various sectors and levels to “make water robustness and climate proofing ‘the most normal thing in the world’ by 2020” (Spatial Adaptation Knowledge Portal 2016). To realise those goals, the programme includes communicative and organisational instruments, e.g., providing a portal of ‘best practices’, a handbook about mainstreaming, a protocol for ‘climate stress tests’ and regional meetings. Hence, it does not incentivize in an economic sense, nor does it include regulatory instruments. For housing, a coherent policy framework for adaptation measures is absent (Rodgers and Straub 2015). In the urban domain, adaptation related issues such as flooding are addressed in water regulation, but attention for the urban climate can be characterized as an institutional void within policy and planning (Boezeman and Kooij 2015; Mees, Driessen, and Runhaar 2015).

## **5. Barriers to adaptation mainstreaming in Dutch social housing**

### **5.1. Current adaptation actions of housing associations**

Interviews with housing association practitioners indicated that anticipatory and deliberate adaptation measures are scarcely implemented. In the scarce cases when measures were taken, they were considered low hanging fruit, often not directly informed by climate concerns.

Two factors influenced actual implementation of adaptation measures. The first factor is experience with weather calamities. Interviewed practitioners who had experience with water related measures explained that, until now, measures were taken only after serious damage had taken place. “It were actually emergency measures

[...]. However, now we'll take possible future developments into account when you start on a residential complex." (interview, practitioner housing association, 2016). Anticipatory climate related assessments are, however, not a standard procedure. Some practitioners mentioned that due to the increasing number of water related incidents causing damage, awareness about water related climate change impacts was raised.

The second factor is when opportunities present themselves: "We don't take measures in this area. At least not systematically. It only happens when the municipality is going to replace the sewage system or is going to construct a separated sewage system. Then they sometimes approach us and a partnership may emerge. However, it is not that we take preventive measures at this moment in time." (interview, practitioner housing association, 2016).

## 5.2. *Discourse related barriers*

One factor for lack of action discussed in the previous paragraph, is the limited circulation of the adaptation discourse within the Dutch social housing arrangement. The content analysis of housing associations revealed the absence of knowledge about, and policy strategies for, climate change impacts for social housing real estate. No presence of any such references were found in the policy documents of randomly selected Dutch housing associations. None of the documents contained the words "climate change", "climate adaptation" or any specific climate change effect or adaptation measure. The word "climate" was found on 14 occasions, but was used in other contexts such as investment climate. "Rain" was mentioned once in the context of higher than expected cost of damage due to rain. Furthermore, the word "indoor climate" was found in three documents. However, close reading of the use of this word in the documents revealed no awareness of, or relation with, climate change or adaptation. The word did relate to climate mitigation. It was used to indicate reducing the energy use and comfort improvement during winter times by enhanced isolation.

Interviews with housing association practitioners also corroborate the indication that there is a discursive void related to climate change. Practitioners described that limited attention to adaptation results from lack of awareness about the concrete implications of climate change for the association's real estate and possible feasible courses of action. "At the moment the technology allows for it and when it's fairly easy to apply, we will certainly not refuse to invest. But we are not a very innovative organization by definition." (interview, practitioner housing association, 2016). Some of the practitioners connected a lacking awareness to a lack of information and communication about the subject, such as the absence of a database about practical and usable adaptation examples, tools and work methods. "You know about the existence of only very few innovative projects. Generally you discover them by chance. [...] There should be something where knowledge and results are shared much better." (interview, practitioner housing association, 2016). However, only one of the practitioners was familiar with the Dutch governmental adaptation knowledge portal ([www.ruimtelijkeadaptatie.nl](http://www.ruimtelijkeadaptatie.nl)). The problem might not be the lack of such databases itself, but rather the unfamiliarity with the existing knowledge networks and tools. Practitioners stated that attention for the subject in their well-known sector-specific channels of communication was limited: "When you read a magazine such as Cobouw, you read about the success stories. But that [extreme weather events] can also cost you money if you don't act is not in these magazines that often." (interview, practitioner housing association, 2016).

During the interviews, it was also added that adaptation had a low short-term urgency in contrast to other pressing issues. Experienced climate impact damage is currently limited. More importantly, the housing of refugees, the climate change mitigation challenge in all of its facets, and the huge changes in the social housing policy domain, were considered more urgent current issues for their housing association. In contrast to those other competing policy issues, there are no legal obligations to address adaptation. In general terms, adaptation misfits the currently dominant ‘core activities’ discourse, a point we turn to next.

### **5.3. Rules related barriers**

The materialization of the ‘core activities’ discourse in the 2015 housing legislation was considered a main barrier. It firstly hampered the legality of adaptation measures. Even though all practitioners interviewed considered adaptation measures a core activity, they questioned whether it was considered as such under the new legislation. If not, investing in such measures is not allowed. Adaptation, as such, is not a concept in the Housing Act 2015. Investing in public space, an activity promoted under the previously dominant liveability discourse, is explicitly not a core activity. Adaptation can only be considered a core activity as long as measures solely relate to the association’s housing units. “The example I just mentioned about that urban flood management. We had really planned to experiment with that. Today you can really forget about that. We are expected to act solely in the interests of public housing and to, therefore, only invest in homes or related social property, but certainly not in infrastructure.” (interview, practitioner housing association, 2016).

Secondly, the practitioners foresaw accountability problems related to adaptation. Under the Housing Act 2015, investments in adaptation outside an owned plot is only possible if the investments relate to the property or infrastructure on the housing associations’ plot. The practitioners expressed uncertainty whether they had to prove, if this was even possible, that their adaptation actions would relate only to their “services of general economic interest” and not the larger area. “It could just be that you then receive a letter [from the Authority housing associations] which states: ‘please explain why you considered it that necessary to invest in such a storm water infiltration facility’. Then you have to motivate your actions very well.” (interview, practitioner housing association, 2016).

Other legislation and regulations, such as the building code and a forthcoming new spatial planning act, were not experienced as barriers by the practitioners interviewed. The other way around, urban planning rules to date do not explicitly address climate adaptation (Boezeman 2016; Roders and Straub 2015).

### **5.4. Resources related barriers**

The practitioners interviewed pointed out several financial resources related barriers to the mainstreaming of climate change adaptation. These financial limitations were considered mostly the result of legal provisions about financial risk, housing affordability for the target group, state aid and the separation of commercial and social activities of housing associations.

First, all social housing associations with more than ten social housing units pay a “lessor charge”, reducing their investment capacity. “Because of the developments in

The Hague our financial capacity has decreased. [...] Therefore you can't invest in a green roof and leave out more details." (interview, practitioner housing association, 2016). Second, interviewees considered "appropriate allocation" to challenge the economic viability of exploitation. Higher investments for climate proofing means that "your property becomes more expensive, [...] which you cannot assign to people with a low income. [...] You really want to minimize investments leading to rent increases." (interview, practitioner housing association, 2016).

In the past, it was common practice for housing associations to offset possible deficits in a social housing project by gains resulting from commercial real estate in the area development, sold or rented at higher rates. Potentially adaptation could have been financed in this way. Under the new housing act this is no longer possible due to the obliged separation of the association's social ('services of general economic interest') and commercial activities. "Previously, we worked with financial gaps. [...] Our revenues are regulated, so that means that we have to reduce our costs." (interview, practitioner housing association, 2016). Moreover, housing associations receive favourable low interest loans from the Social Housing Guarantee Fund, yet only for activities classified 'services of general economic interest'. If an adaptation measure is not considered as such, e.g., investments benefitting a much broader area than the social housing alone, alternative and more expensive project finance has to be arranged.

Even if adaptation would qualify as a "service of general economic interest", the interviewees still expressed much uncertainty "whether the additional investment you should make is sufficiently reflected in the rent." (interview, practitioner housing association, 2016). Adaptation measures are only taken when yielding a positive business case, when cost neutral, or when formally obliged. "When we are involved in a [re]development project in which the investment costs must be limited because the rents must be limited [...] we just comply with obligations in the building code, and make minimal [additional] modifications to our real estate property." (interview, practitioner housing association, 2016).

### **5.5. Actor related barriers**

The interviewees highlighted several actor related barriers. Lack of awareness, urgency, willingness and knowledge was named. Local coalitions around climate adaptation were not observed. Because of unfamiliarity with the new housing act and climate change, the Authority Housing Associations were said not to respond adequately to e.g., questions if and when an investment in adaptation or sustainability was to be considered a core- or permitted activity. "The problem is that [the Authority] often responds by telling us: 'we do not know either, so we just tell you what is stated in law.' [...] [Then we respond:] 'Is it allowed or not?', 'That is your decision, but you would take a considerable risk.'" (interview, practitioner housing association, 2016). This left the associations with the uncertainty of a negative ruling by the inspection.

Cooperation with municipalities was considered a mainstreaming barrier for different reasons. First, other issues dominate strategic municipal housing visions. "The current housing vision puts much emphasis on [improving] the quality of housing with the objective to attract and retain higher income and middle income households. No word on climate [...]. And when we propose: 'we make a bid on your housing

vision, but we also take into account climate issues' then the reaction is: 'is that really necessary?'" (interview, practitioner housing association, 2016). The practitioners had no experience with adaptation goals that had materialised in the obliged social housing performance agreements, e.g., climate adjusted norms for infiltration. Even with Dutch municipalities known for high climate attention, anchoring in sectoral policy is limited (Den Exter, Lenhart, and Kern 2015). Second, some practitioners mentioned the municipality taking a very aloof position and cooperation on adaptation issues being limited. "There is dialogue, but it is still a dialogue of biased statements: [...] the housing association is responsible for solving [storm water issues] on its own plots." (interview, practitioner housing association, 2016). Some respondents considered negotiations about municipal cost recovery as often difficult and conflictual. Sometimes the municipalities only adjust infrastructure on the basis of full cost recovery or "The municipality says: 'all costs are yours, we have not asked for that area development, so solve it.' So any modifications to intersections, more parking, infiltration crates, we have to pay everything. [...] Then you get into a very difficult conversation with the municipality." (interview, practitioner housing association, 2016).

## 6. Conclusion and discussion

The main question of this paper was: what factors influence the mainstreaming of adaptation measures in development and renovation projects in the social housing domain in the Netherlands? On the level of project development, attention for adaptation among actors was limited. The measures implemented that are labelled as adaptation were reactions to experienced events and damage. Anticipatory and deliberate adaptation action was very scarce. This is in line with previous research on private actors in the built environment, which suggests that many adaptation measures are to be considered more 'coping' strategies than actual adaptation (Rodgers, Straub, and Visscher 2013; Shearer *et al.* 2016; Storbjörk, Hjerpe, and Isaksson 2018). The factors that hamper efforts to normalise adaptation concerns in social housing (re)development projects are numerous. Suggested here are limited awareness, low priority in relation to other issues, financial constraints, regulatory constraints and lacking cooperation. It is especially on the intersection of the arrangements' dimensions that factors are experienced to be influential (cf. Liefferink 2006), such as financial-legal factors or the (lacking) materialisation of the adaptation discourse in procedures and performance agreements.

On the level of the policy arrangement, we observe adaptation to be weakly institutionalized in the Dutch social housing arrangement. The adaptation discourse is not gaining dominance in the domain, and did not lead to changes in the rules, actor or resources dimensions. There is, for example, no financial resource structure, formal or informal adaptation framework, or change in the actor constellation, e.g., entrance of an actor stimulating adaptation, that could enable adaptation mainstreaming. Hence, neither 'deep' nor 'shallow' changes (Wiering and Arts 2006) in the arrangement could be observed that could enable adaptation practices to become normalised (cf. Burch 2010). Rather the other way around, the materialisation of the 'core activities' discourse in the 2015 housing legislation has influenced many of the aforementioned factors at the project development level. Fuelled by the 'liveability' discourse, the housing associations had been broadening the scope of their task to include responsibility for the living environment. The sedimentation of the 'core activities' and 'level playing field' discourses hamper the legality of adaptation measures and eroded



financial resources potentially available. Power over adaptation resources is dispersed in the arrangement. The domain-specific legislation posed barriers, as it introduces a number of financial limitations for the implementation of adaptation measures by housing associations, to reduce financial risk and to keep social housing affordable by its target group: people with low incomes. Uncertainty over the exact meaning of adaptation of these institutional changes by a range of actors, in combination with a self-identified culture of risk aversion by housing associations, delimits action. The policy arrangement approach (Arts, Leroy, and van Tatenhove 2006) proved to be a useful perspective in helping to illuminate how barriers to mainstreaming adaptation emerge (Biesbroek *et al.* 2015), understanding the interrelatedness, interdependencies and dynamics of elements in the institutional context (Eisenack *et al.* 2014).

The findings also indicate that sufficient legal and financial incentives for adaptation mainstreaming lack in relation to other competing policy issues. Those issues often do come with substantial financial and/or legal incentives (e.g. energy efficiency measures – climate change mitigation) leading social housing associations to deal with these issues first, also observed by Keskitalo *et al.* (2016). In the debate on mainstreaming (Wamsler, Luederitz, and Brink 2014), soft measures are frequently promoted as desirable (Uittenbroek, Janssen-Jansen, and Runhaar 2013), also by strategic policy makers in the adaptation domain (e.g. the Dutch non-binding Spatial Adaptation Incentive Programme). Here we observed the limits of such voluntary approaches. To increase urgency and priority of adaptation Keskitalo *et al.* (2016) suggest that adaptation should be integrated in (existing) structures of mandatory regulation. As such, steering mechanisms should relate to existing systems and not ‘mismatch’ or reduce existing ones. This adds to previous research showing that adaptation initiatives water down, or come to a complete standstill, if legal and financial incentives are taken away (Lorenz *et al.* 2017; Porter, Demeritt, and Dessai 2015). Fundamentally re-working institutional structures, organizational culture and policy-making procedures is needed for adaptation considerations to become part of standard operating procedures, rather than creating additional resources per se (Beunen, Patterson, and Van Assche 2017; Burch 2010).

In that respect, a particular promising course of action for policymakers is to integrate adaptation in municipal strategic housing policy (housing vision). These are then to be translated into concrete standards by also including adaptation in the compulsory annual municipal performance agreements made between housing associations, tenants’ associations and the municipality. In municipal strategic housing policy, the problem can be identified as well as abstract directions of solutions. Rather than the current approach to mainstream adaptation via introducing new databases, websites and tools, this could enhance the circulation of the adaptation discourse and creation of shared interest in dealing with adaptation at the local level. In addition, the research has shown several examples of incompatibility of the adaptation discourse in the existing social housing domain, which are enhanced by the competing ‘core activities discourse’. It is therefore important to simultaneously address those issues in tandem with creating incentives for adaptation.

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## References

- Arts, B., P. Leroy, and J. van Tatenhove. 2006. "Political Modernisation and Policy Arrangements: A Framework for Understanding Environmental Policy Change." *Public Organization Review* 6 (2): 93–106. <https://doi.org/10.1007/s11115-006-0001-4>
- Beunen, R., J. Patterson, and K. Van Assche. 2017. "Governing for Resilience: The Role of Institutional Work." *Current Opinion in Environmental Sustainability* 28:10–16. <https://doi.org/10.1016/j.cosust.2017.04.010>
- Biesbroek, R., J. Dupuis, A. Jordan, A. Wellstead, M. Howlett, P. Cairney, J. Rayner, and D. Davidson. 2015. "Opening up the Black Box of Adaptation Decision-Making." *Nature Climate Change* 5 (6): 493–494. <http://dx.doi.org/10.1038/nclimate2615>
- Biesbroek, R., J. E. M. Klostermann, C. J. A. M. Termeer, and P. Kabat. 2013. "On the Nature of Barriers to Climate Change Adaptation." *Regional Environmental Change* 13 (5): 1119–1129. <https://doi.org/10.1007/s10113-013-0421-y>
- Boelhouwer, P. J. 2007. "The Future of Dutch Housing Associations." *Journal of Housing and the Built Environment* 22 (4): 383–391. <https://doi.org/10.1007/s10901-007-9091-8>
- Boezeman, D. 2016. "Understanding the Transformation of Climate Futures: A Conceptual Framework Illustrated with Urban Adaptation Policy." *Futures* 76: 30–41. <https://doi.org/10.1016/j.futures.2015.07.008>
- Boezeman, D., and H. J. Kooij. 2015. Heated Debates: "The Transformation of Urban Warming into an Object of governance in The Netherlands." In *Evolutionary Governance Theory: Theory and Applications*, edited by R. Beunen, K. Van Assche, and M. Duineveld, 185–203. New York: Springer. [https://doi.org/10.1007/978-3-319-12274-8\\_13](https://doi.org/10.1007/978-3-319-12274-8_13)
- Buitelaar, E., and G. De Kam. 2012. "The Emergence of Inclusionary Housing: Continuity and Change in the Provision of Land for Social Housing in The Netherlands." *Housing, Theory and Society* 29 (1): 56–74. <https://doi.org/10.1080/14036096.2011.592214>
- Bulkeley, H. 2013. *Cities and Climate Change*. London: Routledge.
- Burch, S. 2010. "Transforming Barriers into Enablers of Action on Climate Change: Insights from Three Municipal Case Studies in British Columbia, Canada." *Global Environmental Change* 20 (2): 287–297. <https://doi.org/10.1016/j.gloenvcha.2009.11.009>
- Carter, J. G., G. Cavan, A. Connelly, S. Guy, J. Handley, and A. Kazmierczak. 2015. "Climate Change and the City: Building Capacity for Urban Adaptation." *Progress in Planning* 95: 1–66. <https://doi.org/10.1016/j.progress.2013.08.001>
- Corfee-Morlot, J., I. Cochran, S. Hallegatte, and P.-J. Teasdale. 2011. "Multilevel Risk Governance and Urban Adaptation Policy." *Climatic Change* 104 (1): 169–97. <https://doi.org/10.1007/s10584-010-9980-9>
- Den Exter, R., J. Lenhart, and K. Kern. 2015. "Governing Climate Change in Dutch Cities: Anchoring Local Climate Strategies in Organisation, Policy and Practical Implementation." *Local Environment* 20 (9):1–19. <https://doi.org/10.1080/13549839.2014.892919>
- Dewulf, A., D. Boezeman, and M. J. Vink. 2017. "Climate Change Communication in the Netherlands." In *The Oxford Research Encyclopedia, Climate Science*, edited by M. Nisbeth, 1–35. Oxford: Oxford University Press. <https://doi.org/http://dx.doi.org/10.1093/acrefore/9780190228620.013.455>
- EEA 2016. *Urban Adaptation to Climate Change in Europe 2016: Transforming Cities in a Changing Climate*. Copenhagen: European Environmental Agency.
- Eisenack, K., S. C. Moser, E. Hoffmann, R. J. T. Klein, C. Oberlack, A. Pechan, M. Rotter, and C. J. A. M. Termeer. 2014. "Explaining and Overcoming Barriers to Climate Change Adaptation." *Nature Climate Change* 4 (10): 867–872. <https://doi.org/10.1038/nclimate2350>
- Elsinga, M., and H. Lind. 2013. "The Effect of EU-Legislation on Rental Systems in Sweden and The Netherlands." *Housing Studies* 28 (7): 960–970. <https://doi.org/10.1080/02673037.2013.803044>
- Flyvbjerg, B. 2006. "Five Misunderstandings About Case-Study Research." *Qualitative Inquiry* 12 (2): 219–245.

- Georgeson, L., M. Maslin, M. Poessinouw, and S. Howard. 2016. "Adaptation Responses to Climate Change Differ Between Global Megacities." *Nature Climate Change* 6 (6): 584–588. <https://doi.org/10.1038/nclimate2944>
- Hajer, M. A. 1995. *The Politics of Environmental Discourse: Ecological Modernization and the Policy of Process*. Oxford: Oxford University Press.
- Hertin, J., F. Berkhout, D. Gann, and J. Barlow. 2003. "Climate Change and the UK House Building Sector: Perceptions, Impacts and Adaptive Capacity." *Building Research and Information* 31 (3–4): 278–290. <https://doi.org/10.1080/0961321032000097683>
- Hoogvliet, M., F. V. D. Ven, A. Venmans, and G. J. Ellen. 2015. *Klimaatadaptatie in de gebouwde omgeving: inventarisatie van belemmeringen, benodigde veranderingen en kansen* [Climate Adaptation in the Urban Environment: Taking Stock of Barriers, Necessary Changes and Chances]. Delft: Deltares.
- Hunt, A., and P. Watkiss. 2011. "Climate Change Impacts and Adaptation in Cities: A Review of the Literature." *Climatic Change* 104 (1):13–49. <https://doi.org/10.1007/s10584-010-9975-6>
- Jordan, A., and A. Lenschow. 2010. "Environmental Policy Integration: A State of the Art Review." *Environmental Policy and Governance* 20 (3):147. <https://doi.org/10.1002/eet.539>
- Kates, R. W., W. R. Travis, and T. J. Wilbanks. 2012. "Transformational Adaptation When Incremental Adaptations to Climate Change are Insufficient." *Proceedings of the National Academy of Sciences* 109 (19): 7156–7161. <https://doi.org/10.1073/pnas.1115521109>
- Kaufmann, M., S. J. Priest, and P. Leroy. 2016. "The Undebated Issue of Justice: Silent Discourses in Dutch Flood Risk Management." *Regional Environmental Change* 18 (2): 325–337. <https://link.springer.com/article/10.1007/s10113-016-1086-0>
- Keskitalo, E., S. Juhola, N. Baron, H. Fyhn, and J. Klein. 2016. "Implementing Local Climate Change Adaptation and Mitigation Actions: The Role of Various Policy Instruments in a Multi-Level Governance Context." *Climate* 4 (1): 7. <https://doi.org/10.3390/cli4010007>
- Klein, J., S. Juhola, and M. Landauer. 2017. "Local Authorities and the Engagement of Private Actors in Climate Change Adaptation." *Environment and Planning C: Government and Policy* 35 (6): 1055–1074. <https://doi.org/10.1177/0263774X16680819>
- Klein, R. J. T., S. E. H. Eriksen, L. O. Naess, A. Hammill, T. M. Tanner, C. Robledo, and K. L. O'Brien. 2007. "Portfolio Screening to Support the Mainstreaming of Adaptation to Climate Change into Development Assistance." *Climatic Change* 84 (1): 23–44. <https://doi.org/10.1007/s10584-007-9268-x>
- Liefferink, D. 2006. "The Dynamics of Policy Arrangements: Turning Round the Tetrahedron." In *Institutional Dynamics in Environmental Governance* edited by B. Arts, and P. Leroy, 45–68. Dordrecht: Springer. [https://doi.org/10.1007/1-4020-5079-8\\_3](https://doi.org/10.1007/1-4020-5079-8_3)
- Lorenz, S., S. Dessai, P. M. Forster, and J. Paavola. 2017. "Adaptation Planning and the Use of Climate Change Projections in Local Government in England and Germany." *Regional Environmental Change* 17 (2): 425–435. <https://doi.org/10.1007/s10113-016-1030-3>
- Mees, H. P., P. J. Driessen, and H. C. Runhaar. 2014. "'Cool' Governance of a 'Hot' Climate Issue: public and Private Responsibilities for the Protection of Vulnerable Citizens Against Extreme Heat." *Regional Environmental Change* 15 (6): 1065–1079. <https://doi.org/10.1007/s10113-014-0681-1>
- Moser, S. C., and J. A. Ekstrom. 2010. "A Framework to Diagnose Barriers to Climate Change Adaptation." *Proceedings of the National Academy of Sciences* 107 (51): 22026–22031. <https://doi.org/10.1073/pnas.1007887107>
- North, D. C. 2005. *Understanding the Process of Economic Change*. Princeton, NJ: Princeton University Press. <https://doi.org/10.2307/25097117>
- Patterson, J. 2018. *Adaptive Cities? Institutional Innovation Under Climate Change: A Global Survey of 96 Cities*. Amsterdam: IVM.
- Porter, J. J., D. Demeritt, and S. Dessai. 2015. "The Right Stuff? Informing Adaptation to Climate Change in British Local Government." *Global Environmental Change* 35: 411–422. <https://doi.org/10.1016/j.gloenvcha.2015.10.004>
- Rauken, T., P. K. Mydske, and M. Winsvold. 2015. "Mainstreaming Climate Change Adaptation at the Local Level." *Local Environment* 20 (4): 408–423. <https://doi.org/10.1080/13549839.2014.880412>
- Reckien, D., J. Flacke, R. J. Dawson, O. Heidrich, M. Olazabal, A. Foley, J. J. Hamann, et al. 2014. "Climate Change Response in Europe: What's the Reality? Analysis of Adaptation

- and Mitigation Plans from 200 Urban Areas in 11 Countries.” *Climatic Change* 122 (1–2): 331–340. <https://doi.org/10.1007/s10584-013-0989-8>
- Roders, M., and A. Straub. 2015. “Assessment of the Likelihood of Implementation Strategies for Climate Change Adaptation Measures in Dutch Social Housing.” *Building and Environment* 83:168–176. <https://doi.org/10.1016/j.buildenv.2014.07.014>
- Roders, M., A. Straub, and H. Visscher. 2012. “Awareness of Climate Change Adaptations Among Dutch Housing Associations.” *Open House International* 37 (4): 61–71.
- Roders, M., A. Straub, and H. Visscher. 2013. “Evaluation of Climate Change Adaptation Measures by Dutch Housing Associations.” *Structural Survey* 31 (4): 267–282. <https://doi.org/10.1108/SS-01-2013-0009>.
- Runhaar, H., H. Mees, A. Wardekker, J. P. Van der Sluijs, and P. Driessen. 2012. “Adaptation to Climate Change-Related Risks in Dutch Urban Areas: Stimuli and Barriers.” *Regional Environmental Change* 12 (4): 777–790. <https://doi.org/10.1007/s10113-012-0292-7>
- Scanlon, K., M. Fernández Arrigoitia, and C. M. E. Whitehead. 2015. “Social Housing in Europe.” *European Policy Analysis* 17:1–12.
- Shearer, H., E. Coiacetto, J. Dodson, and P. Taygfeld. 2016. “How the Structure of the Australian Housing Development Industry Influences Climate Change Adaptation.” *Housing Studies* 31 (7): 809–828. <https://doi.org/10.1080/02673037.2016.1150430>
- Spatial Adaptation Knowledge Portal. 2016. “Deltaplan Ruimtelijke Adaptatie.” <http://www.ruimtelijkeadaptatie.nl/en/page/188>
- Storbjörk, S., M. Hjerpe, and K. Isaksson. 2018. “‘We Cannot Be at the Forefront, Changing Society’: Exploring How Swedish Property Developers Respond to Climate Change in Urban Planning.” *Journal of Environmental Policy and Planning* 20 (1):81–95. <https://doi.org/10.1080/1523908X.2017.1322944>
- Uittenbroek, C., L. B. Janssen-Jansen, T. J. M. Spit, W. G. M. Salet, and H. A. C. Runhaar. 2014. “Political Commitment in Organising Municipal Responses to Climate Adaptation: The Dedicated Approach Versus the Mainstreaming Approach.” *Environmental Politics* 23 (6): 1043–1063. doi:10.1080/09644016.2014.920563
- Uittenbroek, C., L. Janssen-Jansen, and H. Runhaar. 2013. “Mainstreaming Climate Adaptation into Urban Planning: Overcoming Barriers, Seizing Opportunities and Evaluating the Results in Two Dutch Case Studies.” *Regional Environmental Change* 13 (2): 399–411. <https://doi.org/10.1007/s10113-012-0348-8>
- Wamsler, C., C. Luederitz, and E. Brink. 2014. “Local Levers for Change: Mainstreaming Ecosystem-Based Adaptation into Municipal Planning to Foster Sustainability Transitions.” *Global Environmental Change* 29:189–201. <https://doi.org/http://dx.doi.org/10.1016/j.gloenvcha.2014.09.008>
- Wiering, M., and B. Arts. 2006. “Discursive Shifts in Dutch River Management: ‘Deep’ Institutional Change or Adaptation Strategy?” *Hydrobiologia* 565 (1): 327–338.
- Wilby, R. L. 2007. “A Review of Climate Change Impacts on the Built Environment.” *Built Environment* 33 (1): 31–45. <https://doi.org/doi:10.2148/benv.33.1.31>
- Yin, R. K. 2013. *Case Study Research: Design and Methods*. Thousand Oaks, CA: Sage Publications.

### Referred policy documents

- Brugge, R. v., G. J. Ellen, J. Eshuis. 2015. “Resultaten van de Monitor Ruimtelijke Adaptatie.” <http://www.ruimtelijkeadaptatie.nl/nl/library/download/urn:uuid:c26b0325-072f-4776-b123-9edda313660b/resultaten+van+de+monitor+ruimtelijke+adaptatie.pdf>
- Deltaprogramma: deelprogramma Nieuwbouw en Herstructurering. 2014. “Deelprogramma Nieuwbouw en herstructurering Synthesedocument: Achtergronddocument bij Deltaprogramma 2015.” [http://www.ruimtelijkeadaptatie.nl/nl/library/download/urn:uuid:a80ee827-6844-4c11-a83a-76a6c29d0ae2/synthesedocument\\_deltaprogramma2015+%281%29.pdf](http://www.ruimtelijkeadaptatie.nl/nl/library/download/urn:uuid:a80ee827-6844-4c11-a83a-76a6c29d0ae2/synthesedocument_deltaprogramma2015+%281%29.pdf)
- Deltaprogramma: deelprogramma Nieuwbouw en Herstructurering. 2013. “Manifest klimaatbestendige stad: nú bouwen aan de stad van de toekomst.” <http://www.ruimtelijkeadaptatie.nl/en/library/download/urn:uuid:dda3f259-9c5f-447e-acb0-a42a4a36d0ec/manifest+klimaatbestendige+stad.pdf>

- Ministerie van Binnenlandse Zaken en Koninkrijksrelaties. 2015. "De Woningwet 2015: Nieuwe spelregels voor de sociale huursector." <https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/publicaties/2015/03/17/woningwet-2015-in-vogelvlucht/Woningwet-2015-in+vogelvlucht-def2.pdf>
- Ministerie van Infrastructuur en Milieu, ministerie van Economische Zaken. 2015. "Deltaprogramma 2016: Werk aan de delta." <https://www.deltacommissaris.nl/deltaprogramma/documenten/publicaties/2015/09/15/deltaprogramma-2016-pdf>