Incentives to contribute to flood adaptation in cities

Stakeholder analyses in Belgium, the UK and the Netherlands

Katrine Soma, Marijke Dijkshoorn-Dekker, Nico Polman

WAGENINGEN
UNIVERSITY & RESEARCH

Interreg
2 Seas Mers Zeeën
SPONGE 2020
European Regional Development Fund

Incentives to contribute to flood adaptation in cities

Stakeholder analyses in Belgium, the UK and the Netherlands

Katrine Soma, Marijke Dijkshoorn-Dekker, Nico Polman

This study was carried out by Wageningen Economic Research and was financed by the Schieland en de Krimpenerwaard regional water authority as part of the SPONGE 2020 (Co-creation and implementation of innovative, participative climate adaptation solutions in densely-built areas)

Wageningen Economic Research
Wageningen, January 2018

REPORT
2018-013
ISBN 978-94-6343-890-2

WAGENINGEN
UNIVERSITY & RESEARCH

Interreg
2 Seas Mers Zeeën
SPONGE 2020
European Regional Development Fund

Soma, Katrine; Dijkshoorn-Dekker, Marijke; Polman, Nico, 2018. *Incentives to contribute to flood adaptation in cities; Stakeholder analyses in Belgium, the UK and the Netherlands.* Wageningen, Wageningen Economic Research, Report 2018-013. 76 pp.; 20 fig.; 3 tab.; 60 ref.

Increasingly, urban stakeholders are becoming more engaged in contributing to reducing the intensified flooding risks due to climate change in Belgium, the UK and the Netherlands. The aim of this study is to motivate stakeholder engagement for urban flood management. A template is provided including a total of four steps defining stakeholder positions, task roles and barriers, and showing how to deal with the barriers by suggesting communication levels, strategies and approaches. Overall, green solutions to drainage are thought to be favourable to quality of life, recreation, playground, air quality, health, heat stress, and depending on levels of inclusiveness, green can also contribute to social cohesion.

Key words: climate change, flooding risks, flood, Belgium, UK, United Kingdom, Netherlands, urban flood management

This report can be downloaded for free at https://doi.org/10.18174/438335 or at www.wur.eu/economic-research (under Wageningen Economic Research publications).

P.O. Box 29703, 2502 LS The Hague, The Netherlands, T +31 (0)70 335 83 30,
E communications.ssg@wur.nl, http://www.wur.eu/economic-research. Wageningen Economic Research is part of Wageningen University & Research.

Wageningen Economic Research Report 2018-013 | Project code 2282700313

Cover photo: Hanna Grzesik/Shutterstock.com

Contents

Preface 5

Summary 6

S.1 A template for motivating stakeholder engagement 6
S.2 Different transition pathways 7
S.3 Method 7

1 Introduction 9

1.1 Aim and objectives 9
1.2 Reading guide 9

2 Climate urgencies in Belgium, the UK and the Netherlands 11

3 Conceptual framework: transition theory for stakeholder engagement 14

3.1 Introduction 14
3.2 Transition towards effective urban flood adaptation 14
3.3 Stakeholder categories 16
3.4 Targeted stakeholder engagement strategies 17
3.4.1 Levels 17
3.4.2 Approaches 19
3.4.3 Strategies 21
3.5 A template involving stakeholders step by step 22

4 In-depth interviews of selected stakeholder categories 24

4.1 Introduction 24
4.2 The selected stakeholders 24
4.3 The building real estate developer category 27
4.3.1 Position and task roles 27
4.3.2 Barriers 27
4.4 The built environment advisory organisation category 30
4.4.1 Position and task roles 30
4.4.2 Barriers 31
4.5 Public city flood management category 33
4.5.1 Position and task roles 33
4.5.2 Barriers 34
4.6 Summing up 37

5 Template application: involving stakeholders step-by-step 39

5.1 Worked out example of the template 39
5.2 Connecting template with the SPONGE toolbox 42

6 Concluding remarks 43

References and websites 45

Appendix 1 Selection of interviewees: methodology 48

Appendix 2 Online questionnaire design 51

Appendix 3 Interviewees about cooperation 65

Appendix 4 Quick-scan PPT presentation 68

Appendix 5 SPONGE stakeholder analysis PPT presentation 70

Preface

Climate change is becoming increasingly visible in the form of increased flooding in cities. While climate mitigation would be a favourable way of dealing with climate change, mitigating climate change is not achievable, at least not in the short term. Societies need to adapt to climate change, to make sure the increased flooding will not destroy lives, buildings and infrastructure in cities. The effect of investing in flood management immediately can result in avoidance of future disasters.

It has been a pleasure to work with SPONGE partners, who want to contribute through the project to improve flood management in cities in the future. Stakeholder contributions can make a change to enhance flood management.

Special thanks go to the SPONGE colleagues Wessel Tiessens (Netherlands), Milaila Bentz (UK) and Ronny van Looveren (Belgium), with whom we met several times to discuss the contents of the report and contributions to the SPONGE project.

We would also like to thank interviewees in Belgium, the UK and the Netherlands for contributing with valuable insights. Their narratives were critically important to the storyline of this report.

Prof.dr.ir. J.G.A.J. (Jack) van der Vorst
General Director Social Sciences Group (SSG)
Wageningen University & Research

Summary

S.1 A template for motivating stakeholder engagement

The aim of this study is to motivate stakeholder engagement for urban flood management. In order to identify stakeholder contributions and barriers to conduct climate adaptations in the forms of flood management in cities in Belgium, the UK and the Netherlands, a template is designed in this study following four main steps needed for enhancing stakeholder contributions. The four steps define 1) stakeholder positions, 2) task roles, 3) barriers, and 4) how to deal with these barriers by suggesting communication levels, strategies and approaches, with examples (Figure S.1).

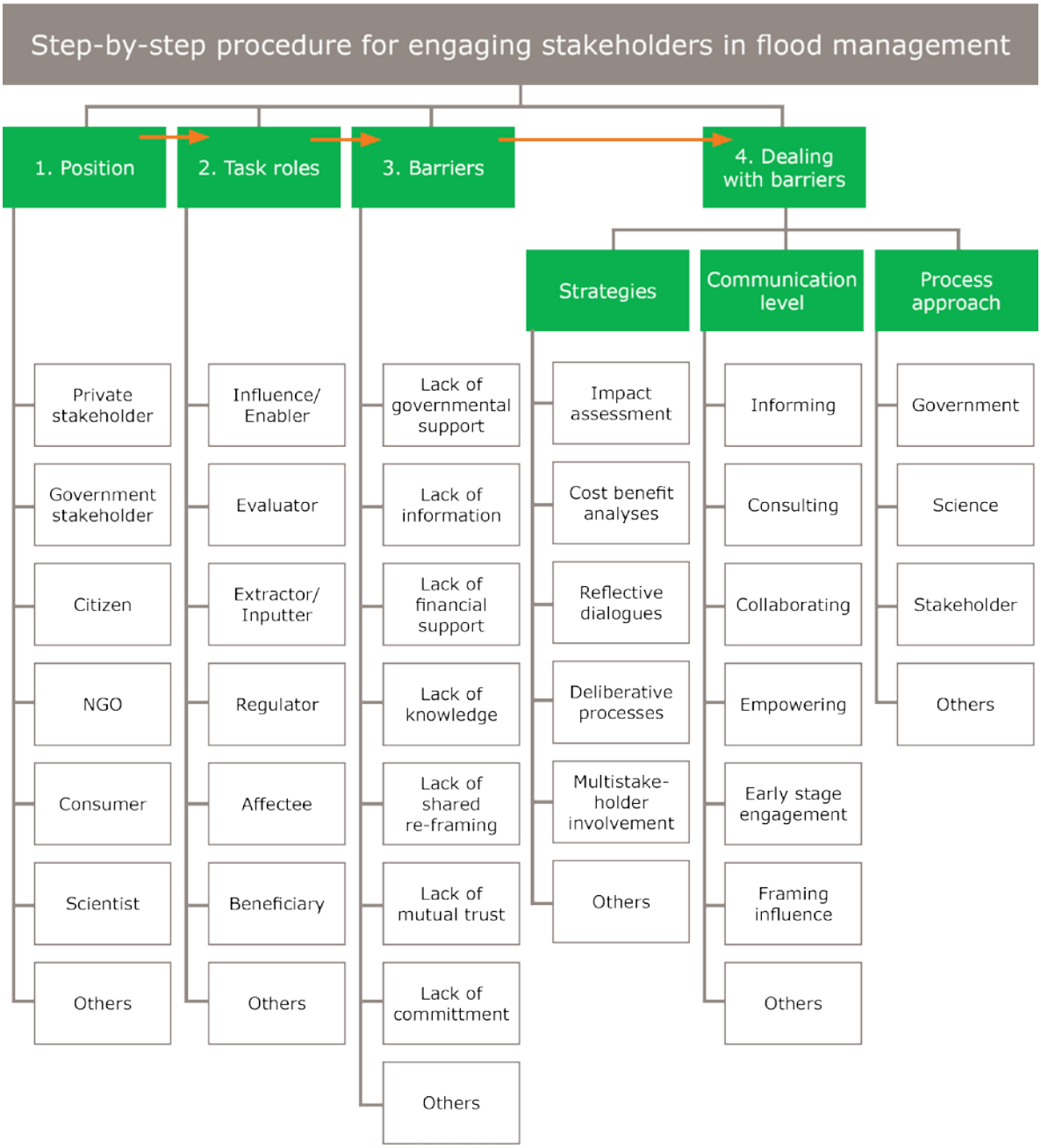


Figure S.1 *Template of main steps for engaging stakeholders in flood management in cities, with examples in each step*

Practical use
To illustrate how the template can be used in practice, it was applied to three stakeholder groups; 1) the building real estate developer, 2) the built environment advisory organisation and 3) the public city flood management. Their position was public and/or private stakeholders (step 1), and they carried out task roles as enablers, influencers, inputters, extractors and regulators (step 2). Their barriers were (step 3) lack of public leadership, lack of public coordination, lack of scientific documentation, lack of citizen awareness, lack of business awareness and lack of consumer demand. The strategies recommended and explained in this study that can contribute to dealing with these barriers, include (step 4) encouraging individual leadership, facilitating reflective dialogues, conducting impact assessment, involving stakeholders at early stages, conducting deliberative processes, as well as establishing platforms and networks.

S.2 Different transition pathways

A transition from less to more stakeholder engagement in flood management is taking place in the three countries. More frequently than earlier, 'green solutions' are implemented as solutions to intensified flood problems in cities. During in-depth interviews, different transition pathways were identified in the three countries, sharing that they intend to proceed with multiple stakeholder participation and workshop arrangements with face-to-face interactions. The common goal is to find ways for re-designing cities from grey to green, in which green can deal not only with flooding issues but also quality of life, recreation, playgrounds, air quality, health, heat stress. Depending on levels of inclusiveness, green can also contribute to social cohesion.

More stakeholder engagement implies needs for new ways to cooperate. Existing experiences with cooperation were informed by different stakeholders in flood management, and are summarised in the following propositions:

- When stakeholders in roles of experts and leaders are invited to discuss and exchange ideas, cooperation is not judged complicated.
- When technical engineer solutions are searched for, cooperation among experts is not judged complicated.
- When sustainable drainage solutions are searched for, and when multiple stakeholder participation is needed, and this is more judged complicated.
- Cooperation effects on flood management are judged to not necessarily be large, that depends on how it is carried out.
- It is judged a possibility to partly replace lack of general public leadership with public representatives who feel the urgency, cooperate and invite others to take action.

S.3 Method

In the formation of a toolbox for stakeholder engagement, Wageningen Economic Research has been asked to contribute with stakeholder analyses, with the aim to motivate stakeholder engagement for urban flood adaptation. This report consists of four chapters, where each chapter is a building block to improve understanding of when and how stakeholders can be encouraged to overcome barriers for effective flood adaption by appropriate strategies (Figure S.2).

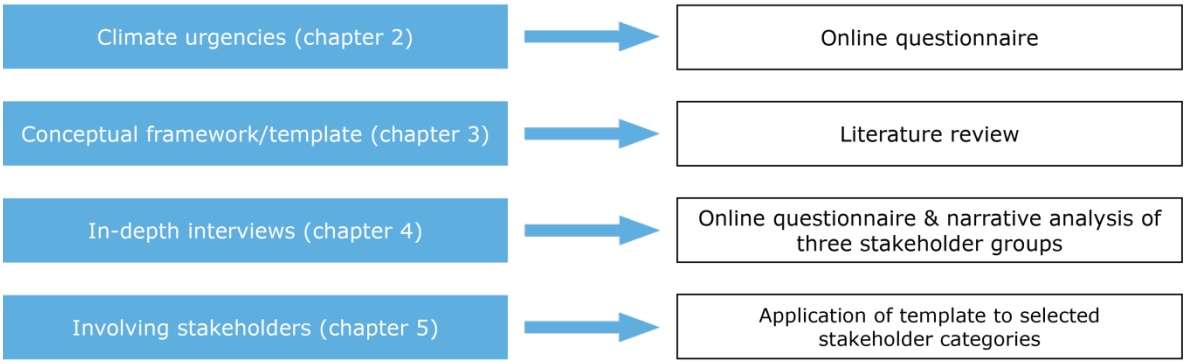


Figure S.2 *Content of building blocks in separate chapters and associated methodological approach*

The analyses include a literature review, an online questionnaire, in-depth interviews of nine selected stakeholders from Belgium, the UK and the Netherlands and narrative analyses of three stakeholder groups.

1 Introduction

1.1 Aim and objectives

Climate change adaptation and mitigation have become urgent issues for cities. Increasingly, urban stakeholders are becoming more engaged in climate adaptation and mitigation across the world. In the Interreg EU project called SPONGE,[1] climate adaptation is addressed in Belgium, the UK and the Netherlands. SPONGE concentrates on identifying the most appropriate ways to encourage different stakeholders in cities to adapt behaviours in view of strategies to reduce risks of climate change. Against this background, targeted stakeholder engagement strategies that impact positively on the effectiveness of urban flood adaptation are particularly relevant in this study. Stakeholders may represent government and private sectors, grassroots organisations, research and educational institutes as well as NGOs, operating at different levels (street/property, neighbourhood, city, regional).

A key output of the Sponge EU project is a digital SPONGE toolbox that is meant to inspire city officials and others in Belgium, the UK and the Netherlands with videos, scripts and good-practice examples of climate change adaptation. In co-creation with a number of various government and private stakeholders, the toolbox will provide examples of recommended techniques and practices to overcome common bottlenecks and incentives to support stakeholders in adapting to climate change in cities, focusing on flooding.

In the formation of this toolbox for stakeholder engagement, Wageningen Economic Research has been asked to contribute with stakeholder analyses, with the aim to motivate stakeholder engagement for urban flood management. Against this background, the objectives of the stakeholder analyses of the study described in this report are:

- To identify and categorise potential stakeholders.
- To identify stakeholder contributions and barriers to conduct climate adaptations.
- To give recommendations.

This study thus supports the SPONGE toolbox. The research approach applied in this study is conceptual, not statistical. It contributes with theoretical background and practical insights based on stakeholder interviews. Notably, in this study, a quick-scan based on an online questionnaire and nine in-depth interviews have been conducted. While these contribute with valuable insights, they cannot in any way represent group opinions statistically.

1.2 Reading guide

This report consists of four main chapters, where each chapter is a building block to improve understanding of when and how stakeholders can be encouraged to overcome barriers for effective flood adaption by appropriate strategies.

[1] http://www.interreg2seas.eu/nl/SPONGE2020

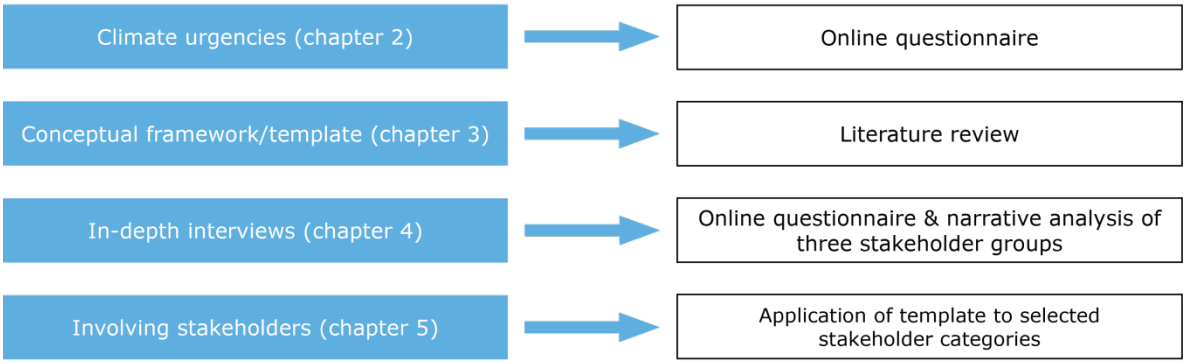


Figure 1.1 *Content of building blocks in separate chapters and associated methodological approach*

The urgencies identified in an online questionnaire about climate adaptation in Belgium, the UK and the Netherlands are provided in Section 2. This is followed by a conceptual framework designed as a template addressing stakeholder categories and stakeholder contributions in Chapter 3, based on a literature review. Further, a selection of nine stakeholders for in-depth analysis, identified positions, task roles, as well as relevant barriers in transition pathways are identified for three stakeholder groups in Chapter 4. In Chapter 5, the template is applied to the three stakeholder categories explored in the previous chapter. For each of the selected barriers, possible strategies are recommended. Finally, some recommendations for the toolbox are provided in the concluding remarks section in Chapter 6.

Supplementary outputs to this survey are attached in the appendices;

1. Selection of interviewees; methodology (Appendix 1)
2. Online questionnaire design (Appendix 2)
3. Interviewees inform about cooperation (Appendix 3)
4. Quick-scan PPT presentation (Appendix 4); and
5. SPONGE stakeholder analysis PPT presentation (Appendix 5).

2 Climate urgencies in Belgium, the UK and the Netherlands

In the first phase of this study, a questionnaire survey was conducted with SPONGE partners (Appendix 2). In the questionnaire, survey questions were asked about what the most urgent climate issues; 1) in their geographical areas, and 2) in their organisation where they are employed. In each of these two categories the respondents had to rank physical urgencies, and also, management urgencies. In the list of urgency possibilities, issues were thus physical as well as management related. Although the level of accuracy of the information would not be suited for any kind of statistical analyses, the information provides valuable insights that we elaborate on in the following. The most urgent climate change issues can be found in Tables 2.1-2.3. The values are normalised to make them comparable across countries.

First, the physical urgencies options include lack of green areas, risks for heat stress and other health problems, risks for sea water entering city areas, risks for insufficient sewerage capacity, insufficient rain water reservoirs, and insufficient foundations of city buildings.

Based on the responses (see Tables 2.1-2.3), we can see that different challenges for dealing with climate adaptation are perceived as urgent in the three areas, with the UK referring to risks for sea water entering city areas, risks for insufficient sewerage capacity, as well as water flooding from rainfall, as the most urgent issues. Belgium refers to rainwater and green as the most urgent issues. The Netherlands' problems are similar to Belgium, but the sewerage problem is seen as more urgent, and some urgency is given to insufficient foundations of buildings. Besides, the options risk for heat stress and other health problems and insufficient foundations of city buildings get relatively low rankings for all responses, except at organisation level in the Netherlands. Still, note that Belgium gave a '3' on health problems, and specified that:

> 'Apart from health problems caused by heat stress, the risk of health problems caused by air pollution (and noise pollution) is growing in Antwerp through the increase of local and (inter)national road traffic. Studies have proven that also climate change will have an accumulative negative effect on air pollution.'

Second, the management-related urgencies include lack of a shared vision, lack of public interest, lack of governmental support to facilitate initiatives, lack of private/public investments in new technologies, insufficient policy strategies, insufficient scientific information, and lack of cooperation and knowledge sharing.

While physical climate issues are perceived similar by the interviewees, the management urgencies differ to some extents in the three countries (Tables 2.1-2.3). Whereas lack of shared vision is stressed a core problem for all countries, in Belgium also insufficient scientific information was seen important, whereas in the UK lack of governmental support and insufficient policy strategies are important, followed by lack of public interest. In the Netherlands, lack of public interest and lack of cooperation and knowledge sharing were seen the most urgent management issues for climate adaptation.

Table 2.1 *Belgian rankings of urgencies (based on one SPONGE partner,* a score ≥*1* is considered important*)*

Urgency options[5]	Geographical area	Organisation
PHYSICAL		
Lack of green areas	1.25	
Risks for heat stress and other health problems[1]	0.75	
Risks for sea water entering city areas	0.25	
Risks for insufficient sewerage capacity	0.5	
Insufficient rain water reservoirs		1
Insufficient foundations of city buildings		
MANAGEMENT		
Lack of a shared vision[2]		1
Lack of public interest[3]		0.5
Lack of governmental support to facilitate initiatives		0.25
Lack of private/public investments in new technologies		
Insufficient policy strategies		
Insufficient scientific information[4]		1.25
Lack of cooperation and knowledge sharing		0.75

Comments:

1) Apart from health problems caused by heat stress, the risk of health problems caused by air pollution (and noise pollution) is growing in Antwerp through the increase of local and (inter)national road traffic. Studies have shown that also climate change will have a accumulative negative effect on air pollution.

2) Shared vision in update of 'structure plan' in process + lack of shared vision within city administration.

3) Lack of awareness is explained by no flood events despite the considerable risk of fluvial and pluvial flooding.

4) Risk analysis of fluvial, pluvial flooding + drought is in process.

5) Normalised to the same scale as the other countries.

Table 2.2 *UK rankings of urgencies (based on 4 SPONGE partners,* a score ≥*1* is considered important*)*

Urgency options	Geographical area	Organisation
PHYSICAL		
Lack of green areas[1]	0.25	0.75
Risks for heat stress and other health problems	0.25	0.75
Risks for sea water entering city areas	1.25	1
Risks for insufficient sewerage capacity	1.75	0.75
Insufficient rain water reservoirs[2]		
Insufficient foundations of city buildings		
MANAGEMENT		
Lack of a shared vision	1	1.75
Lack of public interest[3]	0.5	1.5
Lack of governmental support to facilitate initiatives[4]	2.5	2.5
Lack of private/public investments in new technologies		
Insufficient policy strategies	2.5	1.5
Insufficient scientific information		
Lack of cooperation and knowledge sharing	0.25	0.25

Comments:

1) It was specified separately that: Inadequate use and quality of urban green spaces.

2) Note that even though this option did not get any scores as such, under 'others' it was informed that:

- Surface water flooding (this was mentioned twice)
- Surface Water Flooding from high intensity rainfall
- Risks for Surface Water Flooding from heavy rainfall events
- Extreme weather, storms

3) No knowledge on Climate Change.

4) It was specified separately twice: Lack of funding.

Table 2.3 *Dutch rankings of urgencies (based on 5 SPONGE partners,* a score *≥1* is considered important*)*

Urgency options[1]	Geographical area	Organisation
PHYSICAL		
Lack of green areas	1.6	1.12
Risks for heat stress and other health problems	0.56	0.72
Risks for sea water entering city areas	0.32	0.4
Risks for insufficient sewerage capacity	1.28	1.12
Insufficient rain water reservoirs	1.2	1.6
Insufficient foundations of city buildings	0.8	1.04
MANAGEMENT		
Lack of a shared vision	0.96	1.12
Lack of governmental support to facilitate initiatives	0.72	0.64
Lack of private/public investments in new technologies	0.88	0.72
Insufficient policy strategies	0.96	0.88
Insufficient scientific information	0.56	0.72
Lack of cooperation and knowledge sharing	1.36	1.28

1) Normalised to the same scale as the other countries.

The three countries thus share the urgencies of water flooding, although the sources (rain, sea water, sewage) seem to have different influences across the countries. They also agree that a common vision is needed for a transition towards enhanced effectiveness of urban flood adaptation. However, the highest priorities of urgencies differ, because in Belgium the need for scientific information is judged high, in the UK the governmental support and policy strategies are judged high, and in the Netherlands the cooperation and knowledge sharing are judged high. In the following we will explore this further, by first referring to the literature (Chapter 3), after which a selection of nine stakeholders (Appendix 1) are interviewed in depth (Chapter 4/Appendix 3).

3 Conceptual framework: transition theory for stakeholder engagement

3.1 Introduction

In recent literature, flood adaptation has become a heavily explored issue. Relevant topics include assessments of cities to judge the extent to which they manage flooding (Swart et al., 2014; Van Leeuwen and Sjerps, 2015), theoretical frameworks (van Leeuwen et al., 2012; Almeida et al., 2014; Kingsborough et al., 2016; Trolard et al., 2016), visions for city futures (Eames et al., 2013; Jeffers, 2013), and green solutions to drainage (Bisgrove, 2010; Faram et al., 2010; Tillie and van der Heijden, 2015).

These four topics share a similar pattern of change, in which a transition from less to more stakeholder engagement in flood management takes place. Consequently, cities are increasingly in search for stakeholder engagement strategies that motivate urban flood adaptation. In the next section we introduce a transition theory to illustrate this pattern of change theoretically. The transition theory is followed by sections about stakeholder categories, targeted stakeholder engagement strategies and a template on how to motivate stakeholders step by step.

3.2 Transition towards effective urban flood adaptation

Geels (2011) has developed theories that can help us conceptualise societal transition towards sustainability. The theories of transition are further elaborated on by Rauschmayer et al. (2015). They added another level below the niche-level to explain that the core dynamics of change are fully dependent upon individuals with motivation and capacities for motivating others and influencing others as enabler, and who can assess the extents to which transition actually is going in directions of more sustainability (Figure 3.1). An enabler can motivate multiple objectives at a single time, when for instance green initiatives not only deal with flood management, but also inspire social cohesion and improves health (i.e. multiple benefits). Figure 3.1 also shows how regimes can be interpreted as practices and interaction based on available skills, urgencies and capital. A transition is thus a shift of interaction and practices towards ways which lead to enhanced sustainability.

From this particular theoretical perspective, it would be interesting to know the extents to which the individuals within different stakeholder groups can be categorised as enablers or not. Notably, in a network, many different contributions come together, and as such all contributions to a network are important. Still, the enabler can connect and provide more opportunities for each of them.

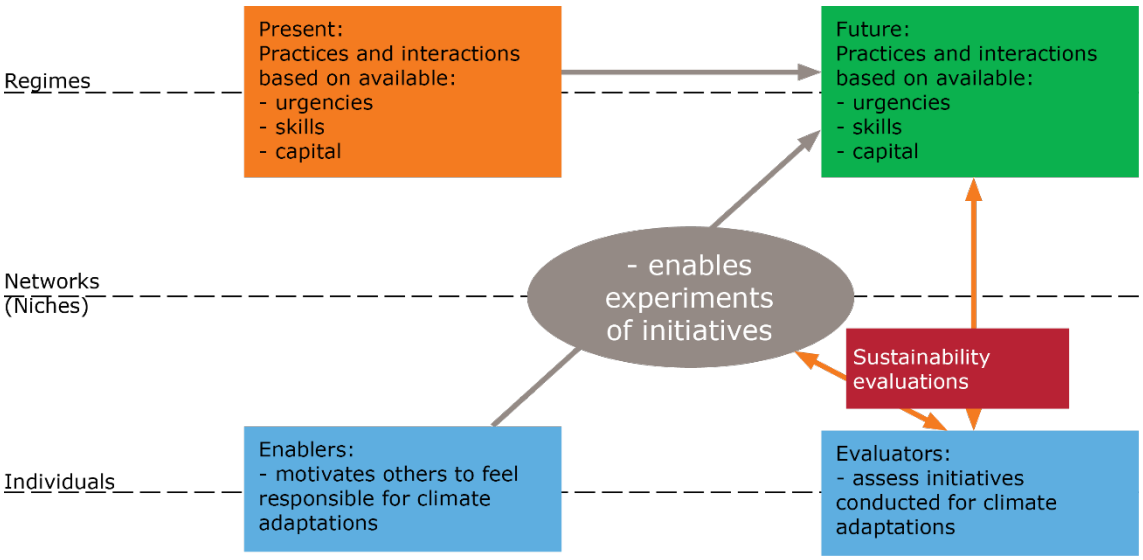


Figure 3.1 *Transition theory and the roles of enablers - who can connect and motivate change, and evaluators - who can judge on pathways towards sustainability (adapted from Rauschmayer, et al., 2015)*

In addition, theories have demonstrated that social learning in multi-actor innovation is a precondition for addressing sustainability (Eames et al., 2013; Sol et al., 2013).

According to some theories the main challenge is to understand how to develop knowledge, capacity and capability for the public agency, the private sector and the multiple users of the city regions to re-engineer their built environment and urban infrastructure in response to climate change and resource constraints. In the process of social learning, trust, commitment and reframing have been identified as interrelated conditions and important properties of interaction. This interaction requires communication between stakeholders. Communication can take different forms, and stakeholders can take different roles. It is thus important to understand different communication levels and roles of stakeholders. This will be addressed in the following sub-sections.

In Figure 3.2 the dynamics of social learning is illustrated in which trust, commitment and reframing are realised through dialogues and actions of individual actors. This dynamic of social change is thus seen as critically important for transitions towards more sustainability.

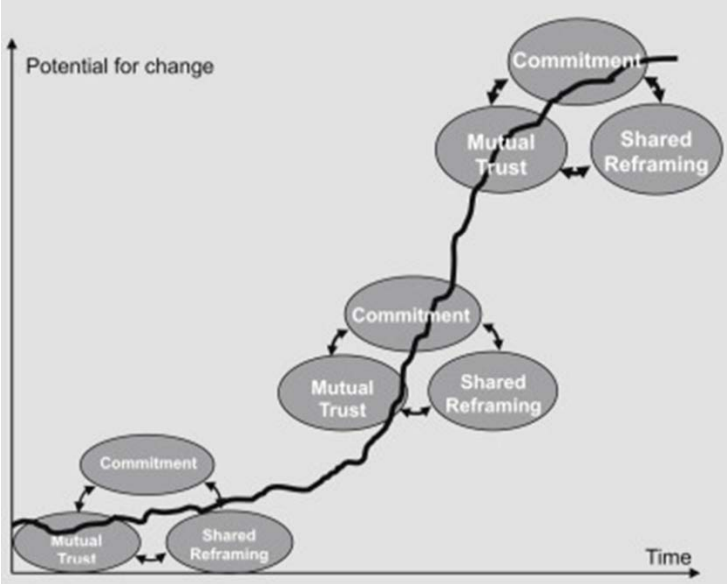


Figure 3.2 *Potentials for change – a dynamics between interpersonal relations with levels of commitments, mutual trust and shared reframing (Sol et al., 2013)*

The transition theory presented here, in particular the roles of enablers and the dynamics of social change, will be used to reflect on transition pathways of flood management in cities in Belgium, the UK and the Netherlands in the following. But first a reflection on communication and stakeholder categorisation will be provided, followed by the methodology and then stakeholder analyses based on their narratives about flood management.

3.3 Stakeholder categories

Regularly, stakeholders are categorised into groups according to their representativeness in order to not have to involve everyone. While this may sound obvious, it is not always straightforward because individual representation will always differ within a group. Reading the literature, stakeholders are often categorised to make some representative to others. For instance, Dobbie et al. (2016) in particular refer to federal government, state government, local government, as well as manufacturer stakeholder, but generalise these stakeholders into two groups: government organisations and private stakeholders. In this study we refer to these groups as government and private sectors. Moreover, citizens and non-governmental organisations (NGOs) are often included in the literature, for instance in Das and Takahashi (2009). Also, consumers (e.g. Hewitt and Escobar, 2011) and scientists e.g. (Giest and Howlett, 2014) are often included groups in stakeholder analyses. Given the literature, a first way to identify stakeholder roles is to find what their societal positions are, which fit into any of the following categories:

- Government sector
- Private sector
- Citizens
- Non-governmental organisations (NGOs)
- Consumers
- Scientists

Still, stakeholder categorisation is not straightforward. This is because context-specific factors lead to stakeholders belonging to the same group, but carrying out different tasks. As such it is further possible to distinguish roles according to which tasks they carry out. According to Elliott (2014) six stakeholder roles can be distinguished (Figure 3.3), referred to as task roles:

1. *Regulators*
   Public policy and administration at multiple levels.
2. *Enablers and influencers*
   Stakeholders motivating others to act in networks and the ones raising awareness of the problems and consequences, respectively (e.g. NGOs, citizens, (online) networks).
3. *Evaluators*
   Stakeholders who evaluate impacts of a flood management measure (e.g. scientists).
4. *Extractors and inputters*
   Stakeholders exploiting natural resources (e.g. use of space for urban buildings and infrastructure), and the stakeholders who place materials into public space (e.g. the buildings are put into an area, but the building may be a factory which process food (natural resource), respectively. The extractors are often operating as inputters as well
5. *Affectees*
   Stakeholders who are unintentionally affected by the activities. Urban citizens for instance may be affected by a process industry making a lot of noise or reducing the air quality in a neighbourhood.
6. *Beneficiaries*
   Stakeholders who are impacted intentionally, who enjoy the outputs of a production, such as producers and consumers of offshore energy, aquaculture, tourism, mining biotechnology, of energy.

In Figure 3.3, an overview of these six task roles is given (blue boxes), with explanations about how they interconnect (arrows). The interconnectedness may be explained as: users/uses of urban space are providing benefits and affecting people otherwise. Awareness is raised of these users/uses, and they are controlled to avoid problems in the short or long run.

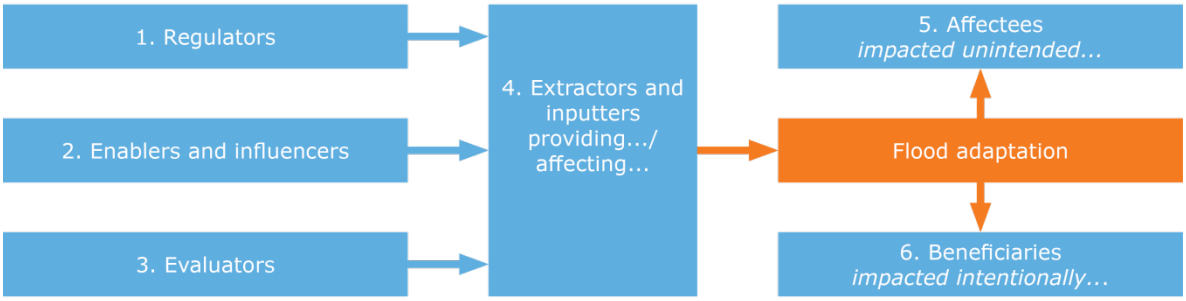


Figure 3.3 *Stakeholder categories according to task roles; regulators, enablers/influencers, extractors/inputters, affectees and beneficiaries*

In order to link this theory in Figure 3.3. to practice, an illustrative example is given. In flood management, for instance, regulators within the governmental institutes will control building developments by regulations, administration and rules. The building developers need space and are thus 'extracting' areas for building purposes. They are also 'inputters', as they implement buildings in these areas. These activities will have consequences for the citizens, who may or may not be victims of floods. They are the affectees who depend on how well water can be captured in the built areas. The building developers are also providing houses and built environment that benefit users, for instance, as private house owners or users of public parks. The influencers raise awareness about how the building activities actually affect people directly or indirectly in the short and long run. They can also raise awareness about how regulators are successful or not in carrying out particular flood management measures. Note that the influencers are taking the enabler role as discussed above, and that they can at the same time represent any of the other groups.

Obviously, it is possible to argue that within each category multiple stakeholders can be identified and that one single stakeholder can take multiple roles. For instance, one may argue that the extractors/inputters refer to entrepreneurial activities, but firms differ in activities, size, level of operation, etc. It may even be argued that within a firm, at individual level different opinions exist, as some raise awareness and other not. The exercise shows us that it is not straightforward to categorise stakeholders.

3.4 Targeted stakeholder engagement strategies

Cooperation is acknowledged as an appropriate strategy for integration of visions, across stakeholders and policy domains (Soma et al., 2015). Moreover, cooperation can be interpreted as stakeholders working or operating together aiming at realising mutual benefits (Bosch-Sijtsema and Postma, 2009). Besides, cooperation can be based on intrinsic motivation and take place when there is no direct benefit to stakeholders, but it brings about positive expectation about future developments in a society in which one belongs (Soma and Vatn, 2014). Cooperation depends on (Soma et al., 2015): a) interactivity among different actors, b) reciprocity in people's behaviour linked with social norms, c) leadership and communication skills, and d) developments of partnerships and shared visions.

3.4.1 Levels

Critical to a transition towards sustainability is interaction and communication as strategies to engage stakeholders in processes of cooperation. Obviously, this can take different forms, and it can be useful to be aware of core differences. For instance, a practical guide for participatory communication (Arnstein, 1969; Gustavsson and Elander, 2016) has specified four core levels (Figure 3.4):

- *Informing*
  A one-way communication, in which a project or a policy are provided with no feedback or assessment taking place.
- *Consulting*
  This is a form of dialogue with interaction, in a form of outside actors, mostly researchers or experts, asking questions to stakeholders. There is no obligation to integrate the consult into the project or policy.

- *Collaborating*
  This refers to organised discussions with the purpose of achieving active involvement by stakeholders in a decision-making process. Although final decision is based on cooperative efforts during process, policy makers are free to make their own final trade-offs in final decision.
- *Empowering*
  In this form of collaborative decision making, stakeholders are equal partners in development during dialogues, and in making necessary trade-offs in final decision.

While these communication strategies provide possibilities for choice, it may also be argued that this all is relevant for decision-making. The communication level does not only depend on the context and purpose of communication, it also depends on which stage in a decision-making process interaction occurs.

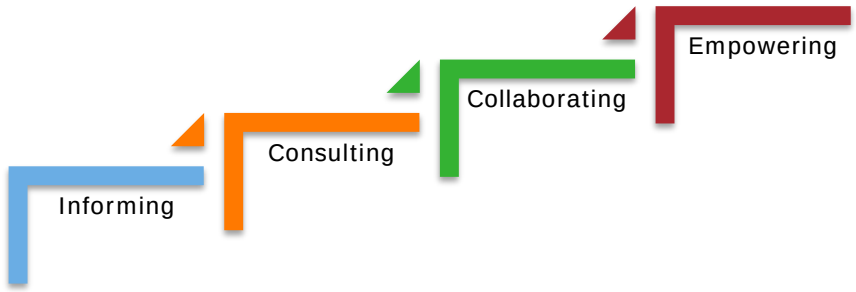


Figure 3.4 *Communication levels: informing, consulting, collaborating, empowering*

Moreover, the level of stakeholder engagement not only refers to the intensity and form of communication, but also on the timing. *Involvement of stakeholders at early stages*, will increase the level of influence and is a principle frequently stated in the literature. For instance, addressing climate risks in London and New York who applies relatively advanced assessment of climate risks and adaptation, case studies have shown that these cities have benefited from stakeholder engagement at an early stage in their risk assessments, as well as specific institutional responsibilities for coordination (Hunt and Watkiss, 2011). Also, Specht et al. (2016) explains an urban farming system that includes rooftop gardens, rooftop greenhouses, edible green walls, indoor farms and/or vertical greenhouses. This was established by means of early stage involvements of stakeholders who jointly defined a roadmap to enable administrators, politicians, citizens and practitioners to effectively address it. Another example is the sustainability visioning, which is about creating descriptions of sustainable and desirable future (Iwaniec and Wiek, 2014). By means of early-stage involvement of stakeholders, this approach in urban planning guides cities about structures, functioning and governing issues.

Furthermore, the level of stakeholder engagement can be influenced by the *framing*. The framing influences of climate change mitigation are addressed more broadly in the literature. Often framing is described along a negative baseline, in terms of creating fear and manipulation to influence with different argumentation (Spence and Pidgeon, 2010). Still, framing can be positive if information is shared by enthusiastic people influencing and inspiring others, or neutral. Climate change frames are among others (Nisbet, 2009) related to:

- Social progress - arguing for improving quality of life or solving problems
- Economic development and competitiveness, referring to economic market benefit or risk
- Morality and ethics - arguing about right or wrong, or respecting or disrespecting limits, thresholds, or boundaries
- Scientific and technical uncertainty - referring to needs for precaution or action in face of possible catastrophe and out-of-control consequences
- Public accountability and governance - serving the public or special interests, emphasising issues of control, transparency, participation, responsiveness, or ownership
- Conflict and strategy - referring to games among elites, such as who is winning or losing the debate.

Framing obviously influences levels of urgencies for flood management stakeholder actions.

3.4.2 Approaches

Most of the time it is not possible to just conduct one communication strategy and have the problem solved. Sequences of strategies with are part of ongoing processes may be needed to enhance stakeholder engagement. The strategies can be carried out by different stakeholders and for different purposes throughout a process. In a survey exploring existing literature about stakeholder participation in cities, it was clarified that three main purposes can be distinguished (Soma et al., 2017) (Figure 3.5):

1. to support scientific insights
2. to support governmental activities and
3. to empower as stakeholders.

For each of these purposes, a series of interrelated strategies are relevant. Whereas the science-based approaches are centred around contributing to impact assessments by identifying indicators and scenarios (Soma, 2010), the government-based approaches need to reflect on vision, strategies, different roles, learning, communication, etc., in order to make space for stakeholders in their public management activities (Dijkshoorn-Dekker et al., 2017). For empowerment, stakeholders need to address problems, trigger ideas, co-create with other stakeholders, identify possible solutions and monitor, in so-called self-governance arrangements (Colin-Castillo and Woodward, 2015; O'Hare et al., 2015). In multiple research contributions, similar designs are provided. While Figure 3.5 illustrates that these different categories exist, it also shows that there are overlaps between them.

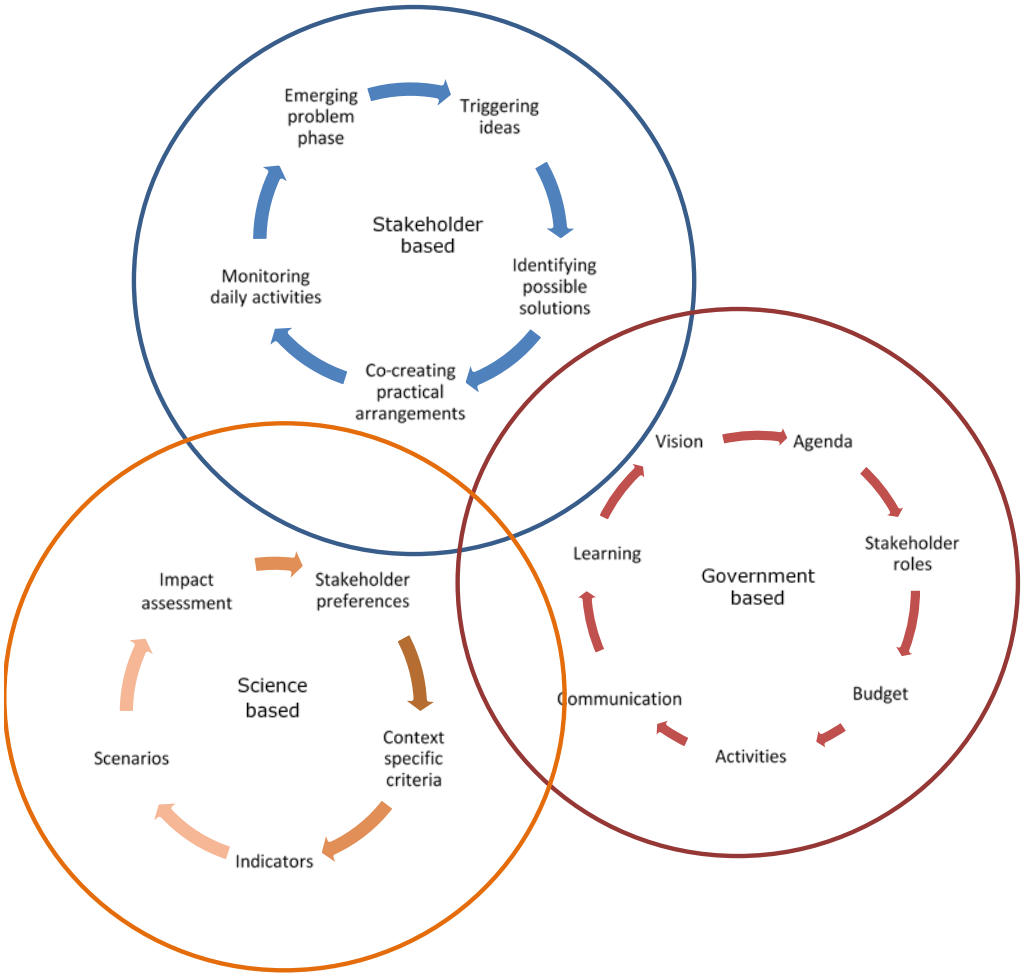


Figure 3.5 *Stakeholder engagement approaches can take form in three different cyclises; bottom up stakeholder based; government based; and science based (Soma et al., 2017)*

Each of the three approaches follows suggested steps serving the purposes of including stakeholders; in governmental decision making, in scientific approaches, and as stakeholder initiatives. These steps involve different and similar strategies across the approaches.

First, *in a science-based approach* (orange circle, Figure 3.5) (Elbakidze et al., 2015; Renn, 2006; Soma, 2010), scientists may take the stakeholder insights into account when developing a relevant selection of *scenarios and socio-economic and environmental indicators*. This insight can be based on in-depth interviews with selected stakeholders, in order to identify *context-specific criteria*. These are urgent issues that in the view of the stakeholder need to be addressed rather early in a process. In addition, these interviews can be useful for development of relevant scenarios. Consultation by experts/policy makers can provide further insights about potential impacts by different scenarios or policy strategies on the urgent criteria mentioned by the stakeholders. The particular stakeholder preferences can be included (as weights) in the *impact assessment*. There are different ways of assigning importance (*weights*), it may be done by a questionnaire survey, but can also be done by means of deliberative processes with citizens. Citizens in contrast with most stakeholders do not have to stay responsible for a stakeholder group and are more willing to think from a societies point of view, long term (Soma and Vatn, 2014).

In order to assign values to multiple use in green areas, it is possible to conduct *cost-benefit analysis* (Jongeneel et al., 2012). Cost-benefit analyses can assist in identifying relevant indicators and to find impacts with different scenarios (or policy strategies). *Ecosystem services* can contribute to identify the exact values that ecosystems provide, beyond what values are directly observed as market values (TEEB, 2011). Ecosystem services do not only include market services, but also regulation and cultural services (Hein et al., 2006). For instance, sustainable drainage can contribute with multiple purposes solutions to flood management in cities, including for instance, biodiversity hotspots, with flood protection, pollination, recreation and cooling (Enqvist et al., 2014). For instance, Howe et al. (2014) analyse how ecosystem services can provide a wide range of benefits for human well-being, including provisioning, regulating and cultural services, and benefitting both private and public interests in different sectors of society. Also, methods exist that can estimate societal and environmental values even when impacts cannot be judged on a monetary scale (Soma, 2006). An alternative to a monetary valuation is to use semi-qualitative scale of importance to judge on relevance of the different societal and environmental values (Ramos et al., 2014; Soma, 2010; Soma et al., 2013).

Second, in (Dijkshoorn-Dekker et al., 2017), *a government-based approach* is provided (red circle, Figure 3.5). This approach is also referred to as *reflective dialogues*. Reflection dialogues involve questions about stakeholder *roles, agendas, visions, budgets, communication, activities and learning*. The interviewees need to reflect on their own as well as other people's role in terms of whether they hold awaiting, engaging, connecting, pulling, chasing and/or rejecting attitudes. The idea is that when the interviewees address their own situation, and thus barriers to change, they also reflect on how they can solve them. It is a lot more effective when ideas for change stem from the people in transition themselves.

Actually, the reflective dialogues have been conducted with Dutch public management to address barriers for the government sector stakeholders when dealing with citizens and firms (Dijkshoorn-Dekker et al., 2017). Three cases address citizens' initiatives for green in the city, and share the findings that the public management finds it difficult to act towards the outside world as one, because they are often fragmented, shot up in small fractions which carry out specific tasks that are linked with particular budget streams. During reflection dialogues awareness was created about the need to improve this by arranging for a focal contact point where externals, such as green citizens' initiatives, can come in contact and be guided towards the people that they need for their specific question. It was further acknowledged that increased communication within the public management will not only make it clear to employees who are doing similar things, what and located where, but will also encourage cooperation among them which eventually can result in more effective use of budgets when similar work is coordinated. When needs, objectives and visions are clarified, it is also easier to adapt existing habits, as well as rules and regulations.

Third, when the purpose is to *empower as stakeholder* (blue circle, Figure 3.5), *networks* are established. A network can contribute to, on the one side, the *awareness raising* among different actors taking part in the network. On the other side, interacting in a network can create possibilities for new *investment possibilities* (Stuiver et al., 2016). Potential investors need to trust activities, and share understanding of what a stakeholder action actually can contribute to mitigating flood risks, before actual contributions are provided. Besides, the literature contains many examples of platforms and networks with different purposes, three of which are given here. First, an uncertainty analysis of a cross-sectoral, regional-scale Integrated Assessment Platform (IAP) for the assessment of climate change impacts, vulnerability and adaptation is presented by Dunford et al. (2014). The IAP couples simplified meta-models for a number of sectors (agriculture, forestry, urban development, biodiversity, flood and water resources management) and facilitates cross-sectoral interactions and feedbacks on a range of future scenarios to support stakeholder dialogues and mutual learning. Moreover, some networks are designed for empowerment of bottom-up initiatives. For instance, Bautista et al. (2014) introduces a not-for-profit citywide network in New York founded in 1991 linking grassroots organisations from low-income communities in their struggle for environmental justice. The network advocates improved environmental conditions and against inequitable burdens by coordinating campaigns designed to affect public policies. Furthermore, other examples include social media platforms. For instance, Kietzmann et al. (2011) present a social media platform by specifying seven functional building blocks: identity, conversations, sharing, presence, relationships, reputation and groups. When a network contributes to these different building blocks, this has a lot more impact than information sharing as such. Actually, understanding the dynamics of these building blocks can explain why stakeholders take no action even though they are fully informed.

Public awareness raising of long-term effects is seen important for climate adaptation in cities (Swart 2014; van Leeuwen and Sjerps 2015). As a strategy to empower stakeholders, *deliberative processes* among citizens can take place. In accordance with the theoretical concept of deliberation which has been explained by (Habermas, 1994), several practical types of deliberative processes have been designed by, for example, Dryzek, (2002), Smith (2003), Rauschmayer and Wittmer (2006), Renn (2006), Soma (2010), Soma and Vatn (2010), Dassen et al. (2013). The shared motivation behind deliberative processes in environmental decision-making, is the thought that they can lead to more 'collective, holistic and long-term thinking'. Further, deliberative processes among citizens can assist decision-making processes by Renn (2006), Soma and Vatn (2014): 1) enhancing understanding and produce new options for actions and solutions to the problem, 2) decreasing aggressive attitudes among participants, 3) showing and documenting the full scope of ambiguity associated with the natural resource problems, 4) helping to make a society aware of the options, interpretations and potential actions that are connected with the issue under investigation, 5) clarifying problems to make people aware of framing effects and explore new problem framings and 6) producing competent and fair solutions.

3.4.3 Strategies

From a theoretical point of view and based on relevant literature, the strategies explained within the different approaches are here summarised as:

1. Developments of socio-economic and environmental indicators, weights, scenarios/policy strategies for conducting impact assessments (based on informing/consulting)
2. Cost benefit analyses and ecosystem service approach (based on informing/consulting)
3. Reflective dialogues (based on collaborating/empowering)
4. Deliberative processes with citizens (based on collaborating/empowering)
5. Online platforms and networks with multi-stakeholder involvement (based on collaborating/ empowering).

3.5 A template involving stakeholders step by step

In this section we explain how to actually apply the theory to practice. In particular, if a stakeholder feels responsible for flood management but cannot proceed, how can this particular stakeholder be assisted?

Given the insights of the transition theory presented earlier in this chapter, the following steps can be used to find ways to engage stakeholders to proceed with flood management:

1. What is the position of this stakeholder? (public, private, citizen, NGO, etc.)
2. What are the task roles of this stakeholder? (Figure 3.3)
3. What are the relevant barriers that this stakeholder must overcome? (e.g. regulatory, informational, financial, etc.)
4. What are the relevant options for dealing with barriers? (e.g. levels of communication Figure 3.4)

In Figure 3.6, a template is provided with an overview of these four steps, including listed options in each step based on the theory in this chapter.

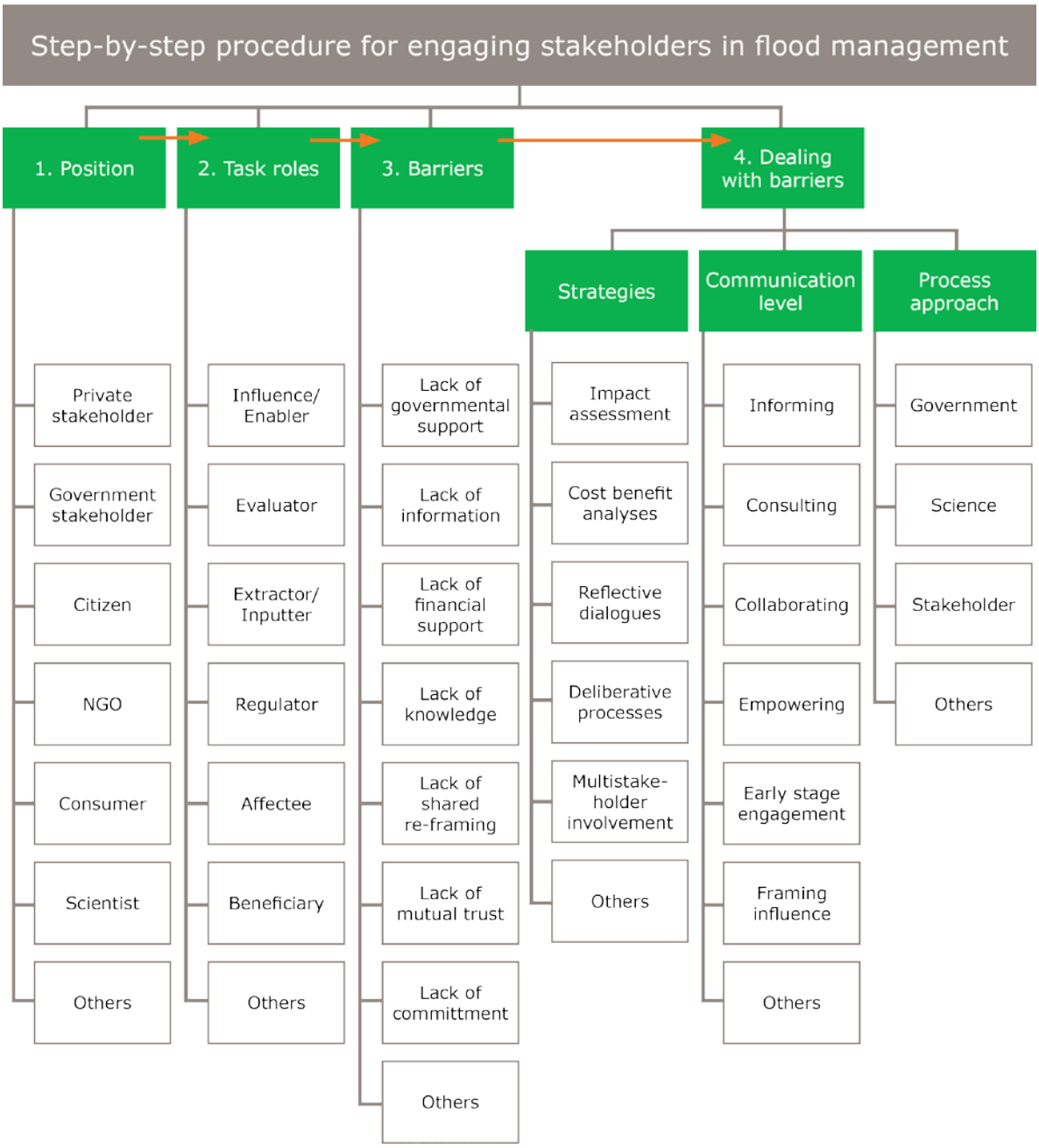


Figure 3.6 *Template of main steps for engaging stakeholders in flood management in cities, with examples in each step*

It is complicated to develop a definitive and final list of stakeholder categories for a toolbox because the different stakeholders can perform different tasks as distinguished in Figure 3.3. In Chapter 4 three different stakeholder roles will be explored and explained based on in-depth interviews within the government and private sector categories, referred to as: 1) building and real estate developer, 2) built environment advisory organisation, and 3) public city climate management. In Chapter 5, the template in Figure 3.6 is applied to the three selected stakeholders.

4 In-depth interviews of selected stakeholder categories

4.1 Introduction

In this section a total of three core stakeholder categories are explored more in detail to reflect on their transition pathways. They include the building real estate developer, built environment advisory organisation and public city flood management categories. These groups are described in the following, their transition pathways are reflected upon, as well as their core barriers, and possibilities to overcome these.

In-depth interviews were conducted to identify narratives of interviewees. A narrative analysis aims at getting an understanding of a person's framing of the world (Iwaniec and Wiek, 2014; Pirro and Anguelovski, 2017). In the narrative analysis, the basic questions asked were:

- What are the most critical *urgencies* for your organisation on climate change/flood-related problems?
- Can you please indicate what kind of climate adaptation *contributions* your organisation provides (Financial, Knowledge, Regulatory, Information, Education, etc.)
- What would you (personal/organisation) need to be willing to contribute more and differently?
- What could be relevant to provide but is not yet possible?
- Can you please indicate what kinds of *barriers* that makes it difficult in your organisation to contribute? (Financial, Knowledge, Regulatory, Information, Education, et.)
- Does your organisation have any strategy/ plan for adaptive management?
- Who are the most important stakeholders within the organisation? Could you please describe the internal *collaboration*?

The in-depth interviews were carried out by means of open questions to gain a better understanding of the narrative of the person being interviewed (Hay, 2000). After an open question was asked, follow-up questions were asked. The follow-up questions thus depended on the interviewees' answers to the basic questions. To ask follow-up questions obviously requires sufficient expertise from interviewer.

The sources used for this section are the nine non-official reports of the meetings, in which each story provided by the interviewees is written down. Some of these texts have been adapted to make sure the interviewees remain anonymous. The stakeholders had a chance to read the citations through and edit the texts before this report was published.

4.2 The selected stakeholders

In this section the nine selected stakeholders for SPONGE are briefly presented. Their personal and organisational names stay anonymous. They provided valuable information, but the interviewees are too few to claim representativeness of specific stakeholder categories. In SPONGE, more interviews are needed to fill the toolbox for relevant stakeholder categories.

The stakeholders are categorised as:

- Public city flood management
  This category belongs to the government sector and is particularly relevant to flood adaptation in cities, as the administrative unit with this as a main responsibility. This category is represented in all three countries. In all countries they were judged as having low barriers by SPONGE.
- Building real estate developer
  This category is logical to put into a private sector stakeholder category. But practice now shows us that in Belgium they have public companies. This a unit within the government sector, operating as

a supplier of building and real estate to public sector clients. A public company is thus operating in response to demands just like a private company, but they enjoy a rather monopolistic role, which give them a stable income. While in the Netherlands a private company represented this category, in Belgium, this category was represented by a public company. In both countries they were judged as with high barriers by SPONGE.

- The built environment advisory
  This is an association, and represented by one stakeholder in the UK. Given the complicated structure with regulations and actors in the public sector in the UK, this association has found their own niche: to assist private companies with advice on how to deal with the public authorities. While it is not maximising profits, and main drive is to assist implementation of sustainable drainage, it may be regarded a market actor because they have to deal with private clients and depend on their willingness to pay. They were judged as with high barriers by SPONGE.
- Public environment authority
  This is a broad category of public units dealing with environmental regulations at national regional and local levels. It was represented by one UK stakeholder and obviously belong to the government sector. It was categories in-between high and low barriers by SPONGE partners.
- Water sewage company
  This is a private company represented by one interviewee in the UK. This company has a monopolistic market position, with no other suppliers to compete with. All inhabitants are clients and pay a yearly contribution for water and sewage services. It was categories in-between high and low barriers by SPONGE partners.
- Private horticulture
  This is a private company, which fits perfectly into a private sector category. It is relevant to flood adaptation because, in cooperation with public sector they provide own dams for climate adaptation measures. It was categories in-between high and low barriers by SPONGE partners.

In Belgium two stakeholders were selected for the interviews. One of them belongs to the building real estate developer category, whereas the other is categorised in the public city flood management category (notably, more issues than flooding are addressed through urban development by this stakeholder). Although they are both judged to contribute highly, the SPONGE partners judged the building real estate developer apparently less willing (high barriers), and the public city management extremely willing (low barriers) (Figure 4.1). This gap will be further explored in the next sections.

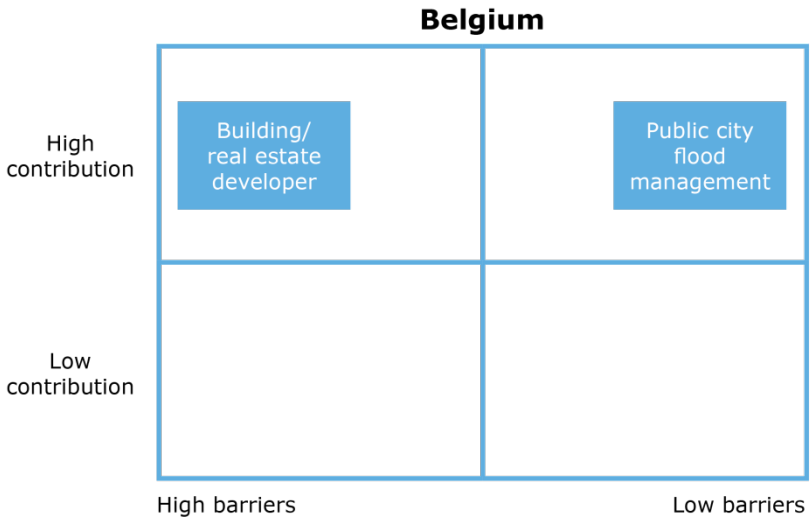


Figure 4.1 *Two stakeholders contributing highly in Belgium: one with high barriers and one with low barriers*

In the UK a total of four stakeholders were selected for the interviews. Whereas one of them belongs to the building real estate developer category, a second belongs to the public city flood management category, a third represented a water and sewerage company, and a fourth represented the public

environment authority. Although they were all judged to contribute highly, the SPONGE partners judged the building real estate developer less willing (high barriers), the public city management extremely willing (low barriers), and the water and sewerage company as well as the public environment authority representatives in between (Figure 4.2). These differences will be further explored in the next sections.

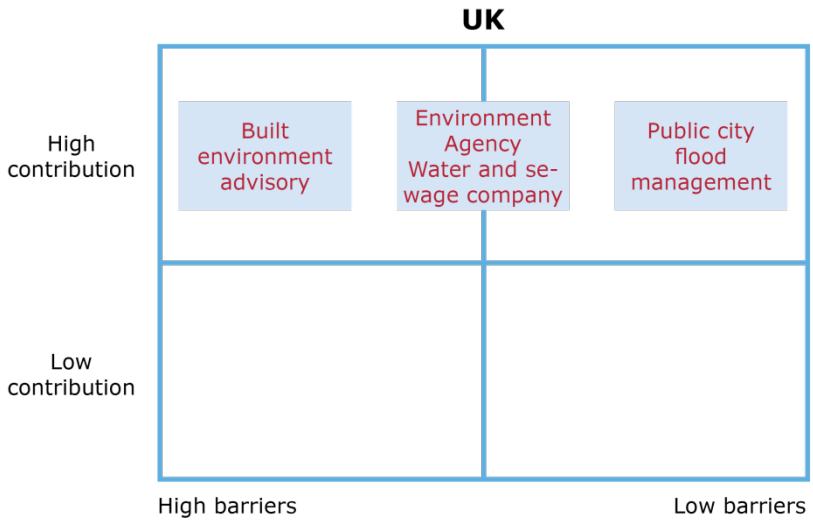


Figure 4.2 *Four stakeholders contributing highly in the UK: one with high barriers, one with low barriers and two categorised in between*

In the Netherlands total of three stakeholders were selected for the interviews. One of them belongs to the building real estate developer category, whereas the other belongs to the public city flood management category. The third represents the private horticulture sector. Although they were all judged to contribute highly, the SPONGE partners judged the building real estate developer less willing (high barriers), the public city management extremely willing (low barriers) and the representative for the private horticulture in between (Figure 4.3). These differences will be further explored in the next sections.

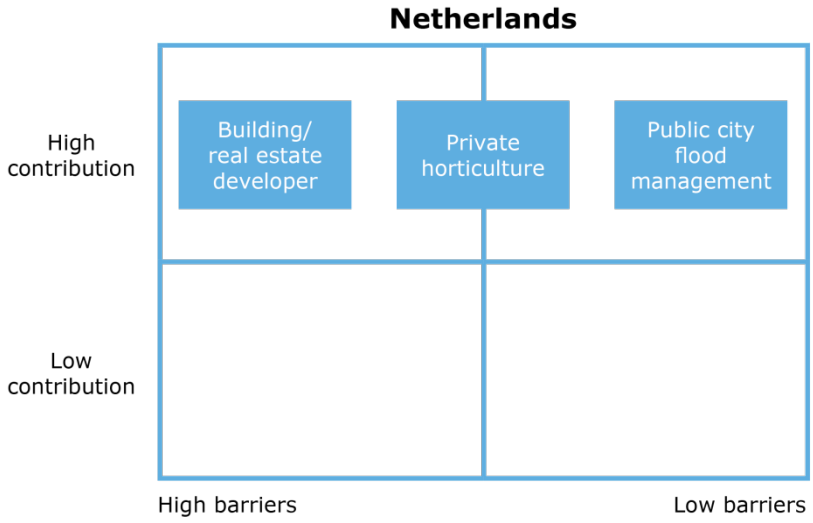


Figure 4.3 *Three stakeholders contributing highly in the Netherlands: one with high barriers, one with low barriers and one categorised in between*

In the following section, three stakeholder categories are specified in order to identify roles, barriers and potential strategies for overcoming barriers. These categories consist of stakeholders who either struggle with high barriers, or enjoy low levels of barriers. The ones in the middle are not included in the following. Still, in Appendix 3, they inform of cooperation. The three stakeholder categories that we refer to in the following: the building real estate developer, built environment advisory organisation and public city flood management categories.

4.3 The building real estate developer category

4.3.1 Position and task roles

Representatives of the building real estate developer stakeholder were interviewed in both Belgium and the Netherlands.

In Belgium, their profile is an 'Autonomous Municipal Company for Real Estate Management and City Projects' in one particular city. They work for public customers, including the city, but also the police, fire brigade, school, etc. Since 2003, they have grown into a full-fledged property subsidiary. As a public company they build on a business-related perspective when developing a viable city within the strategy that the city develops in the context of urban development. They work as an expert and entrepreneur in sustainable real estate, construction and city projects.

In the Netherlands, the profile is a private building developer, a private company, who is marketing sustainable living as comfortable, energy efficient and adaptable for now and in the future in multiple cities around the country. Their customers are real estate investors that invest in rental housing. They insist that sustainability must be self-evident: neither complicated nor too expensive. They carry out an innovative and future-proof business model that focuses on collaboration, sharing and customers.

The building real estate developer can thus formally be a private stakeholder or a government stakeholder, and task roles can be inputter (e.g. inserting buildings in urban space), extractor (e.g. extracting areas from urban space) and influencer and enabler (e.g. promoting green areas for flood risk purposes) (Figure 4.4).

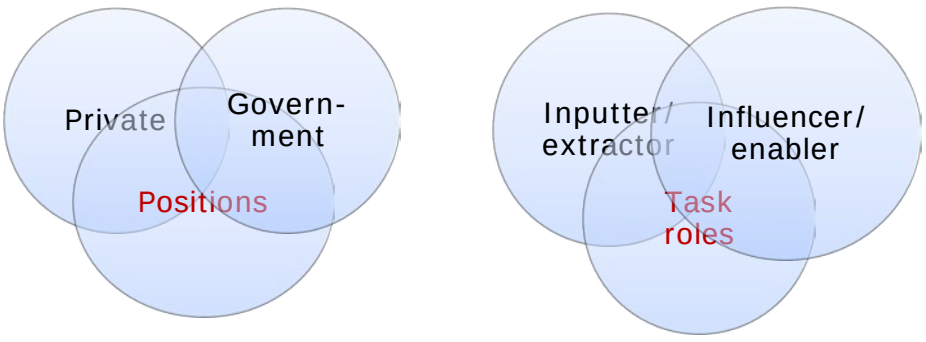


Figure 4.4 *The positions and task roles of the building real estate developer; overlapping government and private positions, and acting as inputter, extractor, influencer and enabler*

4.3.2 Barriers

The Belgian and the Dutch representatives for building real estate developer do both have ambitions to implement green solutions when possible. Still, they are hampered during these transitions. Whereas the Dutch private company finds it difficult to contribute from their position as a market actor, and has lost some of the commitment as they used to have because of lessons learnt in the

past, the Belgian public company faces less of these barriers because they have a strong position to attract public payments by their public customers.

Notably, in processes of a transition, there must be room for trial and error. In the Dutch case, it is shown that experimentation can lead to failures.

The Dutch private company says:

> 'We have started this business with designing sustainable homes, but nobody wanted them because of the high costs and people found them too innovative. In that sense we were before our time. It is difficult to make such change, people must get used to it. Also the real estate world must get used to it.'

The company refers to the lack of willingness of house owners to invest in green.

The Dutch private company continues to explain that:

> 'In practice, the customer has limited interest in water, professionally speaking, and will not be willing to pay a lot extra for this. The urgency is not there. Still, I think people living in green areas are much happier, I am convinced. The good thing is the effect of collecting water, which is a good side effect.'

Still, the most urgent barrier for the Dutch interviewee are lacking public sector interventions:

> 'I think, if it concerns a large area, the solution is not to be found just in the home itself. At building level, relatively little can be done compared with what you can do in the whole area. To solve the water flooding problem at an early stage it must be part of urban planning, to take into account water treatment throughout a larger area. We can influence, but usually urban plans are made by the municipality. We will only be involved at a later stage.'

The Belgian transition pathway was explained to be about carrying out multiple use of space.

For instance, the Belgian public company explained that:

> 'One of the ambitions is to carry out multiple use of space. This will require new forms of public management, a transition must take place, and this can only happen if prepared to take these steps politically.'

They also explained that a public company is a special type of company:

> 'As a public company, there is a possibility, more than for the governmental bodies, to more easily adapt capacity, goals and policies, to carry out a social mission that we believe in, that are suitable to the urgencies of the time. This is a complex and difficult work, in which projects can be carried out with a high level of ambitions. Separated from the public management, young ambitious people, a new generation, emphasises long term quality of life and care for the city as own discipline within our organisation. As such, this is a special type of company.'

They referred to the need for change in public management:

> 'The aim is to replace the classic infrastructure solutions to water drainage with alternatives, such as green areas and playgrounds. This requires more thinking about alternative kinds of infrastructures, and how they can be realised within the urban areas. This implies a swift in public management. Although such change is very much needed, it is difficult as they are continuously busy with maintenance of existing infrastructure.'

Another need is the involvement of citizens The Belgian public company says the following about this issue:

> 'In the projects, citizens are involved throughout the project process. In the first phase, i.e. in the exploration phase, citizens take part in order to contribute to defining the project. In a particular area, square, district, with a specific direction, characterisation, program, etc., we present a project suggestion and get input from citizens in public debates, and after adaptations they return to the citizens. In a second phase, a master plan is designed, which in a third phase is presented to the neighbourhood. In all these three phases the citizens are providing feedback. As for the process and preparations, it is critically important that everyone gets the time needed, and that consensus is obtained and compromises are settled', and 'Debates as such lead to enrichment of the process. Even materials are discussed with the citizens. The earlier citizens are involved, the less problems we get with action committees and personal interests of the citizens. During those trajectories, these events are particularly important in terms of gaining support and to develop important insights. The urgency of flooding is particularly visible in the poor areas of the city, because they have experiences urban heat, drought and flooding.'

Also, the Belgian public company refers to the government sector as a main source of barriers. Not only are policy makers suspected to concentrate mostly on short-term political gains instead of investing in flood management, but regulations are complicated and theoretical approaches used in the government sector are not applicable to practice. The government sector often lacks sufficient time, money and struggle with capacity problems. Besides, the structure is very complex and difficult to relate with. See for instance how this is explained by the Belgian interviewee:

> 'The municipality is a bit of a matrix structure, with multiple responsibilities and powers, and it is not always clear who is ultimately responsible. Sometimes you get a sectoral advice, and sometimes it is difficult to integrate different opinions. When a project begins, a consultation body within the municipality, who coordinates consultation public domain, invites all organisations around a project to a discussion, and about 25 people with different opinions are present. Every expertise belongs to another field, and it is difficult to find an integral connection. We need to be able to deal with a lot of different instructions at the same time, and we are responsible for taking account of all the different regulations sufficiently.'

Not only is the government sector defragmented according to the Belgian interviewee, but also the private sewerage and water companies are. Instead of merging into one company who deals with underground constructions, they operate as two separate companies who always need to coordinate among each other. They are very strong on the traditional engineer infrastructure contribution, but less on alternative innovation.

In order to think about multiuse and green, information is needed for convincing others that these solutions can contribute with additional environmental, economic and social benefits. According to the Belgian public company:

> '... when it comes to climate change adaptation, the right insights are missing. This is one of our largest challenges of today', and: 'Information is a barrier. Sometimes there is too much information, other times insufficient information. When available, it can be difficult to switch quickly and strategically. It could be great to have two more people available who could spend time on knowledge exchange and assist in switching. In practice the knowledge sharing is accidental. The public managers do take care of a large share of this, but not entirely.'

Comparing these two interviewees, they give clues about a more extensive transition pathway obtained by the Belgian interviewee. This can be explained by their role between a private and public entity, in which they benefit from a dynamic adaptability possibility like a firm, but are not fully left

over to the market prices, and instead enjoy more stable sources of incomes stemming from the government sector. This possibly creates extra space for transition.

Still, both these interviewees were seen as less willing seen from the outside world, i.e. the SPONGE partners. This observation is biased to the observed willingness during the interviews. The explanation for seeming unwillingness can be that they face strong barriers. This is explored further in the following section.

The transition pathway for the building real estate developer stakeholder is clearly to move towards more green and less grey solutions for capturing water floods. As developers they can take flood risks into account in design phases, but struggle due to a series of barriers. These barriers include lack of consumer willingness, political willingness, citizens willingness and scientific documentation. These are listen and specified in Figure 4.5.

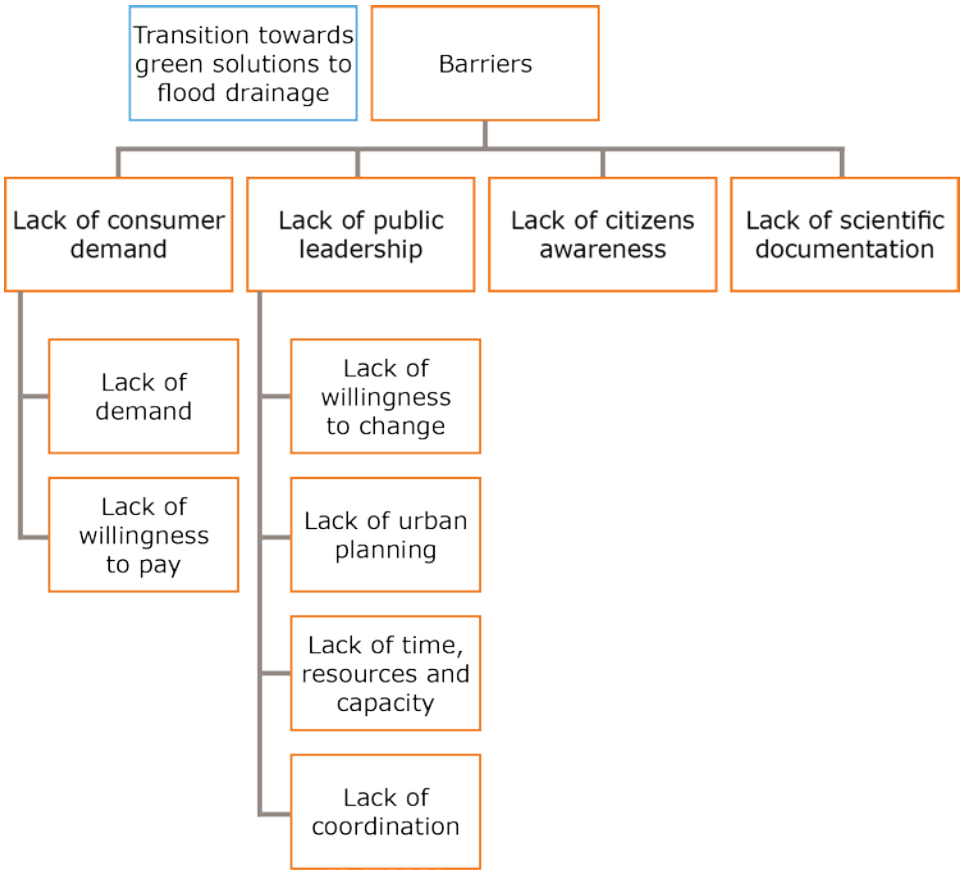


Figure 4.5 *Overview of transition ambitions (blue) and barriers (orange) for the building real estate developer stakeholder for a transition towards more green solutions to flood drainage*

4.4 The built environment advisory organisation category

4.4.1 Position and task roles

This category may be associated with the construction industry and developers, but individuals within this category differ. In particular, they provide advice on good practice on a number of aspects related with the built environment, including the delivery of sustainable drainage and urban water management, working with both government and private organisations. With these intentions, this stakeholder uses a not-for-profit business model for advising the industry about complicated public regulations and organisational structures. The industry in the UK is willing to pay for such assistance

to overcome the government sector complexities. As a result, there is a new niche – with supply and demand of advice.

The built environment advisory organisation is a construction industry research and information association. As a neutral, independent and not-for-profit body, it links other organisations with common interests and facilitate a range of collaborative activities that help improve the industry. Their main contributions involve filling the gaps between science/research and practice, as well as between policies and practice. The mandate is to provide guidance about how to overcome those gaps and challenges in delivering good practice.

The built environment advisory organisation is an association and can thus formally be categorised in between a private and government stakeholder. The core task is to influence and enable the building and real estate developers by informing about sustainable drainage (e.g. promoting green areas for flood risk purposes). This category differs from the building and real estate developer category because they are not inputters nor extractors (Figure 4.6).

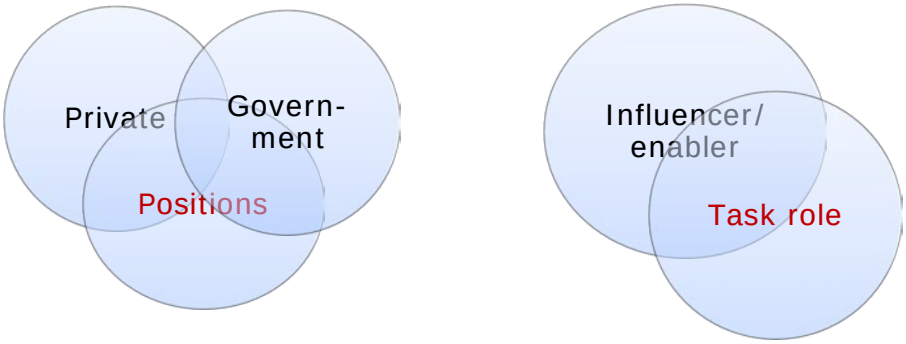


Figure 4.6 *The positions and task role of the built environment advisory organization; overlapping government and private positions, and acting as influencer and enabler*

4.4.2 Barriers

The fact that the advice is paid for, can be seen as a transition in itself. It is a new institutional organisation established for facilitating flood management. According to the UK association:

> 'The strategy consists of two parallel contributions: 1) to explore challenges and 2) to find funds to finance the development of guidance to overcome them. To explore the challenge involves a provision of a guidance that is underpinned by engagement and consolidates good practices in particular locations. This part concentrates primarily on the understanding of what the challenges are, in order to find how to provide good practices and rationalise a process around flood management. The other contribution relates with looking at policy and economical approaches to finance and funds of blue and green infrastructure, which is provided by public partners or the private sector.'

The UK association continues by saying:

> 'They are providing a platform for sharing practice on sustainable drainage. The webpage gets as much as 6,000 visits a month. In this project, they provide information, presentations, animations, infographics and fact sheets, to make information more accessible to people and provide confidence that good practice can be delivered. This is needed because the official planning documents are not always clear on what is required and on what should be delivered.'

Still, in the UK, the national public management has limited urgency for flood management than what they used to. The delivery of sustainable drainage and blue green infrastructure is increasingly based on local champions and voluntary relationships. The UK association further explains that:

> 'Local planners in some places have a limited understanding of surface water management and sustainable drainage and this can impede delivery. For surface water management and sustainable drainage the UK does not have sufficient legislation that enables the different local organisations to work more proactively together. The national legislation also lacks the strength to make it mandatory to apply sustainable drainage. The Minister for Communities and Local Government in 2015 made recommendations that for certain types and major developments, where feasible, sustainable drainage should be delivered. This is thus not made mandatory, and the responsibility has been left for the planners to decide. Nevertheless, the local planners are not necessarily in the best position to understand and judge on whether a sustainable drainage system is sufficient, nor whether it works in practice. Great opportunities get lost because the planners do not encourage sustainable drainage and cannot effectively challenge developers that suggest sustainable drainage is too expensive or not feasible. Looking from the planners point of view, they need to get their heads around things and work better with the County councils, but if you think of all the things that the planners have to do, drainage is not necessarily very high on their priority list. They also have not got the knowledge or the time to be able to look at this.'

In the UK, the core barrier is associated with the national public management's lack of mandatory implementation of local flood management adaptation measures, like sustainable drainage. This can be interpreted as reduced commitment of public management to deal with the flooding:

> 'One of the core barriers is a huge dis-connect between land-use planning and flood risk management especially when it comes to water management and the involvement of water quality, water resources, and sustainable drainage. A UK national planning framework is available to assist management of flood risks. This works well at a strategic level, but when concentrating further down at the local level, issues around surface water management becomes tricky. Whereas the Environment Agency is responsible for strategy, at a local level the County councils and unitary authorities undertake flood risk management. Planning is undertaken by different local planning authorities, that work in the District and Borough councils. The District authorities are responsible for going to developers and other organisations to ensure that different local government functions and responsibilities get integrated with each other when needed.'

Besides, the problem of lack of information about multiple benefits with sustainable drainage is a crucial:

> 'Another barrier relates with lack of information. Sustainable drainage tends to be regarded a little bit subjective, so at the moment there is no statutory standards to use. If looking at flood risks in a more comprehensive fashion it is useful to assess all benefits of flood risks, including improved water quality and increased biodiversity. When these are not taken into account in the planning phase, there is a discrepancy of the quality of the scheme that comes through.'

Further, information is costly, but could be critically important to encourage change towards more sustainable drainage practices:

> 'A useful driver to change would be to demonstrate that sustainable drainage would save money. In this way also developers, like authorities, insurance industry, and water companies, would acknowledge the usefulness. Accordingly, although some already exist, there is also for these reasons a need for more Cost benefit analyses and Willingness to Pay (WTP) studies. Because it is difficult to conduct these generically, they must be done on a project by project basis, which is costly and takes a lot of time as well.'

Finally, the lack of awareness about flood management is mentioned as a problem in the UK:

> 'Unfortunately, the awareness of climate change impacts is still low in the UK. At the moment people's concerns are directed towards Brexit. At this stage people are only aware when there is a flooding problem happening. This is a barrier, as they need to realise the value before investments in flooding can be expected to be extended.'

The transition pathway for the built environment advisory organisation is clearly to move towards sustainable drainage solutions and move away from grey solutions for capturing water floods. This association have two ambitions: 1) to realise good practices for sustainable drainage for flood, and 2) find funds and finance for sustainable drainage solutions. This association is a not-for-profit market actor who advise developer to choose sustainable drainage designs to take flood risks into account, but struggle due to a series of barriers. They include lack of urgency in national public management, by local planners, lack of public coordination, lack of information and public awareness. These are listen and specified in Figure 4.7.

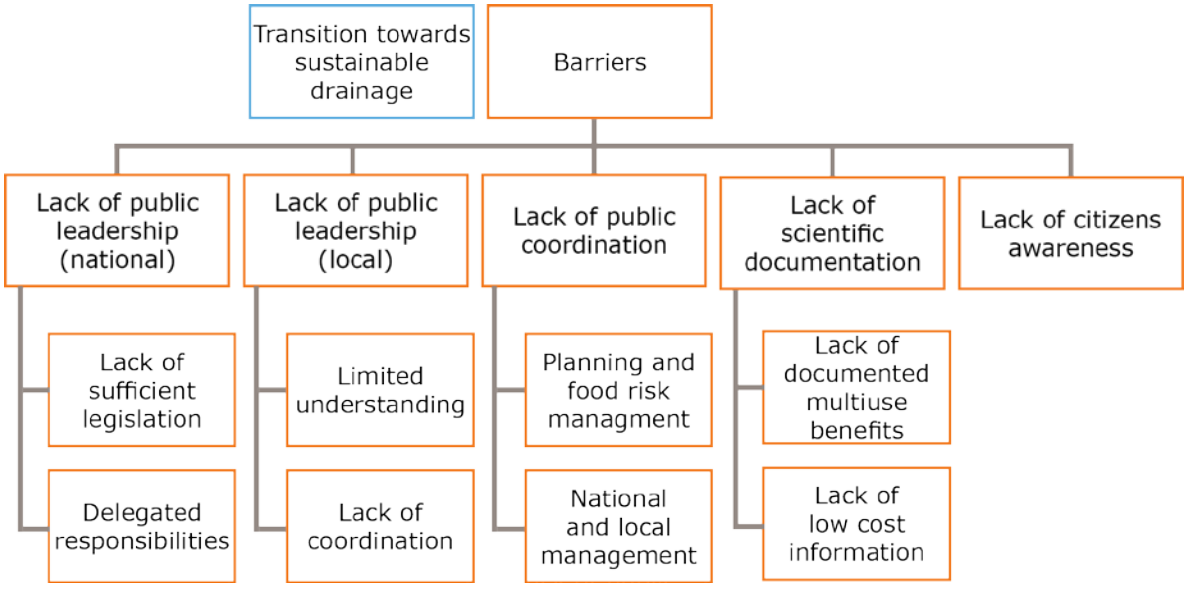


Figure 4.7 *Overview of transition ambitions (blue) and barriers (orange) for the built environment advisory organisation stakeholder for a transition towards more use of sustainable drainage*

4.5 Public city flood management category

4.5.1 Position and task roles

The public city flood management stakeholders were represented in all three countries.
In Belgium, a Spatial section with a team of 15 spatial planners, working on a Strategic Spatial Structure Plan and other instruments to meet urban planning ambitions is represented. The main ambition is to ensure future sustainability, which can be done, on the one hand, by developing and communicating a clear vision and informing about efficient instruments, such as the spatial structural plan, spatial implementation plans and spatial master plans. On the other hand, policy preparatory work is conducted in collaboration with multiple stakeholders in a multi-annual planning.

In the UK, an independent unincorporated city partnership network was established in May 2017. Previously (2001-2017), the secretariat had been part of the Environment Agency. The network consists of experts representing the public, private and community sectors. Together these organisations are helping to prepare for extreme weather today and a changing future climate.

Although the network formally is part of the government sector, it is recognised as a critical friend and has a rather independent voice around the issues of climate change.

In the Netherlands, a city programme on water sensitivity has developed into a movement. It develops measures for flood management. The movement is driven forward by the city municipality, together with citizens and entrepreneurs. Both community building and scientific technical insights are needed to deal with the risks for flooding. The communication and approach applied is aimed at equivalent involvement of municipal services, city residents, companies, interest organisations, associations, etc. In cooperation, everyone contributes with their own possibilities. By cooperating together, silent wishes and needs become explicit, and as a result this step by step process creates a broader sense of co-ownership.

The public city flood management stakeholder category represents a government stakeholder. The main tasks include the regulation and administration of flood management in cities, and they are influencing and enabling multiple stakeholders by organising different forms of stakeholder engagement (Figure 4.8).

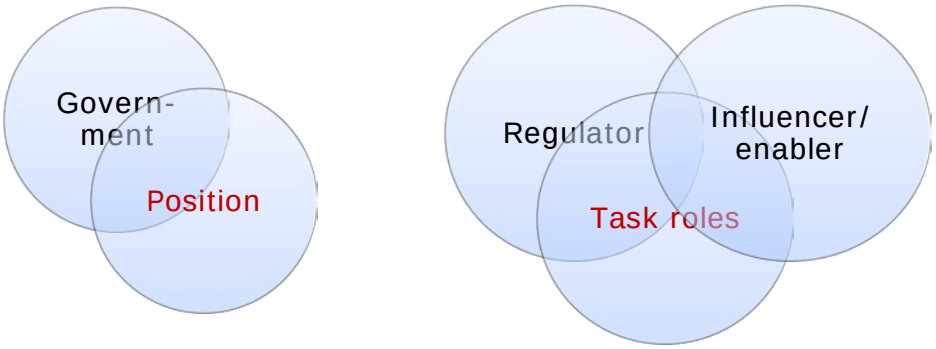


Figure 4.8 *The positions and task role of the public city flood management; government position, and acting as regulators, influencers and enablers*

4.5.2 Barriers

Transition elements are observed in all narratives. The most obvious transition elements are the network activities, the niches in which experiments take place, typically lead by an enabler. All three interviewees clearly took an enabler role, by arranging new settings for interaction, by spreading a sense of urgency and by influencing others to take part. Changing skills, urgencies and capital are observed across the case studies.

For instance, in Belgium the urgencies have become apparent over the last years within the government sector, but not among citizens and businesses. As the Belgian Spatial section puts it:

> 'In Flanders, the water agenda is now quite urgent. Ten years ago water was a marginal element for urban development. Now it is on top of the agenda. Notably, this change in urgency is more apparent within the public sector. Still, the awareness is very limited elsewhere, for instance, citizens and businesses respond only when flooding problems happen. Therefore, we as public sector representatives have to do something, other stakeholders will not. So for now the government steers this process' and 'We strive to work co-creatively from day one when we start a new project. Stakeholders take part around the table and in working groups, in which the CEOs, the directors and the political representatives can contribute with their say in the process with the aim of reaching a balanced solution that everyone accepts. These involve stakeholders with expertise on water and economic issues.'

The change in capital can be observed in terms of more green surfaces in cities, including in Belgium:

> ‘Working at the level of city and landscapes, we design a structural city plan that includes maps of all the blue and green aspects in the city, among other things. The struggle is to improve green areas and to deal with water flooding in the city. The water plan is still in its infancy, but will be ready in a year. We work with other development departments of Antwerp, like the energy department. They create climate plans with environmental conditions around energy, climate, as well as blue/green development’, and ‘... we want to streamline complex ecological, economic and social aspects.’

In the UK, many efforts are made to ensure urgency and leadership for flood management in cities even though this is lacking at a national level. The mayor of a city can play a very important role. He/she can invite stakeholders directly in order to attract more prestige to flood management. The UK partnership network says that:

> ‘The partnership network is set up to ensure stakeholder engagement, coordination and knowledge exchange about climate change impacts and how to adapt to them. Context related resilience needs to be taken into account when identifying how to best adapt to climate change’ and ‘The good news is that the Mayor sees the urgency of risks of flooding with climate change’ and ‘The Major plays an important role as to motivation people to take part, as he is formally inviting them to take part.’

Note that although the partnership network is enabling awareness raising and exchange of information and ideas, they operate with a very low budget. The idea is that stakeholders will grasp the urgency and prioritise flood management in their own work by including it their own budgets

> ‘The core aim is to create a more resilient city. For instance, we want to see houses and infrastructure built with future climate in mind, in ways that will prevent over heating – so that fewer people die from heat. Moreover, we want to see more green space, create healthier spaces for people and are concerned about social vulnerability. Given the fact that the impacts of climate change will not be distributed fairly, and that the most vulnerable people are the ones who will suffer the most, ideally this should be taken into account by decision-makers. As such, fairness and equality are very important issues to the Mayor’ and ‘We represent the members ... the members refers to the 25 representatives sitting in the Steering group (i.e. representatives of fire, police, rescue, local authority districts, the academic community, finance industry, insurance industry, public health, the Environment Agency, business community, engineering, housing, the non-governmental organisations, etc.)’

In the Netherlands, it was explained that the government sector consists of too many sections with separated responsibilities on related issues, and that the challenge is to implement flood management horizontally, and not be put into yet another section. Hence, the aim is that flood management is part of the organisational structure horizontally. According to the Dutch movement:

> ‘A core ambition is to find how the different municipal services can be motivated to think of and take climate adaptive measures into account in each urban plan and project water management. In this way climate adaptation is a point of departure in each policy and plan in flexible manners.’

In order to understand transition of skills, urgencies and capital, this is based in changing cultural habits as well. Habits are very difficult to change, but it is possible by means of sufficient dialogues:

> ‘At different levels and in different manners, there is a cultural shift in public management, a transition which requires change in people’s perceptions about what to do and why’ and ‘The ambition is to create a webpage, a platform, in which individuals in a particular neighbourhood can meet and exchange ideas. This involves facilitation the possibilities for potential investors to meet designers. It also provides access to

information and the neighbourhood can get in contact with the wider world. Also, a neighbourhood newspaper has been developed in a project. Moreover, a pilot was involving a so-called ambassador of a neighbourhood who was knocking on every door to speak with and inform residents. It is essential in the work of the movement to identify and involve such individuals who are willing to carry out initiatives (i.e. enablers).'

Transition can involve integration and coordination of new practices into old, multiple activities within a specific area, multiple (social, economic and environmental) long-term policy goals, multiple stakeholder interests, etc:

'At neighbourhood level, neighbourhood organisations, are involved. They are important because they know what is more urgent in a particular area. This includes technical aspects, such as the need to build new houses, or renewal of old ones. It also includes social issues, such as observed levels of happiness and problems. It also makes a difference if people rent or own the houses. All these aspects are important to address explicitly, in order to ensure a good quality cooperation. The municipality is aiming at making all technical and social aspects stronger. There is often a situation in which a few individuals seem to not want to cooperate, but the question is whether it is worth giving this very small group a lot of attention, or instead take into account the silent majority who see the urgency to solve the problems. The trick is to at early stages address urgent issue to avoid escalations of protests'.

The lack of awareness among people about possible consequences with flooding if not invested in now is hampering flood management in Belgium. The awareness is lowest among bottom-up stakeholders: the citizens and businesses. The Belgian Spatial section explains:

'Bottom-up contributions are still limited, but it is a target to achieve more' and 'The biggest obstruction for increased cooperation relates with arguments in the forms of 'not in my backyard'. ... Regularly, participatory meetings are arranged to integrate citizens inputs in the plans. Many stakeholders must be involved in interaction to ensure support by everyone. It is a step-by-step process, which eventually stimulates awareness about water management and the construction of the landscape park. Still, more neighbours need to be involved.'

The key urgency in the UK is by this interviewee told to be lack of leadership by national government. As explained earlier, the lack of leadership was also by the UK built environment advisory stakeholder provided as the most urgent one in the UK. The UK partnership network comments that:

'One of the main challenges is to convince the national politicians about the urgency of the issue of adaptation to climate change – and see them taking leadership on the issue. It is a dramatic barrier that at a national level adaptation to climate change is not prioritised as urgent at this stage, although the UK has a climate change act with a whole process about climate change adaptation. This came out in 2008 when this was a priority, whereas in 2010 it fell out of priority. The requirements of the Act have not changed, but they have been interpreted differently by successive governments. For example, the act gave government the power to direct UK organisations, including local governments, large cooperations and regulators to report on their climate adaptation actions. After 2010 they dropped the mandatory obligation of reporting and made it voluntary. As a consequence, local government stopped reporting. The first national adaptation programme came out in 2013. This fails to incentivise organisations to adapt to climate change. It basically collects efforts already carried out by organisations and lacks any incentives for the organisations falling behind to actually change that.'

The transition pathway for the public flood city management stakeholder category is:
1. to improve green areas and deal with water flood
2. to create a more flood resilient city and
3. to find how different public services take flood into account.

The main recommendations are:
1. step-by-step involvement of stakeholders
2. invitation of stakeholders by Major to make framing attractive, and
3. early stage involvement of stakeholders in processes.

The three representatives of this category inform of some barriers. They include lack of national public leadership, lack of public coordination, lack of public awareness among citizens and businesses. These are listen and specified in Figure 4.9.

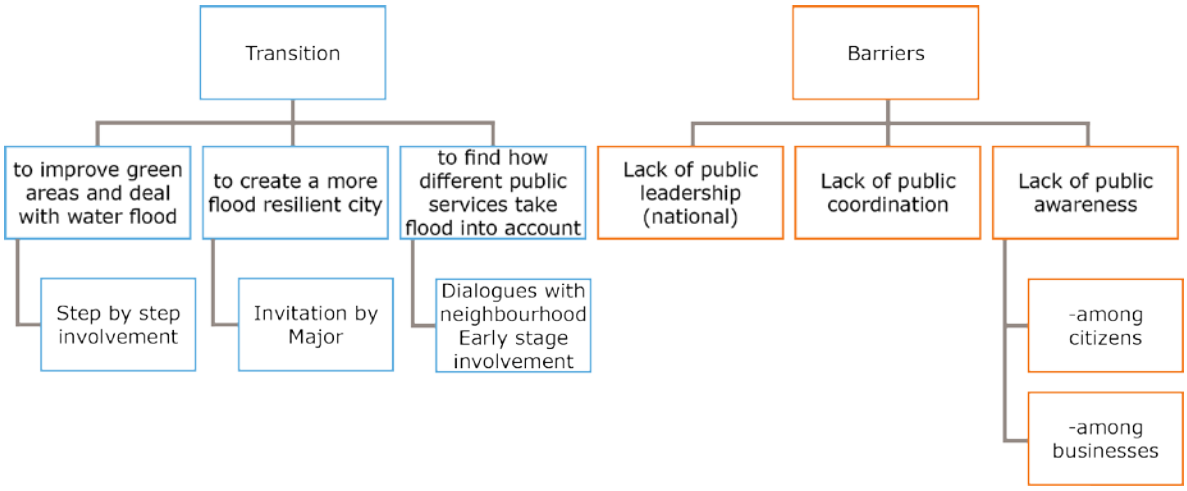


Figure 4.9 *Overview of transition ambitions (blue) and barriers (orange) for the public city flood management stakeholder category for a transition towards more use of green for flood management in cities*

4.6 Summing up

The three example stakeholder categories investigated in this study are:
1. the building real estate developers
2. the built environment advisory, and
3. the public city flood management categories.

The information provided to address steps 1-3 of the template (Section 3.4) for these three groups are based on six interviews. All nine interviews are used for addressing step 4 – the strategy for cooperation (see Appendix 3). While the interviewees provide useful and interesting insights about information relevant to the groups, the information provided cannot in any way be seen as statistically representative group opinions. This research is conceptual, and do not aim at statistical representation.

The insights of transition pathways for the public city flood management category are thus based on one interviewee in each of the three countries. In all three countries they have established networks including multiple stakeholders who on a project specific or regular basis meet to discuss. The three interviewees explain how a different arrangement exists today compared with some years ago. The stakeholder involvement and dialogues have, for instance, gained a more critical role to flood management. In all three countries, social learning has been enhanced in multi-stakeholder networks, and interaction is seen to be critical for achieving improved flood management. These interactions frequently lead to improved commitments, mutual trusts and shared re-framing. As such the public city flood management in all countries have contributed to transformation by means of changes in collaboration among different stakeholders.

Nevertheless, some characters of the networks differ. In Belgium, for instance, the dialogues and argumentation are still very much based on technology-driven arguments. The traditional engineer is very central to finding so-called traditional 'grey' solutions to flood management. Notably, this is changing, as innovative green new areas are being built in Belgium, in which cooperation between the engineers and green infrastructure experts, and others, are leading to new innovative solutions to flood management.

In the UK, the partnership network is escalating social learning by actively involving a city network with multiple government and private expert stakeholders that share their specific expertise. Not only do they organise multiple meetings and workshops, but they also gain importance by the central role of a very committed mayor. This is a form of a sophisticated framing, in which willing well known people invite and encourage stakeholder motivation. Hence, the mayor contributes with prestigious framing to attract stakeholders to take part in a network for flood management.

In the Netherlands, a movement is established within the municipality of a city. In this network, not only experts and people in central positions are involved, but the neighbourhood has a central role to play as well. Social learning takes place by face-to-face interactions in neighbourhoods, as well by an online platform. The idea is that potential investors and people with ideas for flood management learn from each other, establish trust and get inspired to cooperate and contribute. It is not only about finding solutions to flood management, but to identify and solve neighbourhood problems. The idea is to integrate flood management into all kinds of urban project development, and not yet as a separate issue to solve.

In this chapter the transition pathways of selected stakeholder categories have been discussed, based on a total of nine interviews. The stakeholder transition pathways can clarify and demonstrate what barriers are of relevance. When knowing the exact barriers, it is also possible to identify possible ways to overcome them. The concept of transition pathways can in this way provide relevant insights to the SPONGE toolbox. Also the questions asked during interviews are of relevance to SPONGE (see questions in Section 4.1).

5 Template application: involving stakeholders step-by-step

5.1 Worked out example of the template

The experiences made with cooperation in networks have shown that social learning about flood management can lead to stakeholders taking action, and actually implementing measures that mitigate flood impacts in cities.

This chapter addresses the possibilities to move from social learning to stakeholder action. In particular, examples are provided of template in Figure 3.6. It is applied for the three stakeholder categories that are explored in this study in more detail:

1. the building real estate developer
2. the built environment advisory organisation and
3. the public city flood management.

The step-by-step application of the template is meant to support the SPONGE toolbox. With a new stakeholder, it is recommended to follow the steps in the template; see questions of the template in Section 3.4:

1. What is the position of this stakeholder? (public, private, citizen, NGO, etc.)
2. What are the task roles of this stakeholder? (Figure 3.3)
3. What are the relevant barriers that this stakeholder must overcome? (e.g. regulatory, informational, financial, etc.)
4. What are the relevant options for dealing with barriers? (e.g. levels of communication Figure 3.4)

Given that we already have addressed in detail the first three questions in Chapter 4, we now provide a summary of these before we proceed to questions 4).

First, the building real estate developer:

1. Position: both a government and private stakeholder
2. Task role: carries out tasks as inputter, extractor and influencer (Figure 4.4)
3. Barriers:
    1. lack of public leadership
    2. lack of scientific documentation
    3. lack of citizen awareness and
    4. lack of consumer demand (Figure 4.5).

Second, the built environment advisory organisation:

1. Position: both a government and private stakeholder
2. Task roles carries out tasks as influencer (Figure 4.6)
3. Barriers:
    1. lack of public leadership
    2. lack of public coordination
    3. lack of scientific documentation, and
    4. lack of citizen awareness (Figure 4.7).

Third, the public city flood management:

1. Position: government stakeholder
2. Task roles: carries out tasks as regulator and influencer (Figure 4.8)
3. Barriers
    1. lack of public leadership
    2. lack of public coordination
    3. lack of citizen awareness and
    4. lack of business awareness (Figure 4.9).

Lack of public leadership and public coordination are specifications of lacking governmental support (Figure 3.6) that restrict flood adaption in cities. Actually, given these results, the governmental support in terms of taking leadership and coordinating are seen as crucial for flood adaptation according to the interviewees. Besides, consumers, businesses and consumers are highlighted stakeholders who potentially could contribute extensively to flood adaptation but are not yet doing so. Besides, the lack of scientific contributions are impeding flood adaptation.

Steps 1 to 3 cannot easily be transferred from one to the other stakeholder. They must be based on in-depth interviews, so that a particular stakeholder can specify how the particular situation is. This implies that with new stakeholders, the questions specified for narrative analyses in Section 4.1. can be asked during interviews.

In Figure 5.1, the template in Figure 3.6 is adjusted to these three stakeholder categories:
1. the building real estate developer
2. the built environment advisory organisation and
3. the public city flood management.

The options not relevant to any of these stakeholders have been removed from the figure. Below, the possible strategies, communication levels and processes for dealing with barriers are explained more in detail.

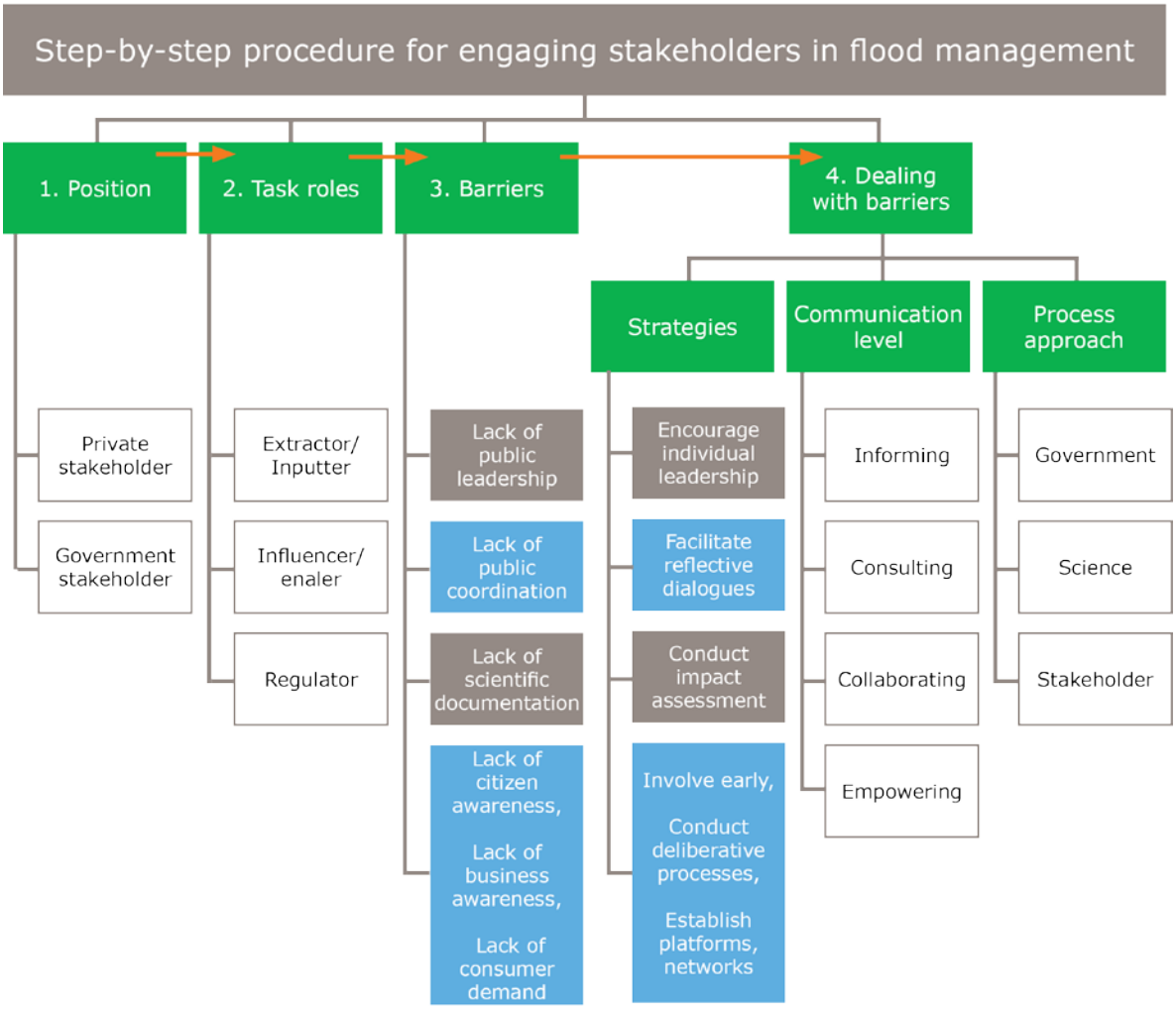


Figure 5.1 *Adapted template of stakeholder involvement in flood management is adapted for: 1) the building real estate developer, 2) the built environment advisory organisation and 3) the public city flood management*

4. As for step 4, possible strategies are listed Figure 5.1. These have been explained in this report (see Section 3.4 for more explanations about what they are). They link one-by-one to the boxes with listed barriers. In other words:
   - With lack of public leadership, a relevant strategy would be to encourage individual leadership. This can take place by self-empowerment of stakeholders, for instance through citizens initiatives, or as illustrated in the UK case: the Mayor takes responsibilities beyond the obligatory tasks to encourage flood adaption among multiple stakeholders.
   - With lack of public coordination, a relevant strategy would be to facilitate reflective dialogues (Section 3.4).
   - With lack of scientific documentation, a relevant strategy would be to conduct impact assessment (Section 3.4).
   - With lack of citizen awareness, lack of business awareness, and/or lack of consumer demand, relevant strategies would be to involve stakeholders early on in a process, to conduct deliberative processes, and/ or to establish platforms, networks (Section 3.4).

Moreover, the process approach needs to be addressed (Section 3.4). In this case, for the identified strategies, the processes that are relevant are:

- Encouraging individual leadership - government based
- Facilitating reflective dialogues - government based
- Conducting impact assessment - science based
- Involving stakeholders early on in a process, for conducting deliberative processes, and/ or for establishing platforms, networks - stakeholder based or government based.

The strategies linked with barriers in Figures 3.6/5.1 can thus be used for the toolbox. They belong to different communication levels (Section 3.4): informing, consultation, collaboration and empowerment. The strategies can thus contribute in the forms of multiple communication levels and throughout a transition. Depending on the stage and particular purpose at the time, all levels can be used appropriately. In Figure 5.2, the strategy examples are coupled with communication levels listed in Section 3.4.

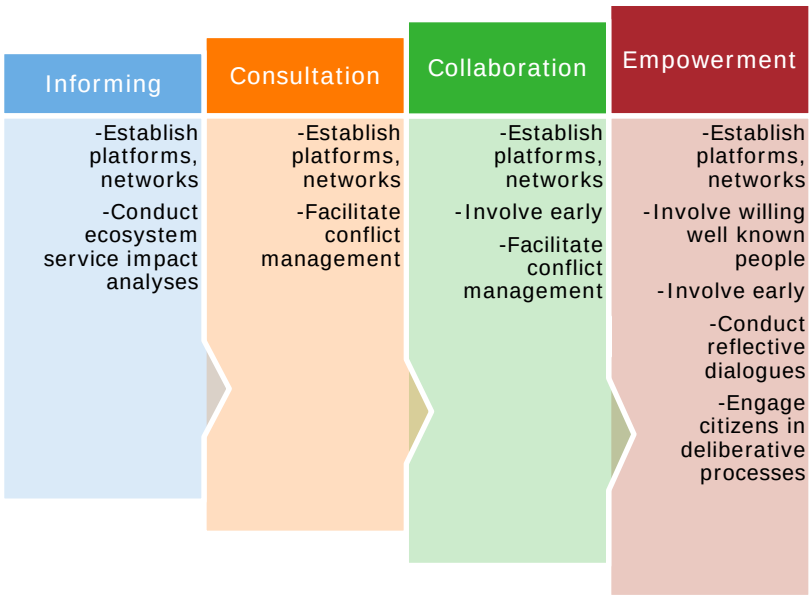


Figure 5.2 *Communication levels and examples of strategies for dealing with flood management barriers*

The three stakeholder categories addressed here consist of very few individuals and cannot be taken as statistical representative of the respective groups. The question is: how to proceed with another stakeholder? In other words, how to apply the template for yet another stakeholder?

Even though the interviewees in this study contribute with valuable insights that are of relevance to the other groups, it is not possible to complete the template for these groups without yet more interviews to be conducted. This implies that, if a stakeholder formally is to be seen as a private or government stakeholder, they need to be interviewed and questions in the narrative analyses (Section 4.1) can be used during interviews.

Moreover, if a stakeholder does not belong to government and/or private groups, such as the citizens, the consumers, the NGOs and the scientists, they must be interviewed to find position, task role, barriers, strategies and process of engagement. Looking at the template in Figure 3.6, some of these stakeholders will undoubtedly be carrying out tasks others than the ones included here, such in the roles of affectees and beneficiaries. They will also struggle with barriers not yet discussed, in which other strategies can be seen useful. The basic strategies of communication (informing, consulting, collaborating and empowering) can be helpful to find ways to deal with upcoming barriers not dealt with here directly. Also, the strategies explained as part of the processes in Figure 3.5 (government based, stakeholder based or science based) can provide clues about how to deal with upcoming barriers. The overall instruction for applying the template presented in this study is that new in-depth interviews must take place with the new respective stakeholders to be included.

5.2 Connecting template with the SPONGE toolbox

Notably, the SPONGE toolbox is still under development into a digital tool which can assist stakeholders to encourage initiatives for taking action that can reduce risks for flooding in cities. In this study a template with four steps have been developed to assist the SPONGE toolbox development. The following is recommended for the toolbox:

1. Specify sub-groups of *stakeholder positions* when new stakeholders are to be included for the toolbox. Note for instance that the government stakeholders address different levels and multiple purposes, ranging from planning, environmental regulations, flooding, etc. Stakeholders representing the education and health systems, infrastructure, etc., can also be relevant to government stakeholders. The private stakeholders include manufactories, water entrepreneurs, horticulture, and many more. Citizens can be specified to the action groups and the general non-aware ones, and NGOs may represent tourism, but also biodiversity, etc. A more detailed *sub-group list* can be specified than what is provided in Section 3.3.
2. The specific *task roles* carried out by a particular stakeholder need to be identified during interviews. Note that the *influencer* role can be particular useful for understanding how to stimulate stakeholders to adapt behaviours to take account of flood risks. How is this role carried out in practice? Is this an *enabler*, who influence and convince others to adapt? When new stakeholders are to be included, for instance a citizen, is it for instance of relevance to understand how roles are carried out as affectees (are they victims of flooding?), beneficiaries (do they benefit from green constructions?) and influencers (do they motivate other citizens to invest in green?).
3. Also the *barriers of a stakeholder* must be identified during interviews with new stakeholders. For instance, a citizen may have problems with understanding how the government stakeholders can assist, and how the public regulations work in a specific case. It can for instance be a problem for citizen initiatives that they do not belong to private nor public regulations but in between.
4. Use the information about *possible strategies for overcoming barriers* provided in Section 3.4 in this report. In the case of citizens, they can play an important role in deliberative processes to reflect on long term consequences, which could be included as a strategy. As for climate change, long term thinking can be very useful. The links between barriers and relevant strategies need to be fully understood. Such links are made in Figure 5.1, as illustrative examples. With new stakeholders, experts must be involved to recommend what strategy would fit the most to a particular barrier.
5. Stakeholder *participation processes* specified in Section 3.4. include steps relevant to a government based process, science based process and a stakeholder based process. It is recommended that these steps are considered for new stakeholders to be included in the SPONGE toolbox. Also in the case of process, which is a sequence of strategies over time, experts must be involved to recommend on what process is appropriate for a particular barrier.

6 Concluding remarks

Climate change adaptation has become an urgent issue for cities, with intensified problems of flooding in cities across the world. Increasingly, urban stakeholders are becoming more engaged in climate change adaptation, also in Belgium, the UK and the Netherlands. The aim of this study is to motivate stakeholder engagement for urban flood management. It is illustrated that different stakeholders can face completely different barriers and become motivated by means of very different strategies. This depends on contexts and individual/organisational characteristics.

Against this background, a template is developed for assisting the development of the online toolbox in the Interreg EU project called SPONGE. The template addresses four steps:

1. Identify stakeholder position
2. Identify stakeholder task roles
3. Explore barriers of a stakeholder
4. Find best strategies for overcoming these barriers.

Although the template has been tested for three stakeholder categories - 1) the building real estate developer, 2) the built environment advisory organisation and 3) the public city flood management - it could also be filled in for other stakeholder groups, such as citizens, NGOs, consumers and scientists. For this to happen, interviews must be conducted for each new stakeholder to be included. Also, only a limited number of interviews were conducted for the three groups, and also for stakeholders belonging to any of these three groups, more interviews must be conducted.

To prepare for interviews, a questionnaire survey is developed in this study to find whether a stakeholder is judged willing to adapt to flood risks, and whether they have been judged important for flood management by SPONGE partners. Some stakeholders were judged less willing in the survey. During in-depth interviews, however, it became obvious that the judgement of willingness based on the questionnaire survey was not always accurate. In fact, the less willing stakeholders were in several instances very willing, though they were restricted by barriers. As such, they struggle against systems that do not favour their flood adaptation activities. In future applications of the questionnaire, it is recommended to replace the ‘willingness’ with another term, for instance, ‘visible’ or ‘noticeable’ or ‘observable’.

Interviewees explained that transition is taking place in the three countries. More frequently than earlier, ‘green solutions’ are implemented as solutions to intensified flood problems in cities. Based on the in-depth interviews, the transition pathways addressed across the countries share that they proceed with multiple stakeholder participation and workshop arrangements with face-to-face interactions. The shared ambition is to find ways for re-designing cities from grey to green, in which green can deal with flooding issues, but a lot more. Green solutions are also thought to be favourable to quality of life, recreation, playground, air quality, health, heat stress, and depending on levels of inclusiveness, green can also contribute to social cohesion.

At the same time, transitions are hampered by a series of barriers. The barriers identified in this study include lack of public leadership, lack of public coordination, lack of scientific documentation, lack of citizen awareness, lack of business awareness and lack of consumer demand. The strategies recommended and explained in this study that can contribute to dealing with these barriers, include encouraging individual leadership, facilitating reflective dialogues, conducting impact assessment, involving stakeholders at early stages, conducting deliberative processes, as well as establishing platforms and networks.

In transition theory, social learning is seen a crucial dynamics for change by means of stakeholder participation and cooperation. Commitment, mutual trust and shared re-framing are critical factors deciding levels of change. It needs to be further developed how the barriers can be explained and

dealt in terms of these factors. In future research, it would be valuable to explore further how these factors link with the barriers.

Moreover, it is recommended in this study that it would not be enough to carry out a single strategy. Depending on the exact purpose, it is necessarily to include sequences of strategies. It is possible to consciously choose for a government based, science based and/or stakeholder based approach on stakeholder participation consisting of a series of logical steps, or a combination of those.

Furthermore, barriers and choice of strategies depend on particular contexts. More stakeholder engagement implies needs for new ways to cooperate. Existing experiences with cooperation were informed by different stakeholders in flood management, and are summarised in the following propositions:

• When stakeholders in roles of experts and leaders are invited to discuss and exchange ideas, cooperation is not judged complicated.
• When technical engineer solutions are searched for, cooperation among experts is not judged complicated.
• When sustainable drainage solutions are searched for, and when multiple stakeholder participation is needed, and this is more judged complicated.
• Cooperation effects on flood management are judged to not necessarily be large, that depends on how it is carried out.
• It is judged a possibility to partly replace lack of general public leadership with public representatives who feel the urgency, cooperate and invite others to take action.

Additionally, at a more general level, based on the insights developed in this study, it is recommended that more research is needed to find:

- How flood management should be integrated into multiple activities
- How incentives aiming for flood adaptation should be merged with multiple stakeholder incentives and objectives
- How the government sector best can:
  - facilitate stakeholders who want to contribute with flood management
  - integrate flood management across public groups and governance levels
  - involve stakeholders continuously and at early project stages.

References and websites

Almeida, M.C., Vieira, P., Smeets, P., 2014. Extending the water safety plan concept to the urban water cycle. Water Policy 16, 298–322. https://doi.org/10.2166/wp.2013.137

Arnstein, S.R., 1969. A Ladder Of Citizen Participation. J. Am. Inst. Plann. 35, 216–224. https://doi.org/10.1080/01944366908977225

Bautista, E., Hanhardt, E., Osorio, J.C., Dwyer, N., 2014. New York City Environmental Justice Alliance Waterfront Justice Project. Local Environ. 20, 664–682. https://doi.org/10.1080/13549839.2014.949644

Bisgrove, R., 2010. Urban horticulture: Future scenarios. Acta Hortic. 881, 33–46.

Bosch-Sijtsema, P.M., Postma, T.J.B.M., 2009. Cooperative innovation projects: Capabilities and governance mechanisms. J. Prod. Innov. Manag. 26, 58–70. https://doi.org/10.1111/j.1540-5885.2009.00334.x

Colin-Castillo, S., Woodward, R.T., 2015. Measuring the potential for self-governance: An approach for the community-based management of the common-pool resources. Int. J. Commons 9, 281–305.

Crabbé, A., Wiering, M., Liefferink, D., 2015. Adapting flood management to climate change: Comparing policy frames and governance practices in the low countries. J. Water Clim. Chang. 6, 55–70. https://doi.org/10.2166/wcc.2014.018

Das, A.K., Takahashi, L.M., 2009. Evolving Institutional Arrangements, Scaling Up, and Sustainability: Emerging Issues in Participatory Slum Upgrading in Ahmedabad, India. J. Plan. Educ. Res. 29, 213–232. https://doi.org/10.1177/0739456X09348613

Dassen, T., Kunseler, E., van Kessenich, L.M., 2013. The sustainable city: An analytical-deliberative approach to assess policy in the context of sustainable urban development. Sustain. Dev. 21. https://doi.org/10.1002/sd.1550

Dijkshoorn-Dekker, M.W.C, Soma, K., and Blaeij, A. 2017. Groene initiatieven in de stad - Handelingsperspectief provincies voor het stimuleren van maatschappelijke betrokkenheid bij groen in de stad. English summary included. The Hague. https://doi.org/10.18174/424282

Dobbie, M.F., Brown, R.R., Farrelly, M.A., 2016. Risk governance in the water sensitive city: Practitioner perspectives on ownership, management and trust. Environ. Sci. Policy 55, 218–227. https://doi.org/10.1016/j.envsci.2015.10.008

Dryzek, J.S., 2002. Deliberative Democracy and Beyond: Liberals, Critics, Contestations. Oxford University Press, Oxford.

Dunford, R., Harrison, P.A., Rounsevell, M.D.A., 2014. Exploring scenario and model uncertainty in cross-sectoral integrated assessment approaches to climate change impacts. Clim. Change 132, 417–432. https://doi.org/10.1007/s10584-014-1211-3

Dupuis, J., Biesbroek, R., 2013. Comparing apples and oranges: The dependent variable problem in comparing and evaluating climate change adaptation policies. Glob. Environ. Chang. 23, 1476–1487. https://doi.org/10.1016/j.gloenvcha.2013.07.022

Eames, M., Dixon, T., May, T., Hunt, M., 2013. City futures: Exploring urban retrofit and sustainable transitions. Build. Res. Inf. 41, 504–516. https://doi.org/10.1080/09613218.2013.805063

Elbakidze, M., Dawson, L., Andersson, K., Axelsson, R., Angelstam, P., Stjernquist, I., Teitelbaum, S., Schlyter, P., Thellbro, C., 2015. Is spatial planning a collaborative learning process? A case study from a rural-urban gradient in Sweden. Land use policy 48, 270–285. https://doi.org/10.1016/j.landusepol.2015.05.001

Elliott, M., 2014. Integrated marine science and management: Wading through the morass. Mar. Pollut. Bull. 86, 1–4. https://doi.org/10.1016/j.marpolbul.2014.07.026

Enqvist, J., Tengö, M., Bodin, Ö., 2014. Citizen networks in the Garden City: Protecting urban ecosystems in rapid urbanization. Landsc. Urban Plan. 130, 24–35. https://doi.org/10.1016/j.landurbplan.2014.06.007

Faram, M., Ashley, R., Chatfield, P., Andho, R.Y., 2010. Approporiate draining systems for a changing climate. Proc. Inst. Civ. Eng. Eng. Sustain. 163, 107–116.

Geels, F.W., 2011. The multi-level perspective on sustainability transitions: Responses to seven criticisms. Environ. Innov. Soc. Transitions 1, 24–40. https://doi.org/10.1016/j.eist.2011.02.002

Giest, S., Howlett, M., 2014. Understanding the pre-conditions of commons governance: The role of network management. Environ. Sci. Policy 36, 37–47. https://doi.org/10.1016/j.envsci.2013.07.010

Gustavsson, E., Elander, I., 2016. Sustainability potential of a redevelopment initiative in Swedish public housing: The ambiguous role of residents' participation and place identity. Prog. Plann. 103, 1–25. https://doi.org/10.1016/j.progress.2014.10.003

Habermas, J., 1994. Three normative models of democracy. Constellations 1, 1–10. https://doi.org/10.1111/j.1467-8675.1994.tb00001.x

Hay, I., 2000. Qualitative research methods in human geography. Oxford University Press, Oxford.

Hein, L., van Koppen, K., de Groot, R.S., van Ierland, E.C., 2006. Spatial scales, stakeholders and the valuation of ecosystem services. Ecol. Econ. 57, 209–228. https://doi.org/10.1016/j.ecolecon.2005.04.005

Hewitt, R., Escobar, F., 2011. The territorial dynamics of fast-growing regions: Unsustainable land use change and future policy challenges in Madrid, Spain. Appl. Geogr. 31, 650–667. https://doi.org/10.1016/j.apgeog.2010.11.002

Howe, C., Suich, H., Vira, B., Mace, G., 2014. Creating win-wins from trade-offs? Ecosystem services for human well-being: A meta-analysis of ecosystem service trade-offs and synergies in the real world. Glob. Environ. Chang. 28, 263–275. https://doi.org/10.1016/j.gloenvcha.2014.07.005

Hunt, A., Watkiss, P., 2011. Climate change impacts and adaptation in cities: A review of the literature. Clim. Change 104, 13–49. https://doi.org/10.1007/s10584-010-9975-6

Iwaniec, D., Wiek, A., 2014. Advancing Sustainability Visioning Practice in Planning—The General Plan Update in Phoenix, Arizona. Plan. Pract. Res. 29, 543–568. https://doi.org/10.1080/02697459.2014.977004

Jeffers, J.M., 2013. Double exposures and decision making: Adaptation policy and planning in Ireland's coastal cities during a boom-bust cycle. Environ. Plan. A 45, 1436–1454. https://doi.org/10.1068/a45386

Jongeneel, R., Polman, N., Slangen, L., 2012. Cost-benefit analysis of the Dutch nature policy: Transaction costs and land market impacts. Land use policy 29, 827–836. https://doi.org/10.1016/j.landusepol.2011.12.010

Kietzmann, J.H., Hermkens, K., McCarthy, I.P., Silvestre, B.S., 2011. Social media? Get serious! Understanding the functional building blocks of social media. Bus. Horiz. 54, 241–251. https://doi.org/http://dx.doi.org/10.1016/j.bushor.2011.01.005

Kingsborough, A., Borgomeo, E., Hall, J.W., 2016. Adaptation pathways in practice: Mapping options and trade-offs for London's water resources. Sustain. Cities Soc. 27, 386–397. https://doi.org/10.1016/j.scs.2016.08.013

Massey, E., Biesbroek, R., Huitema, D., Jordan, A., 2014. Climate policy innovation: The adoption and diffusion of adaptation policies across Europe. Glob. Environ. Chang. 29, 434–443. https://doi.org/10.1016/j.gloenvcha.2014.09.002

Nisbet, M.C., 2009. Communicating Climate Change: Why Frames Matter for Public Engagement. Environ. Sci. Policy Sustain. Dev. 51, 12–23. https://doi.org/10.3200/ENVT.51.2.12-23

O'Hare, P., White, I., Connelly, A., 2015. Insurance as maladaptation: Resilience and the "business as usual" paradox. Environ. Plan. C Gov. Policy 0, 1–19. https://doi.org/10.1177/0263774X15602022

Pirro, C., Anguelovski, I., 2017. Farming the urban fringes of Barcelona: Competing visions of nature and the contestation of a partial sustainability fix. Geoforum 82, 53–65. https://doi.org/10.1016/j.geoforum.2017.03.023

Ramos, J., Soma, K., Bergh, Ø., Schulze, T., Gimpel, A., Fabi, G., Grati, F., Gault, J., Ma, T., 2014. Multiple interests across European coastal waters: The important of a common language. ICES J. Mar. Sci. 1–12. https://doi.org/10.1093/icesjms/fsu095

Rauschmayer, F., Bauler, T., Schäpke, N., 2015. Towards a thick understanding of sustainability transitions - Linking transition management, capabilities and social practices. Ecol. Econ. 109, 211–221. https://doi.org/10.1016/j.ecolecon.2014.11.018

Rauschmayer, F., Wittmer, H., 2006. Evaluating deliberative and analytical methods for the resolution of environmental conflicts. Land use policy 23, 108–122. https://doi.org/10.1016/j.landusepol.2004.08.011

Renn, O., 2006. Participatory processes for designing environmental policies. Land use policy 25, 34–45.

Smith, G., 2003. Deliberative democracy and the environment. Routledge, London.

Sol, J., Beers, P.J., Wals, A.E.J., 2013. Social learning in regional innovation networks: Trust, commitment and reframing as emergent properties of interaction. J. Clean. Prod. 49, 35–43. https://doi.org/10.1016/j.jclepro.2012.07.041

Soma, K., 2010. Framing Participation With Multicriterion Evaluations To Support The Management Of Complex Environmental Issues. Environ. Policy Gov. 106, 89–106. https://doi.org/10.1002/eet

Soma, K., 2006. <I>Natura economica</I> in Environmental Valuation. Environ. Values 15, 31–50. https://doi.org/10.3197/096327106776678979

Soma, K., Dijkshoorn-Dekker, M., Polman, N., 2017. Stakeholder contributions through transitions towards urban sustainability. Sustainable Cities and Society. 37: 438-450. https://doi.org/10.1016/j.scs.2017.10.003. https://www.sciencedirect.com/science/article/pii/S2210670716307521

Soma, K., Ramos, J., Bergh, Ø., Schulze, T., Oostenbrugge, H. Van, Duijn, A.P. Van, Kopke, K., Stelzenmu, V., Grati, F., Ma, T., Stenberg, C., Buisman, E., 2013. The "mapping out" approach: Effectiveness of marine spatial management options in European coastal waters. ICES J. Mar. Sci. 29, 1–13.

Soma, K., van Tatenhove, J., van Leeuwen, J., 2015. Marine Governance in a European context: Regionalization, integration and cooperation for ecosystem-based management. Ocean Coast. Manag. 117. https://doi.org/10.1016/j.ocecoaman.2015.03.010

Soma, K., van Tatenhove, J., van Leeuwen, J., 2015. Marine Governance in a European context: Regionalization, integration and cooperation for ecosystem-based management. Ocean Coast. Manag. 117, 4–13. https://doi.org/10.1016/j.ocecoaman.2015.03.010

Soma, K., Vatn, A., 2014. Representing the common goods – Stakeholders vs. citizens. Land use policy 41, 325–333. https://doi.org/10.1016/j.landusepol.2014.06.015

Soma, K., Vatn, A., 2010. Is there anything like a citizen? A descriptive analysis of instituting a citizen's role to represent social values at the municipal level. Environ. Policy Gov. 20, 30–43. https://doi.org/10.1002/eet.529

Specht, K., Zoll, F., Siebert, R., 2016. Application and evaluation of a participatory "open innovation" approach (ROIR): The case of introducing zero-acreage farming in Berlin. Landsc. Urban Plan. 151, 45–54. https://doi.org/10.1016/j.landurbplan.2016.03.003

Spence, A., Pidgeon, N., 2010. Framing and communicating climate change: The effects of distance and outcome frame manipulations. Glob. Environ. Chang. 20, 656–667. https://doi.org/10.1016/j.gloenvcha.2010.07.002

Stuiver, M., Soma, K., Koundouri, P., van den Burg, S., Gerritsen, A., Harkamp, T., Dalsgaard, N., Zagonari, F., Guanche, R., Schouten, J.J., Hommes, S., Giannouli, A., Söderqvist, T., Rosen, L., Garção, R., Norrman, J., Röckmann, C., de Bel, M., Zanuttigh, B., Petersen, O., Møhlenberg, F., 2016. The governance of multi-use platforms at sea for energy production and aquaculture: Challenges for policy makers in European Seas. Sustain. 8. https://doi.org/10.3390/su8040333

Swart, R., Sedee, A.G.J., de Pater, F., Goosen, H., Pijnappels, M., Vellinga, P., 2014. Climate-Proofing Spatial Planning and Water Management Projects: An Analysis of 100 Local and Regional Projects in the Netherlands. J. Environ. Policy Plan. 16. https://doi.org/10.1080/1523908X.2013.817947

TEEB, 2011. The Economics of Ecosystems and Biodiversity - TEEB for National and International Policy Making. Routledge, London and Washington.

Tillie, N., van der Heijden, R., 2015. Advancing urban ecosystem governance in Rotterdam: From experimenting and evidence gathering to new ways for integrated planning. Environ. Sci. Policy 62, 139–145. https://doi.org/10.1016/j.envsci.2016.04.016

Trolard, F., Bourrie, G., Baillieux, A., Buis, S., Chanzy, A., Clastre, P., Closet, J.F., Courault, D., Dangeard, M.L., Di Virgilio, N., Dussouilliez, P., Fleury, J., Gasc, J., G??niaux, G., Jouan, R., Keller, C., Lecharpentier, P., Lecroart, J., Napoleone, C., Mohammed, G., Olioso, A., Reynders, S., Rossi, F., Tennant, M., de Vicente Lopez, J., 2016. The PRECOS framework: Measuring the impacts of the global changes on soils, water, agriculture on territories to better anticipate the future. J. Environ. Manage. 181, 590–601. https://doi.org/10.1016/j.jenvman.2016.07.002

van Leeuwen, C.J., Frijns, J., van Wezel, A., van de Ven, F.H.M., 2012. City Blueprints: 24 Indicators to Assess the Sustainability of the Urban Water Cycle. Water Resour. Manag. 26, 2177–2197. https://doi.org/10.1007/s11269-012-0009-1

Van Leeuwen, C.J., Sjerps, R.M.A., 2015. The City Blueprint of Amsterdam: An assessment of integrated water resources management in the capital of the Netherlands. Water Sci. Technol. Water Supply 15, 404–410. https://doi.org/10.2166/ws.2014.127

Appendix 1 Selection of interviewees: methodology

The online questionnaire was developed and improved by getting feedback from SPONGE partners. When it was ready online, it was filled in by SPONGE partners. They needed to clarify, among others:

- Who are the most important stakeholders contributing to climate adaptation (positions/ task roles)?
- How willing are they and what are their barriers?

The questionnaire responses were analysed in an excel sheet, and a quick-scan was prepared as input for discussion among SPONGE partners. The aim of the discussion was to select the nine stakeholders. The quick-scan can also be seen as a first draft of this report. In the following, the selection process is explained some further.

The SPONGE partners had to, for each stakeholder, inform about their core contribution and barriers in terms of extents to which they contribute with:

1. regulatory
2. informational
3. financially
4. knowledge based
5. educationally, etc.

Moreover, they had to inform about the extents to which they are faced with barriers along the same scale:

1. regulatory
2. informational
3. financially
4. knowledge based
5. educationally, etc.

They were asked to add other options if missing. The SPONGE partners who filled in the questionnaire, did so by slightly different interpretations about how many possibilities should be included.

Contributions

In Belgium a total of 17 stakeholders were mentioned by respondents in the questionnaire survey. Financial contributions were provided by a total of six stakeholders, all in which also contributed with other contributions as well in terms of information, knowledge and regulatory. All stakeholders contribute with information or knowledge or both. In some instances, education and awareness are added as contribution as well. Regulatory is only a contribution of four of these stakeholders.

In the UK, the respondents provided foremost one core contribution and one core barrier to each of the 34 listed stakeholders, and in some cases barriers were not listed at all. Only in one case is information and knowledge mentioned for as contributions as well as barriers. The financial contribution were stated for eight stakeholders, whereas three contributed regulatory. If looking at information (9), knowledge (12) and education (3) jointly, this is by far the largest category of 23 stakeholders.

In the Netherlands 45 stakeholders have been listed in the questionnaire. In this case a lot of additional options have been included, such as building, renovation, co-design, implementation, maintenance, etc., and many contributions/ barriers are listed for most stakeholders. The financial contribution is provided by a total of 14 stakeholders, the regulatory stakeholders comprise a total of 12 stakeholders, while information (8), knowledge (14), creating awareness (2) and education/ capacity building (7) jointly are distributed over a total of 21 of the stakeholders. Still, what is striking in this case are the additional contributions: with seven stakeholders contributing with building, maintenance and/or renovation, with 12 stakeholders contributing with implementation and/or (co-)

design, as well as property (3), participation (1), organisational skills (1), social cohesion (1) and use of space (1).

Barriers
The barriers in Belgium are foremost financial, only in two cases this is not mentioned. For seven of the 17 stakeholders, barriers were also mentioned in the form of information/knowledge, and also seven with regulatory barriers.

The barriers are foremost financial also in the UK case, which is critical to a total of 17 stakeholders. Regulatory is judged critical for four stakeholders only, while information (5), knowledge (1) and education (1) are reported for six stakeholders.

The barriers in the Netherlands are a bit more straight forward than the contributions, with a total of 20 stakeholders facing financial barriers, a total of 10 stakeholders facing regulatory barriers, nine stakeholders facing knowledge barriers, and four stakeholders face information barriers. Interesting in this case are the additional barriers listed as miscommunication (2), too complicated (1), too late involvement (2), willingness (2), stakeholder involvement (1), awareness (1), responsibility (1), capacity (work pressure (1), communication (1) and ownership (1).

Direct comparison in statistical manners is obviously not possible across countries due to the data base characteristics: with too few observations, and slightly different ways of interpretations when filling in the question (one vs. multiple answers). As mentioned earlier, there is no intention in this study to conduct statistical analyses, and for the conceptual analyses, the responses can contribute as such.

Summing up, the outcome of this so-called mapping out exercise is a total of 96 stakeholders who are listed and specified by the 11 SPONGE partners:
- 17 Belgian stakeholders
- 34 UK stakeholders
- 45 Dutch stakeholders

In the next section, the stakeholders will be further investigated and categorised in accordance with barriers and contribution on scale 1-5:
- 1: Not so important (low contribution)/ not so willing (high barriers)
- 5: Extremely important (high contribution)/ extremely willing (low barriers)

Note that the judgements are not made by the interviewees themselves, and that when someone judge another person for being less willing, it could just as much be that this person feels willing but faces hindrances to perform. The willingness is thus from the outside not directly observable.

Selection criteria
In this study we are searching for stakeholders who have a high contribution potential but possibly high barriers for contributing to flood management. These stakeholders can, if motivated in appropriate ways increase contributions to flood management the most if they can overcome existing barriers. The stakeholders with high barriers and high contribution potentials are referred to in A in Table A1.1. It is further interesting to find stakeholders who are contributing highly and at the same time have a relatively low level of barriers (i.e. B). These are not only having possibilities to share their experiences with others, but may also contribute to enable flood adaptation beyond the present activities in future. Not so relevant are the stakeholders who have low contribution potentials (C and D). The selection criteria are summarised in Table A1.1.

Table A1.1 *Selection criteria based of stakeholders in accordance with levels of barriers and contribution potentials*

A: High barriers - high contribution potential	B: Low barriers – high contribution potential
C: High barriers – low contribution potential	D: Low barriers - low contribution potential

In order to identify relevant A and B categories, in the following we have categorised all the stakeholders into schemes in each country, indicating on a 1,2,3,4,5 scale the altitude for contribution and barriers (1 is low and 5 is high).

Note that the notions of public authority levels differ across the countries. For instance, whereas within Belgium, a lot of municipalities exists within a regional city level, in the Netherlands, the city level is the municipality level. Moreover, in the UK they divide into so-called districts, counties and boroughs. The term municipality is sometimes linked with boroughs, and city authorities operate at county level. Relevant literature explaining the details of the public management structure in the three countries include (Crabbé et al., 2015; Dupuis and Biesbroek, 2013; Massey et al., 2014). It is beyond the scope of this study to investigate the differences of public administration any further across the countries.

During a discussion meeting with SPONGE partners, the categorisations were discussed, and suggestions for selections were provided to each SPONGE country contacts. The SPONGE partners made meeting arrangements and contacted the relevant people and made a time schedule for the nine interviews. In the following section, the nine selected stakeholders are explained more in detail.

Appendix 2 Online questionnaire design

Wageningen Economic Research
The Hague 23.02.2017

SPONGE PROJECT: CLIMATE CHANGE AND FLOODING

THIS SURVEY IS CARRIED OUT UNDER the SPONGE PROJECT AND WILL NOT BE USED FOR ANY OTHER PURPOSE
(For any enquiry about SPONGE conditions please see: http://www.europan-europe.eu/en/project-and-processes/urban-sponge-1)

STAKEHOLDER CATEGORIZATION

---

1. Your identity

a) Your name: .....

b) Name of organisation (Sponge partner):.....

c) Your phone number: .....

d) Your email:.....

e) What are your current responsibilities within your organisation?

.....

.....

f) Gender? ◯ Male/ ◯ Female

g) Education
- ◯ Secondary school
- ◯ College
- ◯ University
- ◯ Other *(please specify)*

.....

h) What is your main field of expertise related to climate adaption?
(more than 1 answer may apply)
- ◯ Social
- ◯ Financial/ economic
- ◯ Public management
- ◯ Technical (e.g. climate, flood, environmental impacts)
- ◯ Lobbying
- ◯ Other *(please specify)*

.....

2. Your organisation

a) At what scale is your organization operating?
(more than 1 answer may apply)
- ◯ International
- ◯ European
- ◯ National
- ◯ Province
- ◯ City

1

◯ Neighbourhood
◯ Street
◯ Other *(please specify)*

.....

b) How would you characterize your organisation?
(more than 1 answer may apply)
◯ Private
◯ Public
◯ Profit
◯ Non-Profit
◯ Other *(please specify)*

.....

3. Please select one of the four climate change scenarios developed by the Intergovernmental Panel on Climate Change (IPCC), which in your opinion would be suitable to your region.

◯ **Scenario a:** World markets will be dominating future developments, with rapid economic growth and globalization as core drivers to change;
◯ **Scenario b:** Global sustainability will be central to future developments, with changing economic structures, clean technology developments and global solutions to sustainability;
◯ **Scenario c:** National enterprise with regional cultural identities and less concern for sustainable development will be core drivers to future economic growth; or
◯ **Scenario d:** Local stewardship, with local solutions to economic, social and environmental sustainability
◯ **No opinion**

4. What is the sense of urgency in <u>your area/city</u> for the following climate change/ flood related problems?
(Select 5 options where 5 is most important, 1 is least important)

(.....) Lack of a shared vision
(.....) Lack of green areas
(.....) Risks for heat stress and other health problems
(.....) Risks for sea water entering city areas
(.....) Risks for insufficient sewage capacity
(.....) Non-sufficient rain water reservoirs
(.....) Non-sufficient fundaments on city buildings
(.....) Lack of public interest
(.....) Lack of governmental support to facilitate initiatives
(.....) Lack of private/public investments in new technologies
(.....) Non-sufficient policy strategies
(.....) Non-sufficient scientific information
(.....) Lack of cooperation and knowledge sharing
(.....) Other *(please specify)*

.....

(.....) Other *(please specify)*

.....

(.....) Other *(please specify)*

.....

5. What is the sense of urgency <u>for your organisation</u> on climate change/ flood related problems?
(Select 5 options where 5 is most important, 1 is least important)

(.....) Lack of a shared vision
(.....) Lack of green areas
(.....) Risks for heat stress and other health problems
(.....) Risks for sea water entering city areas
(.....) Risks for insufficient sewage capacity
(.....) Non-sufficient rain water reservoirs
(.....) Non-sufficient fundaments on city buildings
(.....) Lack of public interest
(.....) Lack of governmental support to facilitate change
(.....) Lack of private/public investments in new technologies
(.....) Non-sufficient policy strategies
(.....) Non-sufficient scientific information
(.....) Lack of cooperation and knowledge sharing
(.....) Other *(please specify)*

.....

(.....) Other *(please specify)*

.....

(.....) Other *(please specify)*

.....

6. Strategy/ plan

a) Does your organization have any strategy/ plan for adaptive management?

◯ Yes / ◯ No

b) In short, what is the objective of this strategy/ plan?

.....

.....

c) Within your organisation who is/ are the main responsible for realizing this strategy/ plan?

.....

.....

d) What is the status of strategy/ plan in your organization?

◯ Just in thought
◯ Prepared
◯ Agreed
◯ Implemented
◯ Other *(please specify)*

.....

e) Does the strategy /plan involve collaboration among stakeholders? If so, with whom and how does it work?

.....

.....

.....

7. Stakeholders

Who are the relevant stakeholders to ongoing climate adaptation strategies in your city/area?

1. Name of organisation:.....

   Department of: .....

   Classification*: (extended list below): .....

   Contribution**(extended list below): .....

   Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city? *(where 5 is very important, 1 is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

2. Name of organisation:.....

   Department of: .....

   Classification*: (extended list below): .....

   Contribution**(extended list below): .....

   Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city? *(where 5 is very important, 1 is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

3. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city? *(where 5 is very important, 1 is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

4. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city? *(where 5 is very important, 1 is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

5. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city? *(where 5 is very important, 1 is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

6. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city? *(where 5 is very important, 1 is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

7. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city? *(where 5 is very important, 1 is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

8. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city? *(where 5 is very important, 1 is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

9. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city? *(where 5 is very important, 1 is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

10. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city? *(where 5 is very important, 1 is not so important)*

	1	2	3	4	5

a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

***Classification list – can you please indicate for the respective option what kind of organization it is?**

a) Grassroots'/citizens' organisations
b) Water authority
c) Non-governmental organisation
d) Building corporation
e) National government
f) Provincial government
g) Municipality
h) Research institute
i) Private company
j) Education
k) Other (*please specify*)

.....

****Contribution list - can you please indicate what kind of contribution is provided?**

a) Financial
b) Knowledge
c) Regulatory
d) Information
e) Education
f) Other (please specify)

.....

*****Barriers list - can you please indicate what kind of barriers are relevant?**

a) Financial
b) Knowledge
c) Regulatory
d) Information
e) Education
f) Other (please specify)

.....

8. Given your experience, how would you advice to best convince stakeholders to take action?

.....

.....

.....

.....

9. How could collaboration among stakeholders be improved in your opinion?

.....

.....

.....

.....

10. SPONGE pilot

To which SPONGE pilot are you contributing?

.....

.....

11. At what scale is your pilot?
(more than 1 answer may apply)

- ◯ International
- ◯ European
- ◯ National
- ◯ Province
- ◯ City
- ◯ Neighbourhood
- ◯ Street
- ◯ Other *(please specify)*

.....

12. What are the core activities in the pilot? *(more than 1 answer may apply)*

- ◯ Take part in building initiatives
- ◯ Ensure that green trees are planted
- ◯ Take care of sufficient draining
- ◯ Take care of people with health problems
- ◯ Build dikes
- ◯ Provide information to people
- ◯ Influence politics/ public sector
- ◯ Take part in business development
- ◯ Take part in citizens' initiatives
- ◯ Encourage market opportunities
- ◯ Encourage investments now
- ◯ Encourage changing behaviours
- ◯ Encourage new technology developments
- ◯ Establish networks
- ◯ Motivate cooperation and knowledge sharing
- ◯ Other *(please specify)*

.....

.....

13. Could you please describe the collaboration among different stakeholders in your pilot?

.....

.....

.....

.....

14. Stakeholders

Who are the relevant stakeholders in your pilot?

1. Name of organisation:.....

   Department of: .....

   Classification*: (extended list below): .....

   Contribution**(extended list below): .....

   Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city *is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

2. Name of organisation:.....

   Department of: .....

   Classification*: (extended list below): .....

   Contribution**(extended list below): .....

   Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city *is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

3. Name of organisation:.....

   Department of: .....

   Classification*: (extended list below): .....

   Contribution**(extended list below): .....

   Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city *is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

4. Name of organisation:.....

   Department of: .....

   Classification*: (extended list below): .....

   Contribution**(extended list below): .....

   Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city *is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

5. Name of organisation:.....

   Department of: .....

   Classification*: (extended list below): .....

   Contribution**(extended list below): .....

   Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city *is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

6. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city *is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

7. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city *is not so important)*

	1	2	3	4	5
a) Importance	○	○	○	○	○
b) Willingness to contribute	○	○	○	○	○

8. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city *is not so important)*

	1	2	3	4	5
a) Importance	◯	◯	◯	◯	◯
b) Willingness to contribute	◯	◯	◯	◯	◯

9. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city *is not so important)*

	1	2	3	4	5
a) Importance	◯	◯	◯	◯	◯
b) Willingness to contribute	◯	◯	◯	◯	◯

10. Name of organisation:.....

Department of: .....

Classification*: (extended list below): .....

Contribution**(extended list below): .....

Barriers***(extended list below): .....

Can you please assign importance/ willingness to contribute of this relevant stakeholder for climate adaptation in your area/city *is not so important)*

	1	2	3	4	5
a) Importance	◯	◯	◯	◯	◯

b) Willingness to contribute	○	○	○	○	○

***Classification list – can you please indicate for the respective option what kind of organization it is?**

a) Grassroots'/citizens' organisations
b) Water authority
c) Non-governmental organisation
d) Building corporation
e) National government
f) Provincial government
g) Municipality
h) Research institute
i) Private company
j) Education
k) Other (*please specify*)

.....

****Contribution list - can you please indicate what kind of contribution is provided?**

g) Financial
h) Knowledge
i) Regulatory
j) Information
k) Education
l) Other (please specify)

.....

*****Barriers list - can you please indicate what kind of barriers are relevant?**

g) Financial
h) Knowledge
i) Regulatory
j) Information
k) Education
l) Other (please specify)

.....

15. Any other advice for encouragements of adaptation strategies for reducing climate change impacts?

.....

.....

.....

Thank you for your cooperation!

Appendix 3 Interviewees about cooperation

In this appendix we provide some information provided by the nine interviewees about cooperation. During the interviews, cooperative activities were explained, and it was clarified that cooperation among multiple stakeholders can take different forms. For example, whereas in Belgium and the UK, the public city flood management interviewees referred to cooperation among experts more than bottom-up cooperation, in the Netherlands, the attention during interviews was a lot more on the bottom-up cooperation to explore solutions. Moreover, in the Netherlands, an example of public-private cooperation with the horticulture sector has shown to be useful, not only for flood management, but also to lower overall costs.

Sometimes cooperation was overwhelmingly positive, and other times complicated. Throughout processes of transition, upcoming cooperation problems must be dealt with subsequently. This implies that cooperation experiences will change in the course of time and will be judged more or less successful depending on the timing and stage of cooperation. For instance, in an early stage of a project, cooperation may be more easy when multiple options are to be identified and discussed. At later stages, when choices must be made, this can lead to more complications. Cooperation very much depends on the attitudes of the people involved and their societal roles. For instance, if needs for formal agreements, it is important that, for instance, steering groups or committees contribute properly.

At the moment of interviews, cooperation experiences were mentioned. Selected statements are provided below.

A building real estate developer:

> '*The most difficult cooperation partner is the Province.* The Province is authorized for dealing with watercourses in our projects. They have a very sectoral attitude, purely looking at the stream. They do not compromise on different political goals and is experienced as an interference in the trajectories. This is also sometimes the case at the municipality.'

A public city flood management representative:

> 'The cooperation in the Steering group involves excellent dialogues, with no unmanageable disagreement. In this setting a lot of new and innovative ideas are presented and discussed. Attendees get updates about what happens across London. Members are keen and interested. *It is a higher level occasion*, and local implementation issues are not usually part of the discussions.'

A public environment authority:

> 'With the aim to achieve joint planning that also involve the environmental aims, besides interests of the private sector and the communities, closer cooperation than earlier takes place with the national governmental authorities – who design planning policy and regulatory documents. Occasionally, talks find place among flooding experts and those people working with climate change adaptation, although *flooding often is regarded a technical issue to be handled by local engineers* providing technical advice. Therefore, cooperation takes place also with the national infrastructure providers, such as water companies, electricity companies, gas and telecoms, to get them to adopt resiliency strategies of their infrastructure for extreme weather, flooding draught, extreme weather, etc.'

A built environment advisory organisation:

> '*Cooperation is needed for development of standards and approaches for designing sustainable drainage*, which is the basis for developing good practice. Consulting with the sewerage undertakers, the County councils, the local planners, the Districts, designers and developers, the intention is to understand what their challenges are – to help overcome them ... Although the issues during the workshop tend to be technical, the process must be dealt with to overcome challenges. Stakeholders get instructions on how to deal with challenges, and this implies working together with organisations, such as the water authority. An assessment is based on workshop dialogues and a document is circulated to a representative Project Steering Group and then these comments are consulted with them.'

A UK water and sewerage company:

> 'The last five years, a total of 100 workshops were organised every year. A total of four people are working on flood risk issues. These meetings are foremost organised with the County councils and the District councils, who are responsible for local water causes. These are contributions to the core activity of planning, together with the District councils who is the planning authorities in the UK. We try to work with them more closely to make sure the plans take the needed areas for dealing with flooding into account. Moreover, if there is a combined surface water cause, opportunities to work together are explored ... *The effect of more cooperation is not huge*, and there may be more opportunities in future.'

A Dutch horticulture private company:

> 'In addition to opening up the a siphon in the water basin when extra flooding water must be captured, we contribute with water level management. This implies that we provide information about the degree to which the water basin is filled with water before the rain comes. Hence, if a rain storm is coming and we inform that, for instance, the degree filled with water is 70 or 80%, then there is no more reason to be anxious as there is capacity enough to catch water. Earlier we did not inform, and the water board did not know and as a result assumed that water level was filled to 100%. Consequentially, they thought the flooding would cause damage, and they would lower the watercourse. We now exchange the information, and they do not need to lower the watercourse when it is not necessarily. This information itself is thus useful. So yes, that was a very good first move. *Now we ultimately understand each other, which is a basis for the cooperation between the municipality, the water board, gardeners.'*

A public city flood management representative:

> 'Currently, we have a good collaboration across multiple stakeholders despite that different interests are involved. This is thanks to the steering group at the city administration who brings everyone concerned at city level to the table. Facilities, finance, and other relevant aspects are taken into account and the agenda is fairly accurate followed up. At the meetings everyone gets along. Even though, the mobility measures form the main *obstacle with the citizens* because the neighbourhood does not like increased traffic, and consequentially a working group on mobility was established by the steering committee.'

A public city flood management representative informs that:

> ‘The flooding measures must be introduced as joint developments with the neighbourhood’s own ambitions. The point is that it is *crucial to understand the citizens* to make it possible for people to change. The core ambitions tend to involve:
> - People want to have a green neighbourhood, so everything that leads to a more green areas is seen positive. The green perspective can be part of any design, for instance for resisting sewage, and then arrange water storage under gardens, for instance.
> - People also want to be part of a neighbourhood, so if contributing with social cohesion, i.e. some improvements of socialisation to make people know each other, it is easier to make changes. This also implies that developments of new design can take place in cooperation to allow people to meet and learn from each other throughout creative sessions. The water contribution is at an early stage brought into the design by the public managers, in a free-riding fashion.
> - Moreover, people typically have a need to feel proud of the area, street and house they live in. It is also valuable to a neighbourhood to sense a feeling of enthusiasm at street level, and this also makes it easier to cooperate on water management.’

A building real estate developer explains that:

> ‘The stakeholders we work with involve the municipality and the current owners of the buildings, architects, technical advisors, and contractors. The municipality is creating the boundary conditions. *Customers pay for their homes*. We are not yet in the phase of development that we have contacts with the water companies. In general, those are further distant, in our projects anyway.’

Appendix 4 Quick-scan PPT presentation

10/11/2017

Sponge: QUICK SCAN

Selection of nine interviewees for the SPONGE tool

Katrine Soma Marijke Dijkshoorn Nico Polman

2 June 2017



WAGENINGEN

Overview

- Aims and method
- Climate urgencies in cities
- Stakeholder importance and willingness
- Transition theory
- Future research

WAGENINGEN

Aims and method

- Aims:
  - To identify core stakeholders to be interviewed to contribute with background information to a SPONGE toolbox for stakeholder participation
  - To explain how a selection of nine stakeholders to be interviewed is made
- Method:
  - Analysis of an online survey in which 10 questionnaires were filled in by SPONGE partners (1 from Belgium, 4 from the UK and 5 from the Netherlands).

WAGENINGEN

Climate urgencies in cities

- Belgian rankings of urgencies

Urgency options[1] (high ranking is set to >1)	Area	Organization
PHYSICAL		
Lack of green areas	1.25	
Risks for heat stress and other health problems[2]	0.75	
Risks for sea water entering city areas	0.25	
Risks for insufficient sewerage capacity	0.5	
Non-sufficient rain water reservoirs		1
Non-sufficient fundaments on city buildings		
MANAGEMENT		
Lack of a shared vision[3]		1
Lack of public interest[4]		0.5
Lack of governmental support to facilitate initiatives		0.25
Lack of private/public investments in new technologies		
Non-sufficient policy strategies		
Non-sufficient scientific information[5]		1.25
Lack of cooperation and knowledge sharing		0.75

WAGENINGEN

Climate urgencies in cities

- UK rankings of urgencies

Urgency options (high ranking is set to >1)	Area (average)	Organization (average)
PHYSICAL		
Lack of green areas[1]	0.25	0.75
Risks for heat stress and other health problems	0.25	0.75
Risks for sea water entering city areas	1.25	1
Risks for insufficient sewerage capacity	1.75	0.75
Non-sufficient rain water reservoirs[2]		
Non-sufficient fundaments on city buildings		
MANAGEMENT		
Lack of a shared vision	1	1.75
Lack of public interest[3]	0.5	1.5
Lack of governmental support to facilitate initiatives[4]	2.5	2.5
Lack of private/public investments in new technologies		
Non-sufficient policy strategies	2.5	1.5
Non-sufficient scientific information		
Lack of cooperation and knowledge sharing	0.25	0.25

WAGENINGEN

Climate urgencies in cities

- Dutch rankings of urgencies

Urgency options[1] (high ranking is set to >1)	Area (average)	Organization (average)
PHYSICAL		
Lack of green areas	1.6	1.12
Risks for heat stress and other health problems	0.56	0.72
Risks for sea water entering city areas	0.92	0.8
Risks for insufficient sewerage capacity	1.28	1.12
Non-sufficient rain water reservoirs	1.2	1.6
Non-sufficient fundaments on city buildings	0.8	1.04
MANAGEMENT		
Lack of a shared vision	0.96	1.12
Lack of governmental support to facilitate initiatives	0.72	0.64
Lack of private/public investments in new technologies	0.88	0.72
Non-sufficient policy strategies	0.96	0.88
Non-sufficient scientific information	0.96	0.72
Lack of cooperation and knowledge sharing	1.39	1.28

WAGENINGEN

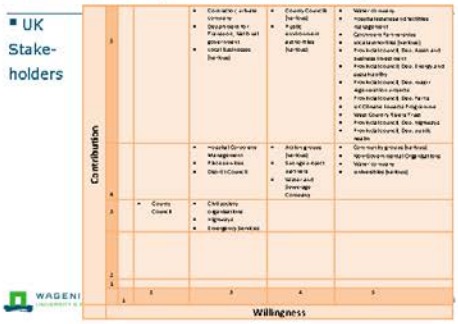
1

Stakeholder importance and willingness

- Belgian stakeholders

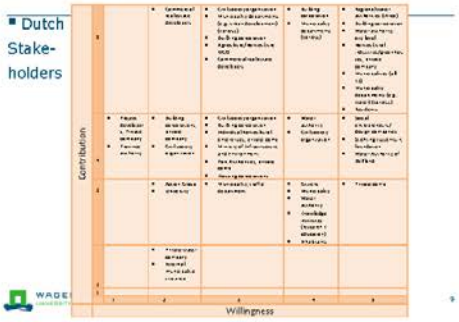
Stakeholder importance and willingness

- UK Stake-holders

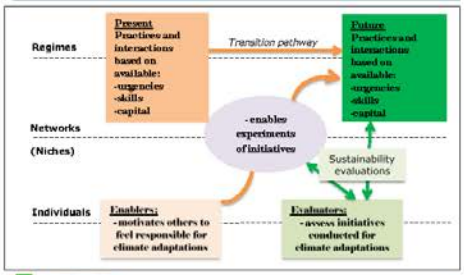


Stakeholder importance and willingness

- Dutch Stake-holders



Transition theory



(Rauschmayer et al 2015)

Future research

- Increased understanding of multiple stakeholder incentives –will provide more opportunities for win-win combined with flood management.
- Wageningen Economic Research can contribute with the reflexive monitoring approach where learning is integrated. This will lead to:
  - A validated and more detailed understanding of willingness/importance and barriers/opportunities of stakeholder groups.

Appendix 5 SPONGE stakeholder analysis PPT presentation

10/11/2017

Sponge: Stakeholder analys1s

Incentives to contribute to climate change adaptation

Katrine Soma Marijke Dijkshoorn Nico Polman

21 September 2017

WAGENINGEN

Wageningen Economic Research

Part of Wageningen University and Research (WUR)

WAGENINGEN

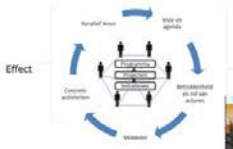
Wageningen Economic Research

- Social and economic, independent and applied research
- To offer insights and integral advice for policy and decision-making.
- Projects focusing on stakeholder participation

WAGENINGEN

Living labs: Stakeholder involvement

- 7 cases, 252 stakeholder interviews
- 4 year reflexive monitoring



WAGENINGEN

Green in the city: roles, action perspectives

- How to provide opportunities for green bottom up initiatives and at the same time reach policy goals?
- Reflexive monitoring, dialogue instruments

WAGENINGEN

SPONGE assignment 2017

Stakeholder analysis

WAGENINGEN

1

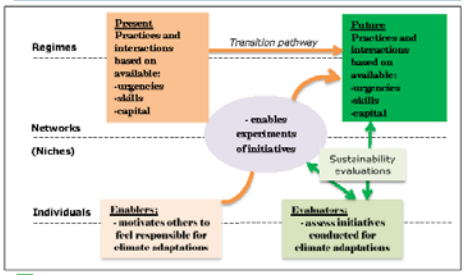
Overview

- Core aims of stakeholder analysis
- Approach
  - Transition theory
  - Stakeholder mapping
- Results
  - Contributions and barriers
- Core recommendations
- Future research

Core aims of stakeholder analysis

- To identify and categorise stakeholders
- To identify contributions and barriers for selected stakeholders
- To give recommendations and to write a final report

Transition theory



(Rauschmayer et al 2015)

Transition theory

- Social learning important for change
  - Commitment
  - Mutual trust
  - Shared reframing

Sol et al 2013.

Stakeholder mapping

- An online questionnaire
- Online questionnaire filled in by SPONGE partners about
  - What are the most important stakeholders?
  - What are their contributions?
  - What are their barriers?
  - How important are they?
  - How willing are they?

'To analyse stakeholders by interest and influence to identify key stakeholder groups'

Stakeholder mapping

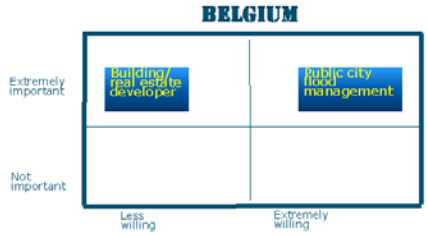
- A total of 96 stakeholders selected by 11 SPONGE partners:
  - 17 Belgian
  - 34 UK
  - 45 Dutch
- Plots with willingness and importance on scale 1-5:
  - 1: Not so important/ not so willing
  - 5: Extremely important/ extremely willing

Stakeholder mapping

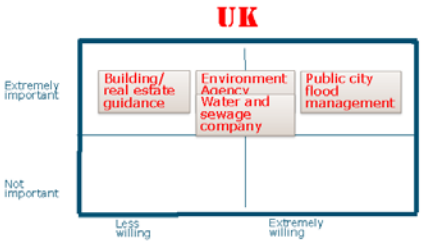
- Selection of nine stakeholders:
  - 2 Belgian
  - 4 UK
  - 3 Dutch

➢ Based on workshop discussions with SPONGE partners

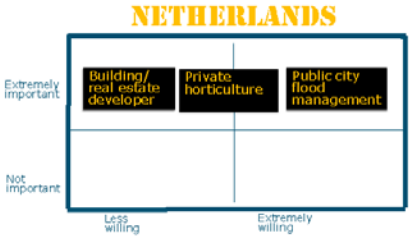
Stakeholder mapping



Stakeholder mapping



Stakeholder mapping

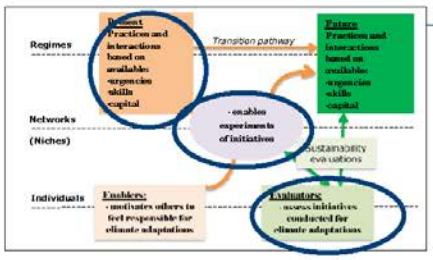


Contributions and barriers: Belgium

Contributions and barriers: Belgium

Ambition: Multiuse of space	Barriers: • Political willingness / complicated regulations • Difficult cooperation: Sectoral approach at province level dealing with water courses
Ambition: Integrated advice to projects	Barriers: • Fragmented public and private organizations; aims, units and regulations (e.g. sewage and water – in two companies)
Ambition: Link theory to practice	Barrier: • Public sector theoretical fixation
Ambition: Timely advice	Barriers: • Lack of time and resources • Low strategic use of available information

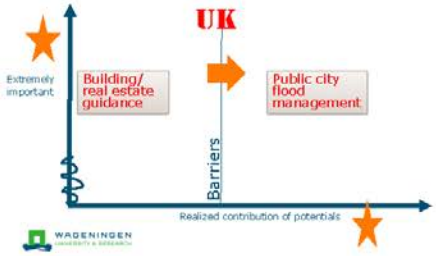
Contributions and barriers: Belgium



WAGENINGEN

Contributions and barriers: Belgium

Contributions and barriers: UK



WAGENINGEN

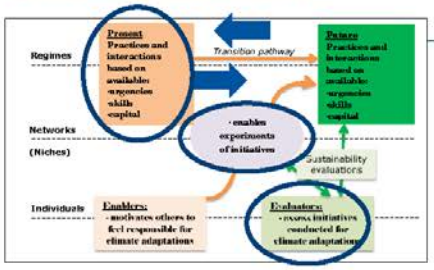
Contributions and barriers: UK

Ambition: Guide entrepreneurs about flood management	Barriers: • Lack of awareness • Low investments
Ambition: Sustainable drainage interventions	Barriers: • Low stringent regulations from top-down • Lack of information of multiuse of space

Ambition: Flood management investments in new developments	Barriers:
	• Local landscape planners –
	  • no good understanding
	  • powerful in decision making

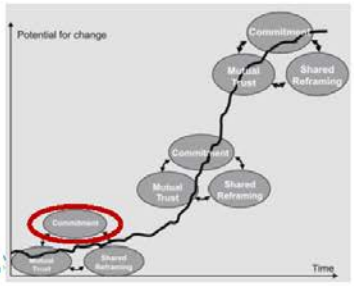
WAGENINGEN

Contributions and barriers: UK



WAGENINGEN

Contributions and barriers: UK

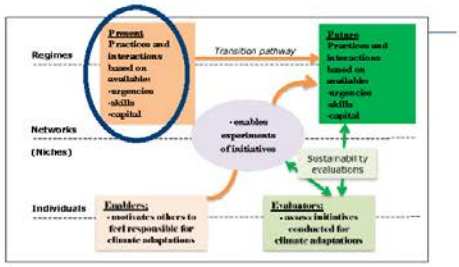


Contributions and barriers: Netherlands

Contributions and barriers: Netherlands

Ambition: Reduce CO_2 emissions, and design green when appropriate	Barriers: • Low general interest of customers to look at flooding problems • Low urgency of private customers
Ambition: Green public terrain, e.g. green roofs on train station	Barrier: • Water and sewage not distinguished

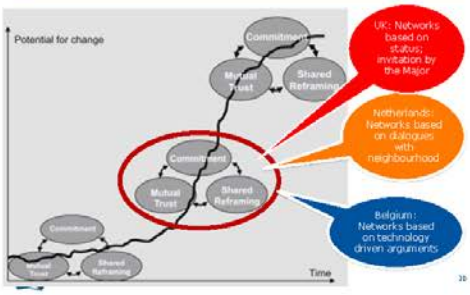
Contributions and barriers: Netherlands

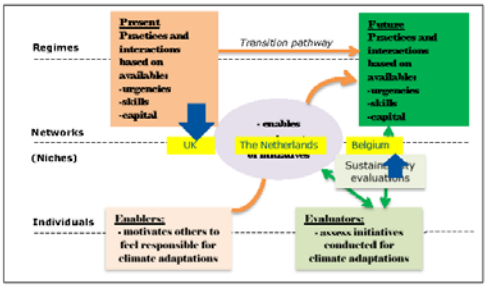


Contributions and barriers: Netherlands

Contributions and barriers: Successes

Contribution and barriers: Successes





Core recommendations

- Acknowledge that;
  - Flood management
    - To be integrated with multiple activities;
    - To be merged with multiple stakeholder incentives and objectives.
  - Public sector needs to
    - Facilitate stakeholders who want to contribute;
    - Integrate their work across public groups and levels;
    - Involve citizens continuously and at early project stages.

WAGENINGEN UNIVERSITY & RESEARCH

Future research

- Stakeholder mapping and interviews show valuable insights;
  - Still, you need to include more stakeholders, this will make the toolbox more robust;
  - Stakeholders are available in the SPONGE pilots;
  - Also, we suggest to co-create with end-users of the toolbox.

WAGENINGEN UNIVERSITY & RESEARCH

Future research

- Increased understanding of multiple stakeholder incentives –will provide more opportunities for win-win combined with flood management.
- Wageningen Economic Research can contribute with the reflexive monitoring approach where learning is integrated. This will lead to:
  - A validated and more detailed understanding of willingness/importance and barriers/opportunities of stakeholder groups.

WAGENINGEN UNIVERSITY & RESEARCH

Wageningen Economic Research
P.O. Box 29703
2502 LS The Hague
The Netherlands
T +31 (0)70 335 83 30
E communications.ssg@wur.nl
www.wur.eu/economic-research

Wageningen Economic Research
REPORT
2018-013

To explore the potential of nature to improve the quality of life

Wageningen Economic Research
P.O. Box 29703
2502 LS Den Haag
The Netherlands
E communications.ssg@wur.nl
www.wur.eu/economic-research

Report 2018-013
ISBN 978-94-6343-890-2

The mission of Wageningen University and Research is "To explore the potential of nature to improve the quality of life". Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 5,000 employees and 10,000 students, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.