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Landscape and Legitimacy Perceptions in Nijmegen - NL

Name: Laura Quadros Aniche

Supervisor: Prof. Dr. Peter Scholten

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Laura Quadros Aniche
Brazil

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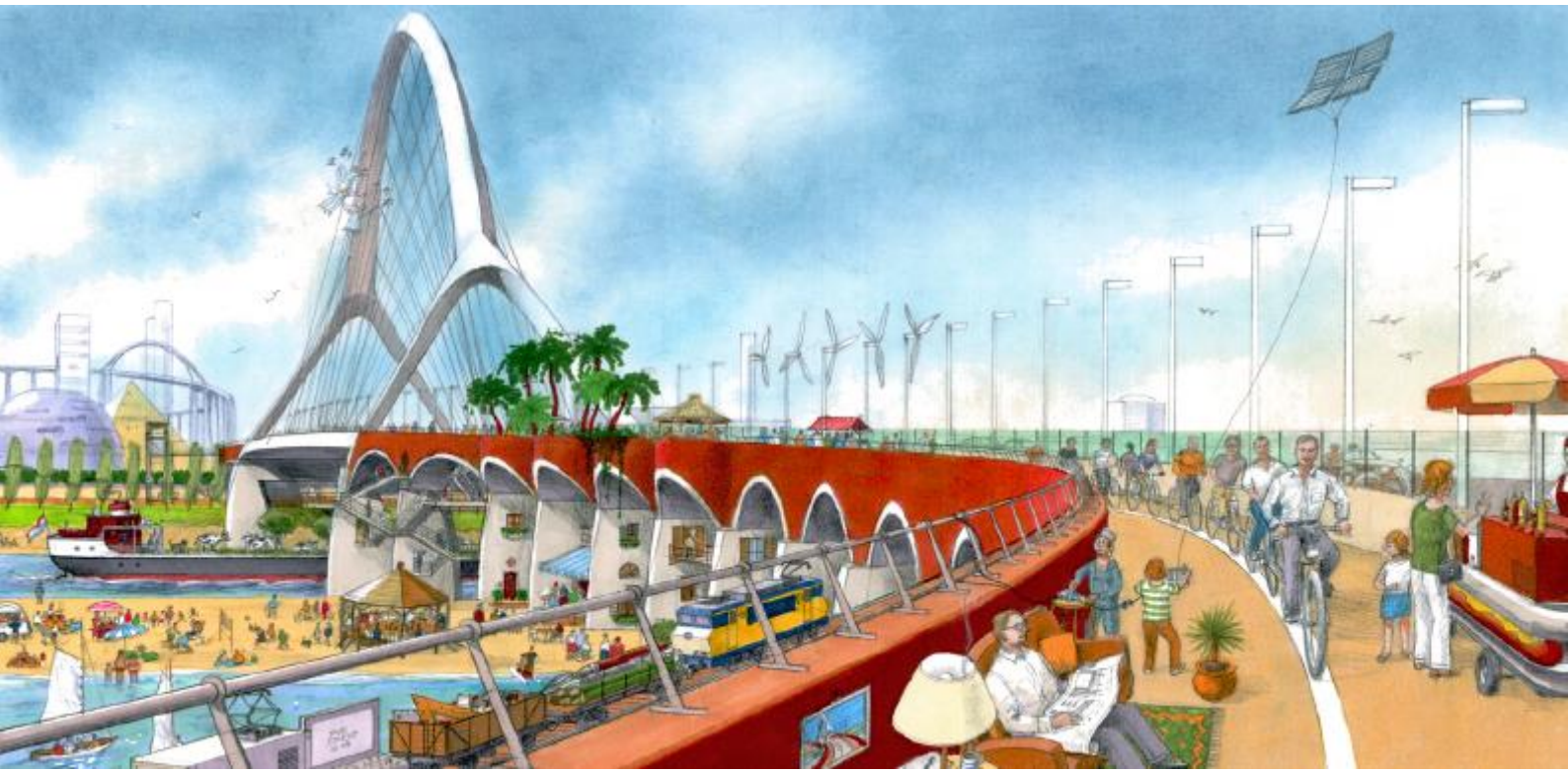

"It is time that we citizens of the world begin to understand that our situation on Earth is not one in which nature must rule over culture or culture over nature, as if one can separate the two in the first place. It is time to reflect upon the geographies and landscape histories of the past throughout the world so that we can bring forward – again – the concept that only by designing and planning with nature and *culture can we begin to heal the landscapes and places of everyday existence – urban, rural, and wild – in environmental and aesthetic terms" (Thompson and Steiner 1997).*

Summary

Cities are the place of the future, sheltering 66% of world's population by 2050. Climate change is increasing the already complex task of urban planners to create resilient cities. The challenge is to find a balance between social and economic development, technology, and a sustainable use of nature. This means a transition towards a holistic and multi-disciplinary approach. At the same time, this approach must be open and accessible to multiple stakeholders, with different aims and perspectives, to achieve legitimacy. Moreover, it is fundamental to understand the social-cultural values that connect the individuals and can empower the actors, framing the new model of water governance. In the context of these Integrated Water Management approaches, there is a trend to 'make space for rivers' aiming to restore the original attractiveness of rivers combining economic development, water safety, ecological sustainability and social-cultural values. River restoration programmes is a hot topic both in research and in practice, reflecting the more natural connection between urban societies and the environment.

In this study, the researchers analyse the river restoration programme 'Room for the Waal', in Nijmegen, The Netherlands. Their objective is to investigate how citizens who were mostly affected by the project (living on the neighbourhoods transformed), and experts involved in the decision-making, perceive: A) the changed urban landscape, regarding social-cultural values, and B) the ex-post legitimacy of the programme outcome and process of decision-making. Moreover, the aim is to discover and explain whether C) a relationship can be established between these two perceptions (A and B).

Regarding the research methodology, the strategy chosen was the Case Study. Twenty-four semi-structured interviews were conducted with inhabitants affected by the programme, living in the area transformed, and with experts involved in the decision-making, from different government levels and consultancy firms. Furthermore, secondary data were analysed to support the primary data collection.

The data analysis showed that citizens and experts have a very positive perception on the transformed urban landscape in Nijmegen, after the 'Room for the Waal' realization. Four social-cultural values were analysed in this study to understand landscape perception: aesthetic and symbolic, place attachment, recreation, and values of nature. Furthermore, it was found that the perception on legitimacy, both on the outcome and on the decision-making process is overall positive among the citizens who were mostly affected by the programme and experts involved in it, with some reservations.

The main research finding on this study is that a relationship can be established between perceptions on the transformed urban landscape and on the programme legitimacy. The findings supported the expectations that a positive perception on the transformed landscape, now that it is completed and usable, would lead to a more positive perception on the outcome legitimacy – that the result is in their best interest – and even on the decision-making process legitimacy – a feeling that 'it was worth it'. Furthermore, the vice-versa also could be applicable: a good perception on legitimacy might increase the appreciation for the changed urban environment. Indeed, it can be concluded that a both-way relationship has occurred between the two variables. This research has both academic and practical implications, suggesting a proximity between the fields of water governance – legitimacy and landscape perception – social-cultural values.

Keywords

Netherlands, urban, water governance, legitimacy, landscape perception

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Chapter 1: Introduction

This chapter provides the background on the research topic – river restoration programmes. The chapter follows with the problem statement, research objective, provisional research question, significance of the study, and scope and limitations.

1.1 Background

Cities are the place of the future. According to UN projections, by 2050 66% of the world's population will be urban, representing an addition of 2.5 billion people to cities, considering the population growth and urbanization rates. In 2014, more than half of humanity was already living in cities. This means increasing challenges for sustainability and development, especially in developing countries, where this pace is going faster (UN 2014).

Climate change adds a new layer of complexity, increasing the scale of threats of fast urbanization. Impacts are related to rising global temperatures, increasingly severe weather such as more frequent and intense precipitation, tropical cyclones, and droughts, sea level rising, and melting of glaciers. Urban planning can be a crucial element in this context, addressing cities' vulnerability – the degree of loss of their population, infrastructure, or monetary assets at risk when exposed to hazard impacts. On one hand, urban environments have higher exposure to climatic impacts due to density of those assets. On the other hand, the same characteristics imply in increased innovation and potential decision-making for mitigation and adaptation (UN – Habitat 2011).

It is important to mention the value of the presence of nature in the urban environment. The pathway for more resilient cities goes beyond controlling and maintaining nature outside urban boundaries. In climate change, resilience is "the ability of a system and its parts to anticipate, absorb, accommodate, or recover from the effects of a potential hazardous event in a timely and efficient manner, including through ensuring preservation, restoration, or improvement of its essential basic structures and functions" (IPCC 2014: AR5). Nature provides multiple benefits including ecosystem services that are essential for sustainable cities, including clean water and air, food, and flood protection. These services are crucial for human economic activities, health, and well-being (TEEB 2011).

There has been an increasing proliferation of academic research and practical approaches related to green areas and water bodies (Ryan and Burton 2016). The importance of blue-green infrastructure is connected to lower infrastructure costs, reduced pollution and health impacts, and aesthetic and cultural values. Urban planners, engineers and architects use those infrastructures as axial points to organize and design cities across the globe. The challenge is achieving the balance between development, use of natural resources and technology innovation, and the promotion of environmental sustainability and social benefits. Planners and policy-makers need a holistic and multidisciplinary approach, at the same time shifting the paradigm from exploitation-control-engineering to harmonization-social-natural methods (Zalewski 2014).

In the water management, this transition is happening. Flooding has one of the biggest magnitude impacts on the planet, affecting multiple sectors and actors, and putting at risk cities' society, economy, and environment. There is a trend towards more natural measures and integration of urban design, development needs and the water cycle (Lawson et al. 2014). Moreover, there is an increasing understanding of the complexity and multifunctionality intrinsic to water management (Tropp 2007). A literature review made by Ryan and Burton (2016) identifies a variety of Integrated Water Management approaches, proving the relevance

of the topic: Integrated Regional Water Management, Regenerative Infrastructure, Integrated Water Resources Management, Total Water Cycle Management, One Water, Blue Green Cities, Water Sensitive Urban Design, Blue Cities, Fourth Generation of Water Infrastructure, Integrated Resources Planning, and Water Cycle Management.

Going a bit deeper on one of these approaches, "a Blue-Green City aims to recreate a naturally-oriented water cycle while contributing to the amenity of the city by bringing water management and green infrastructure together. This is achieved by combining and protecting the hydrological and ecological values of the urban landscape while providing resilient and adaptive measures to deal with flood events" (Blue-Green Cities 2016a). The goal is to bring innovation to urban water management going beyond storm water and flooding strategies, integrating blue and green assets, providing urban ecosystem services, adapting to climate change, and contributing to the city's feature with social and cultural benefits (Lawson et. al. 2014).

One visible field that represents all the points previously discussed is *river restoration*. This topic is turning fast into a hot academic and policy-implementation topic, showing the dynamic transition in the way of how communities interact with nature. River restoration in Europe is an example of this natural framing, which has the potential to make a difference in sustainable water management and in societies connected to both natural and urban environments (Smith et al. 2014).

The 20th century was based on containing, controlling, and draining – the focus was mainly technical. But in the past decades a shift in water management has been occurring with emphasis in a natural and integrated approach, rediscovering the rivers potential for recreation, visual attractiveness, and land value. A trend "to make more space for the river" can be identified, as "an attempt to restore the original beauty of the river by combining economic values and water safety with ecological and cultural historical values" (Warner et al. 2012: p. 2). Furthermore, Verkerk and Buuren (2012) identify based on a literature review five changes that establish this transition: i) the evolution from thinking that humans could control the rivers by engineering systems to an approach where man and nature are treated as equal and mutually adjusted, and later on to a vision that rivers should be protected with humans combining ecology with social and economic development; ii) integration of the holistic view of the river with its natural processes and the local aspects with specific projects; iii) a multi-sectoral approach, combining water management with flood security, urban planning and ecology; iv) a participatory decision-making involving the government, private sector, NGOs, civil society and citizens; and v) the long-term perspective especially due climate change context. These authors also bring the drivers for the space for the river movement: increase on risk awareness and incidence of disasters, technological improvements such as Geographical Information Systems (GIS), scientific knowledge in ecological researches, increase of the value of sustainability in western countries, and more space for stakeholders and social groups participating in democratic decisions. Finally, societies are realizing that rivers bring opportunity and prosperity, apart from threat and destruction.

1.2 Problem Statement

River restoration programmes are far from being easily designed and implemented, requiring a connection with citizens' values and interests to achieve legitimacy and success. On one hand, there is growing application across different countries, driven by increased awareness of environmental values, complexity of water systems and of the need to create resilience face climate change. On the other hand, this change in people's minds does not take place only

within governments and experts, but among individual citizens, organized civil society groups, NGOs, and private companies. The democratization of decision-making processes brings multiple stakeholders to the table, each one with specific perspectives and objectives (Edelenbos et al. 2013a). To gain support and realize legitimacy, programmes aiming to open space for rivers to reduce flooding risk, combine this with other goals such as ecology protection, land development and improvement of spatial quality, promoting more visually attractive landscapes and public spaces such as urban parks that connect urban dwellers with nature and invite them for recreational use. This means incorporating citizens' perceptions to reduce opposition, controversy, and contestation (Buijs 2009). In this study, the researchers investigate the relation between how citizens evaluate the transformed landscape after a river restoration project is implemented and how they perceive the legitimacy of this programme.

The Netherlands is world-wide famous for its tradition in water control, as a river-delta with more than 50% of land below sea-level. In the past 30 years, although, a transition is happening, from an approach focused on technical and engineering to an approach more natural, integrated, and participatory. The water has been treated as guide for urban design and the water management is combining social, physical, and ecological aspects. The realization that water is a complex issue, so-called a persistent or 'wicked problem' highlighted that only a multidisciplinary approach could make sense (Brugge et al. 2005).

The programme "Room for the River" started in 2006 in The Netherlands addressed to the rivers Rhine, Meuse, Waal, Ijssel, and Lek. It has two objectives combined: "improving safety against flooding of riverine areas" and "contributing to the improvement of the spatial quality of the riverine area" (Rijke et al. 2012: p. 2, Brugge et al. 2005, Edelenbos et al. 2017, Buijs 2009). According to a research made, the programme succeeded in achieving both goals, but the transition in Dutch water management is not yet finished and continuity is necessary (Rijke et al. 2012).

A key aspect of success is legitimacy. Articles about the "Room for the river" discuss stakeholders' participation and support during the process. Buuren et al. (2014) deliberate on the complexity and uncertainty around climate change issues, how they are controversial and the impacts of those on legitimacy perception in adaptation actions from the legal, planning and network perspectives. Edelenbos et al. (2017) bring the recurrence of stakeholder participation importance in flood management, the need for governments being more open to local initiatives and for co-production of strategies to achieve legitimacy. A research made by Buijs (2009) showed that in general citizens are favourable to river restoration programmes, and usually appreciate the visual attractiveness of the outcome despite the alterations on a place that they sometimes are attached. It also highlights the necessity of including public perception on the projects to create alliances and achieve ecological benefits.

Another correlated aspect of the effect of this type of project in everyday citizens' lifes is the promotion of well-being, happiness, health, recreation, culture, and social connections. It is important to understand the emotional impacts that spaces have on urban dwellers and how to create more greenery and vitality to cities, enhancing happiness (Blankenship 2016). Public spaces provide a connection between the citizen and the society, contributing to the creation of citizenship sense. This could be even more positive with an approach that combines nature with those spaces, deepening sensitive experiences and rising awareness of environmental responsibilities. The city should be seen as a form of nature, in an integrated and cooperative manner, with green as an element of design (Arnett 2017, Fassbinder 2004).

My hometown São Paulo, in Brazil, is still behind on this pathway. The main river, Tietê, is considered polluted, degraded, and excluded from the urban pattern. Occasional flooding is an economic, social and health concern. Even though cities in many countries are changing their

relationships with their rivers, São Paulo's scenario is still characterized by a disconnection between the rivers and citizens, with lack of public and recreational spaces alongside the river. Recent legislation shows an improvement towards a multidisciplinary approach, but the river is still far from being central in policy-making, and its future remains uncertain (Costa 2014). Understanding the Dutch case may bring important lessons for São Paulo.

1.3 Research Objective

In the context of water governance and integrated water management, there is a trend from cities alongside the rivers to rivers within the cities. Across the globe, programmes are reintegrating rivers to their urban fabric and societies by combining visual attractiveness and spatial quality with flooding safety (especially with the increased awareness of climate change impacts) and social, cultural, economic, and ecological values (see, for instance, Warner et al. 2012 and Buuren et al. 2012).

In this study, the researchers analyse the Dutch river restoration programme 'Room for River', specifically on the project for the city of Nijmegen that took place between 2006 and 2016 – named 'Room for the Waal' -, from the perspective of the citizens. More specifically, the researchers investigate how citizens who were mostly affected by the "Room for the Waal", living on the neighbourhoods transformed, perceive the changed urban landscape and the ex-post legitimacy of the programme outcome and process of decision-making.

The research aim is both exploratory and explanatory. Although there is vast theory about landscape perception, social-cultural values, water governance, and legitimacy, core concepts of this study, there is little empirical information regarding specifically citizens' perceptions in river restoration projects. In particular, the "Room for the River" in the Netherlands was very recently implemented – in April 2016 in the case of the "Room for the Waal" at Nijmegen. Here, the researchers aim to explore what are the citizens' perceptions on the transformed landscape, regarding social-cultural values, and on the ex-post legitimacy of the programme, now that it is concluded. The objective is to collect detailed empirical descriptions of the recent phenomenon in Nijmegen. With these rich, deep, and new qualitative insights, the researchers aim to discover and explain whether a relationship can be established between the two variables: the perception of the changed landscape and the perceived legitimacy of the "Room for the Waal", extending the theoretical knowledge on these two fields. The researchers expect that a positive perception on the transformed landscape, now that it is completed and usable, may lead to a more positive perception on the outcome legitimacy – that the result is in their best interest – and perhaps even on the decision-making process legitimacy – a feeling that 'it was worth it'. Furthermore, the contrary may also be applicable: a good perception on legitimacy may increase the appreciation for the changed urban environment.

1.4 Provisional Research Questions

Provisional Main Research Question

The river restoration programme "Room for the Waal" that took place in Nijmegen/NL between 2006 and 2016 altered the urban landscape with two main objectives: to reduce flooding risk and to improve spatial quality of riverine areas. How do citizens who were mostly affected by this programme, living on the neighbourhoods transformed, perceive: A) the changed urban landscape, and B) the programme legitimacy? Furthermore, can a relationship be established between these two perceptions (A and B)?

Provisional Research Sub Questions

A. How do Nijmegen citizens who were mostly affected by the "Room for the Waal", living on the neighbourhoods transformed, perceive the transformed urban landscape, regarding social-cultural values?
B. Do these citizens consider the ex-post programme outcome and process of decision-making legitimate?
C. How do experts evaluate citizens' perceptions on both the process and outcome of the programme?
D. Can a relationship be established between citizens' perceptions on the transformed urban landscape regarding social-cultural values and on the ex-post programme legitimacy?

1.5 Significance of the study

River restoration programmes is a hot topic both in research and in practice, reflecting the more natural connection between urban societies and the environment (Smith et al. 2014).

Academically, much has been discussed on water governance and its complexity, value of nature in urban contexts, and climate change with its threats and opportunities. River restoration projects are largely studied in this context (see for instance Smith et al. 2014, Edelenbos et al. 2012, and Warner et al. 2012). However, research on citizens' perceptions regarding social-cultural values on the changed urban landscapes produced and the influence that these perceptions may have on the (perceived) ex-post legitimacy of these programmes is still limited. In this study, the researchers intend to fill in this gap, by a deep qualitative insight on the case of 'Room for the Waal Nijmegen', adding to the extensive scientific knowledge of Dutch water governance. Moreover, by investigating the relation between these two components of perception, the research can extend the current knowledge on the link between both academic fields (landscape perception / social-cultural values and water governance / legitimacy).

In policy practice, the study is also relevant because politicians and decision-makers depend on the support of the other stakeholders, especially citizens governed by them. Without this support that emerges from a democratic, open, transparent, and accessible process, the policy intended can face opposition, protest and even veto (Edelenbos et al. 2013b). It is crucial that that citizens perceive the decision as legitimate so the programme can achieve more than political success, but a reflection on the society's values and interests, but the construction of the city image desired for the majority. In the study, the researchers investigate if the Nijmegen case has indeed a positive evaluation of the transformed landscape according to citizens, and further if this is also reflected in their perception of legitimacy, creating a baseline for the next programmes.

1.6 Scope and Limitations

The researchers focus on one of the 34 projects of the Dutch programme "Room for the River" – the one that took place in the city of Nijmegen. It would be interesting to analyse and compare all the locations, but due to time limitation it is not possible. Moreover, since the objective of the research is to capture citizens' perception, and perceptions vary significantly among different people, it might be a different result if the whole Nijmegen population could be consulted, for example in an official survey conducted by the municipality. The research methodology and sampling are discussed in Chapter 3.

Chapter 2: Literature Review

This chapter provides the theoretical background of the study, describing the main concepts related to the research topic, which are: social-cultural perceptions of urban landscape and water systems, water governance, and legitimacy. It concludes with a conceptual framework for this research.

2.1. Perceptions on urban landscapes and water systems: social-cultural values

2.1.1 Values and perceptions

Societies relate to water systems through many different values for landscapes, including social-cultural, political, ecological, and economic. Mankind always had a tight relationship with water systems such as rivers and the values attributed to these directly interfere in the way in how they are managed. Urban planning and water management must coordinate these multiple values that vary between multiple stakeholders and sectors and their complex demands. In this context, water governance has been broader than before, combining knowledge, interests, perspectives, and values and creating a multi-functional environment aimed to make the best of water systems. "Values connect individuals, empower stakeholders, and frame the water governance" (Ast et al. 2013: p. 249).

Values are intrinsically connected with perception. The academy has different approaches to public perception of transformation of landscapes. Buijs (2009) presents four traditions based on literature that are relevant for this study. The first one is visual perception, with emphasis on scenic beauty. This comes from environmental psychology and relates that humans usually have high appreciation for nature, greenery, water, varied scenery, and biodiversity. The second is place attachment, related to emotions of connectedness and belonging to the area and to the society. Human geography is a field that studies this as sense of place, which is connected with the landscape quality and is also compounded by place identity and its use for recreation. The third tradition is about of valuing nature preservation and its ecological purposes, the non-use or intrinsic value. The last one relates to risk awareness and value of safety from flooding, for example.

River restoration projects bring together all these values and perceptions in citizens and societies. These projects reconnect rivers with the urban pattern and life. By transforming the landscape and approximating inhabitants with nature, they can at the same time arouse visual attractiveness, place attachment, sense of citizenship, historic and recreation. These, in turn, can increase well-being and quality of life. Talking about urban greening, Townsend and Henderson-Wilson (2017) argue the importance of green spaces in cities, such as parks and natural areas, for multiple benefits. Among them, the authors highlight social-cultural as human health, quality of life, financial, and visual, providing our biological need for interaction with nature. Further, there are also environmental benefits such as ecosystem services preservation, increase of biodiversity and air quality, and reduction of heat island effects and noise. They also stress that it is not only up to politicians and experts to fight for greening our cities, but to all of us as citizens and community members.

In the next section, the concepts of social-cultural values will be further explained according to the literature.

2.1.2 Socio-cultural values

The presence of rivers, summed with the quality of the water, security against flooding, connectivity, land value and scenic beauty are features that compose a city's identity and attractiveness. 'City-river landscapes', as named by Batista e Silva et al. (2013: p. 165) are especial "cultural landscapes", "'synoptic' spaces where human and non-human elements are fused in a physical and social entity laden with individual and collective associations' comprising three interlocking aspects: form (the visual); meaning (the cognitive); function (biophysical processes and human uses)". Some important factors of social-cultural values that are mostly discussed in the literature, relating to this research are: aesthetic and symbolic, place attachment and recreation. The theory of 'Ecosystem Services' combine these values under the umbrella of 'cultural services', provided by ecosystems, such as rivers in the focus of this study.

'Ecosystem Services' is a concept created with roots in both natural and social disciplines, linking awareness of value of nature, academic knowledge and policy making. Ecosystem services are the benefits that ecosystems provide to humans, directly and indirectly (Braat and Groot 2012, Millennium Ecosystem Assessment 2005). They are composed by four groups of services (see Figure 1). Firstly, "provisioning services: material or energy outputs from ecosystems" like "food, water, timber, fibre, and genetic resources". Secondly, "regulating services: regulating the quality of air and soil or providing flood and disease control", as well as "regulation of climate, floods, and water quality as well as waste treatment." Thirdly, "habitat or supporting services: provide living spaces for plants or animals: they also maintain a diversity of plants and animals", for example "soil formation, pollination, and nutrient cycling". And finally, "cultural services: non-material benefits people obtain from contact with ecosystems: recreation and mental and physical health, tourism, aesthetic appreciation and inspiration for culture, art and design, spiritual experience, and sense of place" (Millennium Ecosystem Assessment 2005: p. 40, TEEB 2011: p. 3-4).

All those services are interconnected and have an important impact on human quality of life. Braat and Groot (2012) discussed about the theories regarding ecosystem services brought by the MA - Millennium Ecosystem Assessment - and TEEB - The Economics of Ecosystems and Biodiversity – mentioned above. Two aspects in their article are particularly relevant for this study. The first is regarding the connection between the components of ecosystem services and human well-being. The authors compare the diagrams from both models: the MA diagram shows the linkages among the groups of ecosystem services and the constituents of well-being (see Figure 2), while the TEEB one includes the services groups between natural and socio-cultural systems, also highlighting the benefits for humans but separating benefits from values (see Figure 3). In both cases, there is a flow from ecosystem services and nature science – in the left – to human well-being and social-cultural-economic science - in the right. The second aspect is regard the complex interrelation between the ecosystem services, in both positive and negative manners. When an ecosystem is managed focusing for the accomplishment of one service, others may be harmed. For example, altering the ecosystem to increase food provision may affect the habitat for other species or the carbon sequestration. This means constant trade-offs between services, especially with intense land use in urban environments.

To illustrate this, the article presents a "provocative visualization of the trade-offs between provisioning and other ecosystem services with an increase in intensity of land use" by Braat and ten Brink (see Figure 4). The Millennium Ecosystem Assessment (2005) also debates about the usual trade-offs among ecosystem services and adds a positive perspective that constructive synergies can also occur. It is important to mention that humans have increasingly using all ecosystem services, and this assessment realized an evaluation and concluded that around 60% of them are currently being degraded or at unsustainable use, highlighting the importance of awareness of their value.

All these aspects are relevant while designing river restoration programmes. The challenge is to find the balance between multiple ecosystem services, and between these and land development and water management.

Figure 1: "Ecosystem categories and types relevant to cities". Source: based on TEEB (2011: p. 3-4)

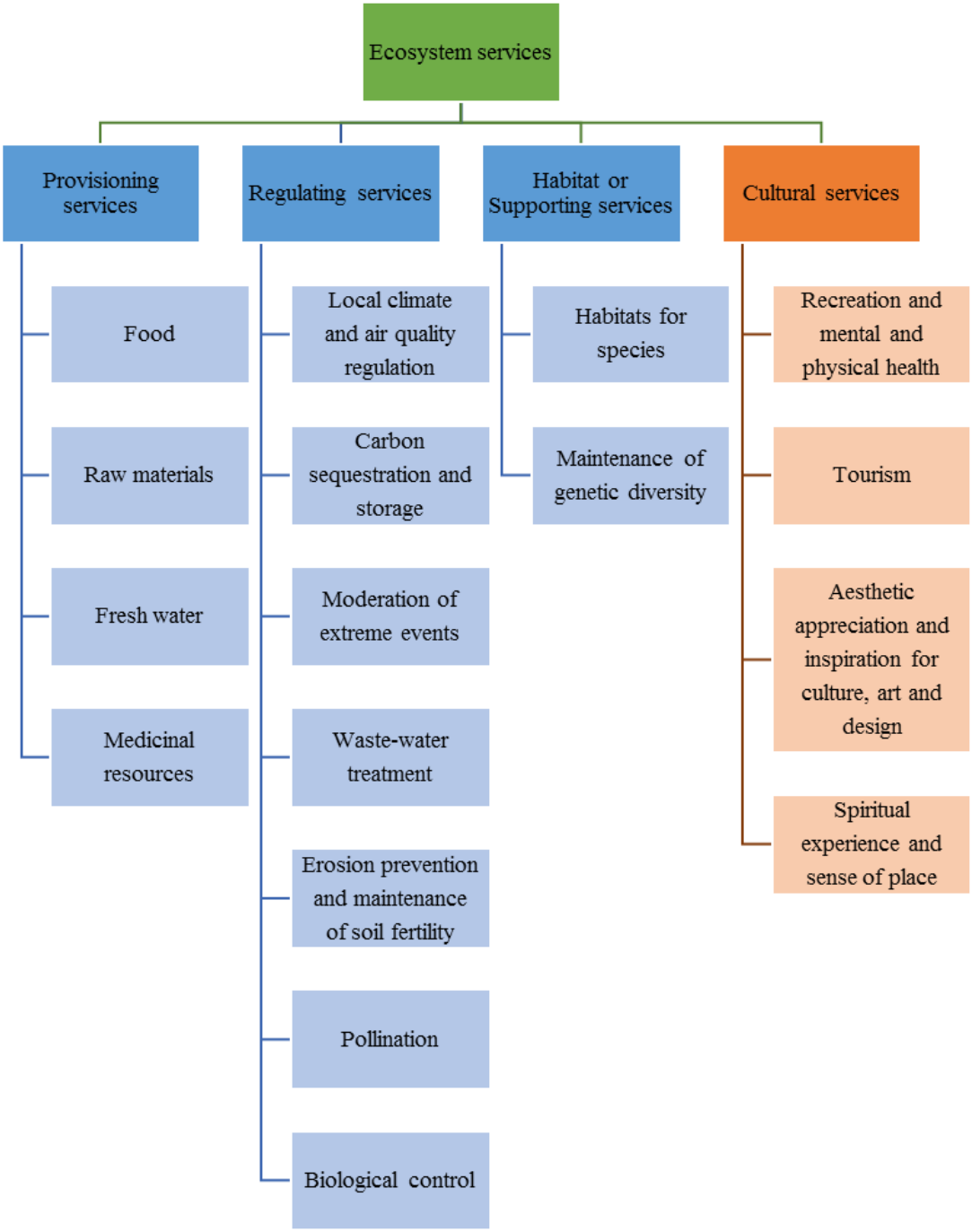


Figure 2: "Millennium ecosystem assessment (MA) overview diagram.". Source: Millennium ecosystem Assessment in Braat and Groot (2012: p. 7)

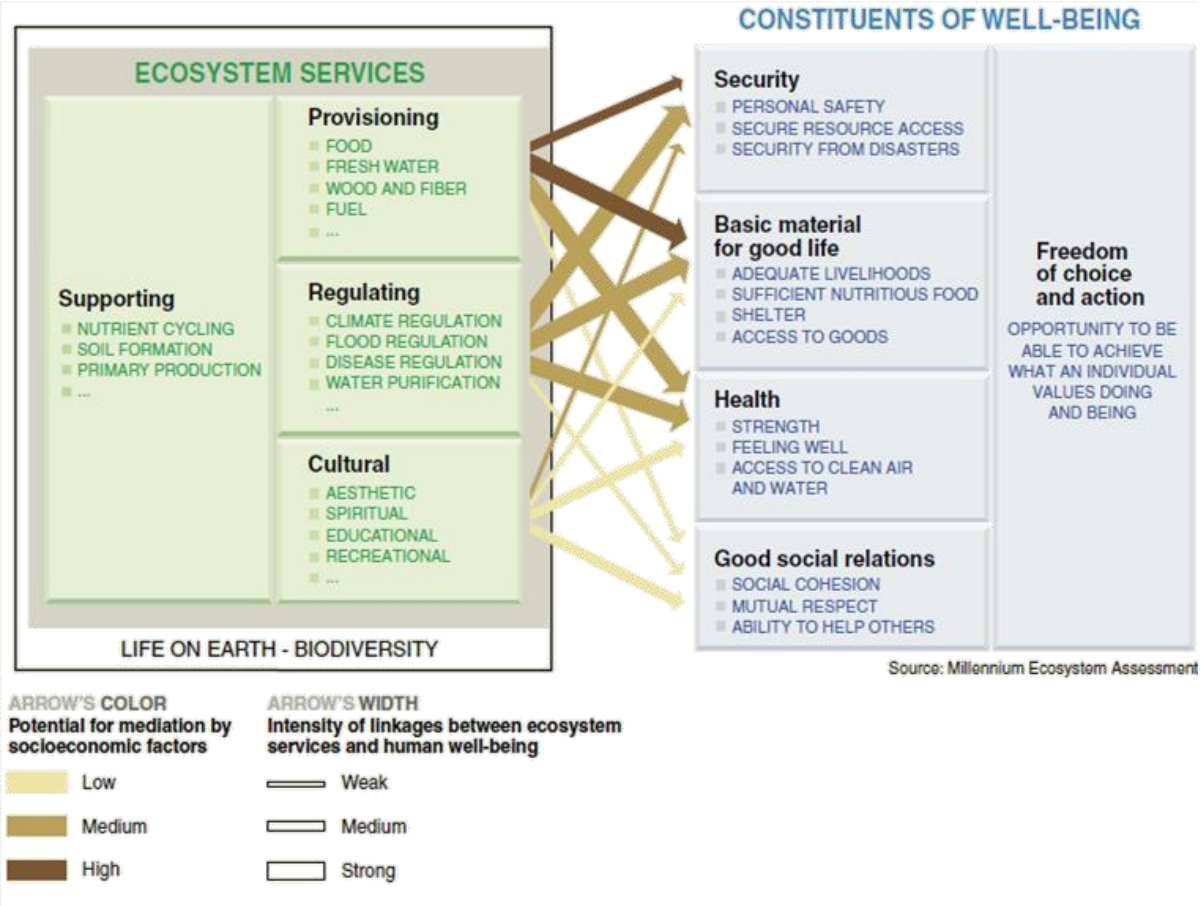


Figure 3: The Economics of Ecosystems and Biodiversity (TEEB) overview diagram. Source: Groot et al., in Braat and Groot (2012: p. 8)

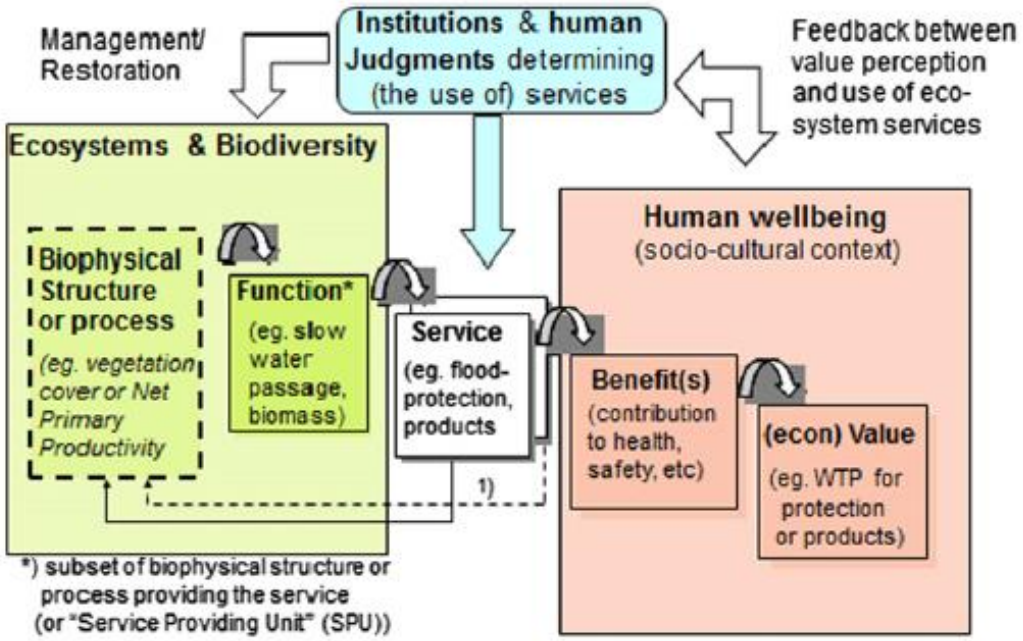
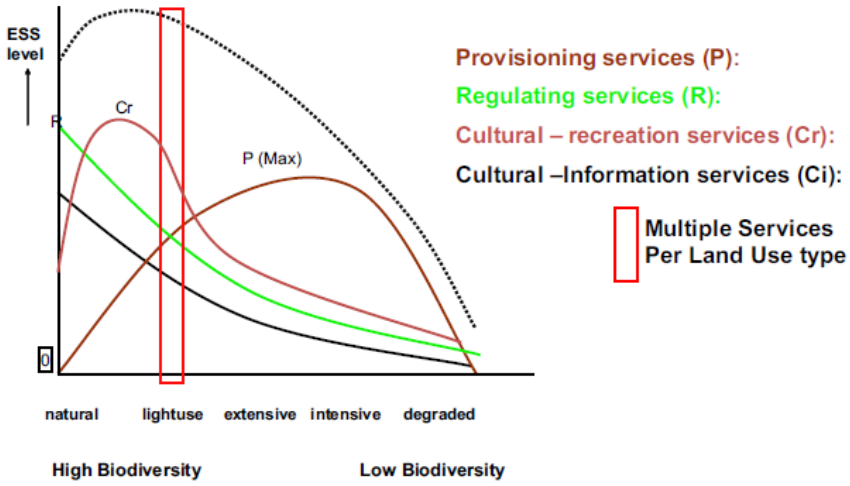


Figure 4: "Land use, biodiversity and multiple ecosystem services". Source: Braat and Groot (2012: p. 11), after Braat and ten Brink.



As demonstrated in Figure 2, alterations on ecosystem services can impact all aspects of well-being: "basic material needs for a good life, health, good social relations, security, and freedom of choice and action" (Millennium Ecosystem Assessment 2005: p; 49). This means that degradation of those services can be highly prejudicial to human societies quality of life. Together with ecosystem services, well-being is also a result of the standards of human systems and technical and institutional development. For example, the correlation between health and well-being and blue components of landscapes is studied by Völker and Kistemann, (2011 and 2013). They discourse on using blue spaces (such as rivers and lakes) as therapeutically landscapes with affective impact of landscape on health that should be incorporated in urban planning. Moreover, these authors state that this relationship relates to perception, values, emotions, design, recreation and restoration, and creates place attachment. Cultural services are especially relevant for the research topic of this study, and they can influence the above aspects in different intensities: strongly on health, social relations, and security, and less in material elements. Moreover, citizens do usufruct enjoyment in aesthetics, recreation, cultural, intellectual, and symbolic aspects through ecosystem cultural services (Millennium Ecosystem Assessment 2005).

In this study, the researchers analyze social-cultural values and perceptions on urban landscape based on the work of the Millennium Ecosystem Assessment (2005) and The Economics of Ecosystems and Biodiversity (2011) using as indicators the concepts of aesthetic and symbolic values, recreation, and place attachment.

Aesthetic appreciation can provide the integration between cities and rivers in visually attractive and sustainable urban landscapes created through urban planning (Batista e Silva et al. 2013). A study made by the Blue-Green Cities (2016b) brought up that residents usually support blue-green infrastructures due to the visual enhancements and amenity they provide for the city. The Millennium Ecosystem Assessment (2005: p.40) also shows aesthetic value from ecosystem services, claiming that "many people find beauty or aesthetic value in various aspects of ecosystems, as reflected in the support for parks, scenic drives, and the selection of housing locations".

Symbolic values are connected to these. Cultural diversity can be influenced by the diversity in ecosystems. Many communities attribute spiritual and religious values to entire ecosystems or parts of them. These spaces have an influence on systems of knowledge and educational value by different societies, also providing structure for formal and informal education. Finally, they serve as source of different kinds of artistic inspiration (Millennium Ecosystem Assessment 2005).

Moreover, blue infrastructures (presence of water system such as rivers and lakes) also have a strong relationship with recreation and human health. They are common places for people practice leisure activities and tourism (Millennium Ecosystem Assessment 2005). Völker and Kistemann (2013: p. 141, 150) discuss how "urban blue space may be interpreted as a therapeutic landscape in various ways", and "as a health factor turns out to have the potential to enhance health in cities". In their research, they argue that despite the broad increase on recognition of the importance of recreational and healthier areas in cities, there is still a gap between urban planning and health issues consideration. They also highlight inhabitants' preference for waterfronts as sites for leisure, recreation, and restoration from stress. In an earlier work of the same authors (Völker and Kistemann 2011), they already were showing the important benefits of blue areas for human health and well-being, connecting the landscape with feelings, leisure, health, and restoration. Furthermore, they presented water presence in therapeutic landscapes as a creative method to embrace "appropriative dimensions of places (experienced space, activity space, social space, symbolic space)", and stated that "there is a need to introduce the prospective findings from environmental health research concerning blue spaces into urban planning and landscape architecture" (p. 458).

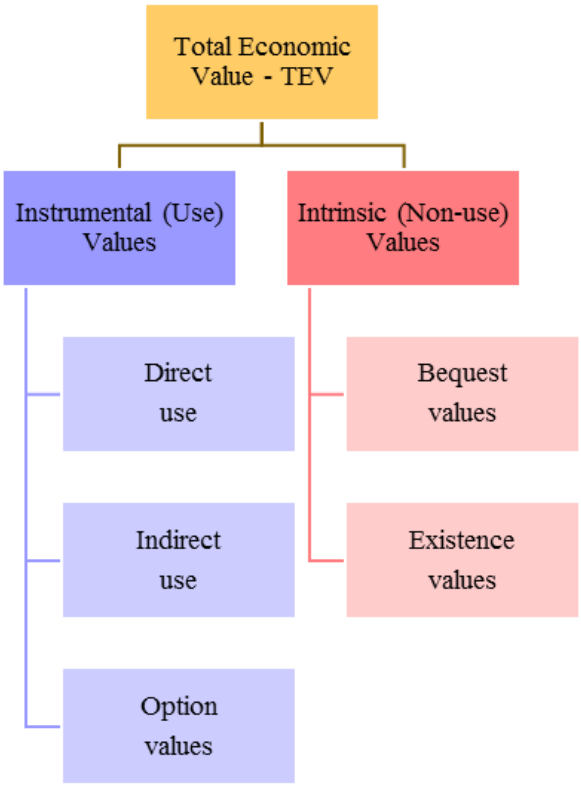
Recently, economists have been connecting individual well-being (or happiness) with socio-economic and demographic factors. They found out that spatial quality, location factors and "amenities such as climate, environmental and urban conditions" are determinants of subjective well-being, increasing the importance of their consideration while analyzing happiness and planning our cities. (Brereton et al. 2008: p. 386)

Finally, place attachment is another important value. Waterfronts inspire positive perceptions and experiences in cities, also creating solid emotional bounds with inhabitants (Völker and Kistemann 2013). It is also called sense of place, regarding place identity and the feeling of being part and belonging to an area (Buijs 2009). These ecosystems can influence the type and level of social relations established in certain cultures, how spatial characteristics are recognized, and the maintenance of cultural heritage values and historically significant landscapes (Millennium Ecosystem Assessment 2005). Arnett (2017) complements with the sense of citizenship constructed through experiences with other society members in those places. Furthermore, as water elements as crucial in landscape design, urban planners are rediscovering the importance of the urban blue. This can be – and is – used to create a positive image for the city, as a new identity or branding.

Another important aspect that is discussed in this study in the context of social-cultural values is the value of nature. River restoration projects alter the region's ecosystem and urban scenery. About values of nature, an interesting model called 'Total Economic Value - TEV' developed by Pearce and Moran (1994) was chosen (see Figure 5), tightly connected with the concept of ecosystem services previously presented. It splits values in two groups: 'instrumental (or use) values' and 'intrinsic (or non-use) values'. The first group has three subgroups: 'direct use value' (in water systems, "ground water recharge, swimming and washing"), 'indirect use value' ("experiencing the water, the landscape, the fauna and the flora") and 'option value' ("planning of recreation or real estate development"). The second group has two subgroups: 'existence value' ("conserving it for its very being/identity as an asset") and 'bequest value'

("conserving it for future generations") (Ast et al. 2013: p. 250). The concept 'values of nature' in this study encompasses both aspects of instrumental and intrinsic values of TEV model. As stated by Ast et al. (2013: p. 250), they "combined can be considered in alignment to the definition of sustainability by the World Commission on Environment and Development (1987), that meets the needs of the present without compromising the ability of future generations to meet their own needs".

Figure 5: "Total Economic Value of Environmental Assets". Source: based on Pearce and Moran (1994).



Across the years these values of nature change in societies. In different countries, the connection between rivers and urban areas was transformed from natural and cooperation, influencing the ways cities were planned and designed, to neglect and separation as urbanization increased. Many rivers were deeply changed or even channelized disregarding their ecosystem services and potential for attractiveness in urban landscapes. Technical and sectoral approaches concerned with control the water were segregate from urban and environmental decisions (Batista e Silva et al. 2013). Recently, the trend of make 'space for the river' is a proof of a new paradigm, with projects across the globe reintegrating rivers to their cities and societies and in which the river is "a source of sentiments" and governance is "making space for values: making mind space" (Warner et al. 2012: p. 1,3).

A research by Born et al. 2001 explores the concept of 'new biophilia' and 'visions of nature' in Western countries that is related to the current values of nature in these societies. They applied the term 'biophilia' "in its original (Fromm 1973) and literal meaning, to refer to love of all that lives or, more simply, nature-friendliness", and combined quantitative and qualitative research finding "a remarkable degree of nature-friendliness in the general public" in the US and Europe (Born et al. 2001: p. 66-67). A high percentage (70-90%) of respondents value the intrinsic right of nature to exist regardless of human use, and many people pointed rich and

deep views of nature. Understanding the perception of this public, meaning non-experts, is essential to design and communicate nature conservation programmes. The authors highlight that further qualitative research is needed to capture the general public's visions and conceptualizations of nature, to investigate below the professionals and politicians 'cultural layers'.

To conclude, all the social-cultural values presented in this chapter confirm the direct and indirect influence of urban landscape and ecosystems - water systems such as rivers in the case of this study - into human well-being. The perception of these values by the citizens of a city is strongly relevant to policy-making and practice regarding implementing a river restoration programme in this specific city, to assure beyond the citizens' support, their later quality of life as users of the transformed urban landscape.

2.2 Water governance and legitimacy

2.2.1 Water governance

Water systems are of complex and multifunctional nature, which has been increasingly realised both in academia and in policy, especially in the context of climate change and 75% of Earth's population living in delta areas with serious flooding risk. Water matters require an approach that embrace multiple stakeholders and sectors, with their varied perspectives, values, and goals in a vertical and horizontal coordinated way: named water governance. In the literature, there are alternative definitions of governance, but they have in common the following characteristics: an interactive process instead of a traditional regime, negotiation and agreement in decision making without dominance, horizontal and vertical networks, inclusion of more stakeholders such as private sector and civil society, emphasis on the common good and in realization (see Table 1) (Tropp 2007, Edelenbos et al. 2013b).

Table 1: "New and old forms of governance.". Source: Tropp (2007: p. 25)

"Old governance emphasises	New governance emphasises
• Emphasises the government and bureaucracy • Political power monopoly • Steering • Hierarchical control • Enforcement of rules and regulations • Control • Top-down management • Formal institutions • Inter-governmental relations	• Civil society and markets. The government and bureaucracy are still important entities but with reduced authority • Co-steering • Diversity of actors and power diffusion • Horizontally shared control • Inter-organizational relations and coordination • Decentralization/bottom-up management • Formal and informal institutions • Co-governing (distributed governance) • Network governance • Process orientation • Expansion of voluntary exchange, self-governance, and market mechanisms • Dialogue and partnership • Participation and negotiation"

Water governance is, therefore, an approach that integrates actors, groups, and institutions from multiple backgrounds - such as ecology, economy, social, cultural, agriculture, landscape design and urban planning – to deal with water issues with creative, holistic, and legitimate strategies. It goes beyond addressing flooding risk and encompasses local and regional development, connecting stakeholders and different levels of government from diverse sectors. Moreover, it involves the users of water systems: the society as organized groups, NGOs, and

individual citizens. Water governance is experiencing a transition from the technical-engineering model to a holistic and democratic one, opener to local and bottom-up initiatives, like citizen involvement, partnerships between public and private spheres and community based initiatives (Edelenbos et al. 2013b).

Ryan and Burton (2016) conducted a literature review and related an increasing interest among academics and practitioners in this form of 'Integrated Water Management', with many different approaches and definitions as presented in the background of this study. For example, Wong and Brown (2009: p. 680) argue for 'Water Sensitive City' as new paradigm in urban planning to address climate change and discuss that "planning and designing liveable, and environmentally responsible communities involves a holistic approach centred on a clear appreciation of the interconnections between key design elements that affects the ecological footprint of urban environments" with the need for "a trans-disciplinary approach to design with active community engagement and participation". Lawson et al. (2014) bring 'Water Sensitive Urban Design', which proposes a holistic urban water management integrating urban planning and design with different technical and environmental disciplines aiming at social, economic, and environmental development. Further, the authors present the concept of 'Blue-Green City' towards a natural approach in water cycle that combines water management, urban amenity, and green infrastructure, at the same time addressing ecological and social-cultural values and reducing flooding risk.

River restoration programmes fit into this scenario. Warner et al. (2012) highlight a trend across different countries that they named 'making space for the river', which aims to recreate the natural visual attractiveness of rivers integrating water security with economic, social-cultural, and ecological values. These interventions are technical measures to increase the discharge potential of rivers that also have the objective to realize sustainable, inclusive and integrating strategies for better quality of life and economic development. 'Space for the River' approaches combine water management with spatial planning, environment protection and human recreation, also bringing to the city an improved branding and political status. In this book, the authors show 'Space for the River' cases from US and Europe: the rivers Ijssel (NL), The Rogue and Willamette (US), Quaggy and Thames (UK), Rhône (FR), Danube (RO) and Tisza (HU). After analysing different programmes, the researchers found five driving values: "i) ecological values, ii) water safety considerations, iii) water safety and ecology in conjunction, iv) implementation of integrated water management, and v) consequences of climate change". Moreover, they concluded that the origins of 'making space for the river' are: "occurrence of (near-)disasters, increased insight into/appreciation of the ecological value of river systems, general trend towards sustainability and quality of life, democratization of society and emancipation of citizens and stakeholder groups, developments of and within spatial planning" (Buuren et al. 2012: p. 189-190). Finally, as discussed above regarding water governance in general, 'Space for the River' programmes require institutional integration and coordination to connect the knowledge and expertise dispersed across sectors and organizations and joint the different objectives, values, and perspectives of all actors.

The decisions made in the new water governance approach (Table 3) are not restricted to governments and water managers, but open to other stakeholder participation. Therefore, public agencies, private companies, NGOs, organized and individual citizens are involved and participate in the whole process. This means that conflicts between different perceptions of issues, possible solutions and their costs and benefits must be managed to the success of the intent programme, achieving support and legitimacy (Ast 2013).

2.2.2 Legitimacy

The fast path of urbanization and increased threat of climate change adds uncertainty to the already complex water governance. The management should be adaptive and flexible to constantly adjust its pathway responding to new scientific knowledge and monitoring data regarding physical features of the water system and the preferences and values expected from this system from society (Ast 2013). In river restoration programmes, expert's valuation should be accompanied by citizen's perception, as stated by Batista e Silva et al. (2013: p. 182): "the capture of cognition, feelings, behaviours and preferences of its users would give valuable inputs—present performances, potential user expectations or desires towards the future of these city–river landscapes". Discussing healthy cities, Leeuw and Simos (2017) bring three relevant ideas. Firstly, the concept of 'Glocal Health' where the relation between global aspects like climate change are inseparable from local actions such as land use regulations to prevent occupation in flood risky areas. Secondly, the notion of 'Political Culture' as an aggregation of opinions, values and traditions that connect people with their societies and leaders constituting an identity reference that is linked with heritage and future expectations. And thirdly, the notion of social values as the unseen connector between societies and culture. These are all important aspects to be considered while intervening in cities and landscapes, affecting the livelihoods of many.

In the literature, authors (Edelenbos et al. 2013a, Edelenbos et al. 2013b) contextualize water governance as of multifaceted quality, crossing different boundaries in governments, territories, policies, and jurisdictions, impacting multiple networks and stakeholders. This leads to a need for constant negotiation towards effective and valid decisions. Each actor has an unique perception on the problem and its solution, complicating the scenario. Water governance should be seen as a bridge that connects the multiple perspectives, values, and objectives, through institutional capacity constructed with lively, flexible and resilient networks, giving voice to the different actors. Governments must be receptive to local and community initiatives, so justice is made to citizens' values and interests and legitimacy is achieved. (Edelenbos et al. 2017).

A literature review (Buijs 2009, Warner 2012, Buuren et al. 2012, Edelenbos et al. 2013b) presents the legitimacy challenge in 'Space for the River' programmes, as a new trail in technic and policy-making where misperception, divergence and disagreement are common among actors. Strong resistance can happen, meaning a cooperative challenge. Win-win solutions are not always possible, and tough decisions and trade-offs remain, especially due to multiple objectives as improvement in spatial quality, nature conservation, aesthetic value, cultural preservation, and flood risk management, public opposition occurs and different stakeholder objectives easily clashes.

The competition for multiple spatial uses is one example – the land designated for more space to water in the case of an intense rainfall could be used for housing, real estate development, or agriculture. This is one of the reasons for the importance of combining the spatial improvement and creation of quality public spaces such as urban parks in river restoration interventions. Even though, every decision implies in judgment and possible controversy. "Realizing legitimacy in complex governance is anything but easy (Buuren et al. 2012: p. 197), and it encompasses more than supporting elected politicians and demanding transparent and accountable processes, it requires giving active voice for all stakeholders. Sharing knowledge, dialoguing and negotiating must be the key actions since the problem assessment, through planning and designing and into implementing the solutions. Public participation has the power to connect citizens and the government, decreasing conflicts and veto power and increasing the outcome quality of the project (Edelenbos et al. 2013b, Warner et al. 2012). Establish a balance between "green" (nature, ecology), "blue" (water) and "red" (housing) policy goals" requires

this new "role distribution between governments, institutions, experts and citizens" (Warner et al. 2012: p.6). Moreover, it can empower communities and connect them to the environment, reflect their landscape preferences and enhance their perception on place identity (Smith et al. 2014, de Buijs 2009).

In practice, 'Space for the River' is hard to implement. Integrated management demands much more engagement, participation, and communication. It involves many more people, administrative procedures, second opinions, political lobbing and even media effort (Edelenbos et al. 2012). A research conducted by Groot and Groot (2009) found out that even though Dutch policies are moving towards working with nature, residents do not perceive the nature in the changed landscapes the same manner as the designers' intention, showing that a gap still exist and communication between planners and the society should be improved. River restoration programmes requires a new perspective: it demands "spanning the mind-space with which we think about river basins and systems" as stated by Warner et al. (2012: p. 3), broadening the discussion and inviting new actors and opinions as "river planning touches the lives and livelihoods of many".

Buuren et al. (2012) present five constituents of legitimacy: i) participation: opportunity for stakeholders manifest their perceptions and interests, at the same time as the authorities have space to make authoritative decisions ii) consideration for local specificities regarding costs and benefits (both real and perceived), iii) reliable evidence of the proposed solutions, iv) focus on multifunctionality, and v) sense of urgency, such as disaster occurrence as trigger. Moreover, Edelenbos et al. (2013a) highlighted that legitimacy has two levels: i) legitimacy as acceptance of the governance regime or political institution, and ii) legitimacy of the practical decision-making procedures. Then, focusing on the later, they established 3 types of legitimacy: i) 'output legitimacy': when the outputs of government decisions are representations of common interests and relevant for the stakeholders (such as citizens, private sector and NGOs), and are considered effective answers to relevant issues for the governed, ii) 'throughput legitimacy': when the process is democratic: opened, transparent, accessible, and stakeholders are involved – especially the citizens; and iii) 'procedural legitimacy': when decision-makers can be hold accountable, for some example the rule of law. In this work, the researchers found out that this type of 'complexity sensitive management' has a positive impact on the output and throughput legitimacy.

In the present study, the researchers use the first two types of legitimacy researched by Edelenbos et al. (2013a) - output and throughput - to investigate the perceived legitimacy of Nijmegen Room for the River, and examine to what extent it is influenced citizens' perception on the transformed landscape produced by an integrative water governance programme.

2.3 The Netherlands

In this section, a literature review is presented on the topics previously discussed, but with the focus on The Netherlands, where the case study is located.

Regarding value perception, Ast et al. (2013) conducted a research and presented that water value changed through time. from a negative perspective of fear from flooding and diseases to a positive of aesthetic and ecological appreciation. Ranking the relative value among Dutch residents, they show that aesthetics, ecology, nature presence and recreation are important factors that have been driven the revitalization of rivers and water systems (see Table 2).

Table 2: "Changes in value perception in The Netherlands". Source: Ast et al. (2013: p. 256)

	*"Importance: * little, ** significant, *** high*		
Relative value (importance related to other values)	**Historical (+/- before 1900)**	**Modern (+/- 1900-2000)**	**Recent (+/- after 2000)**
Religious / spiritual			
Drinking water	**	**	**
Fish production		**	**
Transportation by ship	**	**	**
Sand and clay		*	*
Transportation by pipes		*	*
Recreation		*	***
Cooling water		*	**
Electricity production		**	**
Ecology		*	**
Attractive for housing (aesthetics)		**	***"

On values of nature, a research made by Groot and Born (2003: p. 127) stated that in The Netherlands more than 90% of the respondents "acknowledge the intrinsic value of nature, that is, nature's right to exist irrespective of its uses and functions for humankind". This is named as 'New Biophilia', a new cultural perspective in Western countries, as an evolution from previous control and domination views. In this article, the authors found that Dutch inhabitants (in the city of Gennep) in their majority prefer "deep ecology landscape type", "in which one may experience the greatness and forces of nature". Another third choose "the wild, interactive landscape". This confirms that citizens in highly urbanized environments as The Netherlands are adopting a culture of stronger nature protection and appreciation feelings. The authors highlighted the relevance of comprehending landscape type predilections in urban planning and landscape safety and design, "as are behavioural preferences for policies with respect to the zoning of national parks, the design of amenities, urban parks planning and so on" (p. 137). Moreover, including citizens' preferences in the design of landscapes has the power to create spaces that are attractive, ecologically sustainable, and coherent with citizens' perceptions and desires.

Considering water governance, the Netherlands is transitioning towards a new water management, in which water is seen as a 'friend' (Ast et al. 2013, Groot and Groot 2009, Buijs 2009), as a parallel to the new form of governance discussed in the previous section (see Table 1). The Dutch is well-known for fighting the water. Most of the country is below sea-level rise and relates on continued control and drainage. There is a complex system of technical mechanisms to keep the area dry and safe. At the same time, land is scarce and very disputed among different spatial uses, such as agriculture, residential, commercial, industrial, recreation, and nature (Edelenbos et al. 2012).

The values and management approaches related to water systems changed significantly through the country's history, both intrinsically connected and confirming that the water system is governed side-by-side with how the society perceive and value it (see Tables 2, 3 and 4) (Ast et al. 2013). In the literature, many authors (for instance, Rijke et al. 2012, Buijs 2009, Ast et al. 2013, Edelenbos et al. 2012, Scholten 2013) present the historical overview of the Dutch water-related history (see Box 1). In early times, Dutch focused on interventions related to flood control and fear of diseases, aiming for security with hard engineering measures such as dikes (Buijs 2009, Edelenbos et al. 2012, Scholten 2013). Later, technological developments overcome both fears and The Netherlands even created land from the sea.

Economically, the emphasis on fishing and food accessibility were the first concerns, changing to transportation potential of rivers after some centuries. In the last century, compartmentalization of police into sectors highlighted other values, such as visual, recreational, and environmental, shifting the paradigm from controlling and fighting 'dirty' water to living and developing with 'clean' water (Ast et al. 2013, Scholten 2013). In 1953, a serious flood destroyed the south-western part of The Netherlands, bringing safety as a priority in political agenda and leading to the construction of the delta works and the straightening of dykes (Scholten 2013). During 1970s and 1980s there was a shift from the pure technocratic style towards a more natural and adaptive water management, especially due to the emphasis on environment protection and spatial quality in society's values. It came the realization that an integrated approach was needed, connecting the different sectors (Ast et al. 2013, Buijs 2009, Rijke et al. 2012, Scholten 2013). The near-occurrence of two major floods in 1993 and 1995 was a push towards a more integrated model, as an opportunity for new water policy. Increasingly Dutch decision-makers and inhabitants have been realizing that climate change, rising temperatures, sea-level rise and more frequent and intense rainfalls are matters of national security.

In the recent years, the transition in Dutch water governance is gradually replacing the engineering and sectoral model to a holistic paradigm in which water management is combined with ecology and urban planning, as other planning disciplines (see Table 3), as a sustainable and adaptive approach that is continually adjusted, more participative, focused on the long-term perspective (Ast et al. 2013, Buijs 2009, Rijke et al. 2012, Scholten 2013). The current challenge is continuing this new governance pathway. (Rijke et al. 2012).

Box 1: "Overview of recent Dutch water management history" Source: Scholten (2013: p. 264)

"1940	Standardization of waterways, control over water systems
1940-45	World War Two, damage and inundations
1945-53	Centralized water management
1953	Flood disaster. Safety becomes a top priority in Dutch politics - Building of the delta works - Straightening of dykes
1970-80	Rise of environmentalism Protests against technocratic and centralized approach to water management Integrated approach to water management
1993 and 1995	Near floods in riverine areas
1995-2010	- Primary reaction to near floods: traditional technocratic approach, straightening the dykes - Secondary reaction: paradigm change toward 'space for water' - Adaptability and long-term perspective - Water safety connected to other societal issues (economy, housing, recreation) - Ecological rehabilitation

Table 3: "Changes in water management in The Netherlands". Source: Ast et al. (2013: p. 263)

"FROM traditional water management	**TO Modern water management**
Water as an 'enemy' • 'Fighting against the water' • Sectoral water management • Effective and efficient • Supply Management • Water systems follow social processes • Water follows spatial development • Technocratic: build and maintain	**Water as an 'friend'** • ''Living with the water' • Integrated water system management • Sustainable: long term responsibility • Demand Management • Social processes follow water systems • Spatial development follows water • Ecosystem based: support resilience and self-regulation
National	**International and regional**
• Government lead water management • 'Command and control' water policy	• Participative water management • Interactive water management"

Table 4: "Developments in the concept of water management". Source: Ast et al. (2013: p.262)

"Phase	Concept	Value
Historical times	• Flood control (wet areas) • Drinking water supply (dry areas) • Water quantity management	• Human health • Land use / food production
Modernization	• Sectoral water management • Integrated water management	• Human use • Water system health
Recent times	• Sustainable water management • Adaptive water management	• Sustainability (long term) • Interaction • Adaptation • Resilience"

In the context of this new Dutch water management the programme 'Room for the River' was created in 2006. The literature (Rijke et al. 2012, Brugge et al. 2005, Edelenbos et al. 2017, Buijs 2009, Buuren et al. 2012, Zevenbergen et al. 2013) presents this programme as a governance approach with an ambitious and integrated goal of pursuing both safety against flooding, ecological protection, climate change adaptation, and urban development in local and regional levels. During the participative programme, different spheres of government, private sector, NGOs, and citizens actively interacted, dialogued, and negotiated to construct a social and environmental assessment regarding the rivers Rhine, Meuse, Waal, IJssel, and Lek. The two main objectives were to reduce flooding risk and to improve spatial quality of areas near the rivers.

Four reasons explain the development of the "Room for the River" in The Netherlands, according to Edelenbos et al. 2012 (p. 37): firstly, climatic resilience and adaptation: the increased awareness of the risks of climatic hazards and the limitations of the technical solutions previously adopted, such as dykes, as well as the realization that an adaptive solution should be sought in which rivers could have more space for the periods of bigger discharge need. Secondly, 'landscape, culture and history": the previous engineering focus was less compatible with the original rivers landscape, the historic heritage and the culture of the old constructions, and a new approach considering citizens' values regarding "landscape, nature and culture" (LNC) gained strength. Thirdly, "ecological values": riverine areas are a good opportunity for The Netherlands to obey European rules for ecological protection of existing sites and development of new natural areas. And finally, to increase land availability: since land is a scarce asset in the country, different spatial functions dispute for the same space, and there is a pressure to combine water safety with other land-uses such as housing and public spaces, that can be achieve by innovative ways in the "Room for the River" programme.

As discussed by Rijke et al. (2012), the programme 'Room for the River' fits in the 'modern' water governance, being conceived as an interactional multi-level governance approach. Different government agencies from national, regional and local levels, acting in multiple areas – such as urban planning, water safety, and nature – have collaborated to create and achieve the multi-functional goals of the project, based on the drivers presented above, in a combined centralised and decentralised decision-making processes. The national government has established the overview targets, while regional and local agencies conducted specific project plans and designs. This brought an important opportunity for the local level to link the national water safety agenda with their own city development plans, such as spatial quality and recreational areas. The official programme website (Ruimte Voor De Rivier 2017d) highlights the collaboration between government agencies as hard work of finding and shaping cooperation, which added value to the project. The article mentions that the "program is under the responsibility of the Ministry of Infrastructure and Environment and the Ministry of Economic Affairs. However, seven provinces, eight water boards and thirty municipalities have

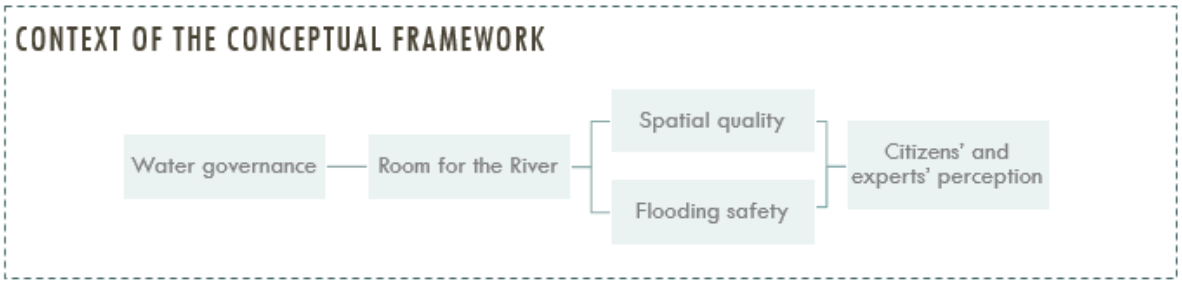
gained a great deal of freedom in the elaboration of the various measures within pre-established frameworks and conditions." Also in the frontline on the national level, the water authority Rijkwaterstaat was in charge, as the part of the Ministry of Infrastructure that is responsible for design, construction, management, and maintenance of the main infrastructure facilities in The Netherlands, as waterway network and water systems (Rijkwaterstaat 2017). As in the case of Nijmegen – the case study of this research – the main other government agencies involved were the Province of Gelderland (regional level), the Municipality of Nijmegen (local level), and the Waterschappen (local water authority).

To summarize, in this section water governance was presented as an interactive and horizontal process, constituted of multiple stakeholders that negotiate to achieve a decision making focused on the common good (Tropp 2007). Societies and citizens participate in this democratic approach which aims to produce an innovative, holistic, and legitimate outcome (Edelenbos et al. 2013b). Due to the multiplicity of perspectives and interests, controversy and conflicts commonly arise, putting the accomplishment of legitimacy in the heart of governance issue, especially in the uncertain context of climate change. The Netherlands is currently in the process of transition toward this integrative, sustainable, adaptive, and long-term vision water governance (Edelenbos et al. 2012), that is also multi-level across different government agencies (Rijke et al. 2012). Better understanding the relation between citizens' perceptions on the "Room for the River" programme outcome – the transformed ecosystem and urban landscape (regarding social-cultural values presented in the previous section) – and the ex-post achieved legitimacy can contribute in both scientific knowledge and policy making in the current Dutch pathway.

2.4 Conclusion and Conceptual Framework

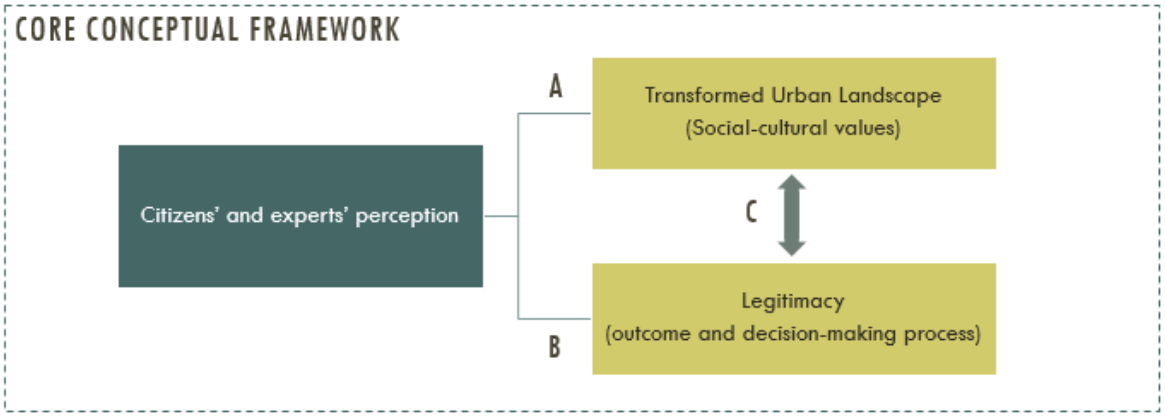
In this section, the conceptual framework of this research is presented, built on the previous theory review. Each concept is developed (conceptualized), clarifying its mean in the context of the present study.

Figure 6: Context of the Conceptual Framework. Source: Author, 2017



In the context of the new water governance that has been practiced in The Netherlands in the past decades, the programme Room for the River has created in 2006 with two main objectives: to reduce flooding risk and to improve spatial quality of riverine areas.

Figure 7: Core Conceptual Framework. Source: Author, 2017



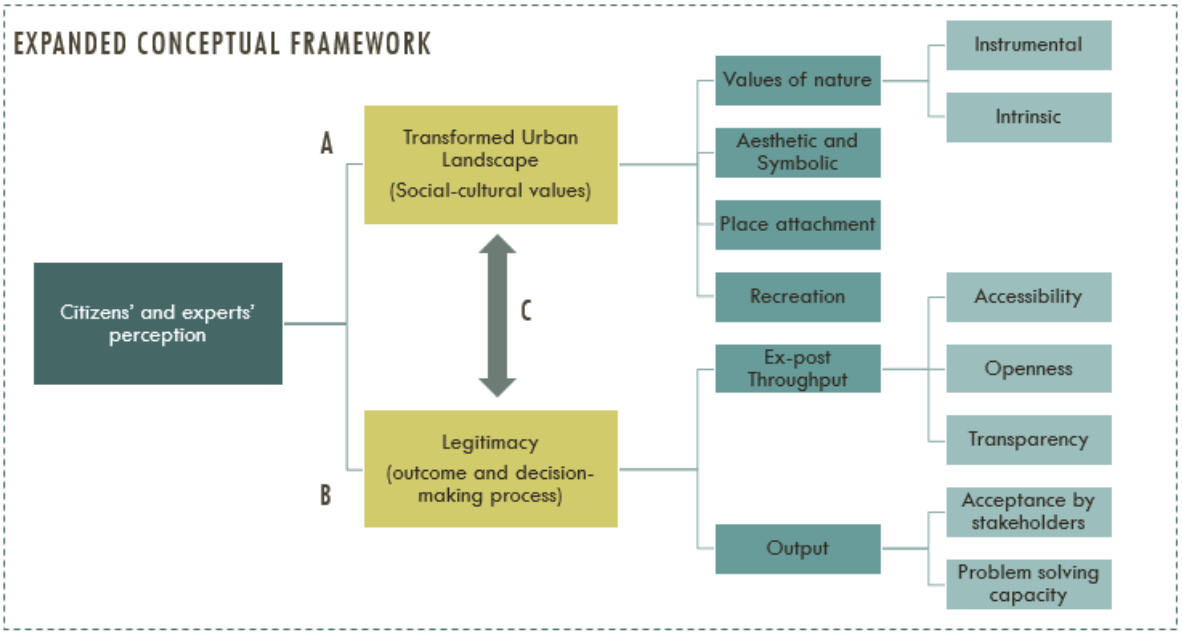
The programme "Room for the Waal Nijmegen", part of the "Room for the River", transformed the river Waal and Nijmegen's urban landscape. In this study, the researchers intend to capture citizen's perception on the transformed urban landscape, as well on the legitimacy of the decision-making. According to Oxford Dictionary, perception is "1. The ability to see, hear, or become aware of something through the senses; 1.1. Awareness of something through the senses.; 1.2. Psychology Zoology - the neurophysiological processes, including memory, by which an organism becomes aware of and interprets external stimuli; 2. The way in which something is regarded, understood, or interpreted; 2.1. Intuitive understanding and insight".

Public perception on the transformed landscape is how people capture, regard, understand and interpret these through a sum of visual perception (focused on scenic beauty and human appreciation for nature and greenery), place attachment (related to emotions of connectedness and belonging), valuation of ecology and nature preservation, and risk awareness (based on Buijs 2009). Here, the researchers focus on one aspect of the landscape perception: social-cultural values. Social-cultural values are non-material factors related to societies' (as individuals and groups) experiences in these places, obtaining benefits such as "recreation and mental and physical health, tourism, aesthetic appreciation and inspiration for culture, art and design, spiritual experience, and sense of place" (Millennium Ecosystem Assessment 2005: p. 40). Furthermore, values of nature are how the ecosystem and its landscape are evaluated regarding its use (directly, indirectly or reservation) and non-use (conservation as an asset of for future generations use) (Ast et al. 2013).

Legitimacy is, according to the Oxford Dictionary, "1. Conformity to the law or to rules; 2. Ability to be defended with logic or justification; validity". In the context of water governance as a participatory management, legitimacy in this study is defined rooted on Edelenbos et al. work (2013a), focused on the governance practice and 'concrete policy and decision-making processes'. A programme is legitimate when its outcome reflects effective solutions to common issues of the society, its process involves multiple stakeholders (and especially the citizens) in a democratic conduct, and it is achieved within the rule of the law with the accountability of decision-makers.

In this study, these two elements in citizens' perception - social-cultural aspects of the transformed landscape and ex-post legitimacy of the programme - are evaluated. Furthermore, it is explored whether a relation between these two components can be established.

Figure 8: Expanded Conceptual Framework. Source: Author, 2017



To investigate social-cultural values, four aspects were chosen due to their relevance in the literature review, especially in the research made by the Millennium Ecosystem Assessment (2005) and The Economics of Ecosystems and Biodiversity (2011). The first aspect is aesthetic and symbolic values: how citizens perceive the visual beauty and attractiveness of the landscape and the subjective meaning of the place, such as spiritual, educational, and artistic inspiration. The second is place attachment: the emotional bounds between the area and inhabitants, as the place identity and the feelings of connectedness and belonging, also among other members of the community, strengthening the sense of citizenship. The third factor is recreation: the use and appreciation of the public spaces created for leisure, relaxation, restoration for the daily stress, sports practice, and other activities with family and friends (such as picnics). And finally, regarding values of nature, based on model made by Pearce and Moran (1994), two groups are discussed: 'instrumental (or use) values' and 'intrinsic (or non-use) values' are used to capture citizens' perceptions on the changed ecosystem and landscape, although in a non-monetary evaluation. The first group, 'instrumental value' is about using the landscape / ecosystem in three forms: directly, for example by swimming in the river or practicing a sport in the park; indirectly, as being more protected from floods, breathing a cleaner air or experiencing the fauna and flora; and having the option to use it in the future, such as planning a real estate development. The 'intrinsic value' regards the non-use of this landscape / ecosystem, and is composed by two aspects: 'existence': conserving it for its identity and simply for being important to exist, and 'bequest': saving it for future generations.

Two legitimacy types were selected from the research by Edelenbos et al. (2013: p. 269): output and throughput. The first one is about the programme outcome and it has two dimensions: the capacity of the decision-makers to achieve a solution for an issue that is common to the citizens, and the acceptance of this solution by all stakeholders – when they perceive the outcome as "relevant and in their own interests". The second dimension relates to the process of the decision making (and is ex-post in the case of this study): "throughput legitimacy is about the democratic quality of the process", meaning that it is open, accessible, and transparent, and multiple actors were listened through a deliberative and consensual way.

Chapter 3: Research Design and Methods

In this chapter, the operationalization and research design chosen to answer the research question are presented and discussed. It recapitulates the research question and objective presented in Chapter 1, and includes the research strategy, data collection methods, sampling, variables used, and data analysis technique. Furthermore, the study validity and reliability are discussed.

3.1. Research Objective and Research Question

Research Objective

In this study, the researchers analyse the river restoration programme 'Room for the Waal', in Nijmegen, The Netherlands. They investigate how citizens who were mostly affected by the project (living on the neighbourhoods transformed), and experts involved in the decision-making, perceive the changed urban landscape and the ex-post legitimacy of the programme outcome and process of decision-making.

The research aim is both exploratory and explanatory. Although there is vast theory about landscape perception, social-cultural values, water governance, and legitimacy, core concepts of this study, there is little empirical information regarding specifically citizens' perceptions in river restoration projects. The case was very recently implemented (April 2016). The aim is to explore what are the citizens' perceptions on the transformed landscape, regarding social-cultural values, and on the ex-post legitimacy of the programme, now that it is concluded. The objective is to collect detailed empirical descriptions of the recent phenomenon in Nijmegen. With these rich, deep, and new qualitative insights, the researchers aim to discover and explain whether a relationship can be established between the two variables: the perception of the changed landscape and the perceived legitimacy of the "Room for the Waal", extending the theoretical knowledge on these two fields. The researchers conjecture that a positive perception on the transformed landscape, now that it is completed and usable, may lead to a more positive perception on the outcome legitimacy – that the result is in their best interest – and perhaps even on the decision-making process legitimacy – a feeling that 'it was worth it'. Furthermore, the vice-versa also may be applicable: a good perception on legitimacy may increase the appreciation for the changed urban environment.

Revised Main Research Question

The river restoration programme "Room for the Waal" that took place in Nijmegen/NL between 2006 and 2016 altered the urban landscape with two main objectives: to reduce flooding risk and to improve spatial quality of riverine areas.

How do citizens who were mostly affected by this programme (living on the neighbourhoods transformed), and experts involved in the decision-making, perceive: A) the changed urban landscape, and B) the programme legitimacy? Furthermore, C) can a relationship be established between these two perceptions (A and B)?

Revised Research Sub Questions

A. How do Nijmegen citizens who were mostly affected by this programme and experts involved in the decision-making perceive the transformed urban landscape, regarding social-cultural values?
B. How do Nijmegen citizens who were mostly affected by this programme and experts involved in the decision-making perceive the legitimacy of the ex-post programme outcome and process of decision-making?

C. Can a relationship be established between perceptions on the transformed urban landscape (A) and on the ex-post legitimacy of the programme outcome and process of decision-making (B)?

3.2 Research strategy

The research strategy chosen was the Case Study. As presented by Thiel (2014) and Timney Bailey (1992), this is a frequently strategy used in Public Administration and Management research realized in a real-life setting and has an applied nature with the researcher aiming to contributing to solve a concrete issue. A case study focuses on a limited number of situations and goes for detail and depth. It fully explores, describes, and explains a phenomenon in its context, aiming for a rich and qualitative understanding. This strategy is suitable for research objectives such as explore, describe, diagnose, design, and evaluate, with a relatively small number of units and a large number of variables. The context matters in this strategy and the variables are analysed within their wilder setting. The researcher chooses one or more specific cases due to their unique aspect, or because they represent a very good example of the interested phenomenon, or it is its first occurrence. Due to these characteristics, findings from a case study are difficult to generalize to other situations, reducing the external validity of the research. Yet, sometimes results can be considered significant for other cases in the same research field, even if they are not the object of the study (Flyvbjerg 2006). On the other hand, the internal validity is usually high because of the wealth of data collected. The reliability and validity are discussed at the end of this chapter.

The case study is the best suitable strategy for this research because of its exploratory and explanatory objective to gather citizens' perceptions by collecting rich, deep, and detailed qualitative data. It is a single case ('Room for the Waal Nijmegen'), that was selected because of the world-wide acknowledgement of The Netherlands as pioneer in water governance, the recent implementation of the program 'Room for the River', and the intervention in Nijmegen transforming significantly the urban landscape. The research focuses on this one situation, in detail, aiming for depth instead of breadth. The number of units is small – the Nijmegen residents who were mostly affected by the programme, living in the area. The number of variables is relatively large, as presented in the conceptual framework (see Figure 8). Due to the duration of this thesis, it is a single moment measurement. In this study, the researchers work primarily with qualitative data collection, that will be explained in section 3.4.

3.3 Operationalization: Variables, Indicators

The concepts presented previously in the conceptual framework (see Figure 8) are operationalized in this section, meaning they are translated from theory into specific and realistic concepts that respondents can understand and interpret.

Firstly, the concepts and variables are recapitulated and defined within the specific context of this study (see Table 5). Following, the variables are translated into realistic indicators (see Table 6), that are expected to appear in a latter step (the coding process). Since this is a qualitative research and it aims to achieve new and rich information from the respondents through the interviews, indicators are used as a guideline and a checklist during the conversations, but the questions prepared in the interview guide before-hand are constructed in a more open way based on the variables, leaving room for unexpected responses (see Annex I).

Table 5: Variables definition. Source: Author, 2017

Concepts	Variables	Definition	Sub Variables	Definition
Citizens' and experts' perception on the transformed urban landscape	Social-cultural values	Social-cultural values are non-material factors related to societies' experiences (as individuals and groups) in landscapes and ecosystems, obtaining benefits such as "recreation and mental and physical health, tourism, aesthetic appreciation and inspiration for culture, art and design, spiritual experience, and sense of place" (Millennium Ecosystem Assessment 2005: p. 40). It also encompasses values of nature, meaning how the ecosystem and its landscape are evaluated regarding its use and non-use values (Ast et al. 2013).	Aesthetic and Symbolic values	How citizens perceive the visual beauty and attractiveness of the landscape and the subjective meaning of the place, such as spiritual, educational, and artistic inspiration (Millennium Ecosystem Assessment 2005, The Economics of Ecosystems and Biodiversity 2011).
			Place attachment	The emotional bounds between the area and inhabitants, as the place identity and the feelings of connectedness and belonging, also among other members of the community, strengthening the sense of citizenship (Millennium Ecosystem Assessment 2005, The Economics of Ecosystems and Biodiversity 2011).
			Recreation	The use and appreciation of the public spaces for leisure, relaxation, restoration for the daily stress, sports practice, and other social activities with family and friends (Millennium Ecosystem Assessment 2005, The Economics of Ecosystems and Biodiversity 2011).
			Values of nature	How the ecosystem and its landscape are evaluated regarding its use and non-use (Ast et al. 2013). The first is named 'instrumental' or 'use values', considering three forms: directly, for example by swimming in the river or practicing a sport in the park; indirectly, as being more protected from floods, breathing a cleaner air or experiencing the fauna and flora; and having the option to use it in the future, such as planning a real estate development. The second is the 'intrinsic' or 'non-use values', and has two aspects: 'existence': conserving it for its identity and simply for being important to exist, and 'bequest': saving it for future generations (Pearce and Moran 1994).
Citizens' and experts' perception on the programme Legitimacy	Ex-post Throughput Legitimacy	Throughput legitimacy is about the democratic quality of the process of decision making (and is ex-post in the case of this study), meaning that it is open, accessible, and transparent, and multiple actors were listened through a deliberative and consensual way. (Edelenbos et al. 2013a).	Openness	The decision-makers are open to listen multiple stakeholders through deliberative and consensual process.
			Accessibility	The process is accessible to all actors: anyone interested in participating, regardless of technical or political knowledge, connections, or social-economic condition.
			Transparency	"The perceived quality of information intentionally shared" from the decision-makers. The process information is shared with disclosure, clarity, and accuracy (Schnackenberg and Tomlinson 2016), accessible to all stakeholders (especially the citizens) throughout time and documenting each step.
	Output Legitimacy	Focusing on the governance practice and concrete policy and decision-making processes, Output Legitimacy occurs when the programme outcome reflects two dimensions: (i) acceptance by stakeholders (especially the citizens), which consider this result as relevant and aligned with their interests; and (ii) reflects the capacity of the decision-makers to achieve effective solutions to common issues of the society (Edelenbos et al. 2013a).	Acceptance by stakeholders	Acceptance of this solution given by the decision-makers by all stakeholders, that occurs when they perceive the outcome as "relevant and in their own interests" (Edelenbos et al. 2013a: p. 269).
			Problem solving capacity	The capacity of the decision-makers to achieve a solution for an issue that is common to the citizens (Edelenbos et al. 2013a).

Table 6: Operationalization of variables and indicators. Source: Author, 2017

Concept	Variables	Sub Variables	Indicators	Data collection method	Data type	Data source
Citizens' and experts' perception on the transformed urban landscape	Social-cultural values	Aesthetic and Symbolic values	Considering the landscape visually beauty and attractive	Primary qualitative data collection: Semi-structured interviews	Qualitative	- Nijmegen citizens (primary) - Experts (primary)
			Having inspiration for art and/or other cultural expression from the landscape			
			Valuing the landscape for educational purposes on children			
			Attribution of religious and/or spiritual meaning to the landscape			
			Considering the landscape design matching the urban pattern / identity of the city			
			Felling invited and motivated to visit and use the public spaces			
		Recreation	Interacting with family and friends in those spaces			
			Interacting with other members of the community in those spaces			
			Using the space for sports practice			
			Using the space for leisure (reading, swimming)			
			Using the space for relaxation and restoration from everyday life			
		Place attachment	Felling happy in the place			
			Feeling as part of the society (sense of citizenship) when using the space			
			Will to go there often			
			Will to participate in decisions and implementation regarding maintenance or alterations on the landscape			
			Feeling connected and belonging to that place when using it			
		Values of nature	Valuing the nature for directly using it: e.g. swimming in the river or practicing a sport in the park			
			Valuing the nature for indirectly using it: e.g. breathing a fresher air, feeling protected from flooding			
			Considering the area important for future use: e.g. housing development			
			Valuing the nature simply because it is important that it exists, regardless of using it			
			Considering that it is important to maintain the ecosystem for future generations			
Citizens' and experts' perception on the programme Legitimacy	Ex-post Throughput	Openness	Perceiving that the decision-makers were open to listen to other actors			
			Perceiving that the process was democratic (based on deliberation and consensus)			
		Accessibility	Having participated in the process (e.g. appearing on public meetings), or believing that could have participated if wanted to.			
			Considering that everyone was listened, regardless of technical or political knowledge, connections, or social-economic condition.			
		Transparency	Having access to documents and information on the process: e.g. having seen it on the media			
			Having knowledge about the official sources of information about the programme: e.g. official website			
	Output	Acceptance by stakeholders	Considering the outcome relevant			
			Considering the outcome as a representation of your own interest			
		Problem solving capacity	Considering the outcome as a solution for a problem common to the society as a whole			
			Considering the decision-makers the best capable of the decision			

3.4 Data Collection Methods & Sample Size and Selection

Data Collection Method

In this study, primary qualitative data collection was used: the data is non-numerical in nature (text), collected by the researcher through an empirical method specifically for the purpose of this research. The method selected was the interview. As explained by Thiel (2014: p. 93), "an interview is a conversation during with the researcher gathers information by questioning one or more people (respondents). As a method, the interview is often applied in case studies, although it is also suitable for other research strategies", and "interviews are a flexible way of collecting data. During the conversation, the researcher can ask supplementary questions to gain a better and fuller understanding of any answers that have been given (more background information, added explanation, asking someone to expand on a subject". In this research, the semi-structured interview was applied. In this method, the researcher conducts face-to-face conversations with the respondents, which are recorded for later transcription and analysis. An interview guide is previously produced as a guideline of the topics of interest and the questions to be asked for the respondents, using the variables and the operationalization of the conceptual framework (see previous section 3.3). The questions are similar to all respondents, although the semi-structured interview has space for improvisation as it is opener than a structured interview or questionnaire, providing more flexibility in responses.

This method was chosen because it gathers rich qualitative results. The data can be comparable but also unexpected responses may appear, and it is in line with the aim to acquire non-factual information (citizens' perceptions), new insights into the variables and to investigate an unknown relationship between these variables. It works with a smaller sample to gain and understand reasons, opinions, perceptions (Thiel 2014). The selection of sampling will be explained in the following sub-section.

Moreover, another method was used to triangulate with the primary data collected from the semi-structured interviews: the secondary data collection. Secondary data is data collected by others (existing data). Here, the researchers used as secondary sources to support the primary data collection: local media (newspapers), social media (YouTube), official websites of both programmes ('Room for the River' and 'Room for the Waal'), official governmental websites (Nijmegen Municipality, Province of Gelderland, and Rijkwaterstaat), official policy documents of the programmes, and official correspondence to citizens. Media were consulted, using keywords (such as 'Room for the River', 'Room for the Waal', citizen, protest, Waal, Nijmegen), to help in the identification of significant respondents: residents who were affected by the case studied and have made a public manifestation on media. This will also be more discussed in the next sub-section. The search for newspapers was made through the academic search database Laxis Nexis. The official government websites, documents and correspondence to citizens were analysed to get more insight on the decision-making plans and process.

Sampling

In research, it is often not possible to reach the entire target population and every stakeholder, so a selection is necessary: this is named sampling – "a sample (n) is a selection from the total population (N) of possible units of study" (Thiel 2014: p. 45). In this study, the researchers used the purposive type of sampling, meaning that the researcher specifically select those people who are supposed to have the most significant knowledge on the research subject and situation, which is suitable for qualitative data collection methods (Kothari 2004 and Thiel 2014). The size of the sample is not previously determined, but based on the saturation concept:

the interviews stop when information starts to be repetitive and no new information emerges. Although the higher the number of respondents can lead to more representative findings in quantitative research, here is important to find a balance, because too many respondents can lead to less depth of understanding in qualitative studies. Moreover, the goal of the case study is not generalization and statistical representativeness, but to get deep and rich new insights. A snowball sampling was used in this study, with the respondents providing contacts of more possible respondents.

The sample selected were among Nijmegen citizens, the ones who experienced the programme closely: the ones who used to live or currently live in the area of the "Room for the Waal" intervention. Those are considered to have the higher knowledge on the situation. Many residents were negatively affected having to be relocated, and several openly protested the programme, as both secondary and primary data revelled. This will be further explained in Chapter 4. The research interest is to find out their perceptions on the transformed urban landscape, regarding social-cultural values, and on the ex-post legitimacy of the project. Moreover, to question them about how they felt during the process and if the perception has changed now that it is implemented. And further, if a relation can be established between how they see the outcome and how the look back at the decision-making process. To achieve this, the interview guide must be carefully prepared and conducted during the conversation.

Regarding the selection of respondents, as mentioned in the previous section, a triangulation of method (secondary data collection) and source (media) was used to help in the identification of the respondents, targeting on those who made a public statement in the past. The secondary data revealed 15 citizens' names that fit this profile. Out of those, 6 were willing to participate in this research and were interviewed. Moreover, the experts were also treated as informants to provide information on possible respondents, but all the names suggested were already in the list made from the secondary data collection. From the interviewees, snowballing was used to get more respondents and the researchers achieved a total sample of 13 citizens. Saturation was achieved during the interviews, with no new information appearing in the last ones.

In the beginning, the researchers were considering talking to a few experts involved in the decision-making just as a source for triangulation of the findings. However, during the fieldwork a significant number of respondents in this category were achieved, creating another sample quota. Interestingly, the researchers had the opportunity to interview experts from all three levels of government (national, regional and local), and also designers of the programme, providing a rich overview of the process and outcome. In the next chapter, while discussing the research findings, both quotas (citizens and experts) will be analysed. This also made an opportunity to review the research questions (as presented in section 3.1.2) to give the experts their own 'voice'. 11 experts composed the final sample: 2 in the municipal government level, 3 in the regional, 2 in the national, 1 from academia and 3 designers of the programme. They were identified through the governmental websites and through snowballing among each other. All of them were personally involved in the project. These interviews were primary qualitative data collection, and saturation was also achieved in this quota.

The interviews were conducted during the months of June and July 2017, by the researcher, in the neighbour of the case study. The duration of the interviews varied between 24 and 105 minutes.

All citizens interviewed have been living for a long period of time (all of them have been living there for more than 20 years) in the area affected by the programme 'Room for the Waal' in Nijmegen, since before it started in 2006. Regarding the experts, 10 out of 11 worked directly in the design or decision-making process. The other is an academic expert with relevant publications on this field. The Annex II present the List of Respondents. During 4 interviews,

2 respondents were interviewed simultaneously, but giving individual responses whenever they disagreed, or complementing each other when agreed. These were: C4 with C11, C8 with C12, C10 with C13, and E6-R with E11-R.

In the next section, the concepts of validity and reliability are discussed in the context of the selected research strategy and method.

3.5 Validity and Reliability

Validity is achieved when the researcher chooses the most appropriate research strategy and method to answer the research question in a coherent and transparent manner. In a case study research with interviews, as in this thesis, the validity is achieved through consistence: a logical connection between the research question, theories, concepts, and their operationalization into the interview. There are two faces of validity: internal and external. Internal validity refers to the research being able to measure what is intended to measure (Thiel 2014). For that, three actions are taken: the choice of indicators is based on academic theory, other researchers with expertise in this field are consulted, and different questions are used to measure the same variable so the respondent's constancy can be checked. External validity is the ability of the study to be generalized to other situations (Thiel 2014). This aspect is especially important for testing and statistical research, which is not the case here. In qualitative research and case studies, generalization is limited: theoretical generalization relies on the wealth of empirical information that is collected, to develop or improve theory. Moreover, the findings are usually suitable only for the case selected, due to its specific context. In this study, the aim is to generate empirical knowledge on the phenomenon through qualitative research. It would be interesting to apply it in a broader population using a quantitative strategy in a future work.

The concept of reliability is connected the variables of the study being accurately and consistently measured, meaning that the findings are not coincidental, but a reflex on the reality (Thiel 2014). In this study, due to the flexibility and open design of semi-structured interviews, a few precautions were taken. Firstly, each step is documented in a systematic way, so the entire process may be reviewed afterwards. Secondly, the interview guide and questions are checked beforehand with inter-researcher comparison, to avoid interference or bias from the researcher. From the early stage, the interpretations are shared with other experts as a form of control, using member checking (adjusting the interview guide with their feedback) and peer debriefing (asking other researcher to check the interpretations and coding in the analysis phase). Thirdly, to avoid interference of respondents, who may answer what is socially desirable or what they believe that would please the interviewer, it is important to be neutral and building trust during the conversation, and prepare carefully the interview guide. And finally, due to a small number of units in a case study, it is pertinent to use different sources. In this study, the researcher considers three sources: citizens, experts, and local media.

To conclude the discussion on validity and reliability, the idea of triangulation is relevant. A few types of triangulation are used here. The first one is of data source: the researchers used two primary sources (citizens and experts) and two secondary sources (local media – newspapers, and social media – YouTube). The second is to researchers: besides the supervisor, an expert from Radboud University in Nijmegen was consulted. And finally, is triangulation of operationalization, with more than one measurement for the same variable.

3.6 Data Analysis Techniques

The qualitative data was collected through semi-structured interviews, that were recorded with authorization of the respondents. This technique suits better the interviews than taking notes during the conversation, leaving the interviewer free to better focus on the discussion and interact with the interviewee. After the fieldwork, the researchers manually transcribed the entire interview and then read these, highlight important concepts. The next step was labelling the relevant words, phrases, sections, which is called coding process. In this phase, it is important that the researcher is unbiased and stay close to the data.

The software Atlas TI was used to conduct this qualitative data analysis, selecting codes, creating categories, and making connections between them. The codes were created firstly using the sub-variables of the conceptual framework (see Figure 8 and Tables 5 and 6): accessibility, openness, transparency, place attachment, recreation, values of nature, problem solving capacity, and stakeholders' acceptance. During the process, accessibility and openness were merged because they were always mentioned together, and four new codes were included due to its current mention in the interviews: background (information related to the context of the process), money (compensation, for example), use issues (problems with landscape function), and future of the area (next steps on urban development there).

After all documents (transcription of the interviews) were coded, the data analysis followed with the use of two tools in the software: Co-occurrence Table and Query Tool. The Co-occurrence Table presents an inventory of combination of codes occurring in a quotation (see Table 13). However, it is important to highlight that it counts only when the respondent explicitly talks about the two matters (or codes) at the same time. If they talk about both subjects, but separately (in different interview questions, for example), it will not appear on the co-occurrence tool. Despite that, the co-occurrence table is an interesting indicator for the data analysis. The next step on data analysis was the application of the Query Tool, which scrutinize the relationship between codes, allowing the researcher to interrogate Atlas Ti by codes or code groups across documents. Reports were generated to show what each document group (citizens or experts) and their respondents said during the interviews about all codes. These outputs were then analysed by the researchers and

Finally, findings were interpreted by the researchers and results and recommendations written, as they will be presented in the following chapters.

Chapter 4: Research Findings and Analysis

In this chapter, more information on the case study is presented, as well as the data analysis and research findings for each variable and sub-variable accordingly to the Conceptual Framework. Sub-conclusions are delineated per variable, structuring the logic to answer the research questions in the next chapter.

4.1 The case study

4.1.1 'Room for the River'

'Room for the Waal Nijmegen' is part of the Dutch programme 'Room for the River' that took place between 2006 and 2016. "The goal of the Dutch Room for the River Programme is to give the river more room to be able to manage higher water levels. At more than 30 locations, measures are taken to give the river space to flood safely. Moreover, the measures are designed in such a way that they improve the quality of the immediate surroundings" (Ruimte Voor De Rivier 2017a).

Figure 9: Measures map of Room for the River.
Source: Ruimte Voor De Rivier (2017b)

Room for the River: Facts and Figures

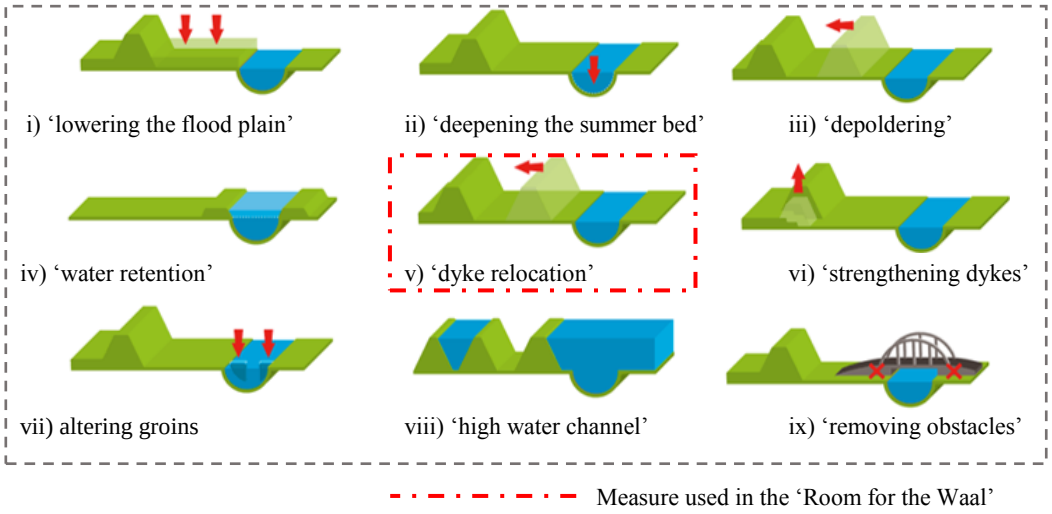
- The rivers Ijssel, Rhine, Lek and Waal are given more room at 34 different locations
- 9 different methods are used
- Initiation: 2007 | Completion: 2019
- 34 Projects
- 6 Provinces
- 60 Municipalities
- 2 Ministries: Ministry of Economic Affairs Ministry of and Infrastructure and Environment
- 12 Regional Water Authorities
- Budget: 2.5 billion Euros's
- Increases the discharge of Dutch rivers capacity from 15 to 16 million liters per second at the Dutch-German boarder
- Total area: 24,000 hectare
- Dry feet for 4 million Dutch citizens
- 47 million m³ ground transportation
- Extremely high water levels in 1993 and 1995: 250,000 people and a million animals had to be evacuated in 1995
- Relocation of 150 houses and over 40 farmers

Box 2: Room for the River: Facts and Figures
Source: material provided by E10-N

The "Room for the River" policy aimed to work with nature instead of against it, increasing rivers' discharge capacity through nine soft measures, chosen accordingly to each local specificities (Ruimte Voor De Rivier 2017c): i) 'lowering the flood plain': excavating the superficial layers of sections of the floodplain; ii) 'deepening the summer bed': dragging part of the length of the river bed to make it deeper; iii) 'depoldering': the dyke is shifted further inland on the river side of a polder, iv) 'water retention': using a lake as a temporary storage in the case of exceptional circumstances, v) 'dyke relocation': relocating the dyke and exposing land that used to be protected to expand the river' bed, vi) 'strengthening dykes': when there is no space available to widening the river, vii) 'lowering perpendicular groins and building attracting groins': expanding the drainage capacity of the river, viii) 'high water channel':

building two dykes in the landscape to create a channel to drain high water by a different path, ix) 'removing obstacles': to increase the flow rate of the river water. (see Figure 10). In the Nijmegen case, the object of this study, the measure adopted was the fifth (highlighted in purple in Figure 10): after a long participative process, the decision-makers opted to move the dyke at Nijmegen Lent 350 meters inland, and also to create a secondary channel for the river Waal, increasing the river drainage capacity (Nijmegen Municipality 2013b).

Figure 10: 'Room for the River' measures to create more space for river water. Source: Ruimte Voor De Rivier (2017c)



4.1.2 'Room for the Waal'

About Nijmegen and Lent

Nijmegen is the oldest city in the Netherlands, located on hills around the river Waal. The ancient Romans developed it due to its strategic place for a military camp. The first constructions date as early as 1030 (Sint-Nicolaaskapel chapel). In 1230 the Roman King Henry VII of the German Empire granted the inhabitants the city rights. Nijmegen gets its first wall in the years 1300's. Around year 1400, Nijmegen was becoming increasingly important for commerce, with ships being docked and their goods being either put into service or taken to one of the many warehouses or workshops in the lower city. The fortress offered protection to the city, but made its growth impossible. In 1874, the Reich gave Nijmegen the consent to abolish the fortress status. Around 1880, the government begins to remove the city walls and expand the city. In the following decades, Nijmegen was developed into a charming city, which made many people their home.

The Second World War hit Nijmegen hard, with severe bombings in 1944 and 1945, when many hundreds of citizens lost their lives and large parts of the city became devastated. After the War, reconstruction took place. A new centre was built around the remaining monuments. The renovation of the old town was awarded the "Europa Nostrapreis", an international architectural prize. In order to meet the high demand for apartments, several new residential areas emerged between 1950 and 2000, mainly in the south and west of the city. Even now, there is still a need for housing in the city and a city expansion is urgently required. Nijmegen continues to build on its future and has even made the leap over the Waal in 1999: more than eleven thousand apartments for thirty thousand people. The quality of the new buildings is so high that the 'Waalsprong' is one of the top five most environmentally friendly newbuilding areas in the Netherlands. The river Waal was for centuries the natural boundary of Nijmegen, but now through the 'Waalsprong', it flows through the city (Nijmegen Municipality 2017b).

Lent is a district of the Nijmegen Municipality, located across the river Waal, North of the city centre (see Figure 11). It used to be an independent municipality until 1818, when it became part of Elst. In 1998, Lent became part of Nijmegen. It was traditionally a village with farms and greenhouses horticulture (see Figure 13, in contrast with Figure 12), and although it is physically very close to Nijmegen centre – 2km, for many years it was considered a 'different world', culturally and functionally, as it will be further explained in the section 4.3.2, with citizens and expert's perceptions. The river Waal used to be a barrier, but in the past decades, Nijmegen has been embracing Lent (especially after the new bridges constructed during the 'Room for the Waal' project), and the old village has been changed into an urban residential area. In fact, already from 1995 the Nijmegen Municipality had plans to expand the city in that direction. They called this aim as 'Nijmegen embraces the Waal', as a chance to connecting the southern city to the northern city, as showed in the 'Structural Vision Nijmegen 2010-2030' (see Figures 14 and 15). (Nijmegen Municipality 2011)

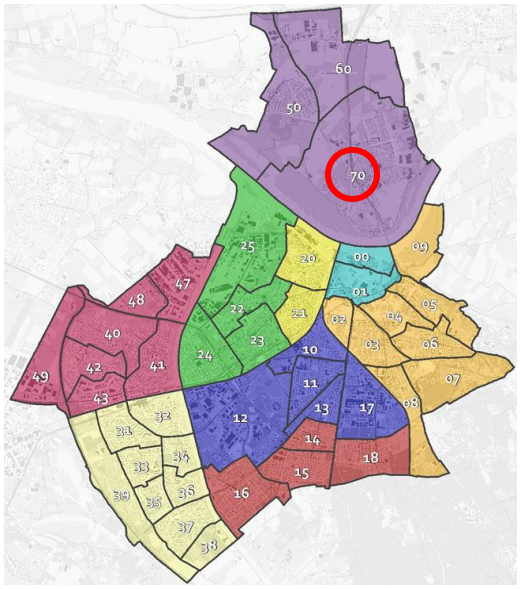
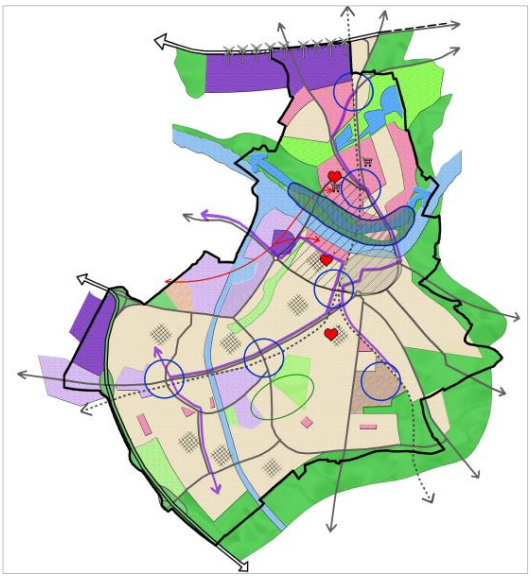


Figure 11 (on the left): Nijmegen districts: Lent is the number 70. Source: Nijmegen Municipality (2017a)

Figure 12 (on the top right): Aerial photo of Nijmegen. Source: Nederland in Beeld (2017).

Figure 13 (on the bottom right): Aerial photo of Lent, before the project. Source: Nijmegen Municipality – provided by E1-M.



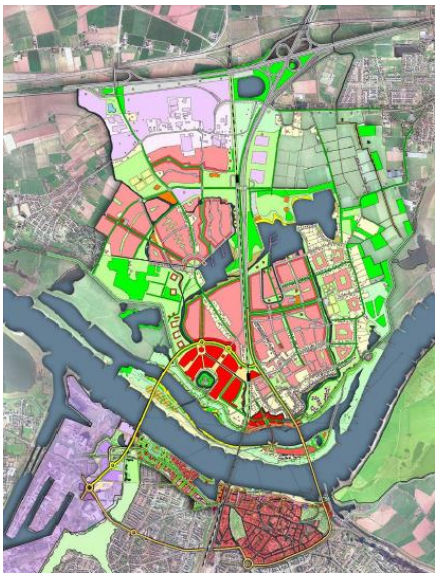


Figure 14 (on the left): 'Structural Vision Nijmegen 2010-2030' plan. Source: Nijmegen Municipality (2011)

Figure 15 (on the right): 'Nijmegen embraces the Waal' plan. Source: Nijmegen Municipality (2011)

The numbers below (Tables 7, 8, and 9) give an overview on some demographic aspects of Nijmegen and Lent. Nijmegen has now (2017) 173,627 inhabitants, out of which 10,140 are

living in Lent (5,84%) (Nijmegen Municipality 2017c). We can see that this percentage is growing over the years, as a result of the urbanization actions that are occurring in the region. The housekeeper income is higher in Lent (39,800 in 2104) than the average in Nijmegen (32,300 in the same year). Regarding the economy, it is possible to see that the percentage of agricultural business is higher in Lent (1,3% in 2016) then in Nijmegen (0,28% in the same period), the same for commerce/non-services (36,36% and 31,85% respectively).

Table 7: Population, between 2010 and 2017. Source: Nijmegen Municipality (2017c)

	2010	2011	2012	2013	2014	2015	2016	2017
Nijmegen	163,036	164,265	165,246	166,443	168,344	170,739	172,096	173,627
Lent	6,525	6,660	6,775	7,344	7,937	8,512	9,162	10,140
Lent / Nijmegen (%)	4.00%	4.05%	4.10%	4.41%	4.71%	4.99%	5.32%	5.84%

Table 8: Housekeeper income (euros/year), between 2007 and 2014. Source: Nijmegen Municipality (2017c)

	2007	2008	2009	2010	2011	2012	2013	2014
Nijmegen	29,600	30,300	30,600	30,800	30,800	30,900	31,200	32,300
Lent	35,600	36,400	37,800	37,300	37,400	37,500	38,100	39,800

Table 9: Companies in 2016. Source: Nijmegen Municipality (2017c)

	Agriculture	Industry, civil construction, wholesale, and transportation	Commerce - services	Commerce – non-services	Total of companies
Nijmegen (#)	40	2,400	7,220	4,515	14,175
Nijmegen (%)	0,28%	16,93%	50,93%	31,85%	100,00%
Lent (#)	10	105	375	280	770
Lent (%)	1,30%	13,64%	48,70%	36,36%	100,00%

The programme

Figure 16: Aerial photo of the region before the project implementation. Source: Landezine (2016)

Figure 17: Aerial photo of the region after the project implementation. Source: Landezine (2016)

The municipality of Nijmegen has created a website and a folder to communicate the specific objectives and measures for this city. They highlight the necessity of protecting the residents against possible flooding, especially due to climate change and after the near-flooding in the years of 1993 and 1995. To achieve this goal, a water channel was projected in the floodplain,

at the same time creating an island for an urban park, intended to be a liveable and cultural space with recreation by water and nature (see Figures 16, 17 and 19 and 20). The municipality claimed to be very proud with the plan in which security and spatial quality are combined. The result is "a unique urban river park in the heart of the city" with "space for living, recreation and culture, water and nature". The park was designed to provide cultural activities such as water sports, benches to relax and contemplate the landscape, and radiate "an urban atmosphere". The island also has space designated for new housing and urban development. (Nijmegen Municipality 2013a).

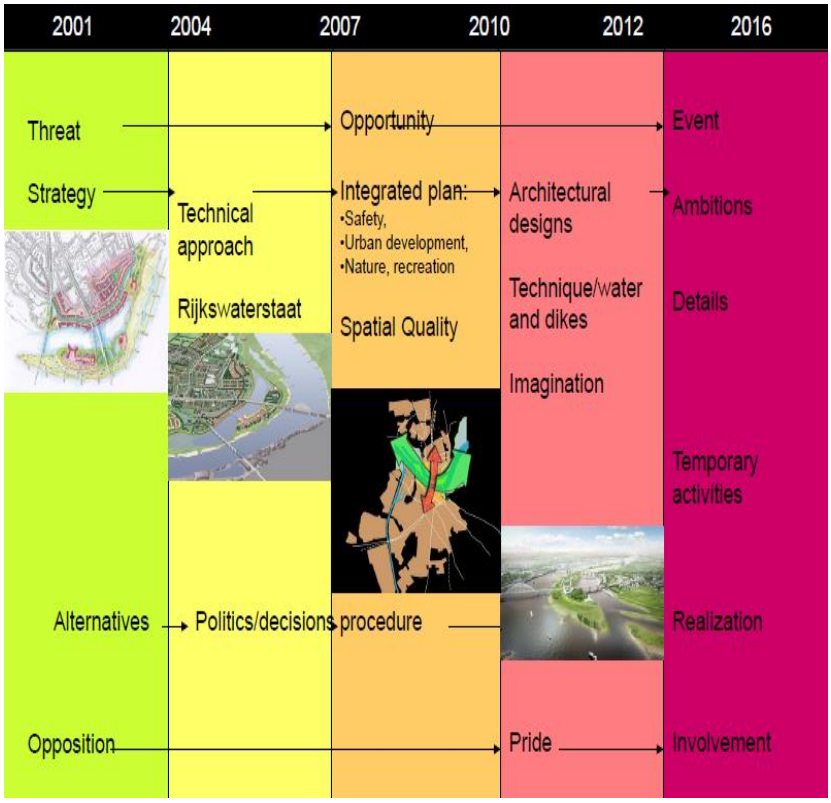


Figure 18: Programme Timeline. Source: Nijmegen Municipality – material provided by E1-M.

Box 3: Additional time information. Source: Interviews: E1-M, E7-M, E6-R, E11-R, E10-N

1993 and 1995: near major flooding
1995 – 1996: Nijmegen Municipality starts the plans to expand urbanization towards the North / Lent
2000: Newspapers informing Rijkwaterstaat intention to create more room for the rivers
2000-2010: Negotiation between government levels to align interests and goals
2005: Province of Gelderland is involved to integrate the local governments' visions
2006: Nijmegen's Alderman embraces the programme as an opportunity.
2009: 'Lent applause': citizens applause the 'Room for the Waal'
2010: Decision of the final design
2011: Preparatory work
2012: Beginning of the construction
2016: conclusion of the 'Room for the Waal'
2016 – 2030: continuation of the urban expansion plans: 'Structural Vision Nijmegen 2010-2030', 'Nijmegen embraces the Waal' and 'Waalsprong'.

A timeline is presented above to show how the programme has evolved over the years (Figure 18 and Box 3). As discussed on Section 2.3, the water management in The Netherlands was marked by two near floods in riverine areas, including Nijmegen, requiring the evacuation on thousands of families. This was a push towards the 'modern water management' in the country, an integrative approach focused on sustainable development on the long-term.

On this model, participative and multi-level governance ruled the decision-making process. In this context, the national government, under the responsibility of the Ministries of Economic Affairs and of and Infrastructure and Environment (including the water authority Rijkwaterstaat, responsible for water systems), started to develop the idea to provide more space for the rivers in the year 2000. In this first moment, the other government levels were not included, resulting in internal opposition.

The decision surprised both regional and local government, which found out about it through newspapers. Between the years 2001 and 2010, a complex interaction took place among the government agencies. Within this period, the Province of Gelderland (regional level) was

involved, in 2005, responsible for combining the national water safety agenda with all local governments, and their own objectives. The Province aimed to create a common vision and to aggregate spatial quality, culture and history to the technical approach suggested by Rijkwaterstaat. In 2006, the programme 'Room for the River' was officially launched. In the same year, Nijmegen changed its position for resistance to support, symbolized by the speech of the alderman Jan van der Meer that if action should be taken, it should be conducted the best way possible for Nijmegen. The Municipality had their own plans for city expansion, as discussed on the previous section. In these first years of the programme, the local level has lobbied, negotiated, and developed design scenarios that could combine their objectives to the national ones, and they have succeeded in this strategy. This will be further detailed in the next sections. The decision-making process lasted until 2010, when the final design was approved, after a long period of political procedures, architectural and technical designs, and the integration of the multi-functional goals (water safety, spatial development, nature, and recreation).

Before that, a mark in the process took place in the end of 2009: the 'Applause of Lent'. In this occasion, the programme design was presented for the citizens, who could visualize the outcome, and it was applauded by them. From that moment on, the process was calmer and the threat started to be seen as an opportunity. It is important to highlight that the citizens also could see the news about the national intention in the year 2000, but only in 2006 the programme in Nijmegen was officialised. Even then, since the negotiation inside the government was still ongoing, their participation and access to information was very limited, causing anxiety and insecurity, with many protests taking place. Over time, this condition was improving, culminating in the Applause of Lent. The process of decision-making and participation will also be further discussed in next sections. Finally, the preparatory planning for execution could start in 2011, and in 2012 the construction began, ending in April 2016. According to the official timeline provided by the Municipality (Figure 18), this process started as a threat and was turned into an opportunity. Moreover, through participation, it changed from opposition to pride.

The 'Room for the Waal' programme consisted in relocating the existing dike and creating a secondary channel, to give more room for the river Waal. This created an island, and new bridges were constructed, providing more connection between the two sides of the river – Nijmegen city centre and Lent (see Figures 10, 16, 17, 19 and 21). This was based on the technical calculations to expand the river's discharge capacity (see Section 4.1.1 for the national goal) and in simulations of different water levels (see Figure 20). The box bellow (Box 4) presents more figures about the programme. Figure 21 shows the transformed landscape.

Room for the Waal: Facts and Figures

- Twin focus: 'To protect Nijmegen and the surround area from future floods and to increase the urban spatial quality'
- Increasing river discharge: 15,000 m³/s to 16,000 m³/s
- Relocation of 50 households
- Cost: €358 million
- Area: 250 hectares
- Water safety 31 December 2015, project finishes in April 2016
- 50 Houses demolished
- Enormous costs for archaeology and explosives
- Excavation Flood channel
  - 3.5 km length
  - 200 m wide | 5m deep
  - 5.2 million m³
- New dike and new quay
  - 1.2 km
  - 20 me deep seepage screen
- Bridges
  - 3 new bridges
- Adaption pillars of rail bridge
  - 3 pillars
  - 20 m deeper

Box 4: Room for the Waal: Facts and Figures. Source: material provided by E1-M

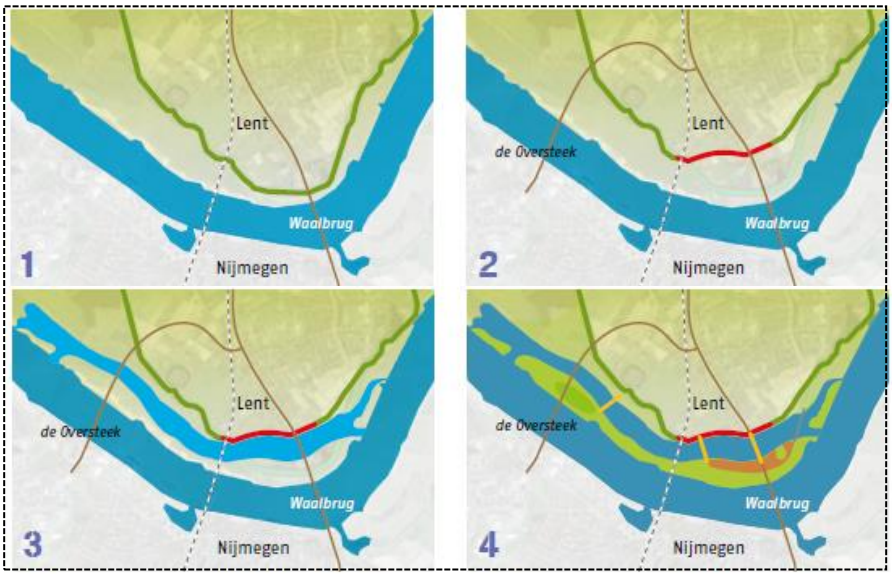
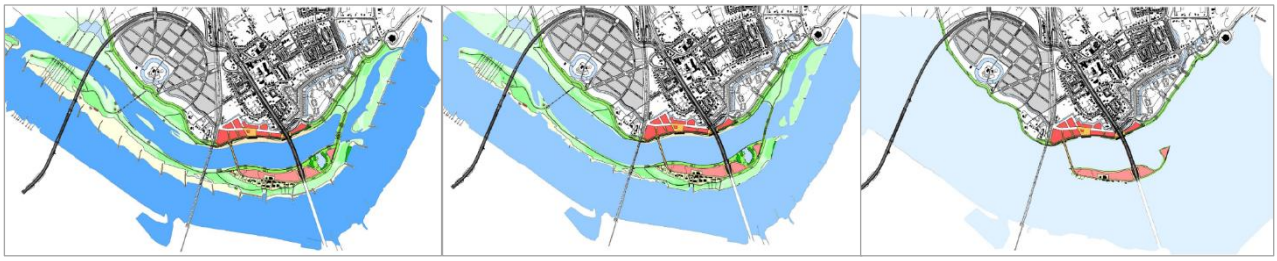


Figure 19: Project phases: 1) The current situation with the existing dike, 2) The dam moved 350 meters inland, 3) To give more space to the river is dug a secondary channel, creating an elongated island, 4) Bridges over the secondary channel. Source: Nijmegen Municipality (2013a).

Figure 20: Water levels. Source: Nijmegen Municipality – material provided by E1-M.



1) 7 m + sea level – 180 days a year

2) 9 m + sea level – 50 days a year

3) 14 m + sea level – once in 150 years

1 - New bridge: 'De Oversteek'

2 - New pedestrian bridge: 'Citadelbrug'

3 - Existing train bridge: 'Snelbinder'

4 - New pedestrian bridge: 'Promenadebrug'

5 - Extended bridge: 'Verlengde Waalbrug'

Figure 21: Transformed landscape. Source: Nijmegen Municipality – material provided by E1-M.

The main stakeholders involved in the 'Room for the Waal' are summarized in the Table 10. The identification of actors and their respective stakes was part of research findings throughout the interviews. Other stakeholders mentioned, but as secondary in the process were: NGO's, private companies, and the Dutch State Forestry. The interaction among actors will be further explored in the next sections, with the data analysis.

Stakeholder	Main stake
Rijkwaterstaat (water authority) – national government:	- Water safety from flooding: increase the river discharge by giving more room to it. - Be in charge of the final decisions, because they have the money and take the risk. - Control the budget and schedule.
Ministries (Ministry of Economic Affairs Ministry of and Infrastructure and Environment) and Parliament – national government	
Municipality of Nijmegen – local government	- City expansion, construction of bridges, spatial quality. - Have autonomy - Take care of the citizens. - Realize the relocation and compensations.
Province of Gelderland – regional government	- Water safety - Spatial quality - Create a unite vision between all local governments
Waterschappen: Local water authority	- Water safety
Citizens of Lent who had to move	- Preserve their houses and livelihood, or receive a good compensation to be relocated - Participate in the decision-making
Citizens of Lent who live near the project area	- Preserve their livelihood. - Participate in the decision-making
Citizens of Nijmegen in general	- Spectators - Spatial quality
Consultancy firms: designers and technicians	- Create a good design combining water safety and spatial quality

Table 10: 'Room for the Waal' main stakeholders. Source: Author.

4.2 Data Preparation and Analysis

As described in Section 3.6, the researchers used the software Altas Ti to conduct the data preparation and analysis. The selected 12 codes as presented in Table 11.

Code group	Code	# of Quotations
Landscape perception	Aesthetic and Symbolic	101
	Place attachment	76
	Recreation	73
	Value of nature	56
	Use issues	21
	Future of the area	28
Throughput legitimacy	Accessibility and Openness	130
	Transparency	46
Output legitimacy	Problem solving capacity	134
	Stakeholders' acceptance	124
	Money	51
	Background	43
Total		**883**

Table 11: Codes and Quotations used in Atlas Ti. Source: Author.

The Co-occurrence Table (Table 12) presented an interesting indicator for the data analysis. It is possible to see, for instance, how the following codes are closely related in this research: Accessibility/Openness and Problem-Solving Capacity (with 58 co-occurrences), Problem-Solving Capacity and Stakeholders' Acceptance (with 61 co-occurrences) and Aesthetic/Symbolic and Stakeholders' Acceptance (45 co-occurrences). This last one is particularly interesting for the research question: 'Can a relationship be established between citizens' perceptions on the transformed urban landscape regarding social-cultural values and on the ex-post programme legitimacy?'. Moreover, the Query Tool was utilized to examine the relationship between codes. The outputs were analysed and the main findings will be presented in the following sections (4.3, 4.4, and 4.5), classified per variable. Each section is organized per

sub-variable, following the Conceptual Framework (Figure 8) and Operationalization Table (Table 6). The sub-sections present the research findings and data analysis. In the end of the sections, a brief summary of findings on the variable is discussed.

Table 12: Output of Co-occurrence Tool in Atlas Ti. Source: Author.

	Accessibility_Openness	Aesthetic_Symbolic	Background	Future of the area	Money	Place attachment	Problem solving capacity	Recreation	Stakeholders' acceptance	Transparency	Use issues	Values of nature
Accessibility_Openness	0	20	11	2	20	18	58	9	38	31	4	7
Aesthetic_Symbolic	20	0	3	4	11	22	32	35	45	5	7	17
Background	11	3	0	0	5	3	9	2	3	5	0	1
Future of the area	2	4	0	0	3	3	7	4	4	0	2	1
Money	20	11	5	3	0	6	24	5	23	6	2	4
Place attachment	18	22	3	3	6	0	11	15	25	4	3	9
Problem solving capacity	58	32	9	7	24	11	0	11	61	11	2	14
Recreation	9	35	2	4	5	15	11	0	25	1	11	12
Stakeholders' acceptance	38	45	3	4	23	25	61	25	0	9	4	14
Transparency	31	5	5	0	6	4	11	1	9	0	0	3
Use issues	4	7	0	2	2	3	2	11	4	0	0	6
Values of nature	7	17	1	1	4	9	14	12	14	3	6	0

4.3 Transformed urban landscape: social-cultural values

The perception on the transformed landscape is analysed in this research regarding Social-cultural values. Those are non-material factors related to societies' (as individuals and groups) experiences in landscapes and ecosystems, obtaining benefits such as "recreation and mental and physical health, tourism, aesthetic appreciation and inspiration for culture, art and design, spiritual experience, and sense of place" (Millennium Ecosystem Assessment 2005: p. 40). It also encompasses values of nature, meaning how the ecosystem and its landscape are evaluated regarding its use and non-use values (Ast et al. 2013).

4.3.1 Aesthetic and symbolic

The data analysis on Aesthetic and Symbolic values of the transformed urban landscape can be grouped in four discussion topics: (i) visual beauty and attractiveness, (ii) impact on city's image, (iii) cultural, historic and identity aspects, and (iv) educational value. This corresponds the expected indicators from theory. The research findings in this sub-variable are very positive perceptions on both groups of citizens and experts. They were practically unanimous describing the landscape as visually beauty and attractive to use. They also stated that the programme has improved the image both insiders and outsiders have of Nijmegen, and they are proud of the result. The design is a good representation of their history, culture and identity, partially due to a participative process of creation. To support the positive perception inferred from data, some respondents clearly stated that there is a direct relation between the transformed landscape and the stakeholders' (importantly including citizens) acceptance on the 'Room for the Waal'.

The first aspect discussed about the perception on the aesthetic of the transformed urban landscape and the symbolic values attached was the visual beauty and attractiveness of the place.

Respondents were almost unanimous (twenty-three out of twenty-four interviewees) by saying that they have a very positive perception on the transformed landscape, meaning they consider it visually beauty and attractive. They used words as 'nice', 'beautiful', 'good', 'pretty', 'attractive', 'unique', 'wonderful' and 'marvellous'. The respondents perceive the result of the programme as a high spatial quality, inviting for use and they are proud of it.

> *"We took in the project very high professionals, top level of design for example. (...) And then you can create something and I think this designing quality was really exceptional."* (E3-D)

> *"I think it´s wonderful. It´s an opportunity for the whole area, for Nijmegen, for Lent. I can´t imagine somebody doesn´t like it."* (C1)

The only exception was one citizen respondent, to whom the aesthetic should be more green and natural. Other three citizen respondents also raised this point, although they consider the landscape beautiful, they wish there was more natural elements. Interestingly, one of the experts interviewed, responsible for the landscape design, clarified this point. The designers had the intention to create a contrast between the natural areas and the sophisticated architecture with a man-made aspect. However, the green elements take time to develop, and the construction is still very recent. Moreover, he explained that in the original plan the housing development in the island should have occurred simultaneously with the 'Room for the Waal', but it did not happen, leaving the space very urban but with a low-density population, resulting in a 'empty', 'stone' and 'hard' aspect. This is still a next step to be solved by the local government, already planned to happen in the next few years.

> *"Didn't like it pretty much and that is just because that everything is from stone and nothing there is green, like the side of this little river, it's all with stones and stairs. Maybe they should do it with grass. Then it gets a different view, and maybe it's more natural."* (C11)

The second matter was the impact on city's image. Most of the respondents (sixteen respondents, both citizens and experts), stated that the 'Room for the Waal' has improved the city's image for its own citizens, as well for Dutch society and international viewers. According to them, Nijmegen is now more attractive to tourists, is more known for its high spatial quality and iconic and unique landscape – which has been rewarded with important prizes, such as the Golden Phoenix this year -, and has received much press attention. The programme has boosted the urban development and transformed the landscape into a symbol for the city. Furthermore, the experts also aimed to present the city embracing the river Waal, as the heart of Nijmegen.

> *"The most beautiful place, and they won a prize, 2 days ago or so. It's like an Oscar for a movie, this project has won a prize in Utrecht, the Golden Phoenix. (...) I would say that we are very happy."* (C3)

> *"It's an icon for the 'Room for the River' and you see the picture of Nijmegen, their photos in many, many, many papers as iconic, it's an iconic image I think. Well they did they made a combination with 'Room for the River' with city development, with a new bridge, with… they combined a lot of things and that's what was so powerful about. (...) People in Nijmegen are very proud of it."* (E6-R)

> *"Yeah, that's what we wanted to do from the beginning [to boost the city development]. (...) That was the vision the idea was if you have a threat, how to make an opportunity. And the opportunity was to make a river park and make the city of Nijmegen… give the city of Nijmegen something for the next 30-40-50 years."* (E7-M)

The third interesting finding on this sub-variable was its symbolic character regarding the history, culture, and identity. Many respondents (eleven) feel that the project and the new landscape are a good a representation of the culture, history, and the place identity. They have mentioned, for example, the maintenance of historical buildings and of objects from the Second World War that were important to them, as well as artefacts discovered from the excavations. Only two citizens said they would like that more historical items were preserved. One respondent has mentioned that the new landscape is a monument for all generations.

"The province got involved (…) on the targets we can make, not only water safety but also nature, recreation, history and also how people can get involved with this." (E11-R)

"There were a few objects that were important and they remind us for example of Second World War. (…) They were important for Nijmegen and they are still there so we didn't destroy them. (…) We had a big money reservation to take care of what we could find and to bring something back of that historical memory. (…) There's in every country, every place, many of those very small parts but together make history and make the culture of an area." (E7-M)

"I felt more deeply connected when the excavations were taking place there were emergency excavations not far from my house. (…) I saw lots of things in the soil as well and I saw the original houses that have been there in the sand. (…) It's part of my background now so I feel connected to it." (C5)

As a fourth aspect, in relation to theory and the expected indicators, the educational value regarding children was not mentioned, although two expert respondents said it has been an example for other countries that have visited Nijmegen to learn from the 'Room for the Waal'. Some other four respondents also mentioned the programme as an inspiration source for culture and art.

"They came from Brazil, they came from Indonesia, from China, Korea, Indonesia, America, and so on, a lot of countries (…), they visited us and they have seen it." (E10-N)

"We started a project to 'Believe the Waal', (…) to experience the Wall, and that was meant to give some more attention to recreation, history, the people, the culture, (…) and that get some focus on how beautiful the river banks are, how much nature, how much peace, how much cultural possibilities there are. (…) River artists are working together with artists in the west to make new plans and new projects and so there is also a big community which was formed." (E6-R)

None of the interviewees mentioned a religious or spiritual meaning of the landscape.

Lastly, ten respondents clearly stated that there is a positive relationship between the project acceptance and the aesthetic/symbolic perception on the landscape. It was stated by experts as a clear strategy made by the decision-makers to increase the programme acceptance.

"After all, if we knew it would be such a beautiful project, we didn't, perhaps we didn't... Well, there was a protest. If we knew before it would be so beautiful, we wouldn't have protested at all." (C3)

"I think they were in the beginning scared, and 'what is going to happen with our village', but it was unstoppable, all right, because it was a plan from the government. Later on, they saw the plans and they are like anticipating, you can imagine how it is. But now it is done, they are really proud of it, because of the structure and like the design is very beautiful." (C4)

"I think the tactics / the strategy of the local government was very handsome at that point and also the double target of the program the target of improving the water safety and also improve the environment." (E10-N)

"We made a very holistic plan so it is not only about flood safety it's also for nature it is also for recreational area it is improving spatial quality for the people who live here. (…) They are really happy now." (E3-D)

4.3.2 Place Attachment

The main research finding on this sub-variable is that the place attachment among the citizens in the area affected by the 'Room for the Waal' is enormous. They have a strong emotional bound with the place, which was naturally impacted by the programme realization because it brought a significant transformation on the landscape where this families have been living for many years, even generations. Furthermore, a central aspect in the discussion is the transformation that has been taken place in Lent, from a small village to a neighborhood integrated with the bigger and urban city of Nijmegen. Although the citizen respondents were not unanimous regarding a perceived change in their level of place attachment due to the project, the large majority claimed it did not change for them (eight respondents), because they were already very connected and

continue to be. Three respondents affirmed an increase and only two a decrease in their attachment, because of the programme. However, during the interviews it was clear that the way they see the city has positively changed with the programme realization. What can be interpreted from data, as detailed bellow, is that the connection between citizens and the place is very high, as well as their happiness and citizenship sense (feeling part of a community). Moreover, they showed a will to use the area and in fact have a perception of owning and belonging – and that both factors have increased with the new landscape - which also results in care and affection with the place maintenance. These findings match the expected indicators from theory. The relationship with the river Waal also seemed to change in Nijmegen, rediscovering its multiple opportunities. Although there are some citizens who wish to continue living in a village atmosphere and are unsatisfied with the urbanization, the majority is happy with the stronger connection between Lent and Nijmegen, and with the new landscape (in especial with the river park). Furthermore, this majority sees a wider range of possibilities (for tourism, business, housing, recreation, nature).

On the first point, all citizens interviewees are living in the area for more than twenty years, most of them for their entire lives, and even generations. They are very connected and emotional about that place. It is natural that the process of adaptation to the new landscape and, more than that, to a new urban way of life, needed time. The respondents mentioned an emotional period in the first years of the process, when they were insecure if the village aspect that they appreciated was going to be changed. They also brought up memories from old times, from their childhood in the farms and greenhouses, or raising their families in the houses that ended up demolished. According to the respondents, it was particularly difficult for older inhabitants. However, it is important to highlight, when looking at the big picture, that this change was going to happen regardless of the 'Room for the Waal'. As presented in Section 4.1, the Municipality was planning the city extension and the urbanization of Lent since the nineties.

> *"It took a year for me to be there happy and it is my home and I can be happy here. (...) I didn't understand but I was not happy there. I wanted to go out, gone. I thought 'oh, I am missing the cosy farm.' (...) I had a lot of problems to settle down. (...) A long time was my medicine."* (C2)

> *"Lent used to be a village. (...) And in 1995, we decided to expand the city to the other side of the river (...). So, we were going to integrate this village. (...) They were very disturbed about the process. (...) The people who are living there, they are living there mostly generation after generation. So, they are very bounded to the ground they are living on. (...) The people who were living there, they have chosen a long time ago to live in a village, an agricultural village really, with greenhouses."* (E1-M)

The second and main aspect discussed was the increased connection between Lent and Nijmegen. Eleven respondents affirmed that the programme increased the connection between Lent and Nijmegen. They perceive that the construction of the bridges and river park contributed to a higher flow between the two sides of the river, as it was desired by the Municipality (see Section 4.1). Moreover, the project influenced the urban development in the North, which is attracting more inhabitants now. The perceived distance has significantly reduced, according to interviewees. If before the project, everyone wanted to live in the old Nijmegen city center, now the other side of the river is seen as 'cool' and 'attractive', for housing but also for recreation and entertainment.

> *"Back in the years, like Nijmegen was a modern city, and we were just a farmer village. We were apart. Now, bridges got us together. I think it is important because Lent was a really small city, it's getting bigger. Because of the river park as well. (...) The river park improved our city."* (C4)

> *"It has changed a lot this whole affair has brought people closer together and both new citizens and old villagers and I also hear from people in Nijmegen that Lent is becoming more attractive because they can cross more easily, they can see the beach…"* (C5)

> *"The aim for the city was to connect the North with the South. (…) Of course, there was a water safety project, but we shaped (…) to use it as a connection between the North and the South."* (E4-D)

They call Nijmegen 'a city of bridges', with new opportunities. Many respondents stated that the programme brought new possibilities for the area, attracting more people, houses, fomenting tourism and business, providing recreation and more contact with nature. The river is seen now as the heart of the city, instead of a boundary. What is interesting is that the inhabitants of Lent were used to live with the river, to enjoy it, to know when the water would rise or which ship was going to pass. But Nijmegen had forgotten about its importance, and was living back to the river. The project and the stronger connection with Lent also made room for a rediscovery of its multiple opportunities.

> *"I think it is important because Lent was a really small city, it's getting bigger. Because of the river park as well. You see a lot of people in the street, (…) there are a lot of people playing, the supermarket is a lot busier, our shop is busier. So, I think it is good for the city or for our village to... The river park improved our city."* (C4)

> *"They* [people from Lent] *are used to live with the river, they know when the water level will rise. (…) A totally different culture than here [Nijmegen], we forgot the reason why our city is by the river. (…) Because the whole dynamic in the city changed, because suddenly the people in the city realized the river, the role of the river, the importance of the river. And they found their way here. (…) People started to discover the area."* (E1-M)

The connection between Lent and Nijmegen, and the urbanization process also bring negative aspects raised by citizens, such as higher taxes, more traffic, disturbance and crime, and more bureaucracy. Another point commonly mentioned by the respondents were that they were used to know everyone before, living in a village community. With a bigger flow of people, and the housing development, this was lost. Again, as discussed in the first point, the urbanization would happen regardless of the 'Room for the Waal'.

> *"The people that are living in Lent, no. (…) They all appreciated it, but people who are living here, they have chosen, generations ago, or maybe when they are new, 30, 40 years ago, to live in this area when it was a village. And now, people that are living here, they say 'it's like an open area, a swimming pool, it's really busy (…) and it's going to be only more, because we are going to develop the area here. (…) I think there will be a change of inhabitants there. I think there will be people leaving, because they don't feel fit anymore. Even though they think it's beautiful, it's urban, it's becoming urban."* (E1-M)

The last point on this sub-variable is the sense of owning the place, that appeared during the interviews. The respondents showed a will to take care and maintain the area, acting as fiscals and reporting irregularities to the authorities. This sense of owning was originated during the design process, with the involvement of the citizens by decision-makers and their acceptance with the final plan for the landscape (as presented previously). The inhabitants are frequently using the river park with many activities, that will be explored in the Section 4.3.3. This 'occupation' of the public space is even causing some disturbance for the government, for example regarding people swimming in dangerous parts of the river and the authorities thinking on how to create a regulation to preserve safety. Cultural events and festivals contribute to strength the connectedness and the societal bounds. As presented in Section 4.3.1, the proud felt of the new city image and the historical identity of the place are also drivers for the place attachment.

> *"Sometimes I feel concern about things that are happening. I see that people throw their rubbish into the island (…) and I see guys with motorcycles crossing on the paths… (…) I call the government, the local government, or I send them an email, with photos. (…) Dealers also, over there, on the other side. (…) This area doesn't deserve dealers. The most beautiful place."* (C3)

> *"A lot of people are very proud it is their project so it's not our project anymore this is their project which is a big reason behind the success, of course"* (E3-D)

4.3.3 Function: Recreation and Use Issues

The research finding on the sub-variable 'Recreation' was a very positive appreciation for the public spaces created with the 'Room for the Waal', that are intensely being used by citizens for sports, leisure, relaxation, and social activities. All indicators expected from theory appeared during the interviews. This public enthusiasm emerged in every conversation with both groups of respondents, experts and citizens. Moreover, during this discussion a few negative aspects regarding use or function of the space were raised, and the researchers decided to create a new code for it during data analysis. The respondents have mentioned issues such as excessive rubbish, drowning, or use of drugs. However, the positive points were much more highlighted and respondents were unanimous by affirming that the programme has provided plenty of opportunities for recreation, which are being highly used and enjoyed by inhabitants from both sides of the river, reinforcing the connection discussed in previous sub-sections.

Firstly, it is important to mention that this success of the recreation function of the landscape was not a coincidence. The experts interviewed stated that this was part of the plan, under the umbrella 'spatial quality', one of the twin goals of the 'Room for the River'. The decision-makers had a vision that the project should not be restricted to water safety, but also englobe nature, recreation, and spatial quality. For that, they have designed a public space, now known as the river park, where people could experience the river, get in contact with nature, relax, swim, and have all kinds of recreational and cultural activities. The project had a multi-functional purpose, also to increase the public acceptance. The designers stated that they were looking for a "something special" (E9-N), a place "where you want to go" (E2-R), and that at the same time could strength the connection between North and South, turning the city towards the river Waal again.

> *"We wanted the river also to be for the people. So, they want nature and that people can walk around it, or go with their bikes and have river parks. Well, that is also target from the city. Then it helps to get people connected* [to the river]*."* (E11-R)

> *"We made a very holistic plan. So, it is not only about flood safety, it's also for nature, it is also for recreational area, it is improving spatial quality for the people who live here. (...) They are really happy now and the people who never came here they are going to swim here. (...) We worked that out in (...) how can the public make use of (...) what is now it's called a river park, which is a big complement for project. (...) We did together with them (...). A lot of people were very enthusiastic about it."* (E3-D)

Secondly, regarding the current recreational use of the space, the respondents have mentioned many activities: walking, marches, festivals, exercising, cycling, swimming, water sports (rowing, kayaking, canoeing), contemplating the landscape, having social activities such as hanging out with family and friends, playing games, enjoying the weather, taking pictures, organizing sport competitions, relaxing on the beaches, climbing in the stones, having picnics, and connecting with nature. The use is very intense, according to the interviewees, especially when the weather is pleasant, confirming the success of the programme on the spatial function matter. To them, the river park was a present and is a central point in Nijmegen.

> *"Walking, biking, swimming, water sports with kayaks, canoes. That's the new experience, that's a totally new way that is coming in. That's good. (...) I enjoy a lot"* (C13)

> *"It's a lot of sporting, lot of boat, running, bicycles. You see a lot of that now. Swimming as well. And it's just for fun. (...) That's really nice. (...) We see that people are enjoying the life here on Lent, and a lot of citizens from Nijmegen come over here to enjoy the life in Lent. (...) It`s like the place to be, for recreation, for sport, everyone comes to here."* (C4)

Some citizens stated that they wish there were more official activities organized by the government, such as open markets, sports competitions, and cultural festivals. They said small actions are taking place spontaneously by private organizations or the inhabitants themselves.

Interestingly, one expert also agreed with this perspective and stated that more density and urbanization are needed for this type of public action, and that the housing development should take a faster pace in order for that to happen.

> *"And what I think that has to happen, you have to bring some more activities out here. Why not every Friday or Saturday a market? Or, yeah. Imagine that you can do a lot of activity also sports, canoe, rowing, competitions. (...) But I think a lot of activities are coming from the citizens, and are not stimulated by the municipality."* (C6)

Lastly, a few use issues resulting from the new function of the place were discussed by some of the respondents: traffic signs missing, drugs, criminal activities, noise at night, people jumping to the water from the bridges, excessive rubbish, and motorcycles invading walking and cycling paths. Drowning was a recurrent point in the interviews. Some deaths have occurred recently due to people swimming in dangerous areas of the river. The experts claimed that the government is working on a solution, possibly by regulating permitted safe areas. Some citizens also stated that the area requires more facilities, such as shops and groceries, especially with a higher influx of people. Some citizens said that they understand that this is normal in a complex project as this, and that the authorities must keep working to solve the issues. An interesting aspect on this matter is their concern in taking care of the place, showing their attachment to it. They act as informants, contacting the government when something is wrong. Another aspect point raised by the experts interlinked with this, is the necessity to finalize maintenance regulation and budget, that are still being discussed. One expert raised an issue on infrastructure, stating that the project lacked the needed equipment and infrastructure necessaire for events and festivals.

> *"There are no signs. (...) There are a lot of things to do because at this moment there is a lot of young people who smoke hashish, a lot of criminal activity, a lot of crime, a lot of noise in the night, a lot of people is jumping off the bridge. (...) There are a lot of things to do still. That's normal with a complex situation like this."* (C2)

> *"Sometimes I feel concern about things that are happening. I see that people throw their rubbish into the island, or at the beach over there. Argh! (...) And I see guys with motors crossing on the paths, and it makes me red, 'Don't do that! (...) When I see thing happening, I call the government, the local government, or I send them an email, with photos. (...) Dealers also, over there, on the other side. A lot of dealers... This area doesn't deserve dealers. The most beautiful place."* (C3)

In overview, it can be inferred from data that citizens are very pleased with the transformed landscaped, and are very much enjoying it. Interviewees used words as 'happy', 'enthusiastic', 'proud' to describe their feeling. According to respondents, it is also attracting more tourism. Moreover, the river park is a connecting spot between inhabitants of Lent and Nijmegen, bringing people together.

> *"I would say that we are very happy. And everybody is so glad (...). There is been very busy on the beach, lots of people. People also have their way, and their fun, and their swimming. (...) It's better than we thought it would be."* (C3)

> *"It is a very big success, and it's so useful. (...) Everybody was on those beaches. (...) I mean whatever beautiful picture you get if people use it. Yeah, then you are a success, then they really appreciate it."* (E9-N)

> *"I think it´s wonderful. It´s an opportunity for the whole area, for Nijmegen, for Lent. I can´t imagine somebody doesn´t like it. It´s beautiful to see the creation for streaming, for walking, bicycling, everything."* (C1)

4.3.4 Values of Nature

During the interviews, all respondents (both citizens and experts) have shown appreciation for nature and both its instrumental (or use) and intrinsic (non-use) values. For the majority of interviewees (twelve respondents, including all experts), nature was a concern in the 'Room for

the Waal'. On the other hand, for seven citizens the decision-makers could have done better on this topic. In general, respondents value the ecosystem and the landscape for its direct use (as for swimming and shipping), indirect use (as for health, well-being and water safety) and existence (for the conservation of species and habitats). A few respondents have mentioned the optional use (reserving it for a future forest or housing development, for example). On this matter, it is important to highlight that for many interviewees, this concern in the process was because of legislation requirements and official procedures (such as environmental assessments and European legal standards). No one has talked about the bequest value, preserving nature for future generations. The main research finding on this sub-variable is the positive evaluation on the importance of nature.

Firstly, regarding the instrumental / use value, ten respondents discussed the direct value. They consider nature (the river and the riverine area, in this case) important for shipping / navigating, transportation, swimming, surfing, canoeing, and fishing. Furthermore, nineteen interviewees mentioned the indirect use of nature, as essential for industry, economic development, flood protection / water safety (especially in this case), reduction of pollution, and plague control. Moreover, it is important to experiencing the landscape, water and ecosystem by biking, walking, picnicking, and all types of recreational activities. The river and riverine area give the possibility to live, work, experience and walk by in an attractive environment. The interviewees value having an opportunity to be in closer contact with water, animals and plants. The respondents claimed that spatial quality increases with the presence of nature, and showed appreciation for a natural beauty, even more than a man-made aspect for some of them. They also stated that the river and parks are important for health, both mental and physical, and well-being, providing relaxation and rest. The respondents see that is profitable for society investing in nature, because of all services it provides, in especial economic development, ecological quality, recreation and wellbeing. As discussed in previous sub-sections, the citizens have a close connection with the river and have been living by the water for many years. It can be interpreted that this connectedness is a driver for this high evaluation on the instrumental value of nature.

> *"Because nature is also a rest... It is a fantastic place to live"* (C3)
>
> *"If you look at the ecosystem values, so the holistic values about what are the services that are brought by the river, in terms of safety navigation, ecological quality, wellness and recreational area… Well, investing in this kind of nature is very profitable for society." (E3-D)*
>
> *"Water takes people to relax, they came here to walk, to bike, relax, swim, fishing..."* (C10)
>
> *"What we would like to have for the whole Waal, is using the river in more ways than just as a way to get water to the sea, to get ships, to rob them all back to Germany. There are more ways, there are more functions. (…) We need the river to work by, to walk by, to live by, to get some air on a holiday and the goal was to get a development in which all these kinds of functions each get their own place."* (C6-R)

Still on the instrumental value, five respondents mentioned the optional use, claiming that it is important to have the possibility to use the natural environment in the future, as a park, as a new forest, for economic development of new companies, for cultural purposes as festivals, or housing development. In fact, there is still an area in the island that is been used as a park but will be transformed in houses in a near future.

Secondly, on the intrinsic / non-use value, the majority of respondents (nineteen) raised the importance of preserving nature simply for its existence, regardless of human use. To them, it is important to conserve the habitats, plants and animals. They also mentioned consequences, such as climate change and pollution, that are compromising nature, due to human activities. The experts explained that the area affected by the 'Room for the Waal' is an important ecological corridor, that must be preserved. According to them, the plan also provided a better connection between other natural areas, improving the flow of species. Moreover, they have conducted

environmental assessments and executed many measures to preserve existing species, and bring back the nature destroyed by the programme realization. It was mentioned creating provisory nests for birds or replanting trees, for example. Interestingly, many of the interviewees stated that the project involves natural areas legally protected, as well that there are European standards and official laws and procedures, such as environmental assessments, that must be followed. It can be interpreted that at least for some of the respondents, the intrinsic value is not related to a personal value or concern, but to a legal obligation. On the other hand, some citizens have mentioned a personal preference for a wilder nature, without human plans and interventions, and a high value for the intrinsic aspect of the environment.

> *"The nature target is that we are part of the European Union and they have the 2000 European Programme for nature protection, development, targets, and goals."* (E11-R)

> *"I think with a bit of luck we will have a major flood (…). Hopefully a lot of mud and seeds from Germany and further away Switzerland will again wash on to the area and mess it up a little bit so bring nature back and not make it too neat."* (C5)

> *"When you want to pass your plans, we have to do an environmental research report. It's rather strict and all… And in this area, there are a lot of special species, and it's a restricted area. So, you can only build and make these kinds of interventions if you have a good idea on how to compensate the nature quality."* (E5-D)

4.3.5 Summary: perceptions on the transformed urban landscape

In this study, the perception on the landscape transformed by the 'Room for the Waal' was analyzed through social-cultural values, meaning non-material factors related to how the society experience this landscape: aesthetic and symbolic values, place attachment, recreation, and value of nature.

The main research finding on this variable is a very positive perception from both citizens and experts in all sub-variables. The respondents consider the physical outcome of the programme – the transformed landscape –with high visual beauty and attractiveness, and also as a good representation of their culture and identity, providing motivation for its use. Moreover, the city's image was improved with the project realization. The connectedness with the place is very strong to the community, with respondents showing sense of attachment, belonging, and owning to it. The relationship between city and its inhabitants with the river has been rediscovered in the process. It is important to highlight that the ongoing transformation from a village to an urban city is not unanimously accepted. However, urbanization would happen with or without the programme, as the local government was already realizing. At the same time, the project has increased the connection between Lent and Nijmegen and brought a wider range of opportunities (for recreation, tourism, housing, business, and nature) that are positively evaluated by all respondents. In fact, it can be interpreted that the multiple recreational possibilities provided by the new landscape is one of the keys of the project's success. All respondents have shown enthusiasm on this aspect. Respondents have also discussed the importance of nature, especially to its instrumental (or use) value, for instance to swim or ship (direct), to provide flood safety or well-being (indirect) or to be an option in the future. The intrinsic (non-use) value was also mentioned, but for some respondents it appears to be more a matter of legislation than for a personal concern to protect nature.

To conclude, the clear majority of citizens and experts evaluate very positively the transformed landscape. It can be inferred that, after the initial fear and anxiety on the first years of the process, the landscape aspect of the outcome seems to have been worth it for most of them, what is supported by some respondents clearly stating that there is a direct relation between the transformed landscape and the stakeholders' (importantly including citizens) acceptance on the 'Room for the Waal'.

4.4 Ex-post Throughput Legitimacy

Throughput legitimacy is about the democratic quality of the process of decision making (and is ex-post in the case of this study), meaning that it is open, accessible, and transparent, and multiple actors were listened through a deliberative and consensual way. (Edelenbos et al. 2013a). The research findings about this variable are divided bellow into: Transparency, Accessibility/ Openness, and Money.

4.4.1 Transparency

Three main aspects were discussed during the interviews regarding transparency: (i) means of communication used in the process, (ii) accessibility to information, and (iii) perceived quality of the shared information and communication process. From the data analysis, it can be interpreted that the programme was transparent in the overview, with all actors having access to the plans and information from official sources, the theoretical indicators for this sub-variable. However, it was not the case in the first years, when the decision-makers were still negotiating among themselves to finalize the plan (which will be further explored in the next Section 4.4.2). It was a period of insecurity and anxiety for the citizens, but that can be explained by the variety of stakeholders involved, with multiple interests (as presented in Table 10), and the size of the 'Room for the River' and 'Room for the Waal' programmes. It can be concluded that the perceived quality of the shared information is positively high for the majority of respondents, but only until a certain extent, because it was not constant through time and in all steps, as the definition chosen in this study requires.

Regarding the first aspect, both respondent groups, citizens and experts reported a variety of communication means used in the 'Room for the Waal'. All of them described the occurrence of many meetings between citizens and decision-makers in the different government levels. During those meetings, the plans were presented by the decision-makers and discussed with the public, which had a chance to expose their wishes and concerns. The meetings and other events face-to-face communication were brought up by all citizen respondents (thirteen respondents), indicating these were their main source of information. The experts (eight respondents) also stated this as a strategic communication with the community. They have involved the community in face-to-face events to meet each other and discuss, involving inhabitants as strategy to create a connection. They also involved universities to gather public opinions. During the construction phase, they had representatives in each street for a direct communication with the inhabitants. Moreover, they organized excursions to the construction site that were always full, as a promotion measure.

> *"After the idea gets into Lent, everybody gets involved and they had a lot of questions. So, like, there was a lot of meetings."* (C4)

> *"We worked intensively together with Radboud University and they helped us to send people to companies, to citizens and to the local community to collect all their wishes so that we could make one vision and one program."* (E11-R)

Other used communication means that were described by the interviewees include: letters / mail (six respondents), newspapers (five respondents), and TV and radio (two respondents). Curiously both programmes 'Room for the River' and 'Room for the Waal' have official websites filled with technical information, news, pictures, etc., but only one citizen has mentioned them, and even though she said that if required effort and will to find a specific information online. Furthermore, only experts talked about more modern forms of information sharing: one described a SMS tool to send alerts about traffic, for example, and another talked about an app with updated photos of the construction. One expert mentioned that social media was not often

used back then. And another one talked about a 3D landscape modelling that was used to help the stakeholders to visualize the final design, which helped in its acceptance and success.

> *"We were always getting post, or mails. There was something to do. It was good."* (C10)

> *"The first idea in the first initial phase of the project was that we made a very clear 3D animation and I think that was one of the decisive moments, when it comes to support the plan, from that moment the people really saw what the project was going to look like. (...) We called it 'the applause of Lent' (...) we were applauded for the plan. That was the decisive moment, that made a change (...) From then afterwards, it became more calm* [sic], *and the relationship between governments and the people of Lent became less tense."* (E4-D)

About the second aspect, the accessibility to information, despite all the communication means discussed above, in some of the interviews it was clear that the depth and speed of the sharing were not equal to everyone. Both citizens and experts (eight respondents), mentioned that there was a group of citizens' representatives, from different technical backgrounds, making the bridge with the decision-makers. They were responsible for gathering inhabitant's opinions in matters required by the decision-makers and return the information regarding plans and decisions back. There was no consensus about this strategy. Some citizens preferred it this way, claiming the representatives were the most suitable ones, and that the communication would flow easier, but others felt they were receiving the news with a delay and that it was unfair. The experts described that they had distinguished groups of inhabitants depending on the level of impact they would suffer from the programme to prioritize the communication.

> *"We created a group and there was [sic] several people of the law, architectural one, with technical experience... We had a group and they contacted with the governments, local and national... And they communicated with us once a month, once a half year. It was depending on what was going on, and what they hear from the government."* (C3)

> *"The big guys have more information. (...) They have the best resource and the best information, so she can anticipate what is changing"* (C13)

> *"'There is a difference between the citizens who were living in the project area, or just near the project area, we have divided them between the people who were going to stay (...), the people who had to leave (...), and the people that (...) are passing the area everyday to go to work, for example. So, in the beginning, the passers, they didn't have any rule in it. We just informed them about the development. The people that were staying and the people that were watching, they did not know in the beginning. (...) Those people who were maybe going to stay, maybe going to leave, those were the participants in the whole process."* (E1-M)

Finally, about the perceived quality of information shared by the decision-makers, the interviews point for a positive ex-post perception in both respondent groups. However, it was not unanimous for the entire duration of the process. For two citizens, the communication should have been clearer and more equally distributed all along, as mentioned above regarding access to information. On the other hand, for four other citizens, it was good and organized in general. However, the majority (seven respondents) claimed that the quality and speed of information was not good in the beginning, especially before the official 'Room for the River' launch, but it improved over the years, and they were satisfied in the end. All the experts have a more positive overview on the topic, but two of them, the ones who were directly in charge of communication and stakeholder management, are aware of the dissatisfaction of inhabitants in the first stages. From all the depositions, it can be inferred that the delay between the national government making the decision of creating more room for the rivers, seeking water safety, and the final design of the local intervention in Nijmegen, aligned with the municipal plan for expansion and increased spatial quality, that took many years, was the root for citizens' insecurity and anxiety. They didn't know if their houses were going to be demolished, or the details of the decision. After everything was decided and communicated to the inhabitants, they could prepare their own plans and move on. The culminant point of this change of mind was the meeting known as 'the

applause of Lent', that occurred in December 2009, when all stakeholders applauded the plan and joined efforts for its realization.

> *"'The minister said 'ok, I have a very intense message to share with you, something is going to happen here. And that is not going to be easy'. 50 houses had to be replaced. And it took 10 years, from the first message until the final financial arrangement, it took 10 years! So, there was a lot of uncertainty, insecurity and fear, there was fear... (...) And now everybody is very happy and positive about the project, but then there were a lot of things that could have been done better. (...) I understand that they could only start the real interactive process after this main decision is made, and that is what happened.'"* (E4-D)

> *"In the beginning, they didn't tell us anything (...) When they started this plan, they didn't tell us anything. But accidentally we found out (...) The communication was bad between the government and citizens, leaving citizens angry. Later on, the communication was improved."* (C11)

4.4.2 Accessibility and openness

Accessibility and openness are two separated sub-variables in the Conceptual Framework (see Figure 8). However, in reality the concepts do not have clear boundaries and do not fit into boxes as in theory. The two codes were merged during data analysis, because respondents always mentioned them together.

Three points were central in the discussion on this topic: (i) who were the stakeholders and what were their main stakes, (ii) the perceived accessibility and openness of the decision makers to the citizens, and (iii) parallel plans developed by the community. All respondents have shown a clear understanding about stakeholders and stakes. From the data analysis, it can be concluded that the 'Room for the Waal' process of decision-making was accessible and open, in the sense that anyone who was interested: all government levels, designers, citizens with different backgrounds and levels ok knowledge, NGOs, and private companies, had multiple opportunities to participate and be listened. Only two out of the 24 interviewees evaluate the matter negatively. However, regarding the openness, the definition states that the decisions must be made in a deliberative and consensus process. The findings show that citizens' participation happened only in a limited manner, for instance regarding parallel plans that some groups of citizens have elaborated and were not approved. On the other hand, one can also interpret that in a democratic process all opinions must be heard, but a decision should be made in favour of the majority. The parallel projects were sent through official means and voted by the Parliament, which has opted by the original plan designed by the government. Judging if it was the best solution for Nijmegen and its citizens goes beyond the role of the researcher. What can be inferred from the data collected is the ex-post satisfaction of the majority. Moreover, the research has shown the citizens' capacity of creating their own network, contacting technicians, and elaborating a new plan, and further knew the law path to make themselves heard.

Regarding the first point, all respondents have shown a clear understanding of who were the stakeholders in 'Room for the Waal', summarized in the Table 10. The perception about each stake was also common among them. One highly mentioned perception was the powerful role of Rijkwaterstaat, the national water authority in charge for the 'Room for the River', also responsible for financing it.

> *"You have a general government, Rijkwaterstaat, they are very powerful let me say that."* (C2)

> *"They [the other stakeholders, apart from Rijkwaterstaat] had other interests but to us the main goal was to realize the centimetres the water level in 2015. The local government of Nijmegen wants to set themselves as an image that they did the project and they were not at a lower level of the central government and that was continuously... that was a struggle... (...) and we told them we pay and you have to do it our way because when things went wrong our minister has to go to the parliament."* (E10-N)

However, the other government levels and authorities had a say in the process and could also negotiate their own interests, meaning the process was accessible and open to them. An example was the interaction and negotiation between the local and the national government levels, as presented in Section 4.4.1. The Municipality took the national programme 'Room for the River' as an opportunity to realize its plan for city extension, by aggregating the spatial quality component with the water safety aim. The local government already had this project since the Nineties (see Section 4.1) and were interrupted with the launch of the national plan. In the first years of the process, a complex interaction took place, culminating in the final design of 'Room for the Waal' with all governmental stakes aligned.

> *"The municipality, they made a very strategic deal with the national government the Ministry of Water and Infrastructure as a big funder of this project that the municipality would step in this project when they got the leading position to organize a good design."* (E3-D)

> *"I mean the beginning was a very difficult one because the city of Nijmegen (...) they wanted to expand the city and the plans were actually made and then the national government said we have to stop building because we had high water and we have climate change (...) It took a few years in planning, in disseminating, in lobbying between those parties until there was a qualitative good decision that the national plan was accepted by the parts. The Dutch parliament made the decision as to what type of plan will be the plan for Nijmegen, it was the Dutch national government. In 2006, the alderman at that moment said 'if we have to do it, if the Dutch government has to do it, we will do it properly. Now we've changed our minds and now we are going to do it in such a way that it is good for the city of Nijmegen'."* (E7-M)

The regional level of government, the Province, was described by its experts as a middle-ground, focused both on water safety and spatial quality. Moreover, they were the bridge between all local governments involved in the 'Room for the River', and tried to engage them in a common vision.

> *"Specially to combine all these targets and to give some attention to (...) spatial quality unity and quality and to connect all these things together with one vision."* (E11-R)

Regarding citizens' participation in the programme process, there is no absolute consensus among the respondents, although the majority has pointed an overview positive perception. Just three citizen respondents only mentioned a negative perspective. To them, the decision-makers were only communicating the decisions, without space for discussion or a consensus process, and they were not equally open to listen all different stakeholders / groups.

> *"There were a lot of meetings and they were typical Nijmegen meetings they listen to you, they nod and they do something else. (...) It's so sad isn't it it's supposed to be a very democratic country and the civil servants just listen to you politely and take notes and just ignore it."* (C5)

On the other hand, eleven respondents remarked both positive and negative aspects regarding the accessibility and openness of the decision-makers to citizens. As negative, they mostly talked about the beginning of the process and the long period of insecurity and anxiety before the inhabitants were officially informed about the plans and involved in the process, as discussed in the previous Section. But as positive, according to these respondents, this relation between authorities and citizens was improved and strengthen over the years.

> *"We had to fight against the government, because we had to move, and nobody wants to move. But after all, there are 2 things: I'm very glad, but why it had to take 14 years? The negotiations, and everybody in the government wants to say something... Everybody wants to decide something. (...) We won the place, we won the money, so why did you have to do it this difficult? (...) We had to fight very hard for everything that we have now. After all, it was worth it."* (C3)

> *"At the beginning, it wasn´t very good, not very well, but after all they made a progress and it was good."* (C1)

Furthermore, as positive aspects, they affirmed that there were many meetings where inhabitants could attend, ask questions, speak out about their opinions and concerns. It was also mentioned that the citizens organized themselves into groups to represent them and to be a connection to the government. These matters were also analysed in Section 4.4.1, regarding the Transparency of the programme.

> *"They started a group with people in Lent who wanted to be involved (...). And they come together and they discuss, and went to meetings together. And it is like if Nijmegen had a question 'how is the feeling in Lent about 'this, or this, or this?', they went to them and they decide 'yeah, I think Lent would agree with it or not."* (C11)

Experts described the strategies used to involve the citizens into the process, providing to them the opportunity to participate and to be listened. For instance, meetings where both experts and inhabitants could dialogue and create different design scenarios, or excursions to reference areas for collective inspiration. They also promoted excursions inside the neighbourhoods where citizens could talk about history, or culture, or their relationship with the river. One expert has described this multi-level and decentralized governance as a root for citizen participation, and together with the spatial quality as a driver, bringing the decision closer to the local government, the keys for the programme success. However, it is important to keep in mind that this participation was only until a certain point. The interviews show that although the citizens were involved, the government always made the final decision. Especially the national level claimed to be concerned with resources (both time and money), acting firmly and not leaving much room for other ideas.

> *"We entitled people from the village to be in these excursions and talk about history. They made a booklet about historical moments (...). And we invited the people to write stories about living with the river. (...) To let the villagers have some kind of pride, because it's their backyard, (...) and we are digging in their backyard. (...) And I think that made that it was 'our project', (...) it was the project of people in Nijmegen, eventually. I think that people are very proud of it now, (...) they embraced it. And they did that by making sure that they were made part of the project in the end. They put a lot of energy and time. They constantly asked me to come to them to ensure that we were going to solve their problems. We changed the project during that time, because of all these questions and suggestions that were made by the people. Not all of them, but many of them."* (E4-D)

> *"We had a very strong planning which cannot take a lot of resources which has no room for new planning that things will not happen so were very strong acting on the planning, very strong."* (E10-N)

Ten interviewees only mentioned positive aspects on the topic. To them, the decision-making process was open and accessible to citizens, who were, in their perception, the co-creators of the result

> *"Nijmegen also listened very well to the people that are involved, the citizens who are involved the most by changing the landscape."* (C6)

> *"We formed a group of (...) politicians and civil servants, policy makers and there was a group of more of companies, citizens and NGOs, (...) explicitly to get a stage to have some conversations about what they thought, what their interests are, what they thought of the whole and the stages. And talk about what was their input."* (E6-R)

> *"That is a nice thing to see, and you can see that the government and citizens are working together to make something great. (...) It's something to be proud of. (...) The best part, I think, is the involvement of the citizens and how they influenced the decisions (...) I think that when governments are listening to citizens, even though the plans are already on the table, you can see that people are getting enthusiastic about the project."* (E2-R)

The last aspect brought up by ten respondents was regarding the organization of citizens in groups to create alternative plans to increase the water safety / river discharge capacity, without having to give more land to the river, and relocating inhabitants. They did that by contacting on their own researchers, professors, or specialists. Some citizens did not agree with the

government's calculations or with the chosen measures. However, despite their efforts, the Parliament and authorities approved the official plan, as it was realized (see Section 4.1).

> *"The people in Lent made another idea about how to deal with the problem. It was a high scientist in Lent. He found out a good idea about how to face the problem without having to move all the people from Lent. But they didn't agree with that, the Province or Nijmegen. (...) They were listening but they found it was not a good idea, or not enough. (...) Both plans would work but from Nijmegen has a nice park with bike, nice beaches and things like that. (...) So, they were quite angry."* (C4)

> *"Same people so many people here they said this is not necessary. (...) There was a group of people they came together and they found an engineer in water, and he said it is not necessary there is another possibility. (...) Rijkwaterstaat is a very mighty department and old, and they wouldn't listen to it but then it came in the Parliament (...) and then said the parliament 'okay, all right' and then they could start."* (C9)

> *"They also mobilized a professor from a Dutch University who (...) knew everything about how the river runs and the discharge of the water and so on. So, they also mobilized other people within the network to bring in the knowledge and at a certain point in time they also developed their own proposal. (...) I quite understand why people respond by saying 'okay, the citizens don't have the capacity and the background to be fully involved in these kinds of processes', but nowadays that's no longer the case in the Netherlands."* (E8-A)

4.4.3 Money

'Money' is a code that was not present during the literature review explicitly connected with legitimacy, and was later created during data analysis because of its occurrence in the interviews. While dealing with water governance, budget and financial management are relevant aspects, especially regarding the complex interactions between multiple stakeholders and large-scale projects, as in the case of the 'Room for the River'. Nevertheless, it was not highlighted as a component of legitimacy during the theoretical research. Throughout the interviews, multiple respondents (both citizens and experts) have mentioned matters involving money that are relevant for this study of the perceived legitimacy of the 'Room for the Waal' programme. Three of them should be highlighted: compensation for the relocated citizens, negotiation between government levels, and a perceived interest in the project as an opportunity of financial gain for the city. Although all three can relate both with both ex-post throughput and output legitimacy variables (as in real life the concepts do not exist into closed boxes, as discussed in the previous section), they are presented here for a better understanding on the context by the readers. They will reaper during the discussions on Section 4.5.

Almost all citizens (eight respondents) and a few experts (3 respondents) discussed on the importance of the financial compensation for the inhabitants who were relocated as one of the pillars for their acceptance during the decision-making process. As presented in Section 4.4.2, the beginning on the programme was a period of insecurity and anxiety, in which citizens living on the affected area did not have a clear answer whether they would have their house demolished, where their families could move to, how much would they receive as compensation and if that was going to be enough for a new start somewhere else.

> *"When the government, the Dutch government decided it´s going, we´re going to realize the plans and the sponsor of real and then the process starting from, there´s a lot of money, but, what´s the amount of money you receive for your old house and old garage and that´s half process it´s not the most lovely [sic] time... (...) So it´s little difficult and it´s a very insecure period…(...) The result for us is very good, yes, we came out with a lot of money we could build this. (...) it was also opportunity and we have a very beautiful house, we have a beautiful garage and we worked hard and the result is good."* (C1)

> *"Yes [the compensation was fair], (...) but at that time it was good we were satisfied. (...) That was all people see, is 'what is your problem, you've sold everything, you've earned a lot of money', but they don't know what's behind that and that's very difficult to tell that you have to fight for your property when most people had seen that as a very, very difficult time."* (C2)

However, after the final design was established and the decision announced, those in the group of the fifty houses demolished could negotiate their terms. According to the respondents, the compensation was fair and that has led to another phase of the process, a calmer and more positive one.

> *"I think Nijmegen handled that very securely, and very polite... They were not forcing someone. They were always helping them with money or something else. So, they are satisfied. Most of the farmers who also sold their property to Nijmegen, so they can grow, they are very happy because Nijmegen was a good friend by paying enough for them."* (C6)

> *"The safety of many is more important than... well, protesting because you lose some of your land. And you will be compensated, it's not that 'I'll take your land, and now go', but there will be a good compensation."* (E2-R)

The second aspect is about the negotiation between government levels, in particular between the national and the municipal. Eight interviewees discussed about it. As presented in Section 4.1, the national government had a goal to increase water safety. For that, a second channel was necessary in Nijmegen. The municipality was presented as wise in that moment to use this as an opportunity to boost the city development and its plans for the urban extension and the integration between North and South. Moreover, they had a chance to negotiate their desired design within the national programme's budget, when the spatial quality steak was attached to the safety from flooding. It was a win-win situation for all stakeholders.

> *"For the municipality (…) they also got finances from the national government there was a deal that they made, they said 'well, we will work along with your measurement for especially the river program but we want to have something in return' and they got a couple of million Euros to make this bridge and to make this redevelopment of the inner city more feasible."* (E8-A)

> *"We are looking for a lot of space making water plants and in combination with urban development. (…) That's with the idea we have not enough money if you only look from urban development how can you develop the nice riverfront or something like that but when you combine it… the water safety question it's simple to realize."* (E5-D)

> *"Nijmegen also understood that they would never have had this river park if it there were* [sic] *no Rijkwaterstaat, that came up with the idea to replace the dike. So, eventually, it's a win-win for the city and its inhabitants and for us, the people for the Netherlands."* (E4-D)

And finally, money was also mentioned by five citizens in a negative connotation as the financial gain was the main driver for the decision-makers.

> *"To me, it is marvellous. It's a big project, as you see all the things. It's yeah, a good work. But I'm afraid that in the long way, the idea is to make capital. Yes, this is nice, but I'm afraid of what's happening next. (…) I think that many project managers are now thinking to take more money. That's always the driver."* (C13)

> *"For Nijmegen, it is just a way to make money with the ground pieces that they have bought from farmers. They want to sell them for more than they got it. That also means that sometimes they are taking decisions that Euro, the power of the Euro, the money importance, can allow you to be fighting with the inhabitants."* (C6)

4.4.4 Summary: perceptions on ex-post throughput legitimacy

Referring to theory, Throughput Legitimacy is achieved when the process has a democratic quality, been perceived as open, accessible and transparent. (Edelenbos et al. 2013a). The data analysis of these three components point to a positive perception on the ex-post decision-making process legitimacy in the case study 'Room for the Waal', both to citizens and experts.

The researchers' interpretation is that the programme process is overall legitimate, with some reservations. Regarding transparency, the respondents perceive a good quality in shared information from decision-makers, with exception from the beginning where the plan was still

being defined by the experts and citizens were left with an insecure period. Despite the delay being explainable within the context of complexity, it compromised the full transparency by its definition, that englobes all phases.

On the accessibility and openness aspects, again the overall evaluation is positive, with all stakeholders having opportunity to participate in the process. Again, there is a reservation, with a few respondents unsatisfied because the parallel plans developed by citizens' groups were not chosen over the official project, that required fifty houses to be demolished to create more room for the river. The interpretation here is that these plans were heard and considered, and the choice made by the rule of the law, and that the majority of interviewees ex-post agrees with the decisions taken, signalizing that the programme was indeed open and accessible. Finally, the role played by financial resources was analysed and it can be inferred that money has contributed to the process legitimacy in two dimensions: with compensation for the families relocated - that was unanimously considered fair – diminishing their fears and anxieties and increasing their acceptance; and with the negotiation that ended with the local government receiving funds from the national to implement a good urban design that was also key for citizens' support, as it will be further explained in the next section.

4.5 Output legitimacy

Focusing on the governance practice and concrete policy and decision-making processes, Output Legitimacy occurs when the programme outcome reflects two dimensions: (i) acceptance by stakeholders (especially the citizens), which consider this result as relevant and aligned with their interests; and (ii) reflects the capacity of the decision-makers to achieve effective solutions to common issues of the society (Edelenbos et al. 2013a).

4.5.1 Problem-Solving Capacity

The data analysis on the sub-variable 'problem-solving capacity' points to the complexity of a programme with this magnitude, involving many stakeholders with different aims and resources (see Table 10). According to theory, this is the capacity of the decision-makers to realize the most suitable solution for a problem that is common for the whole society. The respondents did not show a unique perspective on the matter. For the thirteen respondents, the decision-makers are qualified and capable of making a good decision, which for them was the case on 'Room for the Waal'. On the other hand, eight respondents do not consider the solution as the best option for the whole society. As positive perceptions on the matter, most of interviewees considered the decision-makers efficient in achieving their objectives, learned through the process (improving their capacities for future projects), created a solution based on what would be good for all, and had their capacity and the programme success acknowledged by external viewers.

However, some respondents raised negative aspects, such as inefficiency (especially timely), over manipulation of nature, hidden financial motivation, and distrust in the solution adopted (in the calculations and technical decisions, in especial in the context of the parallel plans developed by citizens, as previously discussed). Another vital point discussed was the complex interaction and negotiation process between different government levels, with different expertise, resources and interests, as shown in Section 4.4. There is an important context for the interpretation of problem-solving capacity in the 'Room for the Waal' programme: the higher motivation for its existence is increasing water safety. The Netherlands has always dealt with flooding risk. As discussed on Chapter 2, there were major floods in the country in 1993 and 1995, which affected also Nijmegen. A large number of families had to be evacuated, creating a permanent risk

awareness and a sense of urgency both in experts and in citizens. With that in mind, the acceptance of a programme to increase water safety is undoubtedly important and in the common good for the whole society, as confirmed in all interviews. The main research finding here is that there is no consensus if the plan realized was technically and economically the most suitable one, but its outcome is supported by most respondents. Moreover, with some reservations, the decision-makers are trusted as capable to achieve a solution for a common problem for the whole society.

The first point to be made is this aspect of unanimity among respondents affirming that water safety is a matter of national importance and a problem common for the whole society, justifying an intervention, especially in the context of climate change and higher levels of urbanization. The interviewees have mentioned these drivers, as well as the major floods in the past. Increasing safety from floods was the first and main goal for 'Room for the River", and the higher stake for the national government.

> *"That's more important, the safety of many is more important than... well, protesting because you lose some of your land. And you will be compensated." (E2-R)*

> *"They made it look very safe for us, because the river has been twice in 1996 and 1995. (...) The river was very high so the people were frightened… were scared that the area was flooded. So, they said 'when we make this plan, it will never happen again in ten thousand years', (...) and they made that very big that it was very safe." (C12)*

Fourteen respondents raised other positive aspects on the decision-makers capacity to create a solution that was for a common good to society, for example: creation of new jobs, housing development, recreation and the river park, improvement of spatial quality, and citizens participation in the process. It can be interpreted that the inclusion of the second objective on the programme – improving spatial quality – was key to higher acceptance, as discussed in the previous section. The possibility of citizens participation was also fundamental to the decision-makers to gain support and conquer trust.

> *"It was part of the policy to attract people to accept the work for 'Room for the River' (...) when this program does not only make water safety but also improve the environment and I think that was a brilliant idea. From 'NIMB' ('Not in my backyard') to 'PIMB' ('Please in my backyard')." (E10-N)*

> *"Because a lot of people are very convinced that we are good people, we are good for them, so we have confidential some trust by the people and (...) we made a very holistic plan so it is not only about flood safety, it's also for nature, it is also for recreational area, it is improving spatial quality for the people who live here." (E3-D)*

> *"The municipality succeeded in I think truly making participation happy. (...) And in that way also (...) the satisfaction for the project was quite high. (...) In the end, the project can be more or less seen as a success in making a multifunctional plan. (...) They really succeeded in aligning all these functions and also making it acceptable for society, for the citizens." (E8-A)*

Furthermore, thirteen respondents talked about decision-makers' efficiency, giving compliments regarding good performance, hard work, realizing what was promised, gaining trust from the citizens, achieving the objective within time and budget proposed, quality in construction, making good negotiations, working well with a multi-disciplinary team, and turning a threat into an opportunity for the city and its inhabitants.

> *"That was marvelous to see the people are on that way, on a schedule, working all minutes, all hours, day, month, or year. (...) That was beautiful to see." (C13)*

> *"The main goals of the project were very elaborated. (...) It stayed within the budget, it stayed within time. (...) A lot of people were very enthusiastic about it." (E3-D)*

> *"I think we changed a treat into a chance for the city, and I am very proud of it. I think everyone involved is very proud of it, and I think we managed to make it a co-production, Rijwaterstaat, Gementee*

Nijmegen, Waterstaat Gelderland, the Province... We all together, suddenly we became a coproduction. So, we are all proud of it together." (E1-M)

Some interviewees (six respondents) mentioned that the attention the programme has been receiving from the press and other cities and countries show the acknowledged success of the programme, attesting in favor of the problem-solving capacity of the decision-makers. It is possible to see that many respondents are proud of the outcome.

"It has a lot of prizes, (...) it received a lot of press attention. (...) They came from Brazil, they came from Indonesia, from China, Korea, Indonesia, America, and so on… A lot of countries, (...) they visited us and they have seen it. (...) And there were also a lot of publications." (E10-N)

"It's nice to show to the world." (C12)

While discussing the perceived capacity of the government levels, thirteen interviewees affirmed that they are the most suitable actors to make the decisions. As presented above, they trusted in the multi-level and multi-disciplinary team, and had a participation channel opened (see Section 4.4.1). They have mentioned the tradition on handling water issues by the water authorities (Rijkwaterstaat in the national level, and the local water boards), and the political courage and leadership in the regional and local governments to negotiate and realize the spatial quality and city development.

This discussion leads to a second important point on the data analysis of the sub-variable 'Problem-Solving Capacity': the complex interaction among decision-makers. As raised before, each stakeholder had its own objective and resources. Fifteen respondents dialogued about it. One of the points raised were the powerful position of Rijkwaterstaat and the national level as 'fathers' of the programme, owners of the financial resources to realize it, and concerned mainly with the national safety from flooding. On the other side, the local government was against the project in the beginning, because they were surprised by it and had to pause the expansion plan for the city that they were conducting. However, they were great negotiators, accordingly to the interviews. The Municipality fought for autonomy and succeeded in lobbying and influencing the higher levels to include the spatial quality as a twin goal for the programme, and furthermore to embrace the responsibility to create the design. That was a strategic deal (discussed in Sections 4.1 and 4.4), which at the same time gave more power to the local level and provided them the financial resources from the national to implement the aimed city development, such as the construction of bridges connecting both sides of the river Waal. In the middle, there was the regional level, the Province, working to connect all levels and achieve a common vision for both objectives: water safety and spatial quality. The most interesting finding on this rich data was the process of decentralization of the decision-making and the acknowledgement of the different capacities among decision-makers, and the achievement of a better coordination throughout the process and a co-production of a successful outcome. Each part could contribute with the best they have: the water boards with their long technical tradition and knowledge on water safety; the national government in leading, planning, controlling the time schedule and budget; the regional government in creating connectedness and alignment among all municipalities; the local government in designing the spatial solution and in closely involving the citizens; and finally, the consultants and designers in providing their technical expertise and creating a range of options and possibilities.

"The municipality, they made a very strategic deal with the national government the Ministry of Water and Infrastructure as a big funder of this project: that the municipality would step in this project, they got the leading position to organize a good design." (E3-D)

"The 'Room for the River' was an important thing that not only the national government but also more decentral governments: the province, but also the municipality, were more involved in this program. And that was also mentioned as a key success factor in 'The Room for the River', is that there was really multi-level governance going on. And because spatial quality is also the main driver, that is not the field

of the national government, it is the field of the profits in the local municipalities. So, there you see in the two main objectives of the program that national government, like safety and environmental quality were brought together and this was also followed up in in the governments' structure and the government's processes around these projects in 'The Room for the River' program. So, there you see that national government explicitly also provided room for the decentral governments to take the lead in projects, Nijmegen is one of the examples that the province and mainly the municipality were getting in charge of city development." (E8-A)

The third aspect of research findings regards to the negative perceptions on problem-solving capacity of the decision makers, showing that although there are all positive views discussed above, they are not unanimous among respondents. The biggest issue for eight interviewees, all citizens, is a distrust in the technical solution chosen and the calculations behind it. Some inhabitants have produced, together with academics and experts, alternative plans to increase water safety and the river discharge capacity. Those alternative plans consisted, for example, excavating the clay accumulated over the years on the river bed, or increasing the height of dikes, or build a storm drain channel. To them, those solutions were simpler, more effective, cheaper, and, especially, did not require to give in land where people lived to the river. Furthermore, to some of them there are errors in the technical calculations and misleads measurement goals, for instance a discrepancy between what is adopted in Germany, where the river comes from, and The Netherlands. These citizens were disappointed that the government has chosen a plan that required the demolition of fifty houses and a complete transformation of the village of Lent, as they were being sacrificed to a higher goal, while other possible solutions could have been chosen. They affirm that there were hidden political agendas and financial reasons for that choice (as discussed in Section 4.4.3). These respondents perceive that the parallel plans developed by the citizens were technically equivalent, or even better, but would not produce such a beautiful landscape or improve the city's image. As presented before, it can be interpreted that the plans were listened through legal means, and democratically voted by politicians elected by the citizens, but a reservation must be made that it did not satisfied all respondents.

"The project managers, they are always thinking about how they can take money." (C13)

"They were quite angry because they said 'your plan is not that beautiful', so they preferred to move like 200 citizens out of Lent instead of doing the same thing but not that beautiful. (...) But of course, we are citizens and not architects. So, I can understand." (C4)

"There are calculation errors. (...) This is terrible we are affecting people's lives using faulty calculations that should be stopped but within the machine, Rijkwaterstaat, people just said no this is the way it is this is going to be. (...) Nationally, I think they wanted to have a showcase project to demonstrate what Dutch engineering could do. (...) There is a political agenda behind it" (C5)

Some other specific negative points raised were: lack of capacity in the maintenance of the place, as discussed in the previous section; a sense that nature is been over-manipulated and that bad consequences may happen; a perceived lack of coordination between stakeholders in the beginning of the process; and a feeling that everyone wanted to have a say and make the decisions, influencing the time length for all negotiations. From these points, it can be argued that the programme is highly complex and it is normal that it takes time, as stated by some interviewees. But it also shows that there is still work to be made in order for the decision-makers achieve the citizens' expectations for their representatives.

"The most negative… The energy you put in (...) and the working slowly of the government. (...) Too many people (...). And everybody has to say something…" (C3)

This perception leads to the last finding, that the decision-makers learned throughout the programme process, and increased their problem-solving capacity over the years. Ten respondents talked about this point, discussing that this programme was a true policy innovation, a change of paradigm in The Netherlands. The stakeholders learned to cooperate and to

communicate wisely. In the end, the goals were achieved within time and budget, with high quality.

> *"The most positive is that it was a kind of a new policy not to make more higher dikes, but to broaden the river. That was very special it was a kind of policy innovation." (E10-N)*

> *"It was emphasized by near flooding in 1993 and 1995, a lot of people had to be evacuated in certain areas, also in Nijmegen area. And that was little bit like a push towards a new paradigm, which provided more room for the river and therefore more room for spatial quality. And that's why this program of 'Room for the River' is very different from the tradition of the Netherlands, that next to the defence and the safety character, also environmental quality was pronounced as an important objective, and that provided room for this initiative in the program. So that is… and certain people in the Ministry were very provocative in doing this." (E8-A)*

> *"To be honest, the way this programme, the 'Room for the River', was set up, in close collaboration between the national and regional governments, and the focus on both river safety and what we call 'spatial quality', or landscape appeal, or how do you call it, multi-functionality, was something new. And we, the Netherlands, have never fully adopted it. But that has been very big part of the success." (E4-D)*

4.5.2 Acceptance by Stakeholders

The sub-variable 'Acceptance by Stakeholders' is the final element on the analysis conducted through all previous sections on this chapter. In theory, each concept has its own box and boundaries, but in real-life setting a complex interlinked network can be seen between all the variables and their sub-variables. Here, the objective was to evaluate if the outcome of the 'Room of the Waal' programme achieved acceptance by all stakeholders, in especial the citizens, considering the solution as relevant and in their own interests. This research finding is a sum of all previous ones. The acceptance by stakeholders was low in the beginning of the programme, when the decisions were still being made, with insecurity fomenting protests against the project. It was a long and emotional path for the citizens that took years. In parallel, the multi-level and multi-functional team discussed and negotiated until the final plan was defined. Now that the realization was completed and the outcome is visible and, more importantly, subject to experimentation, the researchers could interpret from data that the result is accepted for the majority of respondents (twenty-two out of twenty-four interviewees). To them, the outcome is relevant and represents their interests, for many different reasons. The first one, as discussed in Section 4.5.1, is that safety from flood is a common and very important matter to the whole society, justifying an intervention. Moreover, they declared themselves as 'happy', 'proud', and 'enthusiastic' with the result, seeing new opportunities for housing, tourism, recreation, nature, and city development. The main reasons for acceptance raised from data analysis are: the multiple goals of the programme, with special attention to spatial quality and the beautiful transformed landscape, a good financial compensation to the families relocated, and the open participation process. However, some reservations must be made that negative points were also raised, such as the decrease of a villager life style, and distrust by some on the technical choice, as presented previously. Nevertheless, to only two citizen respondents these negative perceptions surpass the positive ones, and to them the outcome is not the most suitable represent of their interests.

Almost all respondents have mentioned the low acceptance in the beginning of the programme. The citizens were afraid about how their village would be impacted, if their houses would be demolished and they would have to move, whether compensation would be enough for a new start, and how the process would be conducted. It was a period of insecurity and anxiety, which resulted in protests and angry back then, while the decision-makers were negotiating among themselves to define the final plan. Fourteen respondents described this a long and emotional process for the inhabitants.

> *"It has been a long trajectory… I say, after all, of course we had to fight against the government, because we had to move, and nobody wants to move. (…) Why it had to take 14 years? (…)* [emotionally] *Terrible. (…) After all, it was worthwhile, everything. I wonder if a second time... Never! I won't do it a second time, never. I wouldn't wish it for my worst enemy, but it was worthwhile." (C3)*

> *"Lent must go away and make room for the river. So, families would have less land to work on, or people who had a house, or lived there, they had to be moved to another place. So, the concerns were quite emotional. It's about your house, it's about your environment, it's about your living, what you work. So, you can imagine that if that disappears, you are not happy." (E2-R)*

The outcome of the programme was accepted for almost all respondents (twenty-two). To them, the solution is relevant and in their own interests. The interviewees area happy, enthusiastic, and proud of the result. Some respondents mentioned that although they were afraid in the beginning, they had to accept the change and move on, leaving the emotions aside and embracing the possibility of a safer (from flood) and better city, with more opportunities for housing, employment, nature, and especially recreation with the river park.

> *"The people living here they enjoy, I would say. They like it, they can go in here, they can swim, can do water sports. They are happy. But you must be going out, out of your emotions, all your believing, to accept that is the new way. (…) I should look in that way and 'ok', that is necessary." (C10)*

> *"We had to fight very hard for everything that we have now. (…) After all, it was worthwhile. Yeah, after all it was worthwhile, sure thing. (…) I would say that we are very happy. And everybody is so glad. (…) It's better than we thought it would be." (C3)*

It can be inferred from the interviews that there were four main pillars for stakeholders' acceptance: increased safety from flooding, good compensation for the relocated, open participation in the process, and the multiplicity of goals – in especial the aesthetic and recreational aspects of the landscape, achieved with the spatial quality aim. Firstly, regarding water safety, as it was discussed in the previous sub-section, the respondents showed an understanding that increasing safety from flooding is a matter of national safety and measures should be made (as explored in Section 4.5.1).

> *"Most people understand that water safety is a main concern. We had some flooding in 95 and 96, I believe, so all the people in the region know what the water can do. So, they are aware that something must happen. Especially when they see the climate change and the rivers will rise more, and we must be prepared for that. That's more important, the safety of many is more important than... well, protesting because you lose some of your land. And you will be compensated." (E2-R)*

Secondly, and connected with the first reason, the families removed have received a good compensation for their houses and had a chance to a new start. According to the respondents (as presented in Section 4.4.3), inhabitants were satisfied with the provided compensation.

> *"We won the place, we won the money. (…) From a little cottage house to this, it is quite a difference. It's great, yeah." (C3)*

> *"The people who had to leave were compensated very nicely." (E8-A)*

> *"The result for us is very good, yes. We came out with a lot of money. (…) It was also an opportunity and now we have a very beautiful house, we have a beautiful garage." (C1)*

Thirdly, the possibility of citizens' participation during the process was key. The decision-makers creating a channel for the inhabitants to talk about their concerns, fears, and interests, and being listened was very important for their support to the programme, and resulted in the feelings of proud and 'owning' of the outcome (as discussed in more detail in the Section 4.4.2).

> *"In the beginning very bad, they don't want it: 'NIMB – not in my backyard'. And after a few years it was 'PIMB - please in my backyard'. And that comes because the local governor, the local government he had a good feeling for how to involve the people. That he had well done. And he involved the inhabitants and after a few years, I told you, it was 'NIMB' became 'PIMB' and now the people of Nijmegen are very proud that the project is complete." (E10-N)*

"They made a bad start so they had to recuperate and to recover from that because the citizens were emotionally so devastated that I thought that they were sacrificed to a higher goal but the municipality succeeded in I think truly making participation happy. (...) That paid off in the end so I think in all the participation procedure really succeeded. And in that way also the project, and the satisfaction for the project was quite high." (E8-A)

"Everyone wants that it will be happening somewhere else, not in their backyard... But then you can see that people started to think 'all right, if it must happen, we can maybe work together to find a way that it happens is such a way that I and people around me can live with it'. And that is a nice thing to see, and you can see that the government and citizens are working together to make something great." (E2-R)

And lastly, the combination of twin goals: increase of flood safety and improve of spatial quality can be interpreted as a game changer (as shown in Section 4.3). The multiplicity of objectives, going beyond the technicality of water safety measures, and including a river park for recreation, a beautiful transformed landscape that would change the city image, all possibilities of recreation, culture, housing, tourism, employment, and city development, was a very smart and attractive strategy from the decision-makers. The experts interviewed stated this was a clear strategy, and the data analysis confirm its success. It is important to highlight once more that the combination of multiple objectives was also decisive for the acceptance inside the different groups of stakeholders (as discussed in Sections 4.4.2 and 4.5.1). The final programme was a combination of all main stakes, and in the end, for instance, the national level achieved the water safety and the local level achieved spatial quality and city development. It was a win-win situation for both.

"It's marvellous. And I think people are proud of it, it has won a prestigious prize. (...) It was part of the policy to attract people to accept the work for 'Room for the River'. (...) when this program does not only make water safety but also improve the environment and I think that was a brilliant idea. (...) The citizens are very pleased. (...) The strategy of the local government was very handsome at that point, and also the double target of the program the target of improving the water safety and also improve the environment." (E10-N)

"We made a very holistic plan so it is not only about flood safety it's also for nature it is also for recreational area it is improving spatial quality for the people who live here. (...) They are really happy now." (E3-D)

"I think we changed a treat into a chance for the city. (...) And I think we managed to make it a co-production, Rijwaterstaat, Gementee Nijmegen, Waterstaat Gelderland, the Province... We all together, suddenly we became a coproduction. So, we are all proud of it together." (E1-M)

Citizens are very pleased with the outcome in this aspect, with some of them clearly affirming that they would not have protested in the beginning if they could visualize the result before. In fact, respondents have mentioned the Applause of Lent, a public meeting where the final plan was presented, including a 3D visualization of the design, and everyone was applauding and enthusiasm with the programme, even the ones who were fighting it before. People who were against the project started to be its ambassadors. From that moment, the process was calmer and smoothed. Now that the project was constructed, and people can go there and see it, experience it, they are very happy with the result.

"I think they were in the beginning scared, and 'what is going to happen with our village', but it was unstoppable, alright, because it was a plan from the government. Later on, they saw the plans and they are like anticipating, you can imagine how it is. But now it is done, they are really proud of it, because of the structure and like the design is very beautiful." (C4)

"After all, if we knew it would be such a beautiful project, we didn't, perhaps we didn't... Well, there was a protest. If we knew before it wold be so beautiful, we wouldn't have protested at all. Ha-ha-ha." (C3)

"In the end of the planning phase, we presented the plans and then in the city of Lent, there is a house where we had the applause of the public, and then people started to be openly enthusiastic. (...) Now, it is better than a few years ago. (...) We are used, as being professionals, to if you have a plan or a vision

to visualize it and expect how it's going to work, but people sometimes have to experience it before they like it." (E7-M)

Although there are all these positive perceptions on the programme's outcome, a reservation must be made that its acceptance was not unanimous among the respondents. For two citizens, there were better technical solutions for water safety, those alternative plans proposed that could have achieved flood safety in simpler and cheaper ways, without giving land that was important for livelihoods to the river (as presented in Section 4.5.1). For that, they do not consider the outcome a good representation of their own interests. Apart from that, other issues were raised from the respondents, although they do not interfere in their acceptance on the result. Those points were also discussed in previous sections, for instance: the impact on the villager lifestyle to those who have chosen to live a quiet life in a farmer, small community. That made adaptation harder for some inhabitants, especially the elderly ones. Moreover, to some of the respondents, there was a hidden financial and political agenda behind decision-makers motivation. It can be interpreted from data that the overview perception on the outcome is very positive and respondents feel it represents their interests and is relevant for a common problem to their society: the need to guarantee the best flood protection as possible. Even for the ones presenting negative points on this sub-variable, for only two out of twenty-four it is decisive in their final evaluation on the result.

4.5.3 Summary: perceptions on output legitimacy

According to the theoretical definition, 'Output Legitimacy' is achieved when stakeholders accept the programme's outcome, considering it relevant and in their own interests, and reflects a problem-solving capacity of decision-makers to realize a solution to a common issue to the society. The data analysis on the problem-solving capacity has shown a divided perception among respondents. On one hand, to some respondents the decision-makers achieved success and proved their capacity, creating a solution good of the whole society. On the other hand, to some interviewees there were better possible solutions. However, this discussion was mainly on the preferred technical solution, and in the overview, there is a positive evaluation on the problem-solving capacity of the decision-makers, and trust in them. Almost all respondents have shown acceptance on the outcome by stakeholders. They have a very positive perception on the result, with some small reservations. In general, they perceive the outcome as successful, increasing the safety from flooding and the spatial quality, the twin goals of 'Room for the Waal'. The solution brought good opportunities for the city and its inhabitants, representing them and being relevant to their interests.

The conclusion on the 'Output Legitimacy' variable is that the project is big and complex, and there is no black or white single perception that summarize all the data and respondent's voices. However, it can be interpreted that for the majority interviewed, the output is legitimate, because it represents them, is relevant for their community, and the decision-makers had enough capacity to go through this long process of negotiation and achieve a solution there is seen for the majority as positive. Other points that should be highlighted in the analysis are the complex interaction among government levels, influencing the final plan, and the risk awareness of stakeholders after major flooding in the nineties', increasing the support for the programme. Moreover, three reasons can be emphasized for the acceptance by stakeholders: the multiple goals of the programme, with special attention to spatial quality and the beautiful transformed landscape, a good financial compensation to the families relocated, and the open participation process. In overview, respondents claimed to be happy, enthusiastic, and proud of the result.

Chapter 5: Conclusions

5.1 Research purpose

Cities are the place of the future, sheltering 66% of world's population by 2050 (UN 2014). Climate change is increasing the already complex task of urban planners to create resilient cities, able to "anticipate, absorb or recover from potential hazards in a timely and efficient manner" (IPCC 2014: AR5). While cities must accommodate the growing urban population, the challenge is to find a balance between social and economic development, technology, and a sustainable use of nature, in order to conserve its ability to provide ecosystem services essential to human activities. This means a transition towards a harmonization-social-natural approach, one that is holistic and multi-disciplinary (Zalewski 2014). At the same time, this approach must be democratic – open and accessible – to multiple stakeholders with different aims and perspectives (Edelenbos et al. 2013). This means participation is key to achieve legitimacy (Edelenbos et al. 2017). Moreover, it is fundamental to understand the social-cultural values that connect the individuals and can empower the actors, framing the new model of water governance (Ast et al. 2013). In the context of these Integrated Water Management approaches, such as the Blue-Green Cities, there is a trend to 'make space for rivers' aiming to restore the original attractiveness of rivers combining economic development, water safety, ecological sustainability and social-cultural values (Warner et al. 2012). River restoration programmes is a hot topic both in research and in practice, reflecting the more natural connection between urban societies and the environment (Smith et al. 2014).

In this study, the researchers analysed the river restoration programme 'Room for the Waal', in Nijmegen, The Netherlands. They investigated how citizens who were mostly affected by the project (living on the neighbourhoods transformed), and experts involved in the decision-making, perceive the changed urban landscape, regarding social-cultural values, and the ex-post legitimacy of the programme outcome and process of decision-making. Although there is vast theory about landscape perception, social-cultural values, water governance, and legitimacy, core concepts of this study, there is little empirical information regarding specifically citizens' perceptions in river restoration projects. Academically, the researchers intend to fill in this gap, by a deep qualitative insight on the case study, adding to the extensive scientific knowledge of Dutch water governance. Moreover, by investigating the relation between these two components of perception, this research can extend the current knowledge on the link between both academic fields (landscape perception / social-cultural values and water governance / legitimacy). In policy practice, the study is also relevant because politicians and decision-makers depend on the support of the other stakeholders, especially citizens governed by them. It is crucial that that citizens perceive the decision as legitimate so the programme can achieve political success, but also a reflection on the society's values and interests, and contribute to the construction of the city's image desired for the majority. Understanding the case of Nijmegen may provide useful insights for next programmes.

The case study was recently implemented, on April 2016. With rich, deep, and new qualitative insights collected in qualitative fieldwork, the researchers aimed to discover and explain whether a relationship ("C" in the Conceptual Framework – Figure 7) can be established between the two variables: the perception of the transformed urban landscape ("A") and on the legitimacy of the 'Room for the Waal' ("B"), extending the knowledge on these two fields. These results will be presented in the next section.

5.2 Conclusions

5.2.1 Research Question A: How do Nijmegen citizens who were mostly affected by this programme and experts involved in the decision-making perceive the transformed urban landscape, regarding social-cultural values?

Citizens and experts have a very positive perception on the transformed urban landscape in Nijmegen, after the 'Room for the Waal' realization. Four social-cultural values – non-material aspects on how society experience the landscape – were analysed in this study to understand landscape perception: aesthetic and symbolic, place attachment, recreation, and values of nature. On the first, respondents showed high appreciation for the beauty and attractiveness of the programme's outcome. To them, the changed landscape is beautiful, and reflects their culture and identity. Furthermore, it has improved the city's image both for their own inhabitants and for outsiders. On the second value, the interviewees already had a strong place attachment and connectedness, as well as citizenship sense. Their relationship with the river Waal was rediscover and strengthened with the project. Still under this value, it was discussed in Chapter 4 the urbanization process that is occurring in the region, modifying the villager way of life, which is not unanimously welcome by inhabitants. However, it was also interpreted that this transformation would happen regardless of the 'Room for the Waal', as the plans for city expansion were already decided by Nijmegen Municipality years before. On the other hand, the possibilities brought by the programme are enthusiastically perceived by citizens and experts: for housing, tourism, business, nature, and recreation. This links to the third value evaluated, recreation, also very positively. The changed landscape provide room for sports, leisure, and relaxation, and it is inviting to use and socialization. On the last value, nature is considered important by respondents especially for its instrumental (use) value – direct, as swim or ship, indirect, as flood safety and promotion of well-being, and optional, as for future housing development -, but also for the intrinsic (non-use) value, for species and habitat conservation. To conclude, both citizens mostly affected by the programme and experts involved in the decision-making have a positive and enthusiastic perception on the transformed urban landscape.

Linking back to the theoretical review presented on Chapter 2, the research findings are aligned with related works. For instance, the social-cultural values in this case study have connected the community, empowered stakeholders, and influenced the decisions, confirming their importance defended by Ast et al. (2013). Furthermore, the 'Room for the Waal' programme has brought, with the implementation of the river park, multiple benefits for social-cultural aspects of well-being such as health, quality of life, interaction of nature and visual attractiveness, as studied by Townsend and Henderson-Wilson (2017) about urban greening. Another example of correlation with theory is the recognition by respondents of the beneficial ecosystem services provided by the river and riverine area, in especial the cultural services (recreation, health, tourism, sense of place, aesthetic and symbolic), as discussed by Braat and Groot (2012), Millennium Ecosystem Assessment (2005), and The Economics of Ecosystem and Biodiversity (2011). Moreover, the aesthetic appreciation created with the project design provided a stronger integration between the city, the river and the inhabitants, as expected by Batista e Silva (2013) and Blue Green Cities (2016b). The blue infrastructure (presence of the river), highlighted by new public spaces, have a connection with recreation, leisure, and restoration, as a therapeutic landscape discussed by Volker and Kistemann (2011 and 2013). The spatial quality achieved with the programme contributed to the perceived happiness (subjective well-being) of citizens, as theorized by Brereton et al. (2008). The water was rediscovered as an important element in the landscape design, in the construction of the city image, as well as in the creation of emotional bounds with

inhabitants, as researched by Arnett (2017), Warner et al. (2012), and Volker and Kiestemann (2013).

Only one aspect has contrasted with the literature review. On nature evaluation, the 'Total Economic Value of Environmental Assets' model developed by Pearce and Moran and studied for example by Ast et al. (2013) was applied. The perceptions of respondents on values of nature pointed almost all categories of the model, excepting the 'bequest value' – conserving nature for future generations -, that was not mentioned by interviewees. A research made by Born et al. (2001) found that a high percentage of respondents in US and Europe value the intrinsic (non-use) value of nature – that includes bequest value -, regardless of human use. The findings here point more towards the instrumental (use), suggesting further research. The suggestions for future work will be presented in the last section of this chapter.

5.2.2 Research Question B: How do Nijmegen citizens who were mostly affected by this programme and experts involved in the decision-making perceive the legitimacy of the ex-post programme outcome and process of decision-making?

The perception on legitimacy, both on the outcome (Output Legitimacy) and on the decision-making process (Throughput Legitimacy) is overall positive among the citizens who were mostly affected by the programme and experts involved in it, with some reservations.

The legitimacy of the ex-post programme process of decision making was evaluated with three components, based on the work of Edelenbos et al. (2013a): openness, accessibility, and transparency. Both groups of respondents, citizens and experts, have a positive perception on the throughput legitimacy. The programme was considered transparent by respondents, with good-quality information shared by decision-makers. A reservation must be made regarding the first years of the process, an insecure period for the inhabitants while the decisions were being made. The process is perceived as open and accessible, providing opportunity for participation to all stakeholders. Another parenthesis should be made on this aspect, with some citizens unsatisfied that the parallel plans developed by them not being approved. However, as discussed on Chapter 4, there was a democratic procedure, following the law, in which those plans were evaluated. Moreover, most interviewees ex-post agrees with the final decision. Lastly, money has played a rule in the perceived process legitimacy, with a fair financial compensation for the families relocated and with a good negotiation between government levels, which ended with the national level financing the spatial quality and city development aimed by the local level, and appreciated by the citizens.

The research finding on Output Legitimacy is that the project is large and complex, and there are variations among respondents' perceptions, without unanimity. However, it can be interpreted that for the majority interviewed, the output is legitimate, because it represents them, is relevant for their community, and the decision-makers had enough capacity to go through this long process of negotiation and achieve a solution there is seen for the majority as positive. Regarding problem-solving capacity of the decision-makers, some respondents affirmed that they have created a solution good for their community and have proven their capacity and achieved success, but to other respondents, there were better technical solutions, once more mentioning the parallel plans discussed above. In general, the evaluation on the capacity component was positive. Regarding acceptance by stakeholders, it is very good perceived, with almost all respondents have shown appreciation on the outcome. They have a highly positive perception on the result, with some small reservations. The respondents consider the outcome as successful, increasing the safety from flooding and the spatial quality, the twin goals of 'Room for the Waal', and

bringing good opportunities for the city and its inhabitants. The combination of multiple objectives was one of the pillars for stakeholders' acceptance, in especial the spatial quality and the 'marvellous' landscape design, as defined by them. Moreover, the sense of urgency created after the major floods in 1993 and 1995, a good financial compensation for the ones relocated, and the participative process, were other main contributors to success. In overview, respondents claimed to be happy, enthusiastic, and proud of the result.

Comparing the results to the theoretical review (see Chapter 2), they are consistent with related work on the topic. For instance, the 'Room for the River and 'Room for the Waal' programmes exemplify the shift from an exploitation-control-engineering approach to a harmonization-social-natural one, a transition on water governance that combines water safety with social-cultural, ecological and economic values in an Integrated Water Management. This was discussed, among others, by Zalewski (2014), and Ryan and Burton (2016). In fact, the combination of multiple goals was key to the programme's success: there was an integration of blue and green assets, adaptation to climate change, and contribution to the city's image with ecosystem services, social and cultural benefits, as the concept of Blue Green Cities discussed by Lawson et al. (2014). Furthermore, the drivers of the programme match the research made by Verkerk and Buuren (2012) and Warner et al. (2012), including a natural approach combining ecological, social and economic development, integration of the national and local aspects of the river, a multi-sectoral design with flood safety, ecology and urban planning, a participative process, and a long-term plan addressing climate change. The multi-sectoral goals, together with democratization of the decision-making progress indeed contributed to increase the programme support and legitimacy, as expected by Edelenbos et al. (2013a) and Buijs (2009). The perception that the project succeeded in achieving its objectives, but that at the same time there is still room for improvement and continuity in the transition, confirm the study made by Rijke et al. (2012).

The data analysis has shown high complexity and a multi-functional nature in the process, as expected by Tropp (2007) and Edelenbos et al. (2013b), while discussing water governance. The trade-offs mentioned in theory appeared in the case study, with the farmer village having to give space to the river and urbanization. An important aspect of the process was the interaction and negotiation between stakeholders, that was well managed and has directly influenced the outcome and the changed landscape design, as well as the support and legitimacy, as foreseen as fundamental by Ast (2013) and Edelenbos et al. (3013a, 2013b, and 2017). An issue discussed by Edelenbos et al. (2013n) and Warner et al. (2012) was raised in the 'Room for the Waal' river: since the dialogue has not started from the very beginning, in the problem assessment, conflicts have occurred in this phase. Later on, the decision-makers were strategic in involving the citizens and letting them bring to the table their expectations and desires, giving valuable inputs to the river programme as studied by Batista e Silva et al. (2013) and Leeuw and Simos (2017). Regarding the multi-level governance discussed, with the interactions and negotiations among government levels and agencies, in especial with the Municipality having the opportunity to integrate their local spatial plans for city development with the national water safety agenda, it is closely related to the research by Rijke et al. (2012) about the integrated river management in The Netherlands. Finally, the constituents of legitimacy found in this project support Buuren et al. (2012): participation, consideration for local specificities, focus on multi-functionality, and the sense of urgency, after the semi-disaster in earlier years.

5.2.3 Research Question C: Can a relationship be established between perceptions on the transformed urban landscape (A) and on the ex-post legitimacy of the programme outcome and process of decision-making (B)?

The main research finding on this study is that a relationship can be established between perceptions on the transformed urban landscape and on the programme legitimacy. Within the case study 'Room for the Waal' in Nijmegen / NL, interviews with citizens affected by the programme and experts involving in the decision-making have provided new, rich, and qualitative insights on those perceptions. The data analysis supported the expectations that a positive perception on the transformed landscape, now that it is completed and usable, would lead to a more positive perception on the outcome legitimacy – that the result is in their best interest – and perhaps even on the decision-making process legitimacy – a feeling that 'it was worth it'. Furthermore, the vice-versa also could be applicable: a good perception on legitimacy might increase the appreciation for the changed urban environment. Indeed, it can be concluded that a both-way relationship has occurred between the two variables, as indicated in the Conceptual Framework (see Figure 7).

Firstly, the positive perception that the process of decision-making was transparent, open and accessible (perceived throughput legitimacy), and that all stakeholders (including citizens) could participate in the design of the landscape (in the meetings, producing maps of the important and historical buildings important to their identity, discussing scenarios with the consultancy firms and designers) can be interpreted as an influence to the later feeling of 'owning' and 'being proud of' the project (landscape perception), discussed by respondents. Here, it is important to mention that this study analyses the ex-post perception, after the conclusion of the project. If it was conducted during the process, in especial in the first years where the decisions were still being outlined and citizens were feeling anxious, the result might have been different. Moreover, it should be highlighted that this influence on landscape perception by the programme process was present not only between citizens and decision-makers, but also among decision-makers themselves, as in different government levels: their interaction and negotiation process impacted the final landscape and its perception.

Secondly, the other way of the relationship (perception of the transformed landscape influencing the perception on the programme legitimacy) was even more present on the speeches of respondents. There are two moments in the project timeline where a good perception on the landscape has increased the project support and acceptance: (i) in the end of the design phase, when the final version was presented to all stakeholders (including a 3D technological representation that allowed the public to have a better comprehension on the design), and it was applauded – the 'Applause of Lent' -, starting a new phase, calmer and more optimistic; and (ii) after the conclusion of construction phase, when the landscape could be seen live, in real scale, and more important, experienced by all. Now that the programme was realized, both citizens and experts are happy, proud, and enthusiastic. Respondents directly affirmed that the 'marvellous' and 'beautiful' changed landscape, together with its range of recreational and nature possibilities, have improved the city's image and they see now that the programme was in their own interest, and that the result was worth the whole process. Some of them even claimed that if they could imagine the final result, they would not have fight the project before. Therefore, there is a clear relationship ('C' in the Conceptual Framework – Figure 7) between both perceptions: on the transformed urban landscape (regarding social-cultural values - 'A') and on the programme legitimacy (both on the outcome and on the decision-making process - 'B').

Making a connection with the theory review (Chapter 2), as affirmed before, although there is vast theory about landscape perception, social-cultural values, water governance, and legitimacy,

core concepts of this study, there is little empirical information regarding specifically citizens' perceptions in river restoration projects, and on the connection between the two academic fields. The multi-disciplinary approach of new water governance raises the flag of combining flood safety with ecology, urban planning, and spatial quality, as studied by Lawson et al. (2014), Blue Green Cities (2016a), Warner et al. (2012), Verkerk and Buuren (2012), and Ryan and Burton (2016). However, little is still known on the influence of stakeholders' perception on the landscape produced by water programmes (including the current trend to make more room to rivers), on their perception on legitimacy, and vice-versa. Suggestions for future research will be presented in the last section.

5.3 Discussion: scientific and practical implications

This research was a pathway to explore how citizens affected by a river restoration project, and the experts involved in the decision-making, perceive the transformed urban landscape and the programme legitimacy. Furthermore, the objective was to explain whether a relationship could be established between the two perceptions, which was positively confirmed as presented in the previous section. There are a few points regarding the research findings that may be further discussed. The first one is the regards the academic link between the two field: landscape perception and water governance. The conceptual framework (Figure 8) was constructed based on existing scientific knowledge on both areas, and the findings confirm that all sub-variables highlighted from theory - aesthetic and symbolic, place attachment, recreation, values of nature, accessibility, openness, transparency, acceptance by stakeholders and problem-solving capacity - had a rule in explaining the perceptions and the relationship between them. Moreover, those concepts are in practice interconnected and do not fit into closed boundaries. For example, the importance given by respondents to recreation is connected to their higher appreciation of the instrumental (or use) value of nature, which is also interrelated with the high place attachment with the river and its ecosystem services. The strong place attachment also relates to the will of citizens to participate in the decision-making, which was facilitated by the openness of the process, and the combination of these two has increased the stakeholders' acceptance on the programme. This is an academic implication, suggesting a proximity between the fields of water governance – legitimacy and landscape perception – social-cultural values.

Discussing the political or practical implication on this point, the 'Room for the Waal' could be a successful example for future programmes. Although some aspects could have been better developed, such as the transparency on the beginning of the process, in overview it has achieved its goals, and with a positive evaluation of the physical outcome (the changed landscape) and of its legitimacy, both by citizens and experts. This is very relevant for the political success of a river restoration project, and furthermore to the construction of an improved city's image, aligned with its society's values. As previously discussed, some strategic decisions on this case study could be considered in other river restoration projects: a multi-functional plan, that embraces more than technical measures for water safety, such as nature, spatial quality, and recreation; a participative process; and a fair financial compensation for families relocated. Two examples should be highlighted as relevant for practical implication.

Firstly, the wise decision of involving the citizens in the design of the landscape, listening to their concerns on cultural and historical aspects, developing multiple scenarios, and presenting a clear visualization of the result – as the 3D presentation that marked the beginning of programme support in the Applause of Lent here – can increase the support and the sense of opportunity, maybe even proud of the project. It is important to make a reservation here: this process should be careful and transparent. Creating a high technological 3D movie or impressive

images that does not correspond to the final result may lead to disappointment in the end: these representations should be true to what will be realized.

Secondly, the effort invested to be present throughout the planning and construction. In this case, many meetings were conducted which inhabitants could attend, listen, and be listened, excursions were made during the realization to explain and show progress. A lot of time and money was invested to create trust and bound between citizens and decision makers. Clearly, this depends on the resources, political will, and scale of project, but it proved to be worthwhile for Nijmegen. It would be interesting that the same evaluation conducted on this research was applied in more moments in time during a programme. Here, the perceptions were captured ex-post the realization. Probably the results would have been different if it was also conducted in the beginning of the project, when the first decisions were being made, and stakeholders were starting to be involved.

Finally, the findings on place attachment are relevant for both scientific and practical bridges between landscape perception and programme legitimacy. In the case of Nijmegen, the inhabitants affected have been living in the area for many years, even generations. They were used to a villager lifestyle, knowing all neighbours in the streets, living a quiet agricultural routine. It is comprehensive that their attachment to the place was already high before the programme. But it is interesting to see how the perceived connectedness has not changed for the majority of interviewees. It is now a different connection: the social bounding has been reduced among neighbours, with the urbanization and increase of housing in Lent, but at the same time has increased in the city level, between Lent and Nijmegen. Moreover, the connection with place itself (place dependence) also changed, diminishing in the village / farmer aspect, but increasing in the whole city, related to the proud they now have of the new city's image, also highlighted by the attention received by outsider, and to the attention of history and culture of the place, during the excavations and the participative planning (the excursions with inhabitants telling their stories, for instance). Their nature bounding is also interesting: their focus on the instrumental value can be related to their agricultural background. Although the landscape was transformed to a more urban environment, it was already used as farms and greenhouses. Perhaps the attachment to the new place would have been harder if it used to be a wild nature. The interesting in place attachment here is the positive perception in such a short period of time (the programme realization was concluded in April 2016, one year and three months before the interviews). People are usually attached to what they know, and they are used to experience. In this case, they have quickly developed a new type of attachment, a different one, but not weaker. A deeper understanding of the components of place attachment can accelerate the adaptation process on river restoration projects, increase its support, and provide elements to maintain (or even increase) how citizens fell connected with the place, nature, and society.

5.4 Suggestions for future work

This research has focused on the case study 'Room for the Waal', that was recently realized. Now that the rich qualitative insights were collected and analysed, it would be interesting to continue the research and apply a quantitative research on the same project, to investigate if the findings can be generalized to a broader population.

Moreover, this is one out of thirty-four projects inside the 'Room for the River' national programme. It would be interesting to do the same analysis for other projects and see if the findings are similar, especially because the level of landscape transformation highly varies among the projects, as the specific local context of the village urbanization in Nijmegen. Furthermore, it would be curious to investigate if the interactions among stakeholders have

occurred in the same manner, how they influenced the landscape design, and consequently, its perception.

Going even broader, similar research could be conducted in river restoration projects in other countries for comparison. For instance, case studies from developing countries could bring inspirational insights for São Paulo, my home town. The literature mainly mentions river restoration projects in developed countries in the US and Europe, but how is the Global South handling with water governance within the challenge context of climate change and fast urbanization? Are there lessons to be shared? Furthermore, what is required to inspire citizens and decision-makers in those countries, that face many other urban issues disputing for priority and resources, to be passionate about their rivers, and move from cities alongside rivers to rivers within the cities?

Figure 22: 3D image of the 'Room for the Waal' design. Source: Nijmegen Municipality –provided by E1-M.

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ANNEX I - Research Instruments

ERASMUS UNIVERSITY, ROTTERDAM, THE NETHERLANDS
INSTITUTE FOR HOUSING AND DEVELOPMENT STUDIES (IHS)
MSc. URBAN MANAGEMENT AND DEVELOPMENT – UMD 13
June / July 2017

1) INTERVIEW GUIDE FOR EXPERTS | DECISION-MAKERS
RESEARCH TOPIC: The Dutch case "Room for the River"

My name is Laura Aniche. I am a Brazilian Master student in the Institute for Housing and Development Studies at Erasmus University, in Rotterdam. The aim of this research is to investigate how Nijmegen citizens perceive the changed urban landscape as a result of the "Room for the Waal", as well as the programme outcome and process of decision-making. I am interviewing you because of your experience in this project and as an expert in this field. This interview is intended to help gather information and data for academic purposes, and it should take around half an hour. If you give me permission, I would like to record our conversation to facilitate my analysis later. Please be assured that all information you provide will be confidential.

Part 1: Introduction
Q1. How long have you been working in this field (e.g. urban planning)?
Q2. Can you tell me what was your involvement in the "Room for the River" programme?

Part 2: Programme process
Going back to the beginning of the programme, around 2006…
Q3. Do you remember how it has started? Could you tell me a little bit about that time?
Q4. Who were the stakeholders, and what was their position/opinion?
Q5. How did that go?
Q6. Can you describe me how was the communication to the community about the programme, along the process?
Q7. How would you describe the citizens participation in the decision-making process? Can you tell me a little bit about the content and level of their participation?
Q8. How do you think they perceived the decision making process, back then?
Q9. Was there a lot of oppositions? In which character / for what reasons?
Q10. Do you remember any citizen that was particularly protesting against the programme?

Part 3: Landscape
About the new landscape around the River, after the 'Room for the Waal' was finished last year …
Q11. What were, in your perception, the main goals for the new landscape, in terms of aesthetic and cultural aspects?
Q12. Can you tell me how the decision-makers imagined the use of this space, back in the project design time? For instance, was it always the plan to have a park, and new housing development…?
Q13. How would you describe this landscape now?
Now talking a little bit about nature...
Q14. *I understand that creating safety from flooding and improving spatial quality were the main objectives of the programme*. But can you tell me if nature preservation was also a project premise, and in which aspects it was discussed?
Q15. Was also an objective to boost the urban development in Nijmegen? And the city image?

Part 4: Programme Outcome
Now that the programme was concluded…
Q16. How would you describe the final result of the process?
Q17. How do you think it is perceived by the citizens now?
Q18. How do you see the difference between how the citizens saw the programme in the beginning and you they see it now?

Part 5: Conclusion
To conclude our interview…
Q19. How do you look back at the entire process?
Q20. And how do you imagine the future urban development of this neighborhood?

Ok, that is all I wanted to ask you at this moment. Would you like to add something else?
Is there someone else that you would recommend me to talk to?
Is it ok if I get in touch latter, if I need any further clarification about what we discussed today?
As I explained to you in the beginning, this information will only be used for academic purposes, and it will be treated with confidentiality.
Thank you for your time and attention.

ERASMUS UNIVERSITY, ROTTERDAM, THE NETHERLANDS
INSTITUTE FOR HOUSING AND DEVELOPMENT STUDIES (IHS)
MSc. URBAN MANAGEMENT AND DEVELOPMENT – UMD 13
June / July 2017

2) <u>INTERVIEW GUIDE FOR CITIZENS</u>
RESEARCH TOPIC: The Dutch case "Room for the River"

My name is Laura Aniche. I am a Brazilian Master student in the Institute for Housing and Development Studies at Erasmus University, in Rotterdam. The aim of this research is to investigate how Nijmegen citizens perceive the changed urban landscape as a result of the "Room for the Waal", as well as the programme outcome and process of decision-making. I am interviewing you because you live in the programme area and therefore were affected by it. This interview is intended to help gather information and data for academic purposes, and it should take around half an hour. If you give me permission, I would like to record our conversation to facilitate my analysis later. Please be assured that all information you provide will be confidential.

Part 1: Introduction
Q1. How long have you been living in Nijmegen, and specifically in this area?
Q2. What is your relationship with the area affected by the programme?

Part 2: Programme process
Going back to the beginning of the programme, around 2006…
Q3. Could you tell me a little bit about how it has started? What did you think of the plans back then?
Q4. Who was involved, why and what was their opinion/ stance?
Q5. Were you involved in the process? In what ways?
Q6. What is your opinion regarding the way the managers made the decisions?
Q7. What do you think about how the process was transmitted to the community along the process? Was it clear from the beginning, did they give frequent updates…?
Q8. How would you describe the citizens participation in the decision-making process?

Part 3: Landscape
About the new landscape around the River, after the 'Room for the Waal' was finished last year …
Q9. How would you describe this new landscape? And what were the main changes with the programme?
Q10. Can you tell me how do you and other citizens use this area?
Q11. How would you describe your connectedness with this place? Has that changed? How?
Q12. And with the city in general?
Q13. Do you perceive any change in how you feel now and how you used to feel before the project? In which ways?
Q14. What is the image that you have about Nijmegen now?
Now talking a little bit about nature...
Q15. Why do you think the riverine area is important, in your personal opinion?

Part 4: Programme Outcome
Now that the programme was concluded, and you feel… (e.g. "happy", or "satisfied" – according to the previous answers) about the transformation of the landscape…
Q16. How would you describe the final result of the process?
Q17. Is it relevant for your own interest, and your community?
Q18. Do you think you have participated as much as you wanted? Considering both your intention and the opportunity that was given…

Part 5: Conclusion
To conclude our interview…
Q19. How do you look back at the entire process? Which are the most positive and negative aspects?
Q20. *(If differences were mentioned before the "now" and "before" perceptions on the legitimacy)*: What have made you change your mind?
Q21. And how do you imagine the future of urban development in this area?

Ok, that is all I wanted to ask you at this moment. Would you like to add something else?
Is there someone else that you would recommend me to talk to?
Is it ok if I get in touch latter, if I need any further clarification about what we discussed today?
As I explained to you in the beginning, this information will only be used for academic purposes, and it will be treated with confidentiality. Thank you for your time and attention.

ANNEX II - List of Respondents

LIST OF RESPONDENTS

Code	Quota	Respondent's description	Source	Interview duration
C1	Citizen	Living in the area for more than 210 years. One of the 50 houses demolished due to the programme. Now living just across the secondary channel.	Secondary data and snowball	32 min
C2	Citizen	Living in the area for more than 30 years. One of the 50 houses demolished due to the programme. Still living on the island.	Secondary data	28 min
C3	Citizen	Living in the area for more than 30 years. One of the 50 houses demolished due to the programme. Still living on the island.	Secondary data	33 min
C4	Citizen	Living and owning a business in the area for more than 20 years, in the village, just across the secondary channel.	Snowball	23 min (with C11)
C5	Citizen	Living in the area for more than 20 years. Part of a resident association in the village.	Secondary data	40 min
C6	Citizen	Living in the area for more than 20 years. Part of a resident association in the village.	Secondary data	48 min
C7	Citizen	Living in the area for more than 30 years. Living in the village, just across the secondary channel.	Secondary data	105 min
C8	Citizen	Living in the area for more than 30 years. Living in the village, just across the secondary channel.	Snowball	32 min (with C12)
C9	Citizen	Living in the area for more than 40 years.	Snowball	38 min
C10	Citizen	Living and having a business in the island for more than 20 years.	Snowball	52 min (with C13)
C11	Citizen	Living and owning a business in the area for more than 30 years, in the village, just across the secondary channel.	Snowball	23 min (with C4)
C12	Citizen	Living in the area for more than 30 years. Living in the village, just across the secondary channel	Snowball	32 min (with C8)
C13	Citizen	Living in the area for more than 50 years, in the island.	Snowball	52 min (with C13)
E1-M	Expert	Local government (Nijmegen Municipality)	Institutional website and snowball	28 min
E2-R	Expert	Regional government (Province of Gelderland)	Institutional website	30 min
E3-D	Expert	Design: river ecology and spatial planning and nature development expert	Institutional website and snowball	43 min
E4-D	Expert	Consultant: stakeholder manager and communication responsible during the planning phase	Institutional website and snowball	40 min
E5-D	Expert	Design: landscape architect	Institutional website and snowball	48 min
E6-R	Expert	Regional government (Province of Gelderland)	Institutional website	44 min (with E11-R)
E7-M	Expert	Local government (Nijmegen Municipality)	Secondary data	32 min
E8-A	Expert	Academia: water governance expert	Snowball	24 min
E9-N	Expert	National government (Rijkwaterstaat)	Snowball	34 min
E10-N	Expert	National government (Rijkwaterstaat)	Snowball	30 min
E11-R	Expert	Regional government (Province of Gelderland)	Snowball	44 min (with E6-R)