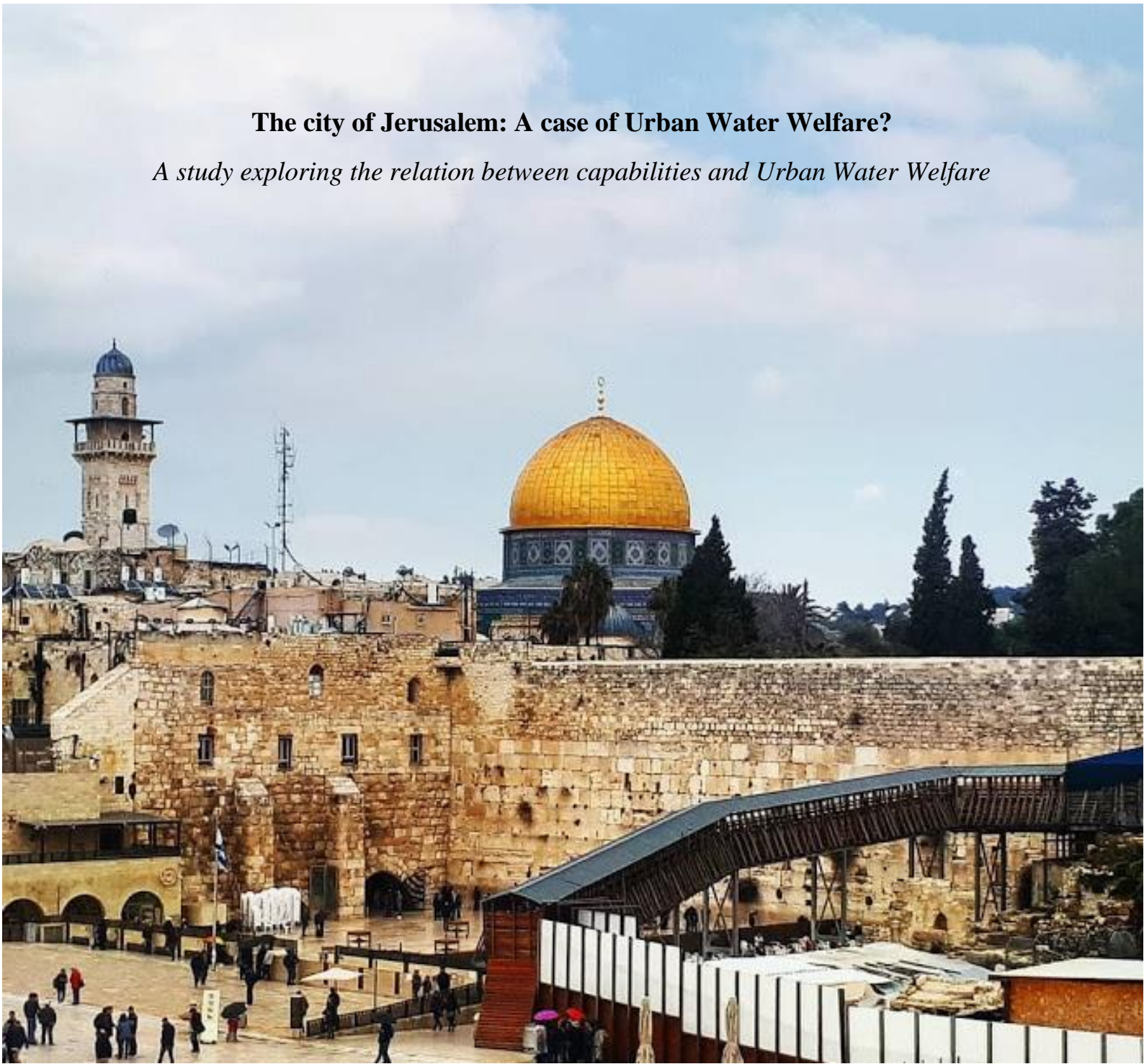


The city of Jerusalem: A case of Urban Water Welfare?

A study exploring the relation between capabilities and Urban Water Welfare



The Temple Mount in Jerusalem with the Western Wall and the Dome of the Rock (Own image).

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Abstract

Two billion people are expected to experience water shortages by 2025, partially caused by the worldwide urbanisation trend (Koop & Van Leeuwen, 2017). This raises the question how urban water can be managed safely, sustainably and equitably (UN, 2015). Integrative approaches are needed to address this question (Gerlak et al., 2018). Urban Water Security (UWS) is such a holistic approach. However, UWS is incomplete as it neglects local context, which is important for the adoption potential of governance strategies aimed at improving UWS (Jepson et al., 2017). To overcome this caveat, this study introduces the concept Urban Water Welfare (UWW) that complements UWS with the Capabilities Approach (CA), an approach for assessing social and political context (Staddon, Rogers, Warriner, Ward, & Powell, 2018). This study aims to develop an assessment approach for UWW and to provide recommendations on assessing and improving UWW by applying the assessment approach in a case study of municipality Jerusalem. This translates into the research question: *To what extent is Jerusalem a city with water welfare and what factors account for it?*

To answer this question, first, UWW is conceptualised by reviewing literature on UWS and the CA. Second, UWW is operationalised through quantitative indicators in the Urban Water Welfare Dashboard (UWWD), and through theoretical propositions on the speculative relation between capabilities and UWW. Third, the UWWD was applied in Jerusalem through desk research, while the propositions were assessed through a Q-study (N = 10) with interviews (N = 11).

Results of the UWWD show that Jerusalem's UWW is above the acceptable threshold, scoring 3.36 out of 5. A great strength is the water sector's technological advancement regarding water infrastructure and alternative water sources. Meanwhile, the state of traditional water sources reflects a great weakness. Testing the propositions identified three perspectives on influential capabilities for Jerusalem's UWW: Environmentalists, the Establishment, and Egalitarians. Across perspectives, the capability *Significant relations with others*, reflecting power dynamics, appeared most important in determining people's water access and participation. Other factors affecting UWW are the neighbourhoods people live in and the policy of the Jerusalem Master Plan.

The study's main theoretical implication is that it addresses UWS' pitfall of neglecting local context by complementing it with the CA in the concept UWW. Practical recommendations for improving Jerusalem's UWW are to make water issues more tangible through education and collaborations; more sustainable and integrated urban planning; and improving political representation of marginalised groups.

Preface

In front of you lies my quite literal Master work. Exactly one year ago I left for Jerusalem to do three weeks of field work for a different project on Jerusalem's governance around water conservation. This project left me unfulfilled as I could not seem to grasp the complex political and social dynamics in the city. With this in the back of my mind, I dove into the urban water management literature. This brought me to this study that proposes the Urban Water Welfare Assessment Approach; a holistic approach to measure a city's water welfare, with a specific focus on mapping the social and political dynamics at play in the urban water sector. And while not under the impression that this work is perfect, I leave it with a feeling of completion. A feeling of distanced understanding of Jerusalem's water sector and the human relations that influence the state of the water sector.

I wish to acknowledge several individuals that contributed to the creation of this report. First of all, my supervisor Carel Dieperink, who provided me with critical and constructive feedback. Second, all the respondents who received me openly and shared their interesting insights with me. I have tried my best to provide an accurate and objective representation of their views. Third, I would like to thank Jonne Vink for proofreading my work and Nina van Tilburg for coding an interview to test inter-rater reliability.

This is all I want to say for now, as the committed readers will have plenty to read.

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1 Introduction

1.1 The importance of urban water management

Freshwater is paramount to the existence of humans and much other life on this planet. This makes that it is of immense importance that water resources remain in a sustainable state. Subsequently, safe water management has been included into the United Nation's (UN) Sustainable Development Goals (SDGs) as SDG 6. Formulated in its simplest form this goal aims to "ensure access to safe water sources and sanitation for all" (UN, 2015). SDG 6 is based on the goal on improved drinking water and sanitation circumstances formulated in the SDGs' predecessor the Millennium Development Goals (MDGs). However, additional targets were included in SDG 6 on "improving water quality, reducing water pollution, increasing water-use efficiency, better water management, protecting ecosystems, strengthening international cooperation, and involving local communities" (Hoekstra, Chapagain, & Van Oel, 2017, p. 439).

Where the MDGs primarily focused on establishing access to safe water sources for drinking and sanitation in developing regions, SDG 6 aims to ensure (continued) water access that is sustainable, equitable and safe for people in all countries (Hoekstra et al., 2017). This broader focus is important because it is estimated that approximately two billion people worldwide will experience absolute water shortages by 2025 (Koop & Van Leeuwen, 2017). One of the causes of the current and anticipated water shortages worldwide is urbanisation. The increased concentration of people in cities complicates sustainable water service availability, an effect that is further enhanced by climatic shifts, population growth and the ecological crisis, but most importantly, by mismanagement and insufficient governance (Dos Santos et al., 2017; Woodhouse & Muller, 2017). This raises the question how cities specifically ensure (continued) safe, sustainable and equitable access to water-related services and work towards achieving SDG 6.

1.2 Measuring safety of urban water access: Urban Water Security

To look at how cities ensure safe, sustainable and equitable access to water services requires a definition of what access in urban areas entails. Gerlak et al. (2018) identify that, when measuring water access, the focus has been on quantitative operationalisations of water quantity and quality, given the relative simplicity of measuring in that way. However, these metrics overemphasise technical aspects, while overlooking other factors that influence safe water access, such as the institutional framework. Moreover, they do not capture whether access is equitable or sustainable. Therefore, a more holistic approach on secure urban water access is required (Gerlak et al., 2018); an idea that is in line with the current reigning paradigms of water management that focus on integrated, adaptive and systems approaches (Hoekstra, Buurman, & Van Ginkel, 2018).

As SDG 6 sets goals for safe water access, it is a logical step to search for a goal-oriented holistic approach to assess cities' water access. A comprehensive and popular concept that captures such an approach is Urban Water Security (UWS). According to Hoekstra et al. (2018, p. 12) UWS as a holistic

concept includes “the fulfilment of all different ‘water system services’, considers overall welfare as well as social equity and environmental sustainability, and addresses both risks and uncertainties. Risks include hazards, exposure and vulnerability, the latter including aspects of coping capability and resilience”. As SDG 6 aims to ensure sustainable, equitable and safe access, all aspects are incorporated in this concept through environmental sustainability, social equity and welfare, and protection from risks and uncertainties respectively. Therefore, using the UWS definition as such would enhance our understanding of cities’ water access. However, in practice, scholars use only certain elements of this definition leading to a scattered understanding of the concept (Bolognesi, Gerlak, & Giuliani, 2018; Gerlak et al., 2018; Hoekstra et al., 2018). The latter limits comparison and hampers the accumulation of knowledge of the concept when this diversity is not mentioned.

The scattered field of UWS has made Hoekstra et al. (2018) highlight the relevance of taking an integrative approach to UWS that incorporates the different emphases. Subsequently, the authors suggest a systems approach to UWS as a valuable way to conceptualise and operationalise the concept (Hoekstra et al., 2018). In response, the Urban Water Security Dashboard (UWSD) was recently developed as a first attempt to provide a systems approach to assess UWS (Van Ginkel, Hoekstra, Buurman, & Hogeboom, 2018).

Next to this, when solutions are proposed to address weaknesses based on UWS assessments, scholars have highlighted the importance of governance arrangements that fit the local context, which determines the successfulness of their adoption (Bakker & Morinville, 2013; Gerlak et al., 2018; Hoekstra et al., 2018; Loftus, 2015). Strategies that carry high technological potential to improve a city’s water security are not necessarily successful, because they might not fit the social context. This means that UWS also needs to be valued in local political, social and cultural dimensions, so that suitable strategies can be found, and improvement can take place (Bakker & Morinville, 2013). However, scholars have pointed out that UWS leaves insufficient room for consideration of the hydro-social cycle, which refers to the co-production of water and society (Jepson et al., 2017). Therefore, it is found that there is a knowledge gap on how to structurally incorporate a relational component in UWS that captures the political, social and cultural dynamics behind the securing of the water system services people require (Staddon, Rogers, Warriner, Ward, & Powell, 2018), even within holistic approaches such as the UWSD. This study addresses this knowledge gap by creating the concept Urban Water Welfare (UWW) that addresses this pitfall of UWS.

1.3 Urban Water Welfare: Addressing UWS’ pitfalls with the Capabilities Approach

To analyse the social, political and cultural dimensions of UWS, the Capabilities Approach (CA) has been identified as a useful lens (Dapaah & Harris, 2017; Jepson et al., 2017; Staddon et al., 2018). Through the CA, basic human capabilities can be identified that, in turn, influence the ease that people can obtain so-called freedoms (Nussbaum, 2003). Thus, variances in acquisition of capabilities

throughout a city can explain differences in whether people can secure their access to certain water services (Goldin, 2013).

What capabilities are relevant can differ across contexts and over time. To illustrate, ‘control over one’s environment’ is considered a human capability relating to the ability to participate in political choices (Nussbaum, 2003). Subsequently, when people are unable to participate in these choices, governance arrangements for UWS might not fit with their needs and wishes (Staddon et al., 2018). In turn, this might hamper the successfulness of implementation of such arrangements. Although scholars have used the CA to assess aspects of UWS (Dapaah & Harris, 2017; Staddon et al., 2018), no effort has been taken to connect capabilities to the broader picture of UWS. For that reason, in this study, the knowledge gap on UWS is specifically addressed by complementing it with the CA in the concept UWW.

1.4 Knowledge gap and problem definition

Both a theoretical and empirical knowledge gap can be identified on how to complement UWS with the CA as to overcome its limitation of neglecting local political and social dynamics. A general and theoretical understanding of the possible relations between capabilities and UWS, in other words UWW, is relevant, because it benefits the adoption potential of strategies aimed to improve UWW as these strategies can then be tailored to fit local hydro-social cycles. Moreover, studying UWW directly addresses the academically identified pitfall of UWS of neglecting political and social dimensions and builds on the UWS literature, thereby cumulatively contributing to the academic literature.

This study attends to the theoretical gap by conceptualising UWW and operationalising it into the Urban Water Welfare Assessment Approach (UWWAA). The first part of UWWAA is the operationalisation of UWW in the Urban Water Welfare Dashboard (UWWD). The second part is the development of theoretical propositions on the potential relations between UWS and capabilities. Meanwhile, the empirical knowledge gap is addressed through a case study that applies the UWWAA in Jerusalem.

For the case study, Jerusalem is chosen as it is a critical case study for all aspects of UWW. On the one hand, because of its arid climate and relative water scarcity Jerusalem is an interesting city to study through an UWS lens. Furthermore, Jerusalem is located in the twelfth most urbanised country in the world with an urbanisation process that is still ongoing (World Bank, 2018a; World Bank, 2018b), putting ever more pressure on the city’s resources. Additionally, a strongly under-highlighted region for place-based research on UWS, despite its dry climate, is the Middle East (Gerlak et al., 2018). This is also the case in the application of the UWSD, whereas only Dubai as a Middle Eastern city has been assessed (Van Ginkel et al., 2018). So far, the focus has been primarily on cities in Asia and Sub-Saharan Africa as a result of their visible water issues due to the arid climate in those regions and the countries’ underdeveloped status. On the other hand, Jerusalem is chosen because of its political dynamics and cultural diversity, which are expected to result in a high degree of differences between people’s

capabilities. For instance, it is imaginable that there is a difference in ‘control over one’s environment’ (Nussbaum, 2003) between Israelis and Palestinians in Jerusalem given their different social and political status. Consequently, this is expected to provide diverse insights into the relation between capabilities and UWS.

1.5 The rationale behind the term Urban Water Welfare

The term Urban Water Welfare is chosen for several reasons. First, because the term Urban Water *Security* alludes that the concept solely involves safety. However, following the definition of UWS, an integrative concept includes all ecosystem services. With that, it can be said that it also ought to include different types of services, such as cultural services from water. While these type of services might pose no imminent threat to safety and focus more on welfare, they might contribute to a safer environment in the long haul by, for instance, increasing welfare through health benefits. Thus, UWW is more about securing or safeguarding the hydro-social cycle and access to all relevant urban water system services, also the ones that, at first glance, solely enhance a city’s liveability. UWW removes the underlying connotation of safety from water system services without downplaying the importance of security, which is an essential component of the concept.

Second, the inclusion of capabilities in UWW shifts the focus further to a more relational approach compared to UWS. This is important as attempts to improve UWW, including technical aspects, depend on whether solutions fit the local context and suit the people that adopt the strategies. This makes UWW inherently relational. Thus, it departs from the measurement of UWS, which assesses whether a basic universal threshold value regarding physical security is met. However, it extends beyond this to include local perceptions of what is valued in terms of water-related services and capabilities. This relational component makes UWW go beyond security considerations to also incorporate more welfare-related considerations.

1.6 Research objective and questions

The objective of this study is twofold. The first aim is to develop an assessment approach of UWW by complementing UWS with the CA to address its shortcomings. This is done by developing the UWWAA, comprised of the assessment framework UWWD and theoretical propositions on the potential relations between capabilities and UWW. The second objective is to make recommendations on assessing UWW and improving Jerusalem’s UWW by applying the UWWAA in a case study of Jerusalem. The research objective translates into the following research question:

To what extent is Jerusalem a city with water welfare and what factors account for it?

Multiple steps are required to meet the research objective and answer the research question. These steps are visualised in the research framework in Figure 1.

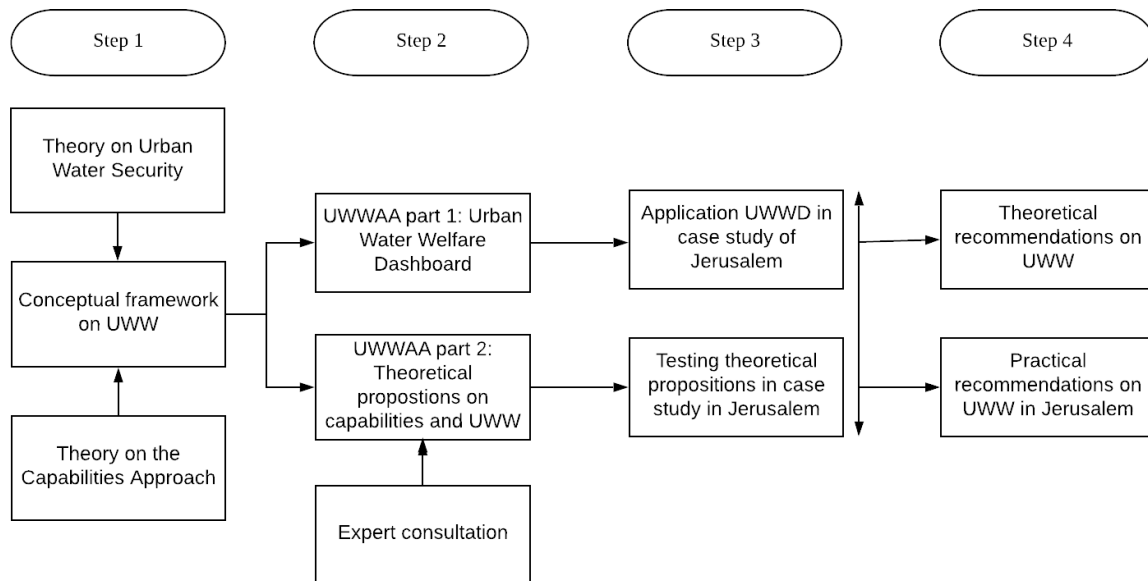


Figure 1. Research framework.

Figure 1 shows that the research consists out of four steps. First, theory is reviewed on UWS and the CA, after which the concepts are integrated into a conceptual framework on UWW. Second, the conceptual framework feeds into the creation of the two parts of UWWAA: the UWWD and theoretical propositions on UWW. The latter are pre-tested through expert consultation. Third, in a case study Jerusalem's UWW is assessed by applying the UWWD and testing the theoretical propositions. Lastly, theoretical recommendations are provided on assessing UWW as well as practical recommendations on improving Jerusalem's UWW. The steps of the research framework can be translated into the following sub-questions:

1. What are limitations of the UWSD for assessing UWW?
2. What capabilities are potentially relevant for UWW?
3. How can the UWSD be altered into the Urban Water Welfare Dashboard to assess UWW?
4. What are potential relations between capabilities and UWW?
5. What are strengths and weaknesses of Jerusalem's water welfare?
6. To what extent do capabilities and other factors influence Jerusalem's water welfare?
7. What suggestions do actors in Jerusalem make for strategies addressing differences in capabilities that influence Jerusalem's water welfare?

1.7 Report outline

To answer the study's research questions, the structure of this report consists out of three parts: the conceptualisation, operationalisation and application of UWW. First, in the second chapter UWW is conceptualised by providing theoretical foundation on the concepts underlying UWW, thereby

addressing sub-questions 1 and 2. Next, chapters 3 and 4 represent the second part of the study on operationalising UWW into the UWWAA. The third chapter operationalises the first part of the UWWAA, namely the UWWD, thereby answering sub-question 3. In addition, the fourth chapter operationalises the theoretical propositions as the second aspect of the UWWAA, which provides an answer to sub-question 4. Furthermore, the third part of this study is the application of the UWWAA in Jerusalem. The fifth chapter elaborates on the research methodology used for this case study. The sixth chapter presents the separate results of the application of the UWWAA in Jerusalem, consequently attending to sub-questions 5, 6 and 7. The seventh chapter confronts the results of the two parts of the UWWAA. Moreover, this chapter discusses limitations of the study as well as avenues for future research. Lastly, the eighth chapter provides a brief answer to all sub-questions, ultimately debouching into an answer to the research question. In this concluding chapter theoretical and practical recommendations are also provided, thereby meeting the research objective.

Part 1

Conceptualising Urban Water Welfare

2 Theoretical foundation

2.1 Introduction

This chapter discusses the theoretical foundation required to arrive at a conceptual framework of UWW. First, a brief overview is provided of the literature on UWS and the UWSD as a holistic measure of the concept. Subsequently, the UWSD's conceptualisation of UWS is reflected on and, building on this, what the UWSD's gaps are for assessing UWW. This debouches into an answer to the first sub-question *What are limitations of the UWSD for assessing UWW?* Second, the theory on CA is shortly explored in general as well as in relation to water-related issues. Ultimately, this results in an answer to the second sub-question *What capabilities are potentially relevant for UWW?*

2.2 The first component of UWW: Urban Water Security

Over the years, Water Security has become an established concept in water management literature and has been applied countless times (Cook & Bakker, 2012; Hoekstra et al., 2018). Generally, the concept refers to ideas around securing the benefits from water ecosystems (Bolognesi et al., 2018). However, scholars often conceptualise what secure entails in varying ways. The most often used interpretations are water security in terms of economic welfare, environmental sustainability, social equity, or risk (Hoekstra et al., 2018). In the case of Water Security of cities, or UWS, a majority of studies appears to have a focus on human uses of water (Gerlak et al., 2018), thereby neglecting the environmental uses of water and the state of the ecosystems. Moreover, it is despite the focus on water services for human uses, that the UWS conceptualisations is said to still lack inclusion of the relational component of water. This means that the way UWS is assessed misses context-dependency (Jepson et al., 2017). Consequently, scholars have recently highlighted the importance of approaching UWS through a holistic and integrative lens, so that the interconnectedness of the hydro-social system is not neglected, and trade-offs can be mapped (Hoekstra et al., 2018; Zeitoun et al., 2016).

2.2.1 Integrative approaches to UWS

Romero-Lankao and Gnatz (2016) were one of the firsts to suggest a way to bridge UWS' conceptualisation gap by creating a framework with indicators derived using the SETEG-dimensions: Socio-demographic, Economic, Technological, Ecological and Governance. However, the authors only provide examples rather than an actual framework, arguing that the type of indicators is determined by scholars' choice of theoretical approach, which is dependent on factors such as people's disciplinary perspective, definition and scope. However, it is exactly this deviation that has led to the current scattered research area and what has to be addressed through an integrative approach.

More recently, after an in-depth review of UWS research, Hoekstra et al. (2018, p. 12) suggested that an integrative approach to UWS addresses "the fulfilment of all different 'water system services', considers overall welfare as well as social equity and environmental sustainability, and addresses both risks and uncertainties. Risks include hazards, exposure and vulnerability, the latter including aspects of

coping capability and resilience.” This definition integrates the different emphases used in the literature, which means that it can be considered one of the more holistic conceptualisations of UWS. Conceptualisations of UWS that incorporate only one or a few of the components can be perceived as more narrow conceptualisations of UWS. Therefore, in this study, this definition is used as a frame of reference when assessing conceptualisations of UWS.

In response to the critical in-depth review by Hoekstra et al. (2018), a first attempt at truly conceptualising UWS using an integrative approach is the Urban Water Security Dashboard (UWSD) (Van Ginkel et al., 2018). The UWSD structures its conceptualisation of UWS using a Pressure-State-Impact-Response (PSIR) model; an often-applied model in systems analysis (Van Ginkel et al., 2018). This PSIR model as a systems approach is what is supposed to make the UWSD a holistic measure of UWS (Van Ginkel et al., 2018). Figure 2 shows a schematic representation of the conceptual framework underlying the UWSD.

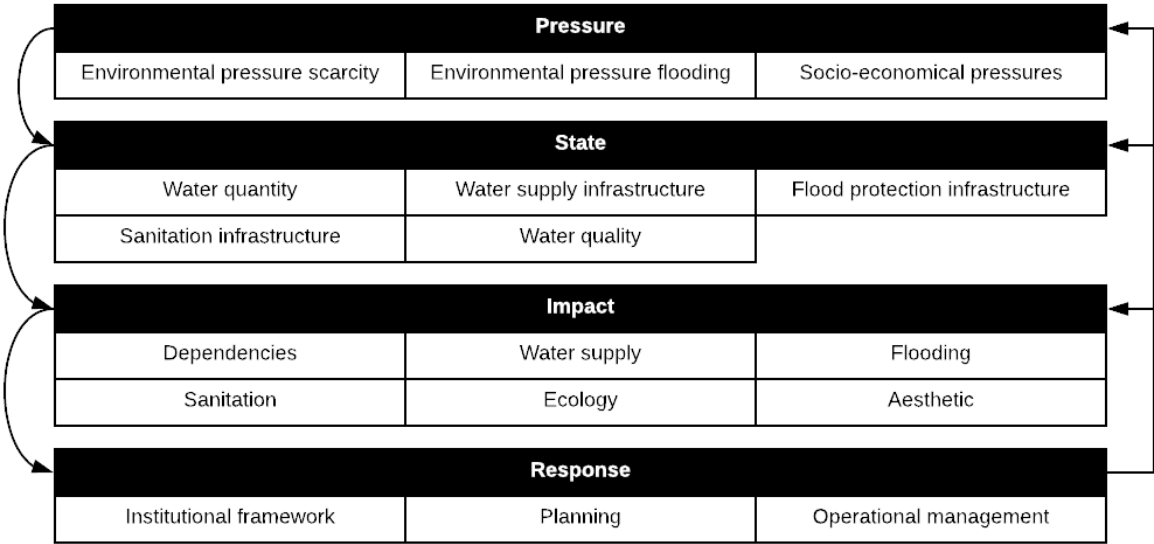


Figure 2. Conceptual model of the UWSD. Adapted from “Urban Water Security Dashboard: Systems Approach to Characterizing the Water Security of Cities” by K. C. H. Van Ginkel, A. Y. Hoekstra, J. Burman, & R. J. Hogeboom, 2018, *Journal of water resources planning and management*, 144(12), p. 4. Copyright 2018 by ‘ASCE’.

Figure 2 shows that the UWSD follows the PSIR approach and that there is directional interaction between dimensions. It starts with the Pressure dimension existing out of environmental and socio-economic pressures on the urban system. Next, the Pressure dimension puts pressures on the State dimension, which refers to the current ecological and technical state of the different water system services. Meanwhile, the Impact dimension covers the effect that the state of the water system services has on ecology and people. Finally, the Response dimension relates to the governance in the water sector, specifically the institutional framework and the required planning and operational management.

Changes in the Response dimension can address issues in any other dimension, thereby explaining the arrows feeding back into all dimensions (Van Ginkel et al., 2018).

2.2.2 Limitations of the UWSD for assessing UWW

As a holistic approach, the conceptual model of the UWSD is used as the point of departure for the conceptualisation of UWW. However, given that the UWSD is a conceptualisation of UWS, it is expected that, in its current form, the UWSD is incomplete to assess UWW. For that reason, it is important to identify the UWSD's limitations to assess UWW; a process that is twofold. On the one hand, this means assessing whether the UWSD's conceptualisation is complete and, on the other, whether it is consistent.

2.2.2.1 UWSD limitation 1: Missing capabilities

The identified pitfall of UWS of neglecting to sufficiently incorporate political and social dimensions also seems to be reflected in the UWSD. In Figure 2 it becomes visible that the UWSD measures socio-economic pressures, but dismisses other contextual factors, such as the socio-demographic and political aspects that might feed into UWS (Cook & Bakker, 2012). Complementing UWS with the CA is seen as a way to overcome this missing element of UWS (Jepson et al., 2017), which means that it is necessary to find the place where capabilities fit into the UWSD.

To find an explanation for the lack of contextual considerations and to find a place for capabilities to address this incompleteness, the UWSD's PSIR approach is found to provide some answers. The PSIR approach is a derivative of the Driver-Pressure-State-Impact-Response (DPSIR) framework, where the Driver dimension captures larger trends underlying any system in society, such as population and economic growth (Gari, Newton, & Icely, 2015). Subsequently, the removal of the Driver dimension in the UWSD can be identified as the cause for lacking incorporation of social context. This could be a deliberate choice for scholars, given that it is said that governance responses are more likely to influence Pressures resulting from Drivers than addressing the actual underlying Driver (Kelble et al., 2013). However, the social dynamics and context are perceived as crucial in terms of UWW, given that people's capabilities are determined by this context. Moreover, even if they might be hard to influence, these contextual factors still interact with and exert influence on the water system (Gari et al., 2015). Therefore, capabilities are perceived to be located in the Driver dimension. Consequently, the conceptual model of UWW at the end of this chapter will reintroduce this dimension.

2.2.2.2 UWSD limitation 2: Missing water system services

The previous section established that the UWSD lacks incorporation of the CA, making it incomplete for assessing UWW. This is logical as UWSD is aimed at assessing UWS. However, this also raises the question to what extent the UWSD is internally valid for assessing UWS as it is defined in this study. The first important component of UWS' definition is the 'fulfilment of all different water system

services'. Therefore, when assessing UWS, it is important to determine what types of services are related to water in order to assess whether these are represented in the UWSD.

A categorisation of water system services, which are essentially “the benefits people obtain from aquatic ecosystems” (MEA, 2005, p. 5), can be found in the often-used typology of the Millennium Ecosystem Assessment (MEA, 2005). First, *provisioning services* are those that provide goods, such as freshwater for drinking. Second, *regulating services* incorporate benefits derived from regulation of ecosystems, for instance, water purification and natural hazard regulation. Third, *cultural services* refer to non-material benefits, such as aesthetics, amenity and educational and spiritual values (Cooper, Crase, & Maybery, 2017; MEA, 2005). Through this categorisation, scholars identify the following common urban water-related services: water supply and sanitation (provisioning); sewerage and urban drainage (regulating); flood protection (regulating); climate and atmospheric regulation (regulating); amenity and aesthetics (cultural); science and education (cultural); and spiritual values (cultural) (Bolund & Hunhammar, 1999; Cooper et al., 2017; Fisher, Turner, & Morling, 2009).¹ Table 1 shows these water system services and whether they are present in the UWSD following Figure 2.

Table 1

Overview of water system services based on MEA (2005) and their presence in the UWSD.

Service type	Water system service	Represented in UWSD
Provisioning	Freshwater supply: Drinking and sanitation	Yes
Regulating	Sewerage and urban drainage	Yes
Regulating	Flood protection	Yes
Regulating	Climate and atmospheric regulation	No
Cultural	Amenity and aesthetic values	Partially in the Impact dimension
Cultural	Spiritual values	No
Cultural	Science and education	No

From Table 1 it becomes clear that the UWSD does not represent all water system services. This can be explained by the fact that the UWSD defines the boundaries of UWS to be water issues that focus around ‘too much, too little and too dirty’ (Van Ginkel et al., 2018). This focus excludes more cultural services of water. Consequently, the conceptualisation of UWW aims to incorporate all of the services presented in Table 1.

¹ Additionally, *Supporting services* underlie all other types of services as they represent the flows within ecosystems. These services are not used directly by people (MEA, 2005). Therefore, they are not part of the explicitly mentioned services, but they are implicitly conceptualised in the Pressure and State dimensions as they are integral to the other services.

2.2.2.3 UWS limitation 3: Inconsistently conceptualising water system services

Next to the ‘fulfilment of all different water system services’, the second component of the UWS-definition is that these services should be perceived through four angles: economic welfare, social equity, environmental sustainability and risks and uncertainties (Hoekstra et al., 2018). It is found that these angles are looked at inconsistently in the UWS for the different water system services.

To illustrate, Figure 2 shows that *Ecology* is attributed to the Impact dimension, as the State of *Water quality* can have effects on *Ecology*. However, it can also be argued that *Environmental pressures* can affect the state of the *Ecology*, which in turn might impact *Aesthetic*. This example clarifies that the water system services that are addressed, are so inconsistently. Moreover, it is unclear in what dimension issues regarding economic welfare or social equity are included, given that both the State and Impact dimensions discuss the emphasis on environmental sustainability, wherefor it is unclear whether this causes the other emphases to be overlooked. Next to this, the Pressure dimension, primarily reflecting the UWS emphasis of risks and uncertainties, solely addresses *Scarcity* and *Flooding* and not the pressures for, for instance, *Water quality* or *Ecology*. This signals an inconsistent analysis of the different water system services from the different perspectives.

To ensure an integrative approach, it is desirable to make a clearer distinction when assessing UWW, which is done in two ways. First, to ensure clearer boundaries between dimensions, the conceptualisation of UWW uses a different derivative of the DPSIR framework, namely the Driver-Pressure-State-Welfare-Response (DPSWR) framework (O’Higgins, Farmer, Daskalov, Knudsen, & Mee, 2014). Here, Pressures specifically link to the emphasis risks and uncertainties. Welfare specifically links to human impacts in terms of economic welfare and social equity, whereas the ecological impacts (i.e. the emphasis environmental sustainability) are included into the State component (Cooper, 2013; O’Higgins et al., 2014). Obviously, in reality the two are interrelated, but this division ascertains that both components are included. Second, the Pressure, State and Welfare dimension are sub-divided through the identified water system services. This ensures that the services are looked at through all emphases. The Driver and Response dimensions use other sub-divisions as they contain societal trends and governance aspects, which are here considered overarching of the individual water system services. In short, as a result of the identified limitations of the UWS to assess UWW, the UWD uses the DPSWR rather than the PSIR framework and incorporates more water system services.

2.3 The second component of UWW: The Capabilities Approach

As discussed, UWS can be put under scrutiny given its lacking ability to chart social dynamics and overlooking contextual factors (Cook & Bakker, 2012; Jepson et al., 2017). The CA shows high potential for investigating social dynamics in relation to UWS (Staddon et al., 2018) or, in other words, UWW.

2.3.1 The Capabilities Approach: A social framework

The CA has emerged as the leading alternative to standard economic frameworks for thinking about poverty, inequality and human development. (Goldin & Owen, 2014) and essentially provides a social framework from an individual and communal perspective. This is deemed important as the CA ought to provide insight into the local social and political dynamics affecting UWW, making citizens more central in the assessment of UWW as they are the people receiving the water system services. The CA can be defined as follows:

“a normative framework to assess how wellbeing and social arrangements contribute to or detract from human flourishing and freedom. This approach defines a person’s well-being in terms of beings and doings (functionings) and in terms of his or her capability to choose among such functionings.” (Jepson et al., 2017, p. 47)

Following this definition, people’s well-being is not determined by a pre-determined end-goal, but rather by people’s ability to choose their own end-goal. Whether people have that ability to choose depends on the extent that people possess certain so-called capabilities. Multiple capabilities have been proposed since the CA was first proposed as a theory (Goldin, 2013). Nussbaum (2003), as one of the founders of the CA, developed a list of ten basic human capabilities that has been used as a starting point by many scholars that applied the CA in their work. An overview of categorisations of capabilities, including that of Nussbaum, is presented in Figure 3.

Nussbaum	Robeyns	Biggeri <i>et al.</i> ^a	UK EHRC ^c	Qizilbash, prudential values ^d
1. Life	1. Life and physical health	1. Life and physical health	1. Life	1. Certain, at least minimal, levels of health, nutrition, sanitation, shelter and security
2. Bodily health	2. Mental well-being	2. Love and care	2. Health	2. Certain, at least minimal, capacities, including (a) literacy and (b) certain basic intellectual and physical capacities
3. Bodily integrity	3. Bodily integrity and safety	3. Mental well-being	3. Physical security	3. Self-respect and aspiration
4. Senses, imagination and thought	4. Social relations	4. Bodily integrity and safety	4. Legal security	4. Positive freedom or autonomy
5. Emotions	5. Political empowerment	5. Social relations	5. Education and learning	5. Negative freedom or liberty
6. Practical reason	6. Education and knowledge	6. Participation	6. Standard of living	6. Enjoyment
7. Affiliation	7. Domestic work and non-market care	7. Education	7. Productive and valued activities	7. Understanding or knowledge
8. Other species	8. Paid work and other projects	8. Freedom from economic and non-economic exploitation	8. Individual, family and social life	8. Significant relations with others and some participation in social life
9. Play	9. Shelter and environment	9. Shelter and environment	9. Identity, expression and self-respect	9. Accomplishment (the sort of achievement that gives life point and weight)
10. Political and material control over one's environment	10. Mobility	10. Leisure activities	10. Participation, influence and voice	
	11. Leisure activities	11. Respect		
	12. Time-autonomy	12. Religion and identity		
	13. Respect	13. Time-autonomy		
	14. Religion ^e	14. Mobility		

^aIncluding the capability not to live in accordance with a religion.

^bBiggeri's *et al.* (2006) list is developed specifically for children and recognises that the relevance of specific capabilities may vary. It is argued that items 1, 2, 7 and 10 are 'foremost among the capabilities conceptualised by children' (p. 77).

^cThis list is intended for adults. A separate list of capabilities for children is currently being developed by Polly Vizard at the London School of Economics for the EHRC (Equality and Human Rights Commission).

^dQizilbash builds on James Griffin's (1986, 1993) list of prudential values.

Sources: Nussbaum, 2000, pp. 72–75; 2011, pp. 33–34. Robeyns, 2003, pp. 71–72. Biggeri *et al.*, 2006, pp. 65–66. Alkire *et al.*, 2009, pp. 2–3 and annex 1.1, pp. 16–18. Qizilbash, 1996a, p. 156; 1996b, p. 1216.

Figure 3. Established lists of capabilities in the literature. Copied from “From vagueness to precision: Raising the volume on social issues for the water sector” by J. Goldin, 2013, *Water Policy*, 15(2), p. 6.

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Figure 3 shows that a wide variety of possible capabilities exists. The identification of relevant capabilities in particular situations helps to understand why people (if desired) are able to access certain freedoms while others are not. In terms of UWW, the CA looks at the extent that people's capabilities provide individuals and communities with effective possibilities to take action that they desire to take (regarding water) and how this is further influenced by governance arrangements in the water sector (Jepson *et al.*, 2017). Therefore, this approach is especially suited to consider social relations, mainly political and cultural dimensions (Staddon *et al.*, 2018).

2.3.2 Prior studies on capabilities in the water sector

Although there exists no research on the relation between capabilities and holistic UWS, several scholars have researched the influence of capabilities through the CA on aspects of UWS. Staddon et al. (2018) studied how the presence of certain capabilities or lack thereof influenced the adoption of rainwater harvesting techniques in Uganda. They found that for the adoption of these techniques, people's membership of community organisations was crucial. Furthermore, they observed that people's control over their environment was an important capability for the occurrence of stakeholder participation. Meanwhile, Dapaah and Harris (2017) investigated the role of capabilities on water access in Ghana. Significant capabilities influencing water access were familial/community conflict, inability to pay fees and water providers deprioritising certain neighbourhoods.

Next to these two specific case studies, Goldin (2013) proposed ten general clusters of capabilities that are presumably relevant in the water sector. These clusters of capabilities are: (1) health and basic goods; (2) education and literacy; (3) certain basic mental and physical capabilities; (4) self-respect and aspiration; (5) autonomy and self-determination; (6) awareness; (7) understanding; (8) significant relations with others; (9) participation in social life; (10) accomplishment (Goldin, 2013).

The capabilities found by Staddon et al. (2018) and Dapaah and Harris (2017) can be allocated to the clusters by Goldin (2013). For instance, the importance of 'membership of community organisations' (Staddon et al., 2018) would be reflected in the ninth cluster on *Participation in social life* as this cluster refers to being part of a large or close community (Goldin, 2013). Meanwhile, 'control over one's environment' (Staddon et al., 2018) is described exactly by Goldin (2013) as belonging in the cluster on *Autonomy and self-determination*. Simultaneously, following the findings of Dapaah and Harris (2017), 'familial/community conflict' and 'water providers deprioritising certain neighbourhoods' could fall under *Significant relations with others* as this capability refers to people's position in power relations. Next to that, 'inability to pay fees' reflects the capability *Basic goods* given that this capability is about the possession of basic goods, such as money. Consequently, the clusters of Goldin (2013) are considered a promising base for the study of UWW and, thus, are used as point of departure in this research.

2.3.3 Potential relations between capabilities and UWW

Looking more closely at the capability clusters of Goldin (2013), it becomes visible that some of these clusters are too broad or too similar, resulting in some slight alterations for the purpose of this study. First, the capability cluster *Basic goods and health* is split up. The distinction between 'non-innate' *Health* and *Certain basic mental and physical capabilities* that are innate (Goldin 2013) is considered very subtle. For that reason, these categories are restructured into *Basic goods* and *Health*. Moreover, Goldin (2013) identifies the separate clusters *Awareness* and *Understanding*. However, these clusters are conditional, given that there is no *Understanding* without *Awareness* (Koop et al., 2017). Therefore, *Awareness and understanding* is transformed into a single category. The same conditional relation

applies to the categories *Aspiration and self-respect* and *Accomplishment*, as Goldin (2013) mentions that there is no feeling accomplished when someone lacks the self-respect and aspiration to attempt to try and accomplish his or her goal. For that reason, these clusters are fused into *Aspiration, self-respect and accomplishment*. Thus, this study uses eight clusters of capabilities as presented and described in Table 2.

Table 2

Identified capabilities for UWW and their description.

Capability	Description (based on Goldin (2013))
Basic goods	The extent that people possess a minimum threshold of shelter and nutrition (and water supply).
Education	The extent that people have a basic minimum level of literacy and education.
Health	The extent that people are physically and mentally healthy, both innate and non-innate.
Aspiration, self-respect and accomplishment	The extent that people feel good, valued and have hope, as to achieve their goals and objectives.
Autonomy and self-determination	The extent that people have control over their own life.
Awareness and understanding	The extent that people have knowledge about and comprehend their external (natural) environment.
Significant relations with others	The extent that people feel connected and belong to a group. Significant refers to having meaningful relations with powerful ‘others’ that can make a difference, as opposed to insignificant ones.
Participation in social life	The extent that people have structural social capital and networks.

In short, Table 2 shows eight clusters of capabilities: *Basic goods; Education; Health; Aspiration, self-respect and accomplishment; Autonomy and self-determination; Awareness and understanding; Significant relations with others* and; *Participation in social life*. It is these capabilities that are studied in terms of UWW. As capabilities are part of the Driver dimension, they feed directly into the Pressure dimension and indirectly into the other UWW dimensions following the DPSWR model. However, based on the discussed literature on capabilities, two additional direct relations are expected to exist between capabilities and UWW.

First, Dapaah and Harris (2017) studied the influence of capabilities on water access. This implies that capabilities directly influence the distribution of access to water system services. Following

the DPSWR dimensions, the Welfare dimension reflects the subject of access, as access is a consequence for human welfare resulting from the State (dimension) of the water system services. Subsequently, the first potential UWW relation is between capabilities in the Driver dimension and access in the Welfare dimension.

Second, when Goldin (2013) refers to the relation between capabilities and the water sector, she hypothesises that this relation is one between capabilities and participation in the water sector. Also Staddon et al. (2018) investigate the relation between capabilities and stakeholder participation. This is a more active role of the individual compared to the more passive relation of having access. In terms of the DPSWR model, this can then be perceived as a second potential UWW relation between the capabilities in the Driver dimension and stakeholder participation reflected in the Response dimension.

In addition, the identification of the potential relation between capabilities and the Response dimension uncovers an additional missing item in the conceptual framework of the UWS, namely a sub-dimension on governance regarding individuals and local communities. The UWS takes an expert perspective and the sub-dimensions merely discuss governance aspects from the viewpoint of policymakers, as Figure 2 mentions the institutions framework and planning and operational management. This limits responses by local communities to only be considered if desired from a top-down perspective. This is indeed also an additional criticism on the (D)PSIR model as it is said to be developed for experts where responses are initiated by policymakers and high-end stakeholders (Gari et al., 2015). Thus, it is relevant to include an extra Response sub-dimension on *Individuals and communities* given that UWW aims to understand the relations between capabilities and participation. This requires both institutionalised participation as governance that is more bottom-up.

2.4 Conceptual framework

This chapter reviewed the theory on UWS and capabilities and their interrelation in order to conceptualise UWW. The conceptual framework is presented in Figure 4.

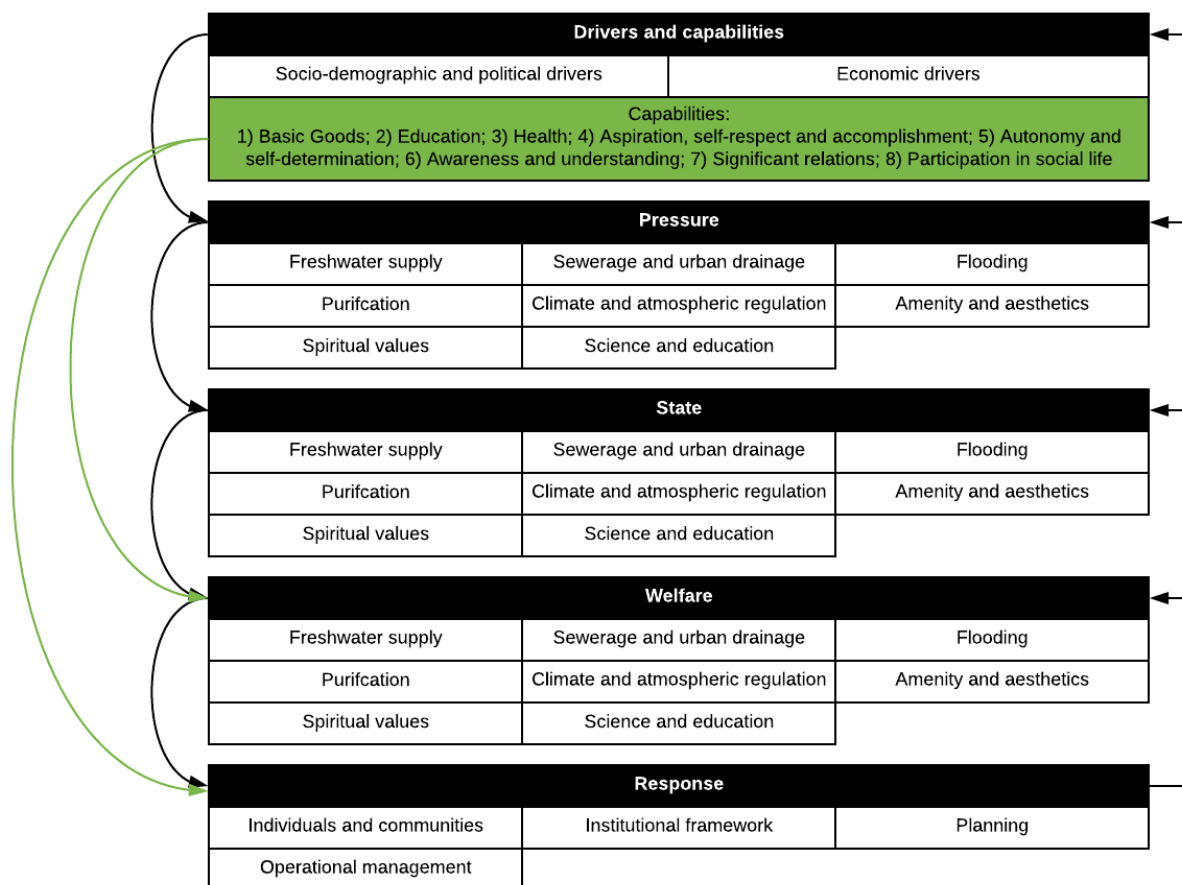


Figure 4. Conceptual model of UWW.

Looking at Figure 4, the concept of UWW is resembled in the dimensions of the DPSWR approach. First, the larger societal trends that are present in society are captured in the Driver dimension. These Drivers are either socio-demographic and political or economic (Cook & Bakker, 2012). It is in this dimension that the capabilities reside. Second, the Drivers, through people's lifestyles, debouch into Pressures on the urban water system services. These Pressures are ecological risks and uncertainties. Third, the Pressures influence the State of the water system services, whereas too much ecological pressure might lead to degradation of the quality of services. Fourth, a change in the State of water system services has consequences for human Welfare, because it alters the benefits derived from ecosystem services. Lastly, especially a change in Welfare is expected to generate a governance Response. This Response can come from Individuals and communities, but responses are also possible through the institutional framework, planning and operational management. The order 'DPSWR' is the assumed directionality between these dimensions. However, the Response dimension can directly feed back into any dimension, given that governance can focus on improving any aspect of UWW, which, in turn, cascades through the system. This scheme will be operationalised in the first part of the UWWAA, namely the UWWD.

Following the DPSWR approach in Figure 4, the influence of capabilities is limited to direct influence on the Pressure dimension. However, the scarce literature that exists on capabilities in the

water sector implies two other direct relations that are represented by the green arrows in Figure 4. On the one hand, this is the relation with people's access to water system services measured in the Welfare dimension (Dapaah & Harris, 2017), because the burdens and benefits from water system services that people receive are expected to reflect the extent that they possess (certain) capabilities. On the other hand, the extent that people possess (certain) capabilities possibly correlates with their involvement in the water sector, ergo the Response dimension (Goldin, 2013; Staddon et al., 2018). When this involvement is skewed towards a particular group, this might perpetuate or deepen existing social dynamics and distributions of capabilities and continuously feed back into Drivers and the other dimensions. Therefore, as to understand this unknown general influence of capabilities on UWW, the green arrows will be researched separately from the UWWD through the second part of the UWWAA: the theoretical propositions.

2.5 Conclusion

This chapter reviewed the theory on UWS and the CA. Limitations of the UWS for conceptualising UWW were identified as well as potentially relevant capabilities. The findings were then combined into a conceptual framework on Urban Water Welfare. In the next part of this study, the concept UWW is operationalised as the UWWAA. First, by creating an indicator set, named the Urban Water Welfare Dashboard, that quantitatively measures UWW. Second, by developing theoretical propositions that explore the potential role of capabilities on access to water services (Welfare dimension) and participation in the water sector (Response dimension).

Part 2

Operationalising Urban Water Welfare: The Urban Water Welfare Assessment Approach

3 Developing the UWWD

3.1 Introduction

In this chapter the first part of the UWWAA is operationalised, namely the UWWD. For the UWWD's operationalisation, the UWSD is used as a base to derive indicators from, thereby answering the third sub-question *How can the UWSD be altered into the Urban Water Welfare Dashboard to assess UWW?*

This chapter first presents the UWWD and then elaborates on its operationalisation. Finally, the chapter finishes with a brief conclusion.

3.2 Indicator set of the UWWD

Based on the conceptual model in the previous chapter, an indicator set was created for the UWWD. The UWWD contains 96 indicators and is presented in Figure 5. The source for each indicator can be found in Appendix A. Moreover, the complete Indicator Protocol elaborating on the collection and processing of data for each indicator is part of the Supplemental Data.

Urban Water Welfare Dashboard			
Driver	Socio-demographic and political		Economic
	City population	Rule of law	GDP
	Population growth	Social capital	Employment rate
	Education rate	Nature awareness	Poverty rate
	Burden of disease	Satisfaction with life	Ease of doing business
	Political stability	Gender equality	Innovation index
Pressure	Freshwater supply		Sewerage and drainage
	Annual precipitation	Rainfall intensity	Purification
	Domestic water use		CH4 from wastewater treatment
	Water-intensive industries		N2O from wastewater treatment
	Alternative water sources	Climate regulation	
	Water footprint	GHG-emissions	Cultural
		Density build-environment	Polluted sediments
			Garbage in surface water
		Flood protection	City noise
		Storm surge hazard	Area of protected land
	Tsunami hazard	Air pollution	
	Expected sea-level rise by 2100	Visitors' pressure	
	Area below sea level and subsidence		
State	Freshwater supply		Sewerage and drainage
	Freshwater scarcity	Coverage sewer system	Purification
	Supply continuity reservoirs	Age sewer system	Secondary WWT
	Dependency overexploited aquifers	Drainage flood	Tertiary WWT
	Local groundwater drawdown	Stormwater drainage infrastr.	Energy recovery
	Coverage supply system		Nutrient recovery
	Leakages supply system	Climate regulation	Sewage sludge recovery
	Continuity domestic supply	Net primary productivity	WWT energy efficiency
	Quality water supply	Vegetation coverage	
	Surface water quality		Cultural
	Groundwater quality	Flood protection	Ecological quality water
	Sustainability water footprint	Coastal fl. prot. Infrastructure	Biodiversity
		River fl. prot. Infrastructure	
Welfare	Freshwater supply		Sewerage and drainage
	Conflicts over supply	Damage stormwater flooding	Purification
	People with adequate water supply		Uses of purified water
	People with adequate sanitation	Climate regulation	
	Water-associated diseases	Heat risk	Cultural
		Use of green space	Water image
			Accessibility areas
		Flood protection	Ceremonial & educational importance
	Damage coastal flooding		
	Damage river flooding		
Response	Individuals and communities		Institutional framework
	Affordability	Clarity roles and responsibilities	Planning
	Consumer willingness-to-pay	Horizontal and vertical coordination	Financial continuation
	Access data and info	Cross-stakeholder learning	Disaster management
	Progress and variety of options	Authority	Strategic planning
	Agents of change	Policy instruments	
	Awareness and understanding	Protection core values	Operational management
	Room to manoeuvre		Water supply management
	Stakeholder inclusiveness		Sewerage and drainage management
			Purification management
		Ecological management	

Figure 5. The Urban Water Welfare Dashboard.

3.2.1 Operationalisation of capabilities

The UWWD in Figure 5 includes operationalisations of the capabilities, thereby addressing the first of the three limitations of the UWSD for assessing UWW identified in the previous chapter. Table 3 shows what indicators are supposed to measure the different capabilities.

Table 3

Operationalisation of capabilities in the UWWD Driver dimension.

Capability	Indicator in Driver dimension	Source
Basic goods	- GDP	Van Ginkel et al. (2018)
	- Employment rate	Koop et al. (2017)
	- Poverty rate	Koop et al. (2017)
Education	- Education rate	Koop et al. (2017)
Health	- Burden of disease	Koop et al. (2017)
Aspiration, self-respect, and accomplishment	- Rule of law	Own addition
	- Satisfaction with life	Own addition
Autonomy and self-determination	- Ease of doing business	Own addition
	- Innovation index	Own addition
	- Gender equality	Own addition
Awareness and understanding	- Awareness and understanding of nature	Own addition
Significant relations with others	- Political stability	Koop et al. (2017)
Participation in social life	- Social capital	Own addition

The indicators shown in Table 3 are partly existing indicators. However, as the CA is a qualitative approach there have been barely any attempts to quantify capabilities as such. Consequently, indicators were sought that were expected to reflect the capabilities. As indicated in Table 3, some of these indicators were found in the literature on urban water management, while some were created for the purpose of this study based on available data from online databases. In practice, it was found that indicators on capabilities overlap with the sub-categories Socio-demographic and political drivers and Economic drivers as identified in the conceptual model. For that reason they are integrated into these sub-categories as can be seen in Figure 5.

3.2.2 Operationalisation of water system services

For the operationalisation of the UWWD as shown in Figure 5, the indicators of the UWSD were used as point of departure. Using the conceptual model from the previous chapter, the indicators of the UWSD were re-divided into the UWWD. This re-division based on the conceptual model was further supported by specific descriptions of the DPSWR dimensions and the corresponding types of indicators. The used

descriptions are supplied in Appendix B. Furthermore, a few ÚWSD indicators were left out as they were found to be already covered by other indicators. For instance, the indicator *Slums* was found to be no better than the indicator on the city's poverty rate, also because the collection-gathering protocol involved looking at slums through maps and estimating their size (Van Ginkel et al., 2018).

However, two of the UWSD's limitations for assessing UWW were the incomplete and inconsistent conceptualisation of water system services. Subsequently, remaining gaps were filled using indicators or suggestions for indicators found elsewhere in the literature (i.e. Gutiérrez & Alonso, 2013; Koop & Van Leeuwen, 2017; Koop et al., 2017; Layke, 2009; Layke, Mapendembe, Brown, Walpole, & Winn, 2012; Maes et al., 2016; Möllersten, 2018; Romero-Lankao & Gnatz, 2016). Unfortunately, it was found that there exists a considerable lack of indicators as well as data when it comes to the different cultural services of water (Layke, 2009; Maes et al., 2016). Therefore, it was found necessary to integrate the services *Amenity and aesthetics*, *Science and communication* and *Spiritual values*, as identified in the conceptual model, into one singular category of *Cultural services*. Protocols developed for new indicators were based on the data-gathering strategies used by Van Ginkel et al. (2018).

3.3 Conclusion

In this chapter the conceptual model was operationalised into the first part of the UWWAA; the UWWD. The UWWD addresses the conceptual limitations of the UWSD for assessing UWW that were found in the previous chapter. The following chapter operationalises the two expected but unexplored direct relations between capabilities and the Welfare and Response dimensions by developing theoretical propositions that represent the second part of the UWWAA.

4 Theoretical propositions on UWW

4.1 Introduction

This chapter develops theoretical propositions that explore potential relations between capabilities and UWW. The propositions reflect the green arrows in the conceptual model. Consequently, these propositions provide an answer to the fifth sub-question *What are potential relations between capabilities and UWW?* Ultimately, the chapter will end by providing a concluding paragraph.

4.2 The relation between capabilities and the Welfare dimension of UWW

The first identified relation between capabilities and UWW was the relation between capabilities and peoples access to the water system services (i.e. the Welfare dimension). The propositions are formulated for each capability, but not for each individual water service. Instead, the services are aggregated following the typology of provisioning, regulating and cultural services. This is done for practical reasons as the number of propositions would become too extensive to test. Consequently, this results in the first three columns in Table 4.

Table 4 shows that a single proposition exists for each service category and capability. This distinction is expected to be relevant given that, for instance, the capability *Health* might no longer prove limiting for access to provisioning services in a developed city with high coverage of piped access. However, *Health* might even in a developed city affect access to cultural services, such as access to recreational water sources, due to, for instance, limited mobility. In addition, the water system service climate and atmospheric regulation is not mentioned explicitly in the propositions. This is because this service is expected to manifest as city green, which is reflected in the propositions on cultural services of water (despite climate and atmospheric regulation being a regulating service).

4.3 The relation between capabilities and the Response dimension of UWW

The second expected relation is that between capabilities and the Response dimension of UWW, as capabilities are expected to play a role in people's participation in the water sector. The Response dimension refers to governance in the water sector and with that the propositions refer to the link between each capability and involvement in the water sector. The propositions on this relation have been formulated in the last column of Table 4. They are formulated in the broadest sense, given that it is unclear how this participation might manifest in different contexts. Moreover, the theoretical propositions are exploratory and steering of respondents is preferably avoided.

4.4 Conclusion

In this chapter the potential relations between capabilities and the Welfare and Response dimensions of UWW were operationalised into propositions. In the next part of this study, the UWWAA is applied in a case study of Jerusalem. The following chapter will first elaborate on the research methodology underlying this case study.

Table 4

Theoretical propositions on the possible influence of capabilities on UWW.

Capability	Provisioning services	Regulating services	Cultural services	Response
Basic goods	People with sufficient basic goods are more likely to have access to adequate freshwater for drinking and sanitation than people without basic goods.	People with sufficient basic goods are more likely to have access to flood protection and sewage (treatment) infrastructure than people without basic goods.	People with sufficient basic goods are more likely to have access to water sources for recreational, spiritual and/or education purposes than people without basic goods.	People with sufficient basic goods are more likely to participate in the water sector than people without basic goods.
Education	People that finished primary education and/or are literate are more likely to have improved access to freshwater for drinking and sanitation than people that did not.	People that finished primary education and/or are literate are more likely to have access to flood protection and sewage (treatment) infrastructure than people that did not.	People that finished primary education and/or are literate are more likely to have access to water sources for recreational, spiritual and/or educational uses than people that did not.	People with finished primary education and/or are literate are more likely to participate in the water sector than people that did not.
Health and certain basic mental and physical capabilities	People in good health are more likely to have improved access to freshwater for drinking and sanitation than people that are limited by their physical or mental health on a daily basis	People in good health are more likely to have access to flood protection and sewage (treatment) infrastructure than people that are limited by their physical or mental health on a daily basis.	People in good health with are more likely to access water sources for recreational, spiritual and/or education purposes than people that are limited by their physical or mental health on a daily basis.	People in good health are more likely to participate in the water sector than people that are limited by their physical or mental health on a daily basis.
Self-respect and aspiration	People that feel valued and like having a voice are more likely to have improved access to freshwater for drinking and sanitation than people that feel that they are not being valued or heard.	People that feel valued and like having a voice are more likely to have access to flood protection and sewage (treatment) infrastructure than people that feel that they are not being valued or heard.	People that feel valued and like having a voice are more likely to access water sources for recreational, spiritual and/or educational uses than people that feel that they are not being valued or heard.	People that feel valued and like having a voice are more likely to participate in the water sector than people that feel that they are not being valued or heard.
Autonomy and self-determination	People that feel empowered and in control of their own decisions are more likely to have improved access to freshwater for drinking and sanitation than people that do not feel in control over their decisions.	People that feel empowered and in control of their own decisions are more likely to have access to flood protection and sewage (treatment) infrastructure than people that do not feel in control over their decisions.	People that feel empowered and in control of their own decisions are more likely to have access to water sources for recreational, spiritual and/or educational uses than people that do not feel empowered and in control over their decisions.	People that feel empowered and in control of their own decisions are more likely to participate in the water sector than people that do not feel empowered or in control over their decisions.
Awareness and understanding	People that are aware of and understand their natural surroundings are more likely to have	People that are aware of and understand their natural surroundings are more likely to have	People that are aware of and understand their natural surroundings are more likely to have	People that are aware and understand their natural surroundings are more likely to

	improved access to freshwater for drinking and sanitation that people that are not aware nor understand.	access to flood protection and sewage (treatment) infrastructure than people that are not aware nor understand.	access to water sources for recreational, spiritual and educational uses.	participate in the water sector than people that lack awareness and understanding.
Significant relations with others	In unequal power relations, people part of powerful communities are more likely to have improved access to freshwater for drinking and sanitation than people part of less powerful communities.	In unequal power relations, people part of powerful communities are more likely to have access to flood protection and sewage (treatment) infrastructure than people part of less powerful communities.	In unequal power relations, people part of powerful communities are more likely to have access to water sources for recreational, spiritual and/or educational uses than people part of less powerful communities.	People part of powerful communities are more likely to participate in the water sector than people part of less powerful communities.
Participation in social life	People with large and close social networks are more likely to have improved access to freshwater for drinking and sanitation than people without such networks.	People with large and close social networks are more likely to have access to flood protection and sewage (treatment) infrastructure than people without such networks.	People with large and close social networks are more likely to have access to have access to water sources for recreational, spiritual and/or educational uses than people without such networks.	People with large and close social networks are more likely to participate in the water sector than people without such networks.

Part 3

Applying the UWWAA

5 Research methodology: Case study

5.1 Introduction

This chapter explains the methodology underlying the application of the UWWAA in a case study of municipality Jerusalem. First, it is explained how data is collected and processed for the application of the UWWD. Second, there is a brief elaboration on the research methods used for testing of the theoretical propositions, namely a Q-study complemented with interviews, as well as how the data gathered through these methods is processed. In the end, a concluding paragraph is provided.

5.2 Data collection and processing for the application of the UWWD

For the application of the UWWD, water system services are left out that are irrelevant for the city. The argument for this exclusion is that it would yield a distorted image of cities' actual UWW. For Jerusalem this means the removal of the water system service *Flood protection*. As Jerusalem approaches an elevation of 800 meters above sea level and is located higher than its surrounding areas both flooding from rivers and seas is unlikely in any scenario (www.floodmap.net). Consequently, aspects such as flood risks would be perceived low, thereby contributing to a stronger UWW. As the UWW ought to reflect actual challenges, the service is excluded. Although this limits the possibility of one-on-one comparison between cities, the cities' overall UWW scores are all the more meaningful as they represent their ability to attend to their own challenges. This increases the internal validity. As a result, the adapted operationalisation of the UWWD for Jerusalem comprises 88 indicators and is presented in Figure 6.

Next, the UWWD in Figure 6 was applied by gathering data through desk research. Data for Jerusalem was collected through desk research using literature and statistical material (Verschuren, Doorewaard, & Mellion, 2010). For each indicator, the Indicator Protocol (see Supplemental Data) contains a short justification of the score attributed for Jerusalem, including sources. The specific scope were the municipal boundaries of Jerusalem and the most recent data available was used.

In addition, data on indicators in the Response dimension can be collected through two methods, depending on time considerations, namely interviews or questionnaires filled in by local experts. In this case study secondary data was used in the shape of interviews that were conducted by the author with stakeholders in Jerusalem for the application of the Governance Capacity Framework of the City Blueprint (Koop et al., 2017). Most indicators in the UWWD's Response dimension are derived from this framework, making that the content of these interviews is considered relevant. The transcripts of these interviews (N = 20) are added to Appendix A of the Indicator Protocol as they are referenced to in that document.

Urban Water Welfare Dashboard Jerusalem			
Driver	Socio-demographic and political		Economic
	City population	Rule of law	GDP
	Population growth	Social capital	Employment rate
	Education rate	Nature awareness	Poverty rate
	Burden of disease	Satisfaction with life	Ease of doing business
	Political stability	Gender equality	Innovation index
Pressure	Freshwater supply		Purification
	Annual precipitation	Sewerage and drainage	CH4 from wastewater treatment
	Domestic water use	Rainfall intensity	N2O from wastewater treatment
	Water-intensive industries		
	Alternative water sources	Climate regulation	Cultural
	Water footprint	GHG-emissions	Polluted sediments
		Density build-environment	Garbage in surface water
			City noise
			Area of protected land
			Air pollution
		Visitors' pressure	
State	Freshwater supply		Purification
	Freshwater scarcity	Sewerage and drainage	Secondary WWT
	Supply continuity reservoirs	Coverage sewer system	Tertiary WWT
	Dependency overexploited aquifers	Age sewer system	Energy recovery
	Local groundwater drawdown	Drainage flood	Nutrient recovery
	Coverage supply system	Stormwater drainage infrastr.	Sewage sludge recovery
	Leakages supply system		WWT energy efficiency
	Continuity domestic supply	Climate regulation	Cultural
	Quality water supply	Net primary productivity	Ecological quality water
	Surface water quality	Vegetation coverage	Biodiversity
	Groundwater quality		
	Sustainability water footprint		
	Welfare	Freshwater supply	
Conflicts over supply		Sewerage and drainage	Uses of purified water
People with adequate water supply		Damage stormwater flooding	
People with adequate sanitation			Cultural
Water-associated diseases		Climate regulation	Water image
	Heat risk	Accessibility areas	
	Use of green space	Ceremonial & educational importance	
Response	Individuals and communities		Planning
	Affordability	Institutional framework	Financial continuation
	Consumer willingness-to-pay	Clarity roles and responsibilities	Disaster management
	Access data and info	Horizontal and vertical coordination	Strategic planning
	Progress and variety of options	Cross-stakeholder learning	
	Agents of change	Authority	Operational management
	Awareness and understanding	Policy instruments	Water supply management
	Room to manoeuvre	Protection core values	Sewerage and drainage management
	Stakeholder inclusiveness		Purification management
			Ecological management

Figure 6. Operationalisation of the UWWD for Jerusalem.

After gathering of the data, each indicator got attributed a score on a 1-5 Likert scale following the scoring system used by Van Ginkel et al. (2018). A description of the scoring scale is given in Table 5.

Table 5
Scoring scale for indicators in the UWW, including colour labels and description.






Indicator		Description
Score	Colour	
1		Very insecure: The indicator reflects a great weakness .
2		Insecure: The indicator reflects a moderate weakness .
3		Around acceptable threshold: The indicator reflects weakness nor strength .
4		Secure: The indicator reflects a moderate strength .
5		Very secure: The indicator reflects a great strength .

Table 5 shows that indicators with scores of 1 and 2 are considered weaknesses, a great and moderate weakness respectively. Indicators with these scores need to be addressed through governance strategies when possible. In tandem, scores of 4 and 5 represent strengths of UWW. A score of 5 indicates a city to be a best practice regarding this aspect. A score of 4 means some room for improvement remains. Lastly, a score of 3 implies that the indicator is at this point in an acceptable state, but it is certainly not desirable to let it deteriorate as it would become a weakness. Simultaneously, some additional effort could relatively easy turn it into a strength.

The scores that are attributed to the indicators for Jerusalem were inserted in an Excel-format that is also provided in the Supplemental Data. The Excel-sheet automatically computes the indicator scores in the fourth tier with indicators into unweighted averages for the other three tiers. The third tier contains the scores for the sub-dimensions, the second tier the scores of each DPSWR dimension and the highest tier the city’s overall UWW score.

5.3 Data collection and processing for testing the theoretical propositions

Next to the application of the UWW, the theoretical propositions were tested in Jerusalem. This was done in several steps, namely through expert consultation, a Q-study and interviews.

5.3.1 Expert consultation

The theoretical propositions were pre-tested through expert consultation. Originally, the propositions were sent out to four experts in the field of UWS and/or the CA. Appendix C provides a list of the experts contacted as well as the document that was sent to the responding experts. The correspondence took place through e-mail, given that the experts were located abroad during the moment of consultation. However, due to time constraints on both sides, no exchange of feedback on the propositions was possible before the actual testing started. Therefore, instead expert consultation took place verbally with

an expert (N = 1) in Jerusalem. No name is provided as anonymity was guaranteed. However, the expert was a female active in an NGO in Jerusalem's environmental sector. She possessed knowledge on the context of Jerusalem, including people's capabilities and basic water system knowledge. Moreover, the expert advised on proposition formulation to avoid miscommunication with Jerusalemites. Ultimately, this resulted in the simplification of propositions and for the them to be adapted slightly to the Jerusalem context to enhance clarity for respondents. The adapted propositions can be found in Table 6.

Table 6

Theoretical propositions on UWW after expert consultation and adapted to the Jerusalem context.

Capability	Welfare (provisioning services)	Welfare (regulating services)	Welfare (cultural services)	Response
Basic goods	1. People possessing basic goods, such as a normal income, are more likely to have access to adequate freshwater for drinking and sanitation than people without basic goods.	2. People possessing basic goods, such as a normal income, are more likely to have access to sewer (treatment) infrastructure than people without basic goods.	3. People possessing basic goods, such as a normal income, are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people without basic goods.	4. People possessing basic goods, such as a normal income, are more likely to take grassroots initiative in the water sector than people without basic goods.
Education/Literacy	5. People literate in Hebrew are more likely to have access to adequate freshwater for drinking and sanitation than people illiterate in Hebrew.	6. People literate in Hebrew are more likely to have access to sewer (treatment) infrastructure than people illiterate in Hebrew.	7. People literate in Hebrew are more likely to have access to green areas and/or water sources for recreational, spiritual and educational uses than people illiterate in Hebrew.	8. People literate in Hebrew are more likely to take grassroots initiative in the water sector than people illiterate in Hebrew.
Health and certain basic mental and physical capabilities	9. People mentally and physically healthy are more likely to have access to adequate freshwater for drinking and sanitation than people that are not healthy.	10. People mentally and physically healthy are more likely to have access to sewer (treatment) infrastructure than people that are not healthy.	11. People mentally and physically healthy are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that are not healthy.	12. People mentally and physically healthy are more likely to take grassroots initiative in the water sector than people that are not healthy.
Self-respect, aspiration and accomplishment	13. People that feel valued and like having a voice are more likely to have access to adequate freshwater for drinking and sanitation than do not feel like valued nor like having a voice.	14. People that feel valued and like having a voice are more likely to have access to sewer (treatment) infrastructure than people that do not feel valued nor like having a voice.	15. People that feel valued and like having a voice are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that do not feel valued nor like having a voice.	16. People that feel valued and like having a voice are more likely to take grassroots initiative in the water sector than people that do not feel valued nor like having a voice.

Self-determination and autonomy	17. People that feel empowered and in control over their decisions are more likely to have access to adequate freshwater for drinking and sanitation than people that do not feel empowered nor in control over their decisions.	18. People that feel empowered and in control over their decisions are more likely to have access to sewer (treatment) infrastructure than people that do not feel empowered nor in control over their decisions.	19. People that feel empowered and in control over their decisions are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that do not feel empowered nor in control over their decisions.	20. People that feel empowered and in control over their decisions are more likely to take grassroots initiative in the water sector than people that do not feel empowered nor in control over their decisions.
Awareness and understanding	21. People that have environmental awareness and understanding are more likely to have access to adequate freshwater for drinking and sanitation than people that lack environmental awareness and understanding.	22. People that have environmental awareness and understanding are more likely to have access to sewer (treatment) infrastructure than people that lack environmental awareness and understanding.	23. People that have environmental awareness and understanding are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that lack environmental awareness and understanding.	24. People that have environmental awareness and understanding are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that lack environmental awareness and understanding.
Significant relations with others	25. People that are part of a powerful/dominant community are more likely to have access to adequate freshwater for drinking and sanitation than people that are not part of such a community.	26. People that are part of a powerful/dominant community are more likely to have access to sewer (treatment) infrastructure than people that are not part of such a community.	27. People that are part of a powerful/dominant community are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that are not part of such a community.	28. People that are part of a powerful/dominant community are more likely to take grassroots initiative in the water sector than people that are not part of such a community.
Participation in social life	29. People that are part of a large or close community are more likely to have access to adequate freshwater for drinking and sanitation than people that are not part of such a community.	30. People that are part of a large or close community are more likely to have access to sewer (treatment) infrastructure than people that are not part of such a community.	31. People that are part of a large or close community are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that are not part of such a community.	32. People that are part of a large or close community are more likely to take grassroots initiative in the water sector than people that are not part of such a community.

5.3.2 Q-study

After expert consultation the propositions were tested on their relevance for Jerusalem. The chosen method for this was a Q-study complemented with interviews. Q-methodology is used to “systematically elicit individual perspectives, and to group them into shared perspectives using quantitative factor analysis. A strength of the method is that it does not require shared perspectives, or groups of subjects that share them, to be known or hypothesized in advance” (Raadgever, Mostert, & Van De Giesen, 2008, p. 1099). The aim of testing the theoretical propositions is to find what capabilities are relevant in Jerusalem for people’s access to water system services and participation in the water sector. For that reason the Q-study is found valuable as it allows to systematically assess people’s perspective on the relevance of capabilities without prior assumptions. Moreover, Q-study helps to identify whether there are different perspectives on the relevance of these capabilities as the perceived relevance is subjective and not everyone might think the same or encounter the same obstacles.

The first step of Q-methodology is to select relevant statements to test, the so-called Q-set, which in this case are the 32 (8 x 4) propositions (Raadgever et al., 2008). After that, respondents (N = 12) were selected based on their expertise of the local water sector and on their affiliation with Jerusalem and its social dynamics. Within this selection, it was attempted to create a diverse set of respondents in terms of their background, although knowledge of some aspect of the water sector was a prerequisite. A list of the respondents can be found in Appendix D.

Third, every respondent was given a stack of 32 paper cards that each contained one proposition. They were asked to sort the statements on the extent that they agreed the statements applied to Jerusalem into a grid ranging from -4 to 4, as visualised in Figure 7. Ultimately, this led to 10 completed Q-sorts, whereas two respondents failed to complete the task. One respondent did not feel like having adequate knowledge, while the second respondent refused to use the scale of the sorting grid as he felt that there is no grey area and the propositions were either true or false.

Most disagree		Undecided						Most agree
-4	-3	-2	-1	0	1	2	3	4

Figure 7. Visualisation of the Q-sorting grid as used in this study.

Figure 7 shows that the Q-sorting grid resembles a forced semi-normal distribution, which is common in Q-studies as it compels respondents to prioritise (Eden, Donaldson, & Walker, 2005; Watts & Stenner, 2005). Similarly, before commencing the sorting task, respondents were asked to compare the statements, so that their opinion of the relative importance of these statements was measured.

Beforehand, respondents were asked to read and sign an informed consent form that asked for permission to record, transcribe and use the interview for the purposes of this study. The form is added to Appendix E. The duration of the meetings with respondents was approximately an hour, in light of respondent's time availability and their attention span. On average, the introduction took circa 10 minutes, the Q-task 20 minutes and the interviews around 30 minutes.

The data processing of the Q-study was executed through the *PQMethod* software, which is tailored for analysing Q-sorts through factor analysis (available at <http://www.qmethod.org>). Each proposition was numbered, as back in Table 6, and the Q-sort of each respondent was entered into the software. After that a Principal Component Analysis (PCA) was performed followed by varimax rotation that maximises the explained variance. A maximum of eight different perspectives can be identified through PCA using the software, leading to eight possible rotations. However, PCA displays eigenvalues for every factor and, following Donner (2001), the number of factors derived from the factor analysis should not be higher than the number of factors with an eigenvalue higher than 1. After controlling for this, the most meaningful number of perspectives was chosen based on the propositions defining these perspectives, which is different in each rotation, as well as on the ability to interpret those findings given the acquired knowledge from the interviews.

After choosing the number of perspectives to use as input for the varimax rotation, the respondents defining each perspective were automatically selected through the software. Respondents could also be manually added to a perspective when there was a good reason regardless of the Q-data (Eden et al., 2005). Ultimately, this factor analysis debouched into the identification of different perspectives. A thorough reflection on the propositions included in each perspective resulted in the labelling of the different perspectives.

5.3.3 Interviews

After respondents executed the Q-task, their individual Q-sorts were used as direct input for the interview. Respondents were asked about the statements that they placed in the two most extreme categories on both the positive and negative side. These questions focused on why they believed these statements did (not) apply to Jerusalem that strongly. They were asked to describe what the current situation and differences (in capabilities) in Jerusalem were regarding these statements. Additionally, for the 'agreed' statements it was asked whether and how they thought the governance might be improved to address this difference in access or involvement between people. Respondents were also asked if there were factors missing that might influence people's water access and participation.

Furthermore, respondents were asked about the importance they attached to the different hypothesised relations between UWS and capabilities, so the relative importance of people’s access to the different types of water ecosystem services (provisioning, regulating and cultural services) in Jerusalem and the widespread involvement of people in the water sector. This was done so that weights could optionally be added to the water system services in the UWW. However, this question was found difficult for respondents and the results were inconclusive. Lastly, respondents were asked whether they had remarks or things to add regarding their Q-sort and the interview. The entire interview guide can be found in Appendix F.

From the twelve respondents, eleven usable interviews came forth. One respondent, that also did not complete the Q-study because of insufficient knowledge, refused to give permission to record the interview. Some notes were made, but these were not considered usable as it was difficult to keep up during the conversation. Subsequently, all interviews (N = 11) were transcribed using Word. The transcriptions were sent back to each respondent as a feedback opportunity to avoid misinterpretations, but no alterations were made. The transcripts of the interviews can be found in Appendix G.

Next, the interviews were uploaded and coded in NVIVO, a program for qualitative data analysis. Given the exploratory nature of the theoretical propositions, the interviews were coded using a grounded theory approach (Verschuren et al., 2010). First, the data was explored without research interpretation through open coding. Second, a narrative was build using axial coding (Strauss & Corbin, 1990). The used axial coding system is presented in Table 7.

Table 7

Axial coding categories with description of type of coded content in each category.

Category	Description
Phenomenon	Capabilities and other possible factors influencing 1) access to water services and 2) participation in the water sector
Causal conditions	Factors that cause the capabilities to be (ir)relevant
Contextual conditions	Contextual factors that capabilities and the other factors are embedded in.
Intervening conditions	Conditions that are said to directly intervene with possible solutions to improve UWW.
Strategies	Solutions for improving UWW by addressing capabilities that cause differences in water access and participation.

From the categories in Table 7, ‘phenomenon’ and ‘strategies’ were leading in the creation of narratives for each perspective, while the others have a supporting role. In addition, for the axial coding an inter-rater reliability test was conducted on the interview with respondent 6, comprising about 10 percent of

the data, to check for reliability. With a kappa coefficient of 0.69, the inter-rater reliability can be considered substantial (Landis & Koch, 1977). Third, a larger ‘theory’ on Jerusalem’s UWW was developed for the case study using higher levels of abstraction (Strauss & Corbin, 1990).

The open and axial coding result in the creation of a storyline for each shared perspective that comes from the Q-study and interviews and the strategies they suggest. Additionally, the last step leads to confrontation of the different perspectives and their proposed strategies with the results of the UWWD application. Through this the UWWD’s scores can be better understood and pathways with large or little potential for improvement can be identified.

5.4 Conclusion

An explanation was given in this chapter on the methods used for the application of the UWWAA in Jerusalem. On the one hand, the case study consists out of application of the UWWD through desk research. On the other hand, theoretical propositions are tested in Jerusalem through a Q-study and interviews. Next, the results of the case study will be presented, with in the following chapter the results of the UWWD application.

6 Results of the UWWD application in Jerusalem

6.1 Introduction

This chapter presents the findings of applying the UWWD in Jerusalem. The results of this application provide an answer to the fifth sub-question *What are strengths and weaknesses of Jerusalem's water welfare?* Strengths and weaknesses will be discussed for the different DPSWR dimensions consecutively. In the end, a concluding paragraph is provided.

6.2 Jerusalem's Urban Water Welfare

Applying the framework in Jerusalem results in an Urban Water Welfare score of 3.36 out of 5. Figure 8 displays the indicator scores for Jerusalem through colour coding as well as the scores for the three-upper tiers. The justification of each score, including references, can be found in the Indicator Protocol in the Supplemental Data.

6.2.1 Strengths and weaknesses in the Driver dimension

Figure 8 showed that with a score of 4, the Driver dimension is the strongest aspect of Jerusalem's UWW. This is fortunate given that this dimension is difficult to influence by the water sector as it represents larger societal trends, such as employment rate. The high scores in this dimension might be explained by the fact that Jerusalem is located in a well-developed country.

Following Figure 8, *Socio-demographic and political drivers* score well above the acceptable threshold with a score of 3.8. All indicators that measure capabilities (see Chapter 3) all score as moderate and great strengths, except for *Political stability* and *Education rate*. The former might be due to the fact that Jerusalem is divided in an Israeli part, i.e. West Jerusalem, and an annexed Palestinian area, i.e. East Jerusalem, ever since the Israelis occupied this area during the six-day war in 1967 (OCHA oPt, n.d.). In addition, two drivers do not reflect a capability, namely *City population* and *Population growth*. Although *City population* is a moderate strength as Jerusalem is a relatively small city, *Population growth* is strength nor weakness as ongoing urbanisation exerts pressures on the city's resources and capacities.

The *Economic drivers* are particularly strong with a score of 4.2, meaning that it is more than a moderate strength. *Innovation* is a great strength of Jerusalem's UWW, something that is reflected in the alternative water sources that are used, such as desalination.

UWW Jerusalem (3.36)			
Driver (4.00)	Socio-demographic and political (3.80)		Economic (4.20)
	City population	Rule of law	GDP
	Population growth	Social capital	Employment rate
	Education rate	Nature awareness	Poverty rate
	Burden of disease	Satisfaction with life	Ease of doing business
	Political stability	Gender equality	Innovation index
Pressure (2.83)	Freshwater supply (2.80)		Sewerage and drainage (3.00)
	Annual precipitation	Rainfall intensity	Purification (2.50)
	Domestic water use		CH4 from wastewater treatment
	Water-intensive industries	Climate regulation (2.50)	N2O from wastewater treatment
	Alternative water sources	GHG-emissions	Cultural (2.83)
	Water footprint	Density build-environment	Polluted sediments
			Garbage in surface water
State (3.01)	Freshwater supply (2.82)		Sewerage and drainage (2.82)
	Freshwater scarcity	Coverage sewer system	Purification (4.50)
	Supply continuity reservoirs	Age sewer system	Secondary WWT
	Dependency overexploited aquifers	Drainage flood	Tertiary WWT
	Local groundwater drawdown	Stormwater drainage infrastructure	Energy recovery
	Coverage supply system	Climate regulation (2.00)	Nutrient recovery
	Leakages supply system	Net primary productivity	Sewage sludge recovery
	Continuity domestic supply	Vegetation coverage	WWT energy efficiency
	Quality water supply		Cultural (2.00)
	Surface water quality		Ecological quality water
	Groundwater quality		Biodiversity
	Sustainability water footprint		
	Welfare (3.82)	Freshwater supply (3.75)	
Conflicts over supply		Damage stormwater flooding	Purification (5.00)
People with adequate water supply		Climate regulation (1.00)	Uses of purified water
People with adequate sanitation		Heat risk	Cultural (4.33)
Water-associated diseases		Use of green space	Water image
			Accessibility natural areas
Response (3.17)	Individuals & communities (2.75)		Planning (4.00)
	Affordability	Institutional framework (2.67)	Financial continuation
	Consumer willingness-to-pay	Clarity roles and responsibilities	Disaster management
	Access data and info	Horizontal and vertical coordination	Strategic planning
	Progress and variety of options	Cross-stakeholder learning	Operational management (3.25)
	Agents of change	Authority	Water supply management
	Awareness and understanding	Policy instruments	Sewerage and drainage management
	Room to manoeuvre	Protection core values	Purification management
	Stakeholder inclusiveness		Ecological management
1 = Great weakness 2 = Moderate weakness 3 = Strength nor weakness 4 = Moderate strength 5 = Great strength			

Figure 8. Indicator scores after application of the UWW in Jerusalem.

6.2.2 Strengths and weaknesses in the Pressure dimension

The Pressure dimension is the lowest scoring dimension with a score of 2.83, which is just under the acceptable threshold, as can be seen in Figure 8. First, pressures on the *Freshwater supply* are overall found to be below the acceptable threshold with a score of 2.8. A large weakness is the city's *Water footprint*, but Jerusalem's *Domestic water use* is also found to be a moderate weakness. Israel is a country in relative water scarcity, which is misaligned with the domestic water use and is accompanied by a high water footprint meaning that Jerusalem uses a lot of virtual water that gets imported. Simultaneously, the country (and with that Jerusalem) tries hard to find *Alternative water sources*, which is a great strength as it relieves pressure from the traditional freshwater sources. These alternative sources are very advanced, for instance, treated wastewater is used for of municipal parks and agriculture and desalination provides over 30% of the national freshwater supply. In addition, *Annual precipitation* and *Water-intensive industries* are perceived strengths nor weaknesses. There is little precipitation, but this is part of the arid climate. At the same time, water-polluting industries in Jerusalem are scarce and have been disappearing.

Second, with a score of 3, the service *Sewerage and urban drainage* scores highest in the Pressure dimension. *Rainfall intensity* scores around the acceptable threshold as rain falls in a short window throughout the year, but the amounts are manageable.

Third, some pressures relate to the *Purification* process that scores below the acceptable threshold with a score of 2.5. The released amount of *Methane from wastewater treatment* is considered a moderate weakness. Meanwhile, the amount *nitrous oxide from wastewater treatment* is a weakness nor a strength.

Fourth, the service *Climate and atmospheric regulation* also scores well below the acceptable threshold with a score of 2.5. This low score is mainly caused by the amount of Jerusalem's *GHG-emissions*, which is found to be a moderate weakness. Meanwhile, the *density of the build-environment* is currently neither a strength nor weakness. However, in the Driver dimension it became clear that Jerusalem's *population growth* was still a potentially vulnerable indicator with a score of 3. If the urbanisation process continues, this pressure is at risk of evolving to a moderate weakness with the corresponding consequences for the liveability of the city. However, the high *satisfaction with life*, as identified in the Driver dimension, might imply that this currently not the case.

Lastly, pressures on the *Cultural services* are just below the acceptable threshold with a score of 2.83. The *City noise* and *Air pollution* in Jerusalem form a great and moderate weakness respectively. Moreover, although there are few places with surface water to begin with, it was found that there is little *Pollution of surface water*, making it a moderate strength. The same applies to *Polluted sediments*. The *Area of protected land* is also a moderate strength as there are clear conservation efforts. However, *Visitor's pressure* on Jerusalem is considered a moderate weakness. The number of visitors is relatively high as Jerusalem is an attractive touristic and pilgrimage destination.

6.2.3 Strengths and weaknesses in the State dimension

The State dimension scores just above the acceptable threshold with 3.01, as can be seen in Figure 8. First, the state of the *Freshwater supply* is just below the threshold value with 2.82 and a large split can be observed in the indicators. On the one hand, Jerusalem's supply infrastructure is of high quality. Subsequently, great strengths are the *Coverage of the supply system* and the *Leakages of the supply system* as well as the *Quality of the water supply*. Regarding local infrastructure, only *Continuity of domestic supply* is perceived as strength nor weakness as there exists some vagueness about the continuity of this supply in annexed areas behind the Separation Barrier. On the other hand, the traditional water sources used for freshwater supply are found to be in a state of degradation. The still growing Drivers of population growth and GDP appear to feed into a growing domestic water demand as more people can afford evermore luxurious lifestyles in a region with an arid climate. Consequently, *Freshwater scarcity* is considered a great weakness. The scarcity is reflected in the *Dependency of overexploited aquifers*, which in turn leads to high *Local groundwater drawdown*, both are considered great weaknesses. Despite overexploitation of traditional water sources, the current *Surface water quality* and *Groundwater quality* are still at the acceptable threshold, being strength nor weaknesses, although they are still in a vulnerable position. Furthermore, water in Jerusalem partially emanates from aquifers across the country, such as the coastal and mountain aquifer, the latter is located underneath Jerusalem. but also from desalination plants at the coast. Mekorot is the national water distributor and pumps the water to Jerusalem every night. Consequently, *Supply continuity to reservoirs* is vulnerable in case of technological malfunctions. Overall, the system is strong, so this does not happen regularly, but it is considered a great weakness in the system. Lastly, *Sustainability of the water footprint* is a strength nor weakness as most water is imported from countries with relative water abundance.

Next, the state of *Sewerage and urban drainage* is found to be below the acceptable threshold with a score of 2.82. On the one hand, the *Age of the sewer system* in place is low, as all infrastructure is replaced every forty years, making this a moderate strength. *Stormwater drainage infrastructure* is found to be a great strength as sewerage and stormwater is separated. Simultaneously, the *Coverage of the sewer system* is deemed a great strength as it stretches across the city. Lastly, *Drainage flood* is considered a great weakness as there is a high percentage of sealed soil making the ground less permeable and more vulnerable to drainage issues.

At the same time, the state of *Purification* as a water service is the highest with a score of 4.5. As such, it is perceived in between a moderate and great strength. There remains an amount of wastewater untreated, but all wastewater that is treated is so at least with *Secondary treatment* and often even with *Tertiary treatment*, thereby scoring both as great strengths. These processes are relatively efficient in *Sewage sludge recovery*, *Nutrient recovery* and *Energy recovery*, making this moderate strengths. The *energy efficiency of wastewater treatment* is found to be a great strength.

Also, it was found that the state of the water service *Climate and atmospheric regulation* is the lowest with a score of 2, meaning that it is a moderate weakness. *Vegetation coverage* and *Net primary*

productivity of this vegetation are both considered moderate weaknesses. The low amount of vegetation and its low rate of storing energy as biomass contribute to a relatively poor state of climate and atmospheric regulation as it affects the temperature in Jerusalem.

Finally, the state of *Cultural* services is a moderate weakness with a score of 2. The *Ecological quality of water sources* and *Biodiversity* are found to be moderate weaknesses. There is severe degradation of the city's karst aquifer ecosystem, while the city (and country) is also characterised by a relatively high loss of species

6.2.4 Strengths and weaknesses in the Welfare dimension

Figure 8 shows that the Welfare dimension scores relatively high with an overall score of 3.82, therefore leaning towards being a moderate strength. The *Freshwater supply* is attributed a score 3.75, which is well above the threshold value of 3. Contributing to this high score are the indicators *People with adequate sanitation* and *Water-associated diseases* that are both signalled to be great strengths. Logically, as there is access to personal access to sanitation there is low occurrence of water-related diseases. Moreover, *People with adequate water supply* is considered a moderate strength. It is mandated by law that residents cannot be disconnected from the water grid even if they do not pay. However, some vagueness exists around the continuity of the water supply in some neighbourhoods behind the Separation Barrier as illegal houses are not allowed to get connected, which is a big issue in this area. In addition, this sub-dimension knows one great weakness which is the *Conflict over supply*. Israel's water sources are subject of conflict, given that there exist agreements on the amount of extraction of the Mountain aquifer that is transboundary. Palestine and Israel both have right to a certain amount, although Israel extracts more than is agreed. At the same time, there are conflicts over issues with sewerage and purification as part of Jerusalem's sewage flows openly to Palestine through the Kidron valley. Years of discussion have so far not resulted in a solution that works for both parties.

The next two ecosystem services, namely *Sewerage and drainage*, and *Purification*, score well in this dimension with scores of 5. The former is a result of the relatively low damages from stormwater flooding that occur. The latter scores well because the purified water is used for high-end agricultural purposes, which avoids irrigation water being logged from the freshwater supply. This is highly valuable given the scarcity in the region.

The lowest scoring sub-dimension in the Welfare dimension is *Climate and atmospheric regulation* with a score of 1; a great weakness. The city is victim to a high Heat risk, which is a great weakness. This might have to do with the earlier identified density of the build-environment and lack of vegetation coverage in combination with high temperatures. Similarly, the *Use of green space* is great weakness. Despite a trend of increasing green spaces, Jerusalem is still characterised by a relative low area of green and blue space, thereby limiting the possibility to use it and to combat the heat risk effect.

Finally, *Cultural* services has a Welfare score of 4.33, meaning it is more than a moderate weakness. The *Accessibility of natural areas* is considered strength nor weakness as areas are overall

freely accessible, but the proximity is skewed in favour of residents in West Jerusalem. The *Water image* of Jerusalem is a great strength as the water features that are present in the city have an overall positive connotation. The same score applies to the indicator *Ceremonial and educational importance*. Jerusalem is characterised by and founded around natural springs. These springs have religious value, especially for Muslims, as well as historic value. There exist ceremonial activities that demand the integrity of these springs and the water. Also scientific monitoring sites for water are present.

6.2.5 Strengths and weaknesses in the Response dimension

Following Figure 8, the Response dimension scores in-between the other dimensions with a score of 3.17, which is above the acceptable threshold. The sub-dimension *Individuals and communities* scores just below this threshold with 2.75. Several moderate weaknesses can be identified. First, *Affordability* is a moderate weakness. Although water is affordable once connected, the connection requires housing build with a building permit, which for some individuals is hard to come by bureaucratically and financially. Second, *Consumer willingness-to-pay* is a moderate weakness as consumers have a lack of influence on the services they receive. In some neighbourhoods in East Jerusalem there is a higher rate of non-payment. Third, there is a lack of *Stakeholder inclusiveness* in the water sector, resulting in a lack of focus on *Progress and variety of options*. At the same time, *Access to data and information* is considered a moderate strength as information is fairly accessible and abundantly available. Also *Agents of change* scores as a moderate strength, given that there are possibilities for entrepreneurial actors to involve themselves in the water sector, albeit probably encountering some bureaucratic obstacles. Furthermore, multiple indicators score as weakness nor strength. *Local Awareness and understanding* on water issues is limited to tangible issues. Moreover, individuals' and communities' *Room to manoeuvre* in the water sector is constrained by the power of institutions.

Next to this, the lowest score is for the institutional framework with 2.67. This has to do with the top-down nature of the water governance system. *Authority* is deemed a moderate strength as the creation of semi-private water utility Hagihon has made clear who the authority is, although they are still highly dependent on decisions made by the national water bodies. Next to this, *Policy instruments* are a moderate weakness as counter-productive policies co-exist in the water sector. For instance, policies for sustainable water management exist next to policies on lower rates for businesses that are using the most water. Simultaneously, the *Protection of core values* is the only indicator that is a great weakness, being caused by the lower quality of received water services by some neighbourhoods in Jerusalem. Moreover, these groups are not adequately engaged, which causes policies to exclude them. Lastly, several indicators score as weakness nor strength. First, the *Clarity of roles and responsibilities*, because although roles and responsibilities are clear, responsibility is not always taken by the authorities responsible. For instance, the neighbourhoods behind the Separation Barrier fall under municipality Jerusalem and are thus the responsibility of Hagihon. Nevertheless, these neighbourhoods are neglected. Second, *Horizontal and vertical coordination* has a score of 3 as the top-down structure gives some

vertical (one-directional) coordination, but horizontal coordination across sectors are lacking, thereby missing an opportunity for mutual benefits. Finally, *Cross-stakeholder learning* scores as strength nor weakness, because this learning mainly takes place when desired by the authorities.

Additionally, *Planning* scores as a moderate strength with a score of 4. The same score applies to all underlying indicators. The semi-privatisation of Hagihon ensured relatively long-term *Strategic planning* and *Financial continuation*. The water utility also has emergency plans in case of, for example, contamination events or technological malfunctions. Thus, the utility is able to execute sufficient *Disaster management*.

Lastly, *Operational management* scores above the acceptable threshold with a score of 3.25. Regardless of how the systems are organised, *Sewerage and drainage management* and *Purification management* are well-arranged by Hagihon and subsidiary MAVTI respectively, thereby scoring as moderate weaknesses, as there is still some room for extension of the infrastructural grid. *Water supply management* is also very adequate, but as the operational management in some neighbourhoods gets neglected this indicator is identified as strength nor weakness. Finally, solely the *Ecological management* of the city seems to have lack of representation in a certain body, thereby translating into a moderate weakness.

6.3 Conclusion

The results in this chapter provided insights into the strengths and weaknesses of Jerusalem's Water Welfare looking at it from the UWW. It showed that some dimensions scored better than others. Moreover, the water system services perform differently across dimensions. The next chapter presents the findings of the role of capabilities and other factors on UWW through testing the propositions. These results contribute to an understanding of the possible interplay of capabilities with other dimensions than the Pressure dimension. Furthermore, suggested strategies by actors in Jerusalem are presented for changing differences in capabilities and other factors that are perceived to have influence on Jerusalem's UWW.

7 Results of testing the theoretical propositions in Jerusalem

7.1 Introduction

This chapter presents the results of the second part of the UWWAA, namely the testing of the theoretical propositions through a Q-study with interviews. First, respondents are clustered into different perspectives as they to some extent perceive different capabilities to be relevant. Second, the consensus that exists across perspectives and the conflict between perspectives is discussed consecutively. The shared and individual viewpoints of the perspectives supply an answer to the sixth sub-question *To what extent do capabilities and other factors influence Jerusalem's water welfare?* Additionally, strategies are presented that respondents proposed for addressing differences in relevant capabilities and other factors, thereby giving an answer to the seventh sub-question *What suggestions do actors in Jerusalem make for strategies addressing differences in capabilities that influence Jerusalem's water welfare?* The chapter finishes with a conclusion on the findings and prelude the next chapter.

7.2 Clustering respondents into shared perspectives

Each respondent organised the 32 propositions in a Q-sort, which were clustered in meaningful ways, so-called factors or perspectives, through the PQ-Method software. The individual scores attributed to the propositions can be found in Appendix H. First, a PCA was conducted that displayed the eigenvalues for every factor. Here, four factors had an eigenvalue higher than 1, which was therefore the maximum number of perspectives extracted (Donner, 2001). Subsequently, varimax rotation, which optimises variance for the factors, was performed with both 2, 3 and 4 factors. After in-depth assessment of the significant statements in each perspective for each rotation, a rotation with 3 factors was chosen as most meaningful and easiest to interpret based on the interviews. It was found that 2 factors offered too little coverage of the data and the factors had relatively many respondents in each factor making it difficult to interpret the results given the lack of a pattern. Simultaneously, 4 factors led to excessive fragmentation of the data, whereas one perspective only contained one respondent. Therefore, 3 factors were believed to provide the most valuable clustering of the data, explaining 66 percent of the variance. The factor loadings of this rotation and the explained variance per perspective are presented in Table 8.

Table 8

Factor loadings of each respondent in each perspective after factor analysis.

	Shared perspectives		
	Environmentalists	Establishment	Egalitarians
Respondent 1	0.4351**	-0.2928	0.5064
Respondent 2	0.7984*	0.1790	0.0968
Respondent 3	0.7754*	0.3589	0.1930
Respondent 4	-0.0208	0.7436*	0.2687
Respondent 5	0.0401	0.7873*	-0.2078
Respondent 6	0.6913*	-0.1452	-0.0723
Respondent 7	0.1979	0.5787**	0.6423*

Respondent 8	0.7707*	0.0779	0.0512
Respondent 9	-0.0633	-0.0213	0.7763*
Respondent 10	0.5402	0.6877*	-0.2107
Explained variance (%)	28	23	15

Note. * Automatically pre-flagged defining factor loading, ** Manually flagged factor loading.

Table 8 shows that each factor is characterised by several defining Q-sorts, which essentially means that certain respondents can be attributed specifically to that certain factor or perspective. Automatic pre-flagging of factor loadings was performed to find the respondents that are defining for each perspective. A respondent's Q-sort is flagged for a factor when the loading is significantly high and it is much larger than the loading of that respondent's Q-sort on other factors (Zabala & Pascual, 2016). Afterwards, two factor loadings were flagged manually, namely respondent 1 in factor 1 and respondent 7 in factor 2. These two respondents have higher factor loadings on multiple factors, which causes them to be considered confounding by the software (Zabala & Pascual, 2016). Consequently, they are not automatically pre-flagged given that their Q-sort does not differ significantly over factors and suits multiple factors. However, after examination of the factors the respondents were included given their background that fitted the factor and helped interpretation. Moreover, the manually flagged factor loadings with values of .59 and .44 can still be considered good and fair respectively (Tabachnick, Fidell, & Ullman, 2007)

Further, Table 8 shows the three perspectives were identified: Environmentalists, the Establishment and Egalitarians. The term Environmentalists was chosen as this perspective is mainly characterised by NGOs and/or respondents with a prioritised focus on environmental sustainability in the city. Simultaneously, the Establishment perspective contains only people that work for the establishment, either the municipality or the semi-privatised water utility Hagihon and its subsidiary MAVTI. It is this group that controls city budgets. Further, Egalitarians are people that have a focus on social inequalities in the city. The group contains a Palestinian and someone for the municipality's Social division. It is not to say that people in the different perspectives perceive other perspectives as irrelevant, but it shows where their own focus appears to lie.

7.3 Shared perspectives across respondents

After the factor analysis, a more in-depth analysis revealed that there is a large base of consensus across perspectives. This signifies that there are propositions on which general agreement or disagreement exists regardless of perspective. Table 9 shows the weighted averages of the propositions for each perspective ranked from most consensual to most conflictual statements.

Table 9

Average weighted scores for propositions by each perspective ranked from most consensus to most disagreement between perspectives.

Capability	Effect on UWW	Proposition	Environmentalists	Establishment	Egalitarians	Interpretation
Health	Access to cultural services	People mentally and physically healthy are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that are not healthy.**	-2	-2	-2	Consensual disagreement
Participation in social life	Access to regulating services	People that are part of a large or close community are more likely to have access to sewer (treatment) infrastructure than people that are not part of such a community.**	0	0	-1	Consensually undecided
Autonomy and self-determination	Access to regulating services	People that feel empowered and in control over their decisions are more likely to have access to sewer (treatment) infrastructure than people that do not feel empowered nor in control over their decisions.**	0	0	-1	Consensually undecided
Significant relations with others	Access to regulating services	People that are part of a powerful/dominant community are more likely to have access to sewer (treatment) infrastructure than people that are not part of such a community.**	1	2	1	Consensual agreement
Significant relations with others	Access to cultural services	People that are part of a powerful/dominant community are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that are not part of such a community.**	2	3	3	Consensual agreement
Aspiration, self-respect and accomplishment	Access to regulating services	People that feel valued and like having a voice are more likely to have access to sewer (treatment) infrastructure than people that do not feel valued nor like having a voice.**	-2	-1	0	Consensual disagreement
Significant relations with others	Access to provisioning services	People that are part of a powerful/dominant community are more likely to have access to adequate freshwater for drinking and sanitation than people that are not part of such a community.**	0	2	2	Consensual agreement
Aspiration, self-respect and accomplishment	Participation	People that feel valued and like having a voice are more likely to take grassroot initiative in the water sector than people that do not feel valued nor like having a voice.*	1	1	3	Consensual agreement
Autonomy and self-determination	Access to provisioning services	People that feel empowered and in control over their decisions are more likely to have access to adequate freshwater for drinking and sanitation than people that do not feel empowered nor in control over their decisions.*	-1	0	1	Non-significant conflict
Significant relations with others	Participation	People that are part of a powerful/dominant community are more likely to take grassroot initiative in the water sector than people that are not part of such a community.*	3	3	1	Consensual agreement

Basic goods	Access to cultural services	People possessing basic goods, such as a normal income, are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people without basic goods.*	1	2	-1	Non-significant conflict
Basic goods	Access to regulating services	People possessing basic goods, such as a normal income, are more likely to have access to sewer (treatment) infrastructure than people without basic goods.	-1	-3	-2	Consensual disagreement
Education	Access to regulating services	People literate in Hebrew are more likely to have access to sewer (treatment) infrastructure than people illiterate in Hebrew	-1	-4	-3	Consensual disagreement
Education	Access to provisioning services	People literate in Hebrew are more likely to have access to adequate freshwater for drinking and sanitation than people illiterate in Hebrew.	-1	-3	0	Consensual disagreement
Awareness and understanding	Access to regulating services	People that have environmental awareness and understanding are more likely to have access to sewer (treatment) infrastructure than people that lack environmental awareness and understanding.	-2	1	-1	Conflict
Autonomy and self-determination	Participation	People that feel empowered and in control over their decisions are more likely to take grassroot initiative in the water sector than people that do not feel empowered nor in control over their decisions.	3	0	4	Consensual agreement
Awareness and understanding	Participation	People that have environmental awareness and understanding are more likely to take grassroot initiative in the water sector than people that lack environmental awareness and understanding.	4	4	2	Consensual agreement
Health	Access to regulating services	People mentally and physically healthy are more likely to have access to sewer (treatment) infrastructure than people that are not healthy.	-4	-2	0	Consensual disagreement
Participation in social life	Access to cultural services	People that are part of a large or close community are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that are not part of such a community.	0	-1	-4	Consensual disagreement
Basic goods	Access to provisioning services	People possessing basic goods, such as a normal income, are more likely to have access to adequate freshwater for drinking and sanitation than people without basic goods.	-3	-4	0	Consensual disagreement
Autonomy and self-determination	Access to cultural services	People that feel empowered and in control over their decisions are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that do not feel empowered nor in control over their decisions.	1	1	4	Consensual agreement

Health	Participation	People mentally and physically healthy are more likely to take grassroot initiative in the water sector than people that are not healthy.	2	-1	-2	Conflict
Education	Access to cultural services	People literate in Hebrew are more likely to have access to green areas and/or water sources for recreational, spiritual and educational uses than people illiterate in Hebrew.	0	-3	0	Conflict
Participation in social life	Access to provisioning services	People that are part of a large or close community are more likely to have access to adequate freshwater for drinking and sanitation than people that are not part of such a community.	0	1	-4	Conflict
Health	Access to provisioning services	People mentally and physically healthy are more likely to have access to adequate freshwater for drinking and sanitation than people that are not healthy.	-4	0	-2	Consensual disagreement
Aspiration, self-respect and accomplishment	Access to cultural services	People that feel valued and like having a voice are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that do not feel valued nor like having a voice.	-2	2	2	Conflict
Basic goods	Participation	People possessing basic goods, such as a normal income, are more likely to take grassroot initiative in the water sector than people without basic goods	4	-2	2	Conflict
Education	Participation	People literate in Hebrew are more likely to take grassroot initiative in the water sector than people illiterate in Hebrew.	2	-2	0	Conflict
Awareness and understanding	Access to provisioning services	People that have environmental awareness and understanding are more likely to have access to adequate freshwater for drinking and sanitation than people that lack environmental awareness and understanding.	-3	3	1	Conflict
Participation in social life	Participation	People that are part of a large or close community are more likely to take grassroot initiative in the water sector than people that are not part of such a community.	3	0	-3	Conflict
Aspiration, self-respect and accomplishment	Access to provisioning services	People that feel valued and like having a voice are more likely to have access to adequate freshwater for drinking and sanitation than do not feel like valued nor like having a voice.	-3	-1	3	Conflict
Awareness and understanding	Access to cultural services	People that have environmental awareness and understanding are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that lack environmental awareness and understanding.	2	4	-3	Conflict

Note. * Non-significant $P > .01$, ** Non-significant $P > .05$

Table 9 shows that eleven statements proved non-significant between perspectives. When two perspectives have consensus and the third perspective has a score of 0 (i.e. undecided), the proposition is perceived as consensual in favour of the other two. Meanwhile, while two scores are 0 and the third one is not, this is perceived as consensually undecided when this difference is non-significant. When this difference is significant, the proposition is perceived to be conflictual across perspectives.

7.3.1 Consensus across perspectives

Across respondents there are several propositions around which consensus exists. These are not only the eleven non-significant statements in Table 9, provided that a difference between perspectives might be statistically significant but that across factors there is still agreement to differing degrees (e.g. agreement of 1 or 4). Here it is discussed about what statements consensual agreement and disagreement exists successively. Where possible these findings are supported by quotes, as only extreme categories were discussed the interviews.

7.3.1.1 *Relevant capabilities for Jerusalem's UWW*

It is found that all propositions on the capability *Significant relations with others* were statistically non-significant and agreed with positively across the board. This means that there is overall agreement that being part of a powerful and dominant group is particularly relevant in Jerusalem for both access to all water services and taking grassroot action in the water sector, thereby affecting Jerusalem's Urban Water Welfare.

Two trends can be observed. First, it is found that being part of a less powerful community coincides with lower access to water services as they will demand less. This does not necessarily mean a lack of access entirely as it does a lower quality of the services received. Egalitarians recognise the better possibilities for water access and participation for more powerful groups (R09; R11). From their perspective, this mainly relates to the national split, meaning that there exist differences between West Jerusalem and annexed East Jerusalem (R11). This essentially correlates with Israeli residents and Arab or Palestinian inhabitants respectively.

At the same time, the powerful group is not always determined by the national split. Environmentalists define a powerful group as one with more resources, may it be political power, money or any other form of a resource. Moreover, they point out that the powerful community can be a situational component that is influenced by the perspective of the establishment (R03). Weaker communities can be part of a strong community when their point of view coincides with governmental agencies and come out winning, even if a strong opposition is present (R03). This group also sees the more powerful community as more often serving their own self-centred motives that often do not align with the group that has environmental awareness and understanding.

Second, grassroots action is seen as a privilege reserved for the more powerful communities. Strong communities will engage in grassroots action, while weak communities are preoccupied with access issues (R06). An exception to this rule seems to be when basic water access of weaker communities is compromised (R01).

“You have to have strength to be able to do grassroots action. So you need to feel that you're secure. However, in some places people are so desperate that they're the ones who go and bang on the table.”

– Respondent 1: Environmentalist

Next to this, consensual agreement exists on the importance of *Aspiration, self-respect and accomplishment, Autonomy and self-determination* and *Awareness and understanding* for taking grassroots action. However, these appear to be subordinate to the capability *Significant relations with others*.

Aspiration, self-respect and accomplishment refers to whether people feel valued and listened to and respondents link this more subjective value to the capability *Significant relations with others* as being part of a powerful community is likely to augment the extent that people feel seen and heard. The same applies to *Autonomy and self-determination* that resembles whether people feel empowered. This is because all these capabilities are associated power-based differences (R09). People discussing these capabilities in combination often reflects the national split that exists:

“I think this is the same point as the last one. They have the power, so they can create more parks, more recreational areas in their communities. The others that do not have voices in the municipality, they cannot decide where the budget goes, so it goes to West rather than East Jerusalem. [...] Everything in Jerusalem is more political and in control. So, if we have the power and positions, we are more likely to take grassroots initiative in the water sector, but also other issues.”

– Respondent 9: Egalitarian

“So we have the powerful communities, part of a large or close community, people that feel valued, people that feel empowered. Those are the ones that take up arms and go out and fight. But I think that another reason that people would take grassroots initiative is because they feel in control and they feel empowered by or, you know, they feel that their actions will have influence.”

– Respondent 3: Environmentalist

The exception appears to be an infringement of basic needs. A lack of water services required for survival has an empowering effect that will make powerless people be heard:

“Somebody empowered, somebody stronger, probably will demand it stronger, of course. 10,000 people did not have water. [...] They had to go to court. If they did not empower, they would have never had water.”

– Respondent 8: Environmentalist

When there is no infringement of basic rights, *Awareness and understanding* is perceived as conditional for taking grassroots action. Water issues are not top of mind, unless people engage in the civil society around environmental issues (R02). However, participation is seen as a privilege in light of access issues, disabling weaker communities (R06; R09). People part of a powerful community, be it because of national reasons or resources, require awareness and understanding to take action.

“And the other group that I put into this category is the people with environmental awareness and understanding. They are the core of Jerusalem’s environmental civil society. They are not a very powerful or dominant community, but they simply care. They will get involved in a grassroots initiative that is not necessarily of benefit to them.”

– Respondent 3: Environmentalist

“I feel like people that are environmentally aware and people that are loud in a good way, people that are loud and put their mind into action, they push the authorities. That is how I see it.”

– Respondent 4: Establishment

To conclude, for people that are not part of the powerful community, their reason for not participating is that they do not feel valued or heard. Meanwhile, for people in the powerful community, having environmental awareness and understanding is most likely conditional for participation. Infringement on basic rights trumps these two reasons and will generate participation regardless of feeling valued and heard or having awareness and understanding. This points to an emancipating effect of the capability *Basic goods*, as water can be seen as a basic good (R09). However, most respondents did not interpret it as such.

7.3.1.2 Irrelevant capabilities for Jerusalem’s UWW

The capabilities *Education* and *Health* were found to be irrelevant or of undecided importance in Jerusalem for people’s access to all water services. This result can be attributed to Jerusalem being part of a welfare state, where less privileged are generally taken care of (R03).

“I don’t believe that at the end of the day it will be different. Of course, if you don’t know the local language you have a problem. You have a problem in the coffee shop, you have a problem when you want to cross the street and ask someone where to go to your destination. But somehow you will get

along and you will get to your destination, the same here. You will ask your neighbour; you will somehow find someone in the calling centre that speaks your language.”

– Respondent 2: Environmentalist

“If they are healthier, they will maybe start asking more; getting more water filters in their individual houses. But they are not likely to have lacking access.”

– Respondent 9: Egalitarian

Next to this, people disagree with *Aspiration, self-respect and accomplishment* and *Basic goods* being relevant for getting access to regulating services in Jerusalem. Meanwhile, they appear to be consensually undecided about the relevance of *Participation in social life* and *Autonomy and self-determination* for regulating services. However, in both instances Egalitarians lean towards them being irrelevant, but this difference is non-significant. Sewer and sewage treatment infrastructure are arranged top-down and is often already in place, therefore access to this service is perceived as not being influenced or determined by most (6 out of 8) capabilities (R01; R03; R11).

“Most of the city has sewage and continues expanding, because it's an environmental and health issue.”

– Respondent 8: Environmentalist

Furthermore, possession of *Basic goods* is found to be irrelevant in Jerusalem for acquiring access to provisioning services. This result can be ascribed to the fact that Hagihon is legally not allowed to cut domestic water supply in light of non-payment (R03; R08).

“You could say that water that water is more of a basic product and therefore there is stronger access to freshwater, even if you're poor or Arab et cetera. [...] Water is a basic right. People don't pay, have to pay. It is very difficult to shut down the water because it is a basic need. Sewer is different, it is the responsibility of the municipality or Hagihon to put the pipes and have the service. But they will say I will not put the pipe and service if you do not pay me. Even if they want to do it, it is difficult to access. But most of the city has sewer and continues expanding because it's an environmental and health issue. [...] Sewer is not about income. It's about other denominators.”

– Respondent 8: Environmentalist

Lastly, respondents generally see *Participation in social life* as irrelevant for access to cultural services of water, meaning that the density of size of communities does not affect this access. Overall, green spaces and water sources are freely accessible, although for some in closer proximity (R07).

“The next one, people that are part of a large or close community are more likely to have access to cultural services. It is very similar to the last one on grassroots initiatives. In East Jerusalem we are 40% of the population and we don’t have green spaces. That is not a 100% true but compared to West Jerusalem.”

– Respondent 9: Egalitarian

“Since some of the strong neighbourhoods for example are small, it probably isn’t a strong way to differentiate. Because sometimes you have a very strong rich small neighbourhood and it is getting all the stuff. And the very large neighbourhoods in East Jerusalem, like Silwan, that holds tens of thousands of people and they might be extremely weak that way, so size is not a... I disagree.”

– Respondent 8: Environmentalist

7.3.2 Conflict between the shared perspectives

Besides agreement across perspectives, there is also conflict as can be seen in Table 9. For some conflictual propositions there is one group that scores different from the other groups, which says something about that perspective in particular. For other propositions all groups score significantly different from each other, meaning that there is no agreement between any of the perspectives. In practice, this translates to two perspectives that score on the outer end of the spectrum and one that is relatively undecided in the middle.

7.3.2.1 Perspective 1: Environmentalists

The first group that is identified is the group of Environmentalists (n = 5). The ten propositions that this group scores significantly different on than the other groups are presented in Table 10. This group is characterised by people from NGOs and sustainability-minded people. They see possibilities for grassroots action, specifically when it comes to cultural services of water, such as community gardens.

Table 10 shows that, first and foremost, Environmentalists attach a lot of importance to the capability *Participation in social life* for taking grassroots initiative, while other groups perceive this as irrelevant. Environmentalists interpret this capability as the ability to create a network (R03), while the other groups appear to see this capability as something static regarding the community someone is and stays a part of (R09). Moreover, Environmentalists see this capability as conditional for most grassroots initiative, given that any idea needs to be backed up by a motivated community (R02). Consequently, in practice, Environmentalists connect this capability to having *Awareness and understanding* to get access to cultural services of water. Interestingly enough, grassroots initiative is mainly perceived as something that applies to cultural services and not as something that can be done with regards to provisioning or regulating water services (R06).

“I think that all sectors of environmental participation or awareness are important, but I think it's because of the issues of access that it's conceived as a privilege. [...] If you're not part of this dominant group then you don't have these two basic services of drinking and sanitation and sewerage and then all the rest of the you know... therefore you're less likely to be active in the third category [cultural services]. I guess I always considered the grassroots initiative part as the as part of this category for recreation, like you said. So, you are less likely to be active when you are not part of that [dominant] group.”

– Respondent 6: Environmentalist

Thus, the idea is that people with environmental *Awareness and understanding*, such as the Environmentalists, will make more use of cultural services than others. Given the idea that only cultural services that can be influenced through bottom-up action, it is people with this awareness and understanding that are likely to take action and have the intrinsic motivation to create a large and/or close community.

“Actually awareness and community are the most important elements for all this that you are interested in. Whether it is water issues or other environmental issues definitely. You cannot do it alone and you won't do it if you are not aware to the importance somehow.”

– Respondent 2: Environmentalist

Additionally, this group is the only one that has a positive association between being educated and healthy to take grassroots initiative. People literate in Hebrew and people that are mentally and physically healthy are better able to voice their opinions (R01; R03).

At the same time, this group perceives the capabilities *Autonomy and self-determination*, *Awareness and understanding*, and *Aspiration, self-respect and accomplishment* to be irrelevant for access to freshwater supply for drinking and sanitation. Effectively this means that neither empowerment, awareness nor feeling valued and like having a voice respectively influence this type of access. This might have to do with the perception that this is a service people receive from the establishment rather than actively demand. Moreover, this group is generally under the impression that everyone has access to freshwater (R01; R02). Consequently, individual capabilities are irrelevant for getting access to drinking water and sanitation.

Finally, Environmentalists are the only ones to perceive *Aspiration, self-respect and accomplishment* irrelevant for getting access to cultural services (R06) and to strongly disagree with the importance of the capability *Health* for access to sewerage and purification (R02; R03). In addition, Environmentalists are undecided over the relevance of *Participation in social life* for access to drinking water and sanitation.

Table 10

Propositions that Environmentalists perceive differently than the other groups (P < .05).

Capability	Effect on UWW	Proposition	Environmentalists	Establishment	Egalitarians
Participation in social life	Participation	People that are part of a large or close community are more likely to take grassroots initiative in the water sector than people that are not part of such a community.	3 (1.26)*	0 (0.13)	-3 (-1.36)
Education	Participation	People literate in Hebrew are more likely to take grassroots initiative in the water sector than people illiterate in Hebrew	2 (1.05)*	-2 (-1.26)	0 (-0.23)
Health	Participation	People mentally and physically healthy are more likely to take grassroots initiative in the water sector than people that are not healthy.	2 (1.02)*	-1 (-0.48)	-2 (-0.87)
Awareness and understanding	Access to cultural services	People that have environmental awareness and understanding are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that lack environmental awareness and understanding	2 (0.89)	4 (1.63)	-3 (-1.36)
Participation in social life	Access to provisioning services	People that are part of a large or close community are more likely to have access to adequate freshwater for drinking and sanitation than people that are not part of such a community.	0 (-0.44)*	1 (0.49)	-4 (1.59)
Autonomy and self-determination	Access to provisioning services	People that feel empowered and in control over their decisions are more likely to have access to adequate freshwater for drinking and sanitation than people that do not feel empowered nor in control over their decisions.	-1 (-0.47)	0 (0.29)	1 (0.53)
Aspiration, self-respect and accomplishment	Access to cultural services	People that feel valued and like having a voice are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that do not feel valued nor like having a voice.	-2 (-0.87)*	2 (0.67)	2 (1.21)
Awareness and understanding	Access to provisioning services	People that have environmental awareness and understanding are more likely to have access to adequate freshwater for drinking and sanitation than people that lack environmental awareness and understanding.	-3 (-1.20)*	3 (1.35)	1 (-0.00)
Aspiration, self-respect and accomplishment	Access to provisioning services	People that feel valued and like having a voice are more likely to have access to adequate freshwater for drinking and sanitation than do not feel like valued nor like having a voice	-3 (-1.53)*	-1 (-0.39)	3 (1.40)
Health	Access to regulating services	People mentally and physically healthy are more likely to have access to sewer (treatment) infrastructure than people that are not healthy.	-4 (-1.66)*	-2 (-0.68)	0 (-0.19)

Note. * P < .01

7.3.2.2 *Perspective 2: Establishment*

The second perspective that was identified is that of the Establishment (n = 4). This group is made up of people that are all active within (semi-)governmental institutions, namely the semi-privatised water utility Hagihon, subsidiary MAVTI concerned with wastewater treatment and the municipality. One respondent from the municipality belonged to Environmentalists instead of the Establishment as he is part of the Sustainability division and has a corresponding focus.

Table 11 shows the propositions that are scored significantly different by people in the Establishment perspective in comparison to the other viewpoints. As can be this group attaches more importance than the other groups to having environmental awareness and understanding for getting access to any type of water service, both provisioning, regulating and cultural. The explanation for this is the idea that someone who is environmentally aware and has understanding can choose where to live and determine the quality of his or her access to these services (R05).

“Again, I'm not saying it's always like that, but people with awareness of environmental issues will be more likely to try to look and ask for the family to go and live in a place where they know that things are better.”

– Respondent 5: Establishment

At the same time, whereas other groups see *Basic Goods* as a requirement for grassroots initiative in the water sector, because a person needs resources like money and time, the Establishment group appears to believe that possessing *Basic Goods* is irrelevant for taking grassroots initiative. This might have to do with the fact that this group sees people's ability to influence their access to water services to be based on people's ability to choose where to live based on their environmental awareness and understanding. This implies that the system cannot be influenced as such, but one can more easily change its literal position in that system. Additionally, this group disagrees with *Basic Goods* being relevant for getting access to sewerage and purification services with this infrastructure being available and non-influenceable by residents (R04; R10).

“It's a nice question and people with basic goods can live in a place with or without a lot of fresh water. But that's not something that anybody would ask. Again, income is important maybe in a place like India. As I mentioned, water quality is really not an issue here in Israel. So it has become less important. [...] Maybe me personally, because I have more awareness and clearly I know more about that, I probably will get involved. But the regular person... nobody cares about it. I mean, they care about when you have a drought and there is no water.”

– Respondent 5: Establishment

Next, the Establishment perspective, in contrast to the other groups, shows disagreement with the relevance of the capability *Education* for access to provisioning and cultural services as well as for taking grassroots initiative. Here, *Education* refers to literacy in Hebrew and the reigning belief is that information is both often available in multiple languages (Hebrew, Arabic and English) as that most people speak Hebrew or know someone that does. A possible explanation for this is that the Establishment is the one supplying the services and might perceive it as more positive than the other two perspectives that contains respondents that receive the services. Lastly, people in this group averagely are undecided about the relevance of *Health* on access to drinking water and sanitations as well as that of *Participation in social life* on taking grassroots initiative.

Table 11

Propositions that the Establishment perceives differently than the other groups ($P < .05$).

Capability	Effect on UWW	Proposition	Environment alists	Establishmen t	Egalitarians
Awareness and understanding	Access to cultural services	People that have environmental awareness and understanding are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that lack environmental awareness and understanding	2 (0.89)	4 (1.63)	-3 (-1.36)
Awareness and understanding	Access to provisioning services	People that have environmental awareness and understanding are more likely to have access to adequate freshwater for drinking and sanitation than people that lack environmental awareness and understanding.	-3 (-1.20)	3 (1.35)*	1 (-0.00)
Awareness and understanding	Access to regulating services	People that have environmental awareness and understanding are more likely to have access to sewer (treatment) infrastructure than people that lack environmental awareness and understanding.	-2 (-0.84)	1 (0.49)	-1 (-0.34)
Participation in social life	Access to provisioning services	People that are part of a large or close community are more likely to have access to adequate freshwater for drinking and sanitation than people that are not part of such a community	0 (-0.44)	1 (0.49)*	-4 (-1.59)
Health	Access to provisioning services	People mentally and physically healthy are more likely to have access to adequate freshwater for drinking and sanitation than people that are not healthy.	-4 (-1.58)	0 (0.41)*	-2 (-1.21)
Participation in social life	Participation	People that are part of a large or close community are more likely to take grassroot initiative in the water sector than people that are not part of such a community	3 (1.26)	0 (0.13)*	-3 (-1.36)
Aspiration, self-respect and accomplishment	Access to provisioning services	People that feel valued and like having a voice are more likely to have access to adequate freshwater for drinking and sanitation than do not feel like valued nor like having a voice.	-3 (-1.53)	-1 (-0.39)*	3 (1.40)
Basic goods	Participation	People possessing basic goods, such as a normal income, are more likely to take grassroot initiative in the water sector than people without basic goods.	4 (1.47)	-2 (-0.66)*	2 (0.87)
Education	Participation	People literate in Hebrew are more likely to take grassroot initiative in the water sector than people illiterate in Hebrew.	2 (1.05)	-2 (-1.26)	0 (-0.23)
Education	Access to provisioning services	People literate in Hebrew are more likely to have access to adequate freshwater for drinking and sanitation than people illiterate in Hebrew.	-1 (-0.58)	-3 (-1.38)	0 (-0.08)
Education	Access to cultural services	People literate in Hebrew are more likely to have access to green areas and/or water sources for recreational, spiritual and educational uses than people illiterate in Hebrew.	0 (0.30)	-3 (-1.64)*	0 (-0.08)

Basic goods	Access regulating services	to	People possessing basic goods, such as a normal income, are more likely to have access to sewer (treatment) infrastructure than people without basic goods	-1 (-0.61)	-3 (-1.67)	-2 (-0.68)
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Note. * P < .01

7.3.2.3 *Perspective 3: Egalitarians*

The third and last perspective that is identified are Egalitarians. People (n = 3) represented in this perspective are a Palestinian and a municipal employee of the Social division. The latter is also in the Establishment perspective as she strongly associates with both viewpoints. In addition, one interviewee did not perform the Q-study accurately and was not included in the factor analysis. However, it is believed that the respondent would have fitted in this perspective, given his focus on the inequalities in Jerusalem based on nationality (R11). Therefore, quotes from that respondent are also included to reinforce the findings in the category.

The thirteen propositions that this group scores significantly different on than the other groups are presented in Table 12. Table 12 strikingly illustrates a different focus on this group compared to the others.

First and foremost, this group is unique in the importance it attaches to the capabilities *Autonomy and self-determination* and *Aspiration, self-respect and accomplishment*. Although all perspectives agree as established in the previous section, Egalitarians in particular perceive autonomy and the idea of feeling empowered and in control over one's decisions to be relevant for access to cultural services and taking grassroot initiative (R09).

In contrast, other groups disagree with the idea that the capability *Aspiration*, i.e. feeling valued and like having a voice, influences someone's access to drinking water and sanitation. Meanwhile, Egalitarians are the only ones to (strongly) agree with it. This is an interesting difference and might be explained by the way access to drinking and sanitation is interpreted. Egalitarians suggest that there are not so much issues of initial access as there are issues with the quality of the provided services that differ depending on the extent that people feel valued (R09).

“People that feel valued and like having a voice are more likely to have access to... it is somehow related to the previous here, they don't have the decision makers but at least they can feel that their voice is valuable. In East-Jerusalem we don't feel that our voice is valuable, this is normal. So that is maybe why we don't have the access to all these water sectors... [...] we don't feel we have a value of our voice. So we don't care to ask for more freshwater or better quality because we got used to get what they give us.”

– Respondent 9: Egalitarian

Following the previous, Egalitarians still believe that environmental *Awareness and understanding* is important for taking grassroot initiative in the water sector, although slightly less so compared to other groups. An explanation for this can be found in the prioritised problems of marginalised groups, as an Environmentalist pointed out that participation springing from environmental awareness and

understanding is a privilege (R06). In light of problems with empowerment and having a voice, this capability is less powerful (R09).

Regarding the influence of the capability *Significant relations with others* on taking grassroots action, people in the current perspective agree, although less so than people in other groups. Respondents directly link this capability on being part of the dominant group with the capabilities *Autonomy and self-determination* and *Aspiration, self-respect and accomplishment* as terminology of all capabilities is used interchangeably. A possible explanation behind this is that this group of people that stand in direct contact with or are part of the less powerful group, prioritise the more subjective values that underly being part of the less powerful group, i.e. feeling empowered and like having a voice, more than others that lack this contact. The subjective components might be perceived as more feasible to alter and might therefore be prioritised by this group, although essentially underlying the same theme of being part of a less powerful group.

It can be observed that this group perceives dynamics often as more static than other groups (R09; R11). The capability *Significant relations with others* and who is part of the powerful group they interpret as being pre-determined by the political situation (R11). Meanwhile, other groups see it as more situational (R03; R08). For instance, when taking initiative to protest construction plans that harm natural water sources or green space, who is part of the more powerful group is determined by the quality of the plan and the perspective of the establishment and one's ability to create a network (R03). This difference might have to do with the idea that participation is a privilege in light of more prominent issues, such as the constant threat of illegal housing demolitions (R09). At the same time, the question can be raised why this could not be applied to the access issues themselves (R06).

In contrast to the other two groups, Egalitarians generally believe that both *Basic goods* and *Awareness and understanding* are irrelevant for getting access to cultural services. This has to do with the knowledge that cultural services are overall freely accessible (R07; R11). However, the proximity of these services is primarily reserved for West Jerusalem (R09). As discussed in the section about the consensus statements, being part of a powerful community is therefore a better denominator of getting access to cultural services. Meanwhile, Egalitarians agree tentatively with the relevance of *Awareness and understanding* for access to provisioning services, as conscious people might look for options to improve their freshwater supply, such as buying water or filters (R07). In addition, Egalitarians are undecided about the relevance of *Basic goods* and provisioning services, as well as between *Education* and taking grassroots action.

Lastly, *Participation in social life* is perceived as irrelevant for access to drinking and sanitation, cultural services, and for taking grassroots initiative. The explanation for this is pretty straightforward, whereas people focused on the distinction between East and West Jerusalem see that being part of the large

community of Palestinians or any close community within that group has no effect for either getting access or initiative (R09). Therefore, the size or density of such a community is perceived as an irrelevant denominator.

Table 12

Propositions that the Egalitarians perceives differently than the other groups (P < .05).

Capability	Effect on UWW	Proposition	Environmentalists	Establishment	Egalitarians
Autonomy and self-determination	Access to cultural services	People that feel empowered and in control over their decisions are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that do not feel empowered nor in control over their decisions.	1 (0.33)	1 (0.63)	4 (1.93)*
Autonomy and self-determination	Participation	People that feel empowered and in control over their decisions are more likely to take grassroot initiative in the water sector than people that do not feel empowered nor in control over their decisions.	3 (1.05)	0 (0.46)	4 (1.93)
Aspiration, self-respect and accomplishment	Access to provisioning services	People that feel valued and like having a voice are more likely to have access to adequate freshwater for drinking and sanitation than do not feel like valued nor like having a voice.	-3 (-1.53)	-1 (-0.39)	3 (1.40)*
Awareness and understanding	Participation	People that have environmental awareness and understanding are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that lack environmental awareness and understanding.	4 (2.23)	4 (1.68)	2 (0.76)
Significant relations with others	Participation	People that are part of a powerful/dominant community are more likely to take grassroot initiative in the water sector than people that are not part of such a community.	3 (1.18)	3 (1.09)	1 (0.23)
Awareness and understanding	Access to provisioning services	People that have environmental awareness and understanding are more likely to have access to adequate freshwater for drinking and sanitation than people that lack environmental awareness and understanding.	-3 (-1.20)	3 (1.35)	1 (-0.00)*
Basic goods	Access to provisioning services	People possessing basic goods, such as a normal income, are more likely to have access to adequate freshwater for drinking and sanitation than people without basic goods.	-3 (-1.19)	-4 (-1.67)	0 (-0.04)*
Education	Participation	People literate in Hebrew are more likely to take grassroot initiative in the water sector than people illiterate in Hebrew.	2 (1.05)	-2 (-1.26)	0 (-0.23)
Basic goods	Access to cultural services	People possessing basic goods, such as a normal income, are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people without basic goods.	1 (0.49)	2 (0.68)	-1 (-0.38)
Awareness and understanding	Access to cultural services	People that have environmental awareness and understanding are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that lack environmental awareness and understanding.	2 (0.89)	4 (1.63)	-3 (-1.36)*

Participation in social life	Participation		People that are part of a large or close community are more likely to take grassroots initiative in the water sector than people that are not part of such a community.	3 (1.26)	0 (0.13)	-3 (-1.36)*
Participation in social life	Access to cultural services		People that are part of a large or close community are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses than people that are not part of such a community.	0 (0.06)	-1 (-0.37)	-4 (-1.40)
Participation in social life	Access to provisioning services		People that are part of a large or close community are more likely to have access to adequate freshwater for drinking and sanitation than people that are not part of such a community.	0 (-0.44)	1 (0.49)	-4 (-1.59)*

Note. * P < .01

7.4 Other factors than capabilities influencing Jerusalem's UWW

Next to testing of the theoretical propositions on capabilities, respondents were asked about other factors influencing someone's access to water services and participation in the water sector. Three additional factors reoccurred across interviews, namely the neighbourhood someone lives in, the policy of the Jerusalem Master Plan and actuality that determines the agenda.

Neighbourhoods

The first and most prominent of these factors are *Neighbourhoods*. Jerusalem is characterised by a clear division of neighbourhoods and between them there are significant differences in living standards (R01; R02; R08). Differences between neighbourhoods can be seen through several lenses. For instance, there are rich and poor neighbourhoods, neighbourhoods that differ religiously, culturally and topographically and neighbourhoods with Israelis and Palestinians. Important to note is that these divisions are layered and partially overlap, consequently, they are not absolute, and exceptions always exist:

“In the non-orthodox neighbourhoods, you will find very poor and neglected neighbourhoods too. And you will find both in the Arab and ultra-orthodox communities you will find rich and poor neighbourhoods. So, I do not think that the divisions are not as clear as it might be convenient for us to have them be.”

– Respondent 3: Environmentalist

Regardless, the division of neighbourhoods by nationality is the one that was most often mentioned (R05; R06; R08; R09; R11). The water supply infrastructure in Palestinian neighbourhoods in East Jerusalem is older and more often insufficient, especially the areas beyond the Separation Barrier experience a shortage of infrastructure (R05). However, this does not apply to all these neighbourhoods, whereas some of them have good infrastructure and more welfare.

“There are nice villages in the city of Jerusalem, big villages of Palestinians living with a very high quality of live, the water is wonderful. But were the wall is, you know when they build the wall after all the terrorist attacks, the access to take care of the things on the other side became more difficult. So they have less.”

– Respondent 5: Establishment

However, the good infrastructure in Palestinian neighbourhoods, like Beit 'Hanina and Shu'afat, seems to connect to the fact that the neighbourhoods are the only way to get infrastructure to the Israeli settlements on the border of the municipality in annexed East Jerusalem without crossing the municipal borders (R11).

“And even then, the national parameter is not enough. Because if you are a Palestinian and you have the good luck to live near a settlement you will get the same quality of water as a Jew without any relation to your nationality.”

– Respondent 11: Egalitarian

Thus, it has to be considered that the exceptions of Palestinians with good infrastructure are focused on neighbourhoods that are located in a ‘good’ spot. These exceptions are plenty, but at the end of the day this difference can be said to still be caused by belonging to a powerful community or not, because without the settlements this infrastructure would most likely not have been as qualitative.

Jerusalem Master Plan

Another factor that was mentioned regularly is the importance of the *Jerusalem Master Plan*. This policy document is used to determine planning of new infrastructure (R06; R08; R11). The Jerusalem Master Plan applies to the whole municipality and determines, for instance, what areas are destined as residential and green area. Water infrastructure is only developed for domestic use if the area is defined as residential according to the Master Plan (R08). However, it is said that the Jerusalem Master Plan is used for restrictive planning. Following the national demographic policy there is a set boundary of a maximum of 40 percent Arabs in Jerusalem (R06).

“Well that brings us to the whole demographic question and the demographic policy of the country, because the planning policy is guided by the National Policy and demographic policy is a very major component of policy. [...] I mean, certainly money could buy anything, but not entirely in the local context in the sense that even people who can pay for a permit and can pay for planning and can pay for everything, they still reach the limits that the national structure is putting on them.”

– Respondent 6: Environmentalist

“The municipality uses the Master Plan in order to supply services and to refuse. If according to the Master Plan an area is for residential purposes, so the municipality will develop infrastructure for water. If according to the Master Plan this is defined as green land, then they will not do it. [...] What I try to say is that they use the Master Plan in order to try to limit the amount of services they [refers to Palestinians in East Jerusalem] get.”

– Respondent 11: Egalitarian

Thus, it is difficult for Palestinians to obtain a building permit and a lot of illegal building occurs because of this. Meanwhile, these illegal houses cannot be connected to the water grid following the destination plans in the Jerusalem Master Plan:

“But if you will ask people from the establishment, they will say that everything depends on the Master Plan. It is according to what the Master Plan says. If the land has been defined as residential, they will have access to water and sanitation, everybody. If they decided to build illegally in a zone that is not for residential use, they will not have access. But it is not ‘our’ fault, it is their fault, because they build without permit.”

– Respondent 8: Environmentalist

“So, if you will ask someone from the ground or from NGOs, they will say that everything [including water infrastructure] depends on nationality and location. But if you will ask people from the establishment, they will say that everything depends on the Master Plan.”

– Respondent 11: Egalitarian

Actuality

A last factor mentioned to influence urban water welfare was actuality, this means that issues on the agenda determine whether people participate in the water sector, making it a situational component (R02; R03). There have been several real estate projects threatening cultural services of water (R01). Respondents say that capabilities are not always the most important for taking action, it is actuality and whether something in your neighbourhood is at stake. If that is the case, you will take grassroot initiative and allows someone to access certain capabilities. After the issue at hand moves out of the spotlight, participation might subside (R02).

“Adding to all this, probably some major projects that are anti-environment, people would join in demonstrations and going against them through public activities. And through their public activities of them trying to prevent certain projects, they would without even noticing go into being more aware of environment, because it is close to their home. [...] If you would ask me about environment and awareness, maybe at that point of time and life I would be very aware to certain things, not to other environment elements. Maybe a year after or a year ago I would have been completely different.”

– Respondent 2: Environmentalist

7.5 Strategies proposed across perspectives

Across perspectives around eight, sometimes interrelated, strategies were proposed to address the capabilities that play a role in Jerusalem’s UWW through water access and participation. Table 13 displays the strategies proposed and by whom.

Table 13

Proposed strategies to improve UWW by people with different perspectives.

Strategy	Perspective proposing the strategy
Make water issues more tangible by starting initiatives that connect people to water	Environmentalists
Make urban planning more sustainable	Environmentalists
Improve the existing water infrastructure	Establishment
Finding initiators to lead local projects	Environmentalists and Egalitarians
Stimulate more collaboration	Environmentalists and Egalitarians
Alter the political representation in the municipality for budget allocation that is fairer.	Environmentalists and Egalitarians
Improve socio-economic status	Environmentalists and Establishment
Make water issues more tangible by improving education and communication	Environmentalists, Establishment and Egalitarians

Earlier it was established that there was consensual agreement on the capability *Significant relations with others* for both water access and participation. The same applies to the capabilities *Aspiration, self-respect and accomplishment, Autonomy and self-determination* and *Awareness and understanding* for people's participation in the water sector.

To address these capabilities that influence UWW, Table 13 shows that Environmentalists and the Establishment propose to improve socio-economic status (R03; R07). Meanwhile, Environmentalists and Egalitarians suggest improving Palestinian political representation to support more equal budget allocation (R03; R08; R09). The latter is most likely a complex process as there is an unwillingness to recognise Israeli sovereignty as well as a fear for Palestinian retribution when Palestinians in East Jerusalem go voting (R08). Although addressing different marginalised groups, both strategies focus on empowerment and strengthening weak communities, which in turn makes them feel more valued and heard, thereby addressing the corresponding capabilities *Significant relations with others, Aspiration, self-respect and accomplishment* and *Autonomy and self-determination*. In turn, this is expected to contribute to improving Jerusalem's UWW.

"A very wise professor that I know, said that the future sustainability of Jerusalem does not depend on whether there are more ultra-orthodox Jews or more Arabs or more secular and traditional Israelis, it depends on having a majority of people that can pay their taxes and take an active part in civil society and be a part of the city's community."

– Respondent 3: Environmentalist

For improving *Awareness and understanding*, which is deemed important for participation in the water sector, people from all three perspectives put forward better education and communication that make water issues more tangible (R01; R02; R05; R06; R07; R10). Education of the general public on water issues will generate gradual change as it is believed that the other way to change awareness is if disaster strikes, like a drought, because water is such a relatively invisible aspect of daily lives (R02; R05).

“In most cases I think major changes in the way we manage our life would be in two ways. Or a disaster where there is no option. Or education. Starting very patiently from the babies. I don’t see any other way. I mean, you can talk a lot about awareness of the youngsters and changes that happen gradually.”

– Respondent 2: Environmentalist

At the same time, some additional solutions were proposed by people in different perspectives based on the specific capabilities each perspective deemed relevant. Environmentalists table more sustainable urban planning as a way to improve UWW. Urban planning ought to be more integrated for neighbourhoods, stimulate the building of more high-rise buildings, focus on legalising housing now and in the future to avoid illegal building and demolitions, preserve existing green areas, and protect important nature areas through the judicial system (R03; R06). This strategy does not reflect any capabilities in particular but focuses more on the effects of the planning policy, the Jerusalem Master Plan, and the population pressures resulting in more and more real estate development (R03; R06; R07).

Further, Environmentalists advance starting more initiatives that connect people to water as a way to make water more visible, such as community gardens (R02; R03; R06). This connects to the capability *Participation in social life* as they perceived the ability to create a network important for taking grassroot action in the water sector. Moreover, by creating initiatives that provide cultural services of water, like the community gardens, *Awareness and understanding* of the public is potentially further augmented according to this perspective (R06).

“One of things that [anonymous] and I have been involved in over the last 20 years, and I think the community gardens are particularly representative of this change, is that you can get less empowered people more involved with something very positive. More easily than with something very negative.”

– Respondent 3: Environmentalist

“I think that there is priority and there is possibility. I think that priority certainly is equalising access, first of all, to drinking water and sanitation, but also sewerage and treatment. [...] But then I think that there's the possibility. The possibility of creating changes on a smaller scale is. You know, access to... it is this one cultural services for recreational, spiritual educational. There is more possibility for change there.”

– Respondent 6: Environmentalist

The idea to start more initiatives around water links to the last two strategies proposed by Environmentalists, namely to find initiators to lead these local projects and to stimulate more collaboration; two strategies also mentioned by Egalitarians.

Environmentalists believe that the sustainability of the initiatives is dependent on initiators that are willing to take the projects far and beyond (R02; R03). Meanwhile, the impact of these initiatives can be enlarged by collaborating within and between communities, or even cross-boundary, and finding common interests (R03). Finding common interests is essential to start re-building trust (R03), as trust has been found to be a delicate commodity in the political conflict Jerusalem finds itself in since 1967 (R09).

An illustration of this, is the issue of Jerusalem's sewage flowing openly into the Kidron valley back and forth across borders eventually flowing into Palestine. For years, attempts have been made to come to a joint solution to deal with the sewage. Once again, a bilateral agreement has been signed. If it comes to an execution, this might symbolise the start of a new trust-building process (R03).

“I have stopped talking about peace projects, I no longer have on my agenda. But I very much believe in any project or initiative that brings people together to do something that is in all their interests.”

– Respondent 3: Environmentalist

Egalitarians recognise the value of collaboration and the need for community initiators (R07; R09). However, scepticism exists around the possibilities for (cross-boundary) collaborations between Israelis and Palestinians:

“I don't believe in trust anymore between the municipality and the Palestinians in Jerusalem. It is more like a mutual benefit. You have to spend money because this is their right, so you will respect some kind of basic level of services.”

– Respondent 9: Egalitarian

“If the political situation will not change there is no way to improve the situation in East Jerusalem. It just depends on the international and political situation and not on something that the people on the ground can do. Not Palestinians and not Jewish people.”

– Respondent 11: Egalitarian

Therefore, Egalitarians' focus is on enhancing collaborations within weak communities (R09). Together with stimulating political representation of weaker groups, such as Palestinians, this contributes to enhancing the capabilities *Autonomy and self-determination, Aspiration, self-respect and accomplishment* and *Significant relations with others* considered important by Egalitarians. This will

then stimulate more participation in the water sector and issues around freshwater access as it will help these groups to stand up for their basic rights and beliefs.

“People did not work together because they do not trust each other and at the same time we need initiators. We need community initiators, an entrepreneur who can really work as an engine in the city in order to change things and to make smaller communities more of a community; strengthening the communities within themselves.”

– Respondent 9: Egalitarian

Lastly, the Establishment proposes a solution to improve UWW by continuous improvement and extension of the water infrastructure, in light of the differences between neighbourhoods in quantity and quality of water infrastructure (R05). This solution addresses the issues around water access directly rather than influencing certain capabilities.

The earlier mentioned shared solution of education covers the capabilities perceived as important by the Establishment. The Establishment sees *Awareness and understanding* as important for people’s access to all water services. As education is aimed at improving *Awareness and understanding* regarding water issues, this will then help people make conscious choices that will stimulate their access to water services (R05; R07; R10).

7.6 Conclusion

To conclude, this chapter presented the findings on capabilities and other factors and the role they play in Jerusalem’s Water Welfare. Respondents also proposed strategies to address differences in relevant capabilities as to improve Jerusalem’s UWW. The next chapter confronts all the results from the past two chapters. Furthermore, limitations of this study are debated, thereby also suggesting pathways for future research.

8 Discussion

8.1 Introduction

This chapter will discuss the findings of this study. First, the results of the two parts of the UWWAA are confronted. This comes down to comparing the strategies proposed by local stakeholders to address differences that play a role in Jerusalem's and whether they have the potential to address the weaknesses identified in the UWWD. Second, limitations of the study are described and with that opportunities for future research. Lastly, a concluding paragraph is provided.

8.2 Confrontation of all results of the UWWAA

The strengths and weaknesses found through the application of the UWWD can be confronted with the testing of the theoretical propositions. This way potential synergies, trade-offs and gaps can be found between strategies proposed by local actors to address capabilities and other factors that play a role in Jerusalem's water welfare, and the weaknesses found in the Jerusalem's UWW through the UWWD.

The first proposition by Environmentalists and Egalitarians was altering the power structure in the municipality in Jerusalem through more political representation for Palestinians. According to them, Palestinians ought to vote for municipal elections, so that they acquire representation in the city council and get allocated more budget that allows for development of water (and other municipal) services. This is most likely a complicated and gradual process, given that there is resistance to acknowledge Israeli sovereignty and a fear for retaliation when they go voting. Nonetheless, it is a strategy with high potential. The strategy has the potential to address several weaknesses in the UWWD. First and foremost, political representation of Palestinians could directly improve the *Political stability*, which is the indicator aiming to measure the capability *Significant relations with others* and is the only capability-measuring indicator scoring as a weakness, which is in line with the finding that this capability is most influential for Jerusalem's UWW. Next, better political representation of marginalised groups could safeguard the *Protection of core values*, currently a great weakness in the UWWD as not all groups are considered by decisionmakers. Moreover, better inclusion and representation of Palestinians in local politics (as they cannot vote nationally) and policy has the potential to strengthen the moderate weaknesses *Consumer willingness-to-pay* and *Affordability* as they then might more easily obtain building permits. Political inclusiveness in the municipality might also directly enhance *Stakeholder inclusiveness* and *Progress and variety of options* as it might percolate into the water sector as Palestinians get stronger representation in city policy.

Second, sustainable and integrated urban planning was proposed by Environmentalists and Egalitarians. The need for sustainable planning is reflected in the absence of effective *Ecological management* in Jerusalem, as this was identified as a moderate weakness in the UWWD. Preserving existing green spaces and creating new ones helps the great weaknesses of *City noise* and *Heat risk* given the sound-

dampening and temperature regulating abilities of city green. More natural areas also simplify the *Use of green spaces*, which is a great weakness at this point in time. With that, more green (and blue) areas also have the potential to address the moderate weaknesses *Air pollution*, *Biodiversity* and *Vegetation coverage*. More sustainable planning might also help the *Ecological quality of water*. Moreover, it might compensate for the difficult to change factors of the region's climate, *Net primary productivity* that is a moderate weakness. More green also helps to take up some of the *GHG-emissions*, which is considered a moderate weakness, although this is solely symptom control. It also functions as a temperature regulator, increasing the city's liveability, and the risks of *Drainage flood*. Potentially, more green area might also relieve some of the *Visitors pressure* on natural areas, as this is a moderate weakness.

Integrated planning refers to planning that is more sustainable from a social perspective. The restrictive nature of the Jerusalem Master Plan perpetuates the power dynamics in the city. Therefore, integrated planning might help overcome some of the planning barriers and contribute to the *Political stability* as more houses will be built legally, which are not at risk for demolition and are allowed to get connected to the freshwater supply.

Third, more collaborations were proposed by Environmentalists and Egalitarians combined with the need for finding initiators for these collaborations. Environmentalists extend these collaborations to specifically include initiatives around water issues to improve visibility. There is some scepticism around cross-boundary collaboration between Israelis and Palestinians. However, thinking about this power dynamic as structural and static might be counter-productive for their own situation. Where collaboration has instilled distrust in the past, it might also be the way to create new trust, especially when departing from issues that they have in common rather than the differences, starting from water issues rather than political ones. Starting small to create connections, rather than aiming to solve larger political problems. This might help the moderate weakness *Political stability* and the great weakness *Conflicts over water supply*, at least on the local level.

Fourth, socio-economic status should be improved according to Environmentalists and Egalitarians. Meanwhile, the UWW points out that the GDP is a great strength. However, GDP is a nationally-measured indicator, while Jerusalem is the poorest city of Israel, thus explaining the gap. It is believed that UWW will increase as socio-economic level does, given that the access issues will be dealt with and sustainability issues come to the front. Nevertheless, it has to be taken into account that a great weakness of the UWW is Jerusalem's *Water footprint* and *GHG-emissions* and *Domestic water use* are moderate weaknesses. As people become richer, their lifestyles might become more luxurious, negatively impacting these aspects of UWW.

Simultaneously, this proposed strategy exposes a gap in the perception of local stakeholders. As pointed out by respondents, water issues are not perceived as important as there are no pressing matters within the city (R02; R05). This low value is partially caused by the visibility of other issues over water

(R03; R07). In Jerusalem, overpopulation in some areas as well as overburdening the transport system and solid waste are more prominent and visible issues (R03). However, the UWWD points out that *Freshwater scarcity* is a great weakness and that the traditional water sources are severely at risk of degradation as the *Dependency on overexploited aquifers* is a great weakness. This is in spite of *Alternative water sources*, which form a great strength as a high volume of water comes from desalination and irrigation water comes largely from treated wastewater. As long as the state of the water sources remains unknown on a local level, sustainability considerations most likely are outweighed by anthropocentric real estate developments.

Thus, it seems that water issues could benefit from being made more tangible. This is also addressed by respondents through the strategy education. It is the only strategy agreed on across perspectives and seems necessary in light of the ignorance on the nation's water sources. The question can be raised whether this education has to be extended with education on a national level. As water supply is arranged nationally, the degradation of water sources might have to be improved through other measures as well. *Policy instruments* is currently a moderate weakness in the UWWD. Consistent policy instruments that reduce the great weaknesses *Dependency on overexploited aquifers* and *Local groundwater drawdown* and the moderate weakness *Domestic water use*, could improve both the state of traditional water sources and strengthen the indicator *Policy instruments* itself.

“We have never got to a point, at least in the last years but even before, like in California where they had no water, so people were forced not to water their gardens. And they had to actually destroy their private gardens for a certain period of time, to dry them, because they had no water. It was by law or I don't know how, but something like this did not happen in Israel. Maybe not because we did not have to, but because we did not.”

– Respondent 2: Environmentalist

Lastly, further improving water infrastructure is the last proposed strategy. Freshwater supply and purification infrastructure are already a strong aspect of Jerusalem's UWW, although respondents point out that supply issues still exist in certain neighbourhoods. Relying on the strengths regarding technological advancement is logical to explore for solutions to improve weaknesses in the other water system services, as well as maintaining the high quality of existing infrastructure. Improving the infrastructure could also focus on bettering the *Supply continuity to reservoirs* in Jerusalem as this has to be done nightly, making it a vulnerable system. Improving the infrastructure could also focus on improving the process of wastewater treatment as the released *Methane from wastewater treatment* is currently a moderate weakness.

8.3 Limitations and suggestions for future research

The study is characterised by a few limitations, which consequently offer pathways for future research. First of all, during the study it became clear that there exists a gap in data and indicator availability. There is little data to be found on city-level, meaning that there was a need to resort to data on a higher scale. At the same time, indicators are lacking when it comes to measuring cultural services of water, which led to the aggregation of different types of cultural services into one category. Thus, future research could focus on filling this data and indicator gap.

In addition to this, for Jerusalem specifically it was difficult to find representative data as a lot of sources appear to leave out annexed East Jerusalem. Israeli sources appear to exclude this area as it skews data, because it scores lower than the rest of the city (and nation) on most indicators. Meanwhile, it seems that Palestinian sources often exclude East Jerusalem as it skews the data on the West Bank to display a more positive image. In the case of Jerusalem specifically, qualitative data was therefore found to be especially valuable.

Second, the indicators found to reflect the capabilities are a first proposition. It could be researched to what extent these indicators are internally valid for measuring the respective capabilities and, if not, what better indicators are available or could be developed. However, it is a promising sign that the capability *Significant relations with others* that was found to be the most relevant capability influencing Jerusalem's UWW was reflected in a low score on the indicator *Political stability*, which was aimed at measuring this capability. At the same time, the indicators measuring other capabilities all scored as strengths, even the ones identified by local stakeholders as displaying relevant differences in light of Jerusalem's UWW. This might indicate that the indicators are not adequate representations of the capabilities. However, the indicators are scored based on a worldwide benchmark. As Jerusalem is a developed city, this might explain the high scores. Moreover, quantitative indicators are to a certain extent unable to visualise nuances as they are a city average.

Additionally, the capabilities *Aspiration, self-respect and accomplishment* and *Autonomy and self-determination* were found redundant by some respondents as they were considered to be too subjective. Meanwhile, other respondents found them particular meaningful and perceived them as interrelated. Future research could therefore also focus on the exhaustiveness and mutual-exclusiveness of the list of capabilities.

Third, as the theoretical propositions were broadly defined, it was difficult to find respondents with adequate knowledge. As research on UWW develops, this might allow for creating more specific propositions, so that the search for respondents can be more focused. Moreover, in this study the UWW and theoretical propositions were developed separately as the propositions were aimed to explore the broader role of capabilities in UWW. Future research on UWW might do this stepwise, so that the propositions reflect a city's weaknesses following the UWW, rather than being open ended. This would possibly also lead to respondents proposing strategies that are even more relevant as they are

focused on the city's weaknesses. This simultaneously would lead to propositions that are more specific, which simplifies finding suitable respondents.

Regardless of the limitations, some additional suggestions for future research can be made. First, future research could work on improving the UWWAA. Questions could focus on the UWWD and whether the same can be measured with less indicators, as the UWWD is currently quite extensive. Furthermore, future research could study to what extent UWW is similar to other urban water management concepts, such as the City Blueprint and the Green City index. UWS was taken as point of departure as a scattered research field was identified. However, the question can be raised to what extent the newly developed UWW provides value over similar urban water management concepts.

At the same time, this study resulted in strategies for improving Jerusalem's UWW. Follow-up research could zoom in on a specific strategy to further investigate the prerequisites for implementation. Furthermore, the existing different perspectives ignite the question whether solutions proposed for enhancing UWW are more likely to be implemented when they come from a particular perspective. In a top-down system such as Jerusalem, it might be that the strategies of the Establishment have the highest implementation potential. Future studies could study the likeliness of implementation based on perspectives as well as the different type of perspectives that occur across contexts.

8.4 Conclusion

This chapter provided a confrontation of the findings of the UWWAA in Jerusalem. Moreover, limitations of the study and options for future research were discussed. The next chapter concludes this study by answering the research questions and providing recommendations.

9 Conclusion

9.1 Introduction

In this final chapter the study is concluded. First, by providing summarising answers to the sub-questions, which debouch into an answer to the main question. Second, theoretical recommendations on assessing UWW and practical recommendations on improving Jerusalem's UWW are suggested, thereby meeting the research objective. This simultaneously reflects the theoretical and practical implications of this study.

9.2 Answering the research question(s)

In order to arrive at an answer for the study's research question, seven sub-questions were developed. These questions allowed a stepwise exploration of the research question, ultimately resulting in an answer to this same question.

SQ 1: What are limitations of the UWSD for assessing UWW?

The UWSD has several limitations for assessing UWW. First of all, the UWSD measures UWS and with that is incomplete for assessing UWW, given that capabilities are not incorporated. The UWSD also lacks indicators on governance from the individual/communal perspective, making it top-down and expert-focused, which is found incomplete in light of UWW's aim to capture local social and political dynamics. Second, following the definition of UWS used in this study, the UWSD is incomplete in its conceptualisation of water system services. Third, some of the water system services included in the UWSD are not represented in all dimensions, while others are, making the conceptualisation inconsistent. Finally, the UWS definition accentuates the importance of looking at the different water system services from the four perspectives economic welfare, environmental sustainability, social equity and risks and uncertainties. The UWSD fails to look at some of these water system services from all perspectives making it inconsistent also. Thus, according to the definitions used in this research, the UWSD is found to be both incomplete and inconsistent for assessing Urban Water Welfare.

SQ 2: What capabilities are potentially relevant for Urban Water Welfare?

From the literature, eight clusters of capabilities can be derived that might influence Urban Water Welfare. First, *Basic goods* refers to the extent that someone possesses basic goods, such as a normal income. Second, *Education* links to people's access to sufficient education and their literacy. Third, *Health* resembles the extent that people are mentally and physically healthy. Fourth, *Aspiration, self-respect and accomplishment* connects to whether people feel valued and like having a voice, which ultimately determines if they can feel accomplished in life. Fifth, *Autonomy and self-determination* reflects to what extent people feel empowered, which influences whether they will take certain decisions and actions. Sixth, *Awareness and understanding* is a capability that involves the idea that when someone has the knowledge, this determines his or her actions. Seventh, *Significant relations with others*

refers to the power position people have, which determines their room to manoeuvre. Lastly, *Participation in social life* is about structural social capital and community that someone is a part of. Being part of a large or close community and network influences one's capability to take action.

SQ 3: How can the UWSD be altered into the Urban Water Welfare Dashboard to assess UWW?

The UWSD was improved by addressing the limitations identified through sub-question 1. The inconsistent nature of the UWSD was attended to through two measures. First, to ensure that the different water system services were studied from all four perspectives of economic welfare, environmental sustainability, social equity and risks and uncertainties, the UWSD's PSIR approach was changed into a PSWR approach that follows a clearer conceptual and operational division. The Pressure dimension explicitly addresses risks and uncertainties, the State dimension environmental sustainability, the Welfare dimension economic welfare and social equity and the Response dimension governance aspects. Second, the inconsistent use of water system services was addressed by using the services as sub-dimensions in the Pressure, State and Welfare dimensions.

The incomplete nature of the UWSD was also overcome in two ways. First, the capabilities were included by extending the UWSD's PSIR dimensions with a Driver dimension that precedes all other dimensions. The Driver dimension captures larger societal trends, including people's capabilities. Second, the UWSD's incomplete inventory of water system services was complemented. A typology was made for the different water system services. Following the MEA (2005), three types of services were identified: provisioning, regulating and cultural.

SQ 4: What are potential relations between capabilities and UWW?

Based on the current body of literature two possible relations were identified between capabilities and UWW. Dapaah and Harris (2017) studied the role capabilities play in water access. The first potential relation is therefore the influence on capabilities on access to the different water system services: provisioning, regulating and cultural. Indicators regarding access were incorporated in the Welfare dimension, which means that the first relation is one between capabilities in the Driver dimension and access as part of the Welfare dimension.

Simultaneously, Staddon et al. (2018) and Goldin (2013) discuss capabilities in relation to whether citizens participate in the water sector. Subsequently, the influence of capabilities and engaging in the water sector is the second potential relationship. As participation is part of governance, which is conceptualised in the Response dimension, this second relation is one between the capabilities in the Driver dimension and bottom-up participation in the Response dimension.

SQ 5: What are strengths and weaknesses of Jerusalem's water welfare?

With a score of 3.36 out of 5, multiple great strengths of Jerusalem's water welfare can be distinguished. First, on a societal level, Jerusalem is considered a healthy city as well as a city with gender equality

and a high level of innovation. The latter is reflected in the high use of alternative water sources, such as desalination. The high level of innovation is also resembled in infrastructure in Jerusalem that is of high quality for the water system services freshwater supply, sewerage and urban drainage and purification. This, in turn, is reflected in good access to sanitation and low water-related health risks, little damages from stormwater flooding and great use of purified water. Lastly, on a cultural level, water is in Jerusalem associated with a positive image and has high educational and ceremonial significance.

At the same time, several great weaknesses can be identified to Jerusalem's water welfare. Jerusalem is characterised by a high water footprint as a lot of water is virtually imported through products. The high water footprint might be a result of the city's severe freshwater scarcity. The dependency on overexploited aquifers for freshwater is high as is the local groundwater drawdown. In addition, water has to come from different areas in Israel every night making the supply continuity of Jerusalem's reservoirs a vulnerable aspect. Furthermore, the freshwater scarcity in the region makes that there are conflicts over the supply, signalling another weakness. Additionally, Jerusalem has a high level of city noise, which links to the low presence of green space to absorb sound. In turn, this low level of green space is represented in a high amount of sealed soil that amplifies the city's chance for drainage floods. Also, the high amount of sealed soil and relatively little green space links to the high heat risk in the city. Lastly, the protection of core values in water governance is a great weakness as marginalised groups are insufficiently considered.

SQ 6: To what extent do capabilities and other factors influence Jerusalem's water welfare?

Three perspectives can be identified on the capabilities that influence Jerusalem's UWW, namely Environmentalists, the Establishment and Egalitarians. Across perspectives there is some consensus on what capabilities influence Jerusalem's UWW. First, the capability *Significant relations with others* is relevant for both people's access to water services and their participation in the water sector. For taking grassroot action, *Aspiration, self-respect and accomplishment, Autonomy and self-determination* and *Awareness and understanding* further contribute to strengths and weaknesses in Jerusalem's UWW, although they appear subordinate to the capability *Significant relations with others*. Second, there largely seems to be agreement on the irrelevance of *Health* and *Education* for access to water services in Jerusalem.

Next to consensus, there is some conflict that results in the different perspectives. Environmentalists interpret grassroot action as being aimed at cultural services. This is seen as a something reserved for people with environmental *Awareness and understanding*. Moreover, in this process the capability *Participation in social life* is relevant as it reflects people's ability to create a community. Meanwhile, the Establishment prioritises the capability *Awareness and understanding*, meaning that differences in (quality of) access to water services can be explained by people that are environmentally aware who will make different choices than unaware people regarding where to live. However, there is an assumption in there that people have the freedom to make that choice. Furthermore,

the Establishment is the only perspective perceiving *Basic goods* as irrelevant for taking grassroot action. Combining these findings might imply that the Establishment sees the system as uninfluenceable, but rather the physical residence position of people within the system. Lastly, Egalitarians questions the quality of water access the most as these people perceive differences between people based on the capabilities *Aspiration, self-respect and accomplishment* and *Autonomy and self-determination*. As this perspective is preoccupied with ensuring rights of marginalised groups, this perspective attaches most importance to these two subjective capabilities.

SQ 7: What suggestions do actors in Jerusalem make for strategies addressing differences in capabilities that influence Jerusalem's water welfare?

Different reoccurring suggestions were made by people from the different perspectives. All perspectives, Environmentalists, the Establishment and Egalitarians, proposed to make water issues more tangible through improved education and communication on the water system and issues. Environmentalists also suggested to make issues more tangible by starting local initiatives that connect people to water, such as community gardens. Moreover, they argue in favour of more integrated and sustainable urban planning. Meanwhile, the Establishment advocate for creating new and improving existing water infrastructure. Environmentalists and the Establishment together table the importance of improving the socio-economic status of people in Jerusalem. Lastly, Environmentalists and Egalitarians together emphasise the importance of stimulating collaborations around water issues focused on mutual benefits as to instil trust, as well as the need to find initiators to lead projects springing from this. Also, they propose to improve political representation of Palestinians in the city council to ensure fairer budget allocation to their neighbourhoods.

RQ: To what extent is Jerusalem a city with water welfare and what factors account for it?

Jerusalem performs above the acceptable threshold when it comes to water welfare with a score of 3.36 out of 5. The greatest strengths of Jerusalem's UWW is the high technological advancement of the water sector in terms of infrastructure and use of alternative water sources. Moreover, the underlying social and economic drivers perform well. Great weaknesses are the state of traditional water sources and the overall presence and quality of green and blue areas in the city.

Across perspectives identified in the city, consensual agreement across perspectives exists on the differences in water access and participation that arise from the capability *Significant relations with others*, as being part of a powerful group determines one's possibilities. Other relevant capabilities are found to be relatively subordinate to this one. Other important factors are the neighbourhoods people live in as there are large differences in infrastructure and the planning policy around water infrastructure resulting from the Jerusalem Master Plan.

9.3 Recommendations

Based on the development of the UWWAA and its application in Jerusalem, recommendations can be developed. On the one hand, practical recommendations for policymakers in Jerusalem for improving the city's UWW. On the other hand, theoretical recommendations on assessing UWW.

9.3.1 Practical recommendations

Based on the findings in this study, six main recommendations can be made to improve Jerusalem's UWW. Some of these recommendations can foster results short term, while others are part of long-term and also national processes.

1. Make water issues more tangible through education and communication

Water issues are currently not considered by Jerusalem's citizens. Education and communication need to create awareness. The largest ignorance focuses on traditional water sources that are in a severe state of degradation. As these are managed on a national scale, education should also occur at this scale. On the urban scale, education might further enhance awareness and understanding of the water system.

2. Stimulate collaborations fostering mutual benefit for water issues

Collaborations that focus on mutual benefits for everyone involved can strengthen links within and between communities in Jerusalem. Focusing on shared water issues instead of political dynamics might be more effective in light of the structural conflict. In turn, this might help trust-building processes. For the success of collaborations it is important to find initiators and visionaries to lead projects and that can organise people and mobilise weaker individuals and communities. Moreover, practical collaborations focused on water issues play a supportive role in making water issues more tangible and engaging people. Collaborations are a relatively short-term strategy that can enhance UWW. This can be useful for keeping motivation intact, while also pursuing some of the other long-term strategies.

3. Develop new and existing water infrastructure

Technological advancement and alternative water sources are some of the greatest strengths of Jerusalem's water welfare. Building on these aspects for the development of water infrastructure can improve UWW and equalise qualitative water access for all inhabitants of Jerusalem.

4. Stimulate political representation of Palestinians in municipality Jerusalem

As Palestinians are currently not represented in the city council, this leads to a lack of budget allocation for municipal services in these neighbourhoods. This translates into lower levels (of quality) of water system services. Including them(selves) in local politics has the potential to empower this weaker community and give them more input in water-related policies.

5. Generate planning policy that is more sustainable and integrated

Current planning policy is perceived as restrictive and unsustainable. Despite urbanisation pressures, planning should ensure the preservation of existing green areas and water sources. High-rise buildings and integrated planning across sectors might support this process. Furthermore, legalising existing and future housing takes away fear for demolition and illegal water access, thereby taking away worries of the basic needs shelter and water. In turn, it improves UWW by enhancing secured water access.

6. Improve Jerusalem's socio-economic level

Jerusalem's socio-economic level is behind on the other cities in the country. Reducing this gap is expected to emancipate weaker groups in Jerusalem, ultimately helping their access to water services and participation. However, this development has to co-occur with improved education on water issues and sustainable development as more economic welfare might increase (virtual) water use as a result of more luxurious lifestyles.

9.3.2 Theoretical recommendations

From a theoretical viewpoint, several recommendations can be made to take into account in future applications of the UWWAA.

1. Take into account that DPSWR dimensions are interrelated

The theoretical propositions explored the idea that there might be a direct relation between capabilities in the Driver dimension and the Welfare and Response dimensions. As for Jerusalem relevant capabilities were identified both in terms of water access and participation in the sector, it implies that these direct relations indeed exist. However, as this is just one case study, the external validity of this finding is low. Nevertheless, future applications of the UWWAA should consider the idea that the relations between the DPSWR dimensions are not as directional as implied in the original model.

2. Use both methods in the UWWAA for their complementary value

The application of UWWAA in Jerusalem showed the importance of complementing the UWWD with the qualitative study. Both approaches revealed different aspects of Jerusalem's UWW, while not being mutually exclusive. The UWWD was able to expose objective trends on the condition of water system services, while the in-depth assessment of capabilities uncovered the political and social dimensions that affect UWW. At the same time, the UWWD failed to, for instance, catch inequalities in provisioning services between communities and neighbourhoods as well as the influence of the planning policy. The testing of the theoretical propositions was unable to recognise the issues on a higher scale regarding the ecological state of water sources. Thus, the methods in the UWWAA proved complementary and as such valuable.

3. Keep searching for indicators on cultural services and for urban levels

The UWWD is an extensive set of indicators, but compromises had to be made on scale and content. Future studies should review the state-of-the-art literature to explore new possibilities. At the same time, the UWWD adds value to the body of literature as it proposes some new indicators for measuring capabilities and cultural services.

4. Specify theoretical propositions based on the UWWD results

The methods of the UWWAA are found complementary. However, for getting to strategies proposed by local stakeholders that specifically address the weaknesses found in the UWWD, propositions could be based on these weaknesses. This means a stepwise approach rather than a parallel one. Meanwhile, some exploratory propositions should ensure that the complementary value of the propositions is maintained and that not too many assumptions are made based on the UWWD.

9.4 Conclusion

This final chapter answered the research questions and provided theoretical and practical recommendations, thereby meeting the research objective. All in all, this study offered a new way to incorporate context-dependency into the assessment of urban water management. The research implies that there is no panaceas for similar problems manifesting in different contexts, as one size does not fit all. Although this might complicate finding solutions to improve UWW worldwide, it is this diversity that makes our globe adaptable and resilient.

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Appendix A: Sources indicators UWWD

Table A1 provides an overview of all the indicators in the UWWD. For each indicator it is clarified from what source it is derived. Some indicators are developed for the purpose of this study, either based on suggestions in the literature or invented by the author for some of the indicators reflecting capabilities.

Table A1

List of indicators including and the source that provided or suggested each indicator.

Number	Indicator	Adapted from:	Own addition, but suggested by:
1000	Driver Index		
1100	Socio-demographic and political drivers		
1101	City population	Van Ginkel et al., 2018	
1102	Population growth	Van Ginkel et al., 2018	
1103	Education rate	Koop & Van Leeuwen, 2017	
1104	Burden of disease	Koop & Van Leeuwen, 2017	
1105	Political stability	Koop & Van Leeuwen, 2017	
1106	Rule of law	Own addition	
1107	Social capital	Own addition	
1108	Awareness and understanding of nature	Own addition	
1109	Satisfaction with life	Own addition	
1110	Gender equality	Own addition	
1200	Economic drivers		
1201	GDP	Van Ginkel et al., 2018	
1202	Employment rate	Koop & Van Leeuwen, 2017	
1203	Poverty rate	Koop & Van Leeuwen, 2017	
1204	Ease of doing business	Own addition	
1205	Innovation index	Own addition	
2000	Pressure Index		

2100	Freshwater supply	
2101	Annual precipitation and variability	Van Ginkel et al., 2018
2102	Domestic water use	Van Ginkel et al., 2018
2103	Water-intensive industries	Van Ginkel et al., 2018
2104	Alternative water sources	Gutiérrez & Alonso, 2013; Möllersten, 2018
2105	Water footprint of consumption	Van Ginkel et al., 2018
2200	Sewerage and urban drainage	
2201	Rainfall intensity and variability	Van Ginkel et al., 2018
2300	Purification	
2301	CH4 from wastewater treatment	Gutiérrez & Alonso, 2013
2302	N2O from wastewater treatment	Gutiérrez & Alonso, 2013
2400	Climate and atmospheric regulation	
2401	GHG-emissions in city	Möllersten, 2018
2402	Density build-environment	Romero-Lankao & Gnatz, 2016
2500	Flood protection	
2501	Storm surge hazard	Van Ginkel et al., 2018
2502	Tsunami hazard	Van Ginkel et al., 2018
2503	Expected sea-level rise by 2100	Van Ginkel et al., 2018
2504	Area below sea level and subsidence	Van Ginkel et al., 2018
2600	Cultural	
2601	Polluted sediments	Van Ginkel et al., 2018
2602	Garbage in surface water	Van Ginkel et al., 2018
2603	Noise in city	Layke et al., 2012
2604	Area of protected natural land	Maes et al, 2016
2605	Air pollution in city	Layke et al., 2012
2606	Visitors' pressure on natural areas	Layke et al., 2012; Maes et al., 2016
3000	State Index	
3100	Freshwater supply	

3101	Freshwater scarcity around city	Van Ginkel et al., 2018
3102	Supply continuity reservoirs and lakes	Van Ginkel et al., 2018
3103	Dependency overexploited aquifers	Van Ginkel et al., 2018
3104	Local groundwater drawdown	Van Ginkel et al., 2018
3105	Coverage of water supply system	Van Ginkel et al., 2018
3106	Leakages of water supply system	Van Ginkel et al., 2018
3107	Continuity of water supply	Van Ginkel et al., 2018
3108	Quality of water supply	Van Ginkel et al., 2018
3109	Surface water quality	Koop & Van Leeuwen, 2017
3110	Groundwater quality	Van Ginkel et al., 2018
3111	Sustainability of water footprint of consumption	Van Ginkel et al., 2018
3200	Sewerage and urban drainage	
3201	Coverage of sewer system	Van Ginkel et al., 2018
3202	Average age of sewer system	Koop & Van Leeuwen, 2017
3203	Urban drainage flood	Koop & Van Leeuwen, 2017
3204	Stormwater drainage infrastructure	Van Ginkel et al., 2018
3300	Purification	
3301	Secondary WWT	Koop & Van Leeuwen, 2017
3302	Tertiary WWT	Koop & Van Leeuwen, 2017
3303	Energy recovery	Koop & Van Leeuwen, 2017
3304	Nutrient recovery	Koop & Van Leeuwen, 2017
3305	Sewage sludge recycling	Koop & Van Leeuwen, 2017
3306	WWT energy efficiency	Koop & Van Leeuwen, 2017
3400	Climate and atmospheric regulation	
3401	Net primary production	Möllersten, 2018
3402	Vegetation coverage	Möllersten, 2018
3500	Flood protection	
3501	Coastal flood protection infrastructure	Van Ginkel et al., 2018
3502	River flood protection infrastructure	Van Ginkel et al., 2018

3600	Cultural		
3601	Ecological quality of urban water	Van Ginkel et al., 2018	
3602	Biodiversity		Maes et al., 2016
4000	Welfare Index		
4100	Freshwater supply		
4101	Conflicts over water supply	Van Ginkel et al., 2018	
4102	People with adequate water supply	Van Ginkel et al., 2018	
4103	People with adequate sanitation	Van Ginkel et al., 2018	
4104	Water-associated diseases	Van Ginkel et al., 2018	
4200	Sewerage and urban drainage		
4201	Damage stormwater flooding	Van Ginkel et al., 2018	
4300	Purification		
4301	Uses of purified water		Möllersten, 2018
4400	Climate and atmospheric regulation		
4401	Heat risk	Koop & Van Leeuwen, 2017	
4402	Use of green spaces	Koop & Van Leeuwen, 2017	
4500	Flood protection		
4501	Coastal flooding	Van Ginkel et al., 2018	
4502	River flooding	Van Ginkel et al., 2018	
4600	Cultural		
4601	Water image of city	Van Ginkel et al., 2018	
4602	Accessibility/proximity of natural areas		Maes et al., 2016
4603	Ceremonial and educational importance of water sources		Layke, 2009; Maes et al., 2016
5000	Response Index		
5100	Individuals and communities		
5101	Affordability	Koop et al., 2017	
5102	Consumer willingness-to-pay	Koop et al., 2017	
5103	Access to data and information	Koop et al., 2017	

5104	Progress and variety of options	Koop et al., 2017	
5105	Agents of change	Koop et al., 2017	
5106	Awareness and understanding	Koop et al., 2017	
5107	Room to manoeuvre	Koop et al., 2017	
5108	Stakeholder inclusiveness	Koop et al., 2017	
5200	Institutional framework		
5201	Clarity of roles and responsibilities	Koop et al., 2017	
5202	Horizontal and vertical coordination	Koop et al., 2017	
5203	Cross-stakeholder learning	Koop et al., 2017	
5204	Authority	Koop et al., 2017	
5205	Policy instruments	Koop et al., 2017	
5206	Protection of core values	Koop et al., 2017	
5300	Planning		
5301	Financial continuation	Koop et al., 2017	
5302	Effectiveness disaster management	Koop et al., 2017	
5303	Strategic planning	Koop et al., 2017	
5400	Operational management		
5401	Effectiveness water supply management	Van Ginkel et al., 2018	
5402	Effectiveness sewerage and urban drainage management	Van Ginkel et al., 2018	
5403	Effectiveness purification management		Own addition based on Van Ginkel et al. (2018)
5404	Effectiveness environmental and ecological management	Van Ginkel et al., 2018	
5405	Effectiveness of flood management	Van Ginkel et al., 2018	

Appendix B: Description of DPSWR dimensions

The DPSWR approach was used to ensure that all emphases of economic welfare, environmental sustainability, social equity and risks and uncertainties were reflected in indicators for each water system service. Therefore, the indicators were divided across dimensions based on these emphases. Table B1 shows a description of each dimension, the emphasis they address and the corresponding type of indicators.

Table B1

Description of the DPSWR dimensions and type of indicator belonging in each dimension.

Dimension	Description	Indicators	Emphasis of UWW
Driver	Capabilities and economic and social forces resulting from government policies, markets, and private industry.	Socio-demographic, political and economic	Economic welfare and social equity (in society)
Pressure	The ways these drivers place demands upon water system services. Pressures are at the interface between the social and ecological components of the system, caused by the social part of the system, but occurring within the ecological part.	Ecological	Risks and uncertainties
State	Environmental and technical changes occurring to the water system service resulting from pressures.	Ecological and technical	Environmental sustainability
Welfare	The change in human welfare, regarding economic welfare and social equity, attributable to the State changes.	Economic and social	Economic welfare and social equity (regarding water system services)
Response	The management response to a particular problem may then be directed toward any of the other elements (D, P, S, or W) in an effort to achieve a balance between the benefits of economic and social development and ecosystem costs.	Governance	

Note. Adapted from “Achieving good environmental status in the Black Sea: Scale mismatches in environmental management”, by T. O’Higgins, A. Farmer, G. Daskalov, S. Knudsen, & L. Mee, 2014, *Ecology and Society*, 19(3), p. 2. Copyright 2014 by the authors.

Appendix C: Expert consultation

For the expert consultation a request was send out to all experts in Table C1.

Table C1

Experts contacted for consultation, including their field of expertise and whether they responded.

Name	Expertise	Initial response
Arjen Hoekstra	Urban water security and UWSD	Yes.
Kees van Ginkel	Urban water security and UWSD	Yes.
Chad Staddon	Capabilities and water security	Yes.
Wendy Jepson	Capabilities and water security	No.
Elizabeth Dapaah	Capabilities and water security	No.
Bas de Gaay Fortman	Capabilities and water access & sanitation	Yes.
Karen Bakker	Social relations/power and water security	No.

Table C1 shows that four experts responded and were willing to help. Subsequently, the following document was sent.

Summary of study

RQ: To what extent is Jerusalem a city with water welfare and what factors account for it?

Knowledge gap and problem definition

The study departs from the concept of Urban Water Security. Following Hoekstra, Buurman and Van Ginkel (2018, p. 12), holistically urban water security addresses “the fulfilment of all different ‘water system services’, considers overall welfare as well as social equity and environmental sustainability, and addresses both risks and uncertainties. Risks include hazards, exposure and vulnerability, the latter including aspects of coping capability and resilience.” Regarding Urban Water Security, the literature identifies a knowledge gap that is twofold.

First, more knowledge is needed on holistic approaches to UWS, because until now UWS has been conceptualised in many different ways, which has led to a scattered understanding of the concept (e.g. Hoekstra et al., 2018). Van Ginkel, Hoekstra, Buurman and Hogeboom (2018) propose the Urban Water Security Dashboard (UWSD) as a framework for assessing UWS holistically. Holistically because they apply a systems approach through the Pressure-State-Impact-Response (PSIR) framework. Therefore, the study uses this framework as a point of departure for the holistic assessment of UWS.

Second, overall, studies on water security insufficiently include social and political context (Bakker & Morinville, 2013). This essentially translates into a neglect of the subjective, relational

component on the way that people (want to) interact with water (Jepson et al., 2017). Here, the Capabilities Approach provides an opportunity to include this subjective component into the assessment of UWS (Staddon, Rogers, Warriner, Ward, & Powell, 2018). Many basic human capabilities have been introduced over the years (e.g. Nussbaum (2003)), but, based on Goldin (2013), nine clusters of capabilities can be identified that are potentially relevant for people's inclusion in the water sector: Basic goods; Education; Health; Self-respect and aspiration; Autonomy and self-determination; Awareness and understanding; Significant relations with others; Participation in social life; and Accomplishment.

Following these knowledge gaps, this research studies the broader relation between UWS (as defined by Hoekstra et al. (2018)) and capabilities (based on the list by Goldin (2013)) through a case study in Jerusalem with a quantitative (UWS measurement) and qualitative component (testing propositions on relations between UWS and capabilities through interviews). For the quantitative component, the UWSD is altered based on two steps:

- Capabilities are included in the extended version of the UWSD. To do this, the PSIR-approach of the UWSD is restructured into one of its derivatives, namely the Driver-Pressure-State-Welfare-Response (DPSWR) framework. Capabilities can be captured in the Driver dimension, which reflects larger socio-demographic and economic trends in society. Furthermore, the DPSWR-approach is chosen for its clearer distinction between social (Welfare dimension) and ecological (State dimension) aspects (without forgetting their interactions), which helps the formulation of the relation between capabilities and UWS.
- The UWSD is compared to the description of holistic UWS by Hoekstra et al. (2018). Following their definition that mentions 'all water system services', the UWSD is extended to include more water ecosystem services: Instead of mainly provisioning and regulating services, also cultural water ecosystem services are included. This categorisation is used to structure indicators in the Pressure, State and Welfare dimensions. The categories are not used in the Driver dimension, given that these show overarching trends in society, nor are they used in the Response dimension provided that governance is often overarching for multiple services.

Following these alterations, the study coins a new term for the combined approach of measuring UWS and capabilities, namely Urban Water Welfare. This because the new 'Urban Water Welfare Framework (UWWF) extends beyond security in the sense of safety to also include liveability values (i.e. broader safeguarding of ecosystem services), given its inclusion of capabilities and cultural water ecosystem services.

Literature

Bakker, K., & Morinville, C. (2013). The governance dimensions of water security: a review. *Phil. Trans. R. Soc. A*, 371(2002), 20130116.

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Nussbaum, M. (2003). Capabilities as fundamental entitlements: Sen and social justice. *Feminist economics*, 9(2-3), 33-59.

Staddon, C., Rogers, J., Warriner, C., Ward, S., & Powell, W. (2018). Why doesn't every family practice rainwater harvesting? Factors that affect the decision to adopt rainwater harvesting as a household water security strategy in central Uganda. *Water International*, 1-22.

Van Ginkel, K. C., Hoekstra, A. Y., Buurman, J., & Hogeboom, R. J. (2018). Urban Water Security Dashboard: systems approach to characterizing the water security of cities. *Journal of water resources planning and management*, 144(12), 04018075.

Conceptual framework

A conceptual framework of Urban Water Welfare can be created that shows the expected relation between capabilities and UWS. Figure 1 shows that UWS is operationalised through the DPSWR dimensions and capabilities are placed within the Driver dimension as they reflect social dynamics in society. Subsequently, two main relations are expected. First, capabilities are assumed to influence people's access to water ecosystem benefits (which are measured in the Welfare dimension) (red arrow). Second, capabilities are expected to influence people's involvement in urban water management (which is measured in the Response/Governance dimension) (blue arrow).

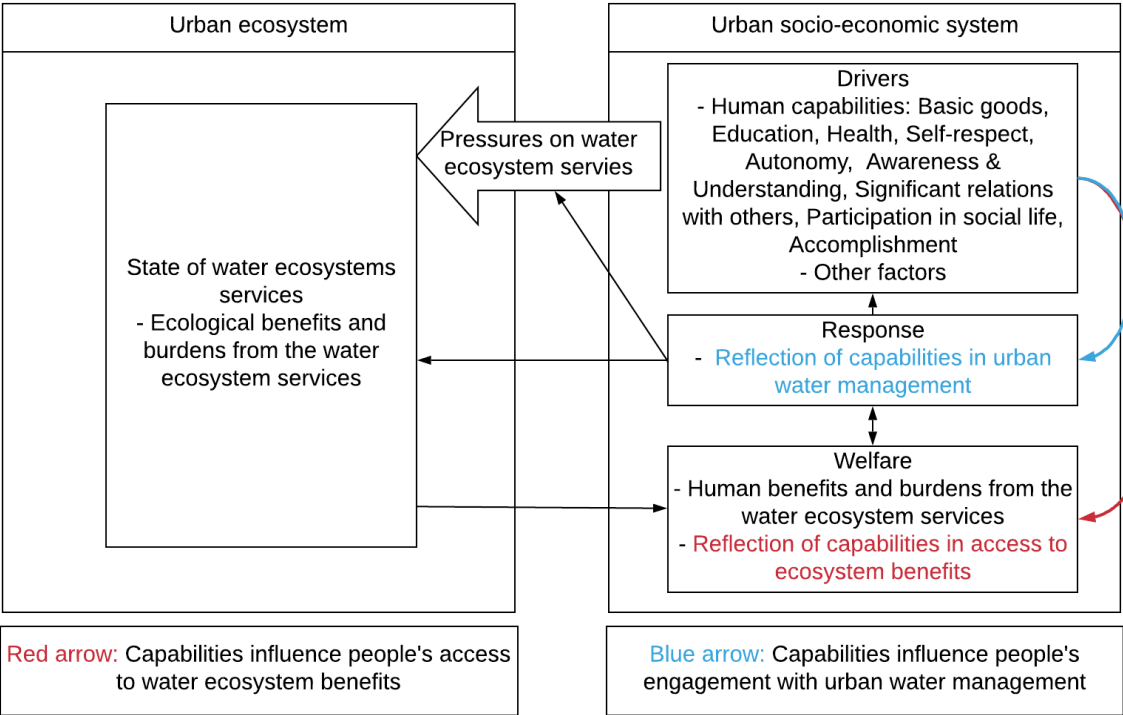


Figure 1. Conceptual framework of Urban Water Welfare: The relation between UWS and capabilities.

Theoretical propositions

The two expected relations between UWS and capabilities that were visualised in Figure 1 can be specified into theoretical propositions that are shown in Table 1. First, the relation between each capability and the Welfare dimension is formulated, which has resulted in the first three columns. Three because, in the UWFW, the Welfare dimension measures people's access to water system services and those services are structured using the categorisation of provisioning, regulating and cultural services. Subsequently, a single proposition is formulated for each service category and capability (this distinction is expected to be relevant given that e.g. the capability Health might no longer prove limiting for access to provisioning services like drinking water, given the coverage of piped access (in Jerusalem), but it might be so for cultural services, such as access to recreational water sources). Second, the relations between each capability and the Response dimension have been formulated in the last column. Response dimension refers to governance of the water sector and with that the propositions refer to the link between each capability and involvement in urban water management.

The propositions are formulated in a general manner (not specified for Jerusalem), given that they are exploratory. The interviewees will be asked to structure the statements using Q-methodology (forced structure) by placing the statements in order regarding the extent that they believe that they apply to the case of Jerusalem. They will be asked to consider the statements' relative importance concerning the categories of ecosystem services as well as the capabilities. Through an interview, they will later be asked about the statements that they placed in the 'extreme agree-disagree' categories: Why do especially the statements in these categories do or do not fit the Jerusalem context? Ultimately, this will provide insights into, on the one hand, the relevance of each capability (in Jerusalem) for access to different water system services and involvement in water management. On the other hand, it demonstrates the relative importance of the types of ecosystem services. Moreover, it potentially visualises the different importance that people from different groups attach to certain services and capabilities.

[Overview of propositions was inserted as displayed in Table 4]

Questions to experts

Regarding the propositions:

1. Given that the propositions are statements on the broad relation between capabilities and urban water security in general, to what extent do you think that the propositions are clear and precise enough? (As they will be used as statements using Q-methodology)

Additional questions if time allows it:

Regarding the list of capabilities:

2. In your experience, what do you think of the exhaustiveness of the capabilities list?

Regarding the relation between human capabilities and urban water security:

3. Looking at the conceptual framework, to what extent do you think the relation between capabilities (in the Driver dimension) and access to ecosystem services benefits (Welfare dimension) is accurate?
4. Looking at the conceptual framework, to what extent do you think the relation between capabilities (in the Driver dimension) and involvement in urban water management (Response dimension) is accurate?
5. Looking at the conceptual framework, are there other possible relations between capabilities and UWS dimensions according to you?

Appendix D: List of respondents for the Q-study and interviews

Table D1 gives an overview of the respondents. No names are provided as anonymity was guaranteed. Respondents 1 through 10 completed the Q-study, while the other two did not. Interview data of respondent 11 was still used to support the results. The interview of respondent 12 was not used as it did not contain relevant information, also because it had not been recorded and it was difficult to recall valuable information.

Table D1

List of respondents and their characteristics.

Respondent	Gender	Organisation type	Division	Referenced as:
1	Female	NGO	Environmental education	R01
2	Male	Grassroot	Community garden	R02
3	Female	NGO	Lobbyist and former deputy mayor	R03
4	Male	Water utility	Monitoring	R04
5	Male	Water utility	Infrastructural planning	R05
6	Female	Business	Urban planning (East Jerusalem)	R06
7	Female	Municipality	Social division	R07
8	Male	Municipality	Sustainability division	R08
9	Male	Grassroot	East Jerusalem placemaking	R09
10	Male	MAVTI	Wastewater treatment	R10
11	Male	Academic	Israeli policy in East Jerusalem	R11
12	Male	Water utility	Sewerage department	NA

Appendix E: Informed consent form

Dear Sir/Madam,

Thank you for participating in my study on Jerusalem's Water Welfare. You are asked to take part in a face-to-face interview that will last about an hour. Your participation will help me to understand the social dynamics on an individual level that influence people's access to water and their participation in the water sector.

Participation in this research activity is entirely voluntary. You may decide not to answer any of the questions if you wish. You may also decide to withdraw at any time. You will not be contacted after the activity is complete unless you seek to be further involved.

The results from this interview will be used in my thesis report. Neither your name nor any other personal identifying information will appear in the report and anonymous data will be used in these outputs. For the analysis of the data, it will be necessary that the interview is recorded in order to be transcribed in full. Consequently, the meaning and interpretation of the discussion can be captured in a more accurate way. The transcription will be send to you for feedback before integrating it in the study's results. The interview will be recorded only with your permission. All information will be anonymised and stored in a secure location.

After reading the information presented in this document:

Do you agree to participate in this study?

Yes

No

Do you grant permission to record the interview?

Yes

No

Signature participant:

If you have any questions regarding this study or would like any additional information, please do not hesitate to contact me.

Thank you for your assistance in this study.

Yours Sincerely,

C.C. (Chakira) Vink, MA

Student MSc Sustainable Development, Utrecht University, the Netherlands

Tel: +31 61 095 3245, Email: chakiravink@gmail.com

Appendix F: Interview guide

Intro (10 minutes)

Thank you for participating in this study. Before we start, I will give a short intro on its content.

Last time we talked about governance aspects around Jerusalem's water conservation. To tell you a bit about my current study. It consists out of two parts.

The first part I conduct individually through literature and data from last time. Here I update an existing framework and its indicators to make an assessment of the current state of Jerusalem's different water services. These services include provisioning services (freshwater for drinking and sanitation), regulating services (sewerage (purification) and cultural services (spaces with) water sources for recreational, spiritual and educational uses).

The second part is where you come in. I do not only want to make a quantitative assessment of these services, but I also want to see what social factors influence people's access to these services and whether they participate in bottom-up action in the water sector.

This second part of the study is exploratory as this topic has not been researched as such (combining CA with UWS). For this reason, I do not want to start asking you questions about my hypotheses, but I first want to let you do a short sorting task of some statements I created based on the theory. This helps me to systemise my findings and allows for better comparison between respondents. Moreover, it helps determine immediately what social factors are more important according to you, which makes it easier to discuss relevant factors. After that, we talk about some of these statements more in-depth as well as some additional questions.

Before we start, I want to ask you to read and sign the informed consent form, which asks for your permission to record the interview, which I will transcribe. This data will be used anonymously and safely.

Q-study (20 minutes)

Here is a grid with 32 cells as well as 32 statements. I want to ask you to think about the entire municipality of Jerusalem and the different kind of individuals/communities that you know of and their characteristics. For each statement, think if this statement makes a large difference between/is relevant for these different individuals/communities. For instance, *if it says, 'possessing a normal income is important for access to drinking water', then think of differences in the city regarding income you know of and to what extent you (dis)agree that a normal income is important for accessing drinking water for the case of Jerusalem.*

I want to ask you to sort the 32 statements based on the extent that you agree or disagree with their relevance for Jerusalem municipality. From – 4 (I think this does not apply to Jerusalem at all) to 4 (I believe this does apply to Jerusalem entirely (when there are differences)). When you do not know how a statement affects Jerusalem, then you can put it in the category 0. There is a limited number of statements that you can put into each category. Therefore, it is very important to compare the statements with each other when placing them on the grid. It might seem like a difficult task, but just fill it in as you think it is. There is no wrong answer, because it is exactly your perception that I am curious about.

If there are words you do not understand you can ask me. I will either explain or let you put it in the 0 category.

Interview (30 minutes)

1. *Make picture of sorted Q-grid.*
2. *Start Dictaphone.*
3. Discuss the statements in the two/four most extreme categories.
 - What does the statement look like for the case of Jerusalem; Why does it (not) apply so strongly.
 - o When it applies
 - What are the differences?
 - How does this have an effect on access or involvement?
 - Should the differences be decreased? If so, how/through what type of response do you think it might be improved?
 - o When it does not apply, two options:
 - The differences do not have an effect on access or involvement
 - There are no differences.
 - Why did you think this statement is more (or less) important than the others?
4. Are there (social) factors (on an individual/community level) that you think are important for people's access to water services or their involvement in bottom-up water management that were not included in these statements?
5. So, as I mentioned, I distinguish three types of water system services: Provisioning (freshwater supply), regulating (sewerage, drainage, purification, climate regulation) and cultural (recreational, spiritual and educational).
 - What do you think of the relative importance of these services? Is one, or multiple, more important than others, given the current situation in Jerusalem?
6. Do you have any other remarks on this interview or things you would like to add?

Appendix G: Interview transcripts

Respondent 1

Respondent 1: I wonder how many homeless people there are in East Jerusalem, because there are homeless people in West Jerusalem, mostly youth at risk. That's what I think about when I think about income and capability and strengthening your place in the community. They are really in trouble.

Interviewer: Yes. There are a lot of different groups with different disadvantages. Everybody's going to think about different groups which makes it interesting. Is there a shared perspective underneath all that? Okay. So I want to like to discuss the extreme categories and the statements you put in there, so we can start with the most disagree.

Respondent 1: If you had a colour code with a number on it you would know what it was. Okay, so being part of a large or close community is important to get the access to drinking water and sanitation. I don't agree because I think large close communities are more likely to have political weight. And the society looks after them. We're not talking about Bedouin here?

Interviewer: No. I mean we are talking about Jerusalem.

Respondent 1: Yeah. Because if you're talking about Jerusalem and it's around. You're talking about which side of Jerusalem, which... You know if you're talking about the Bedouin then that's a completely different because they're a large community. They have their own issues. That's another that's right of the scale.

Interviewer: Guess I'm a little bit confused.

Respondent 1: Okay. So being part of a large or close community is important to get access to fresh water. No I think that they get fresh water.

Interviewer: But are there differences in Jerusalem to people there are part of such a community and people are not.

Respondent 1: I don't think so. That is why I disagree.

Interviewer: Exactly. So even if you're you have a small network or like a small community you will also have access to.

Respondent 1: No it does not matter. Not that I, I have to say I don't know enough about East Jerusalem and you're making me... [short cell phone interruption]

Interviewer: You don't have to think about East Jerusalem. It is about the groups that you think about.

Respondent 1: No I think that there's water equality in Jerusalem. If that answers across the board.

Interviewer: Okay. So the second one.

Respondent 1: Being part of a large close community is important to get sewer infrastructure. Same thing.

Interviewer: Okay so it's more... you just disagree with that capability to start with.

Respondent 1: Yes. With the category. Because there is equality.

Interviewer: Okay. Let's move to the most agree category.

Respondent 1: Being aware and understanding one's natural surroundings is important to get fresh water for drinking and sanitation. Generally, I think it's the opposite of the mentally and physically healthy thing. I think it's about knowing. I think about people who have come here who are new immigrants and who have started in the system and it's really to do with how the system is managed and the bureaucracy.

Interviewer: So if you have different degrees of awareness and understanding you think people have different degrees of access?

Respondent 1: Not degrees of access, but capability. What's the thing with standing natural surroundings is important as the fresh water for drinking and sanitation... Now when you say natural surroundings that sounds like you mean out in nature.

Interviewer: Just understanding ecosystems. Where water comes from and the issues around it.

Respondent 1: Oh not really. Because you don't have to understand your ecosystem to be able to turn on the tap. So it's really, it's in the wrong place. So here I fully support being aware of one's understanding one's natural surroundings is important to get access to sewer infrastructure. No they're in the wrong place. I don't know where I'm going to put these [moves statements on the board]. I put possessing basic goods such as a normal income is important to get access to sewer infrastructure. Both of those, it is about infrastructure. And it's the same for drinking water infrastructure, because you do have to have an income because you have to pay. Otherwise you're going to get into debt and there are places where people get their water cut off because they don't pay the bill. It is basic need.

Interviewer: And the reasons for those cut offs are mainly a lack of basic income, or like a lack of sufficient income throughout all the city?

Respondent 1: Yes, lack of a sufficient income throughout all the city. There are situations where people get their water turned off.

Interviewer: Yes. I am also wondering to what extent that is because of illegal connections?

Respondent 1: I don't know how many. There are illegal connections. Illegal connections are also because there's also illegal housing. And that's another issue. Whether people are actually stealing water because they don't have income, so income is a really important issue. Do you go into the cost of living here? Have you looked at the cost of living?

Interviewer: I look at the cost of water. Consumer willingness to pay and affordability are in my framework. I mean I discussed it last time so I'm using that data. It is in there.

Respondent 1: Cost of living is really high.

Interviewer: The second one, why did you put it there.

Respondent 1: This one, feeling empowered. I think also because it's sort of it's got to do with what we teach here very often, it's how to empower people to have a voice on environmental issues. It's the same thing that people very often feel: Who's going to listen to me? Nobody's listening to me so I think feeling empowered is that you can make a difference. To get access to sewer infrastructure for yourself or somebody else, it doesn't matter who it's for, it's whether you need to know that you have the ability. So I think.

Interviewer: So I was wondering how you see those two. Do you think they should be improved? And if so, how do you think that might be done.

Respondent 1: I think it's to do with bureaucracy and all power holding offices. Whether it's electricity or whether it's you know it's all to do with you financial you know that as we're talking about your financial ability to pay for everything, so maybe sewer is different because sewer infrastructure exists throughout the whole city. In old buildings, less here on the street. So possibly it's not the point, it's about having drinking water is the most important thing

Interviewer: Okay, we will come back to that relative importance later. But is it also not that quite a lot of houses that don't have sewer infrastructure? I mean in the pipeline kind of way, like septic tanks or a large part still flows freely into the Kidron valley.

Respondent 1: Ah, but sewer infrastructure is your sewage being looked after. It's getting out of your house. It is sewage not sewer. Sewage is not the infrastructure. Sewage flows away from the places we live in into nature. And then in different parts of the city it's dealt with in different ways. So in the Kidron Valley I don't know now, I thought it was being. It goes into an East Jerusalem, there's a place where it's cleaned; it goes into the Sorek WWTP, there's a cleaning system there. That's what I know about. But if we're talking about the city, is it being dealt with enough? Is that the question?

Interviewer: Well I'm looking at that through my framework.

Respondent 1: Yes. Do people know what happens to their sewage. Is that what you're asking? And the effect it has. There's also grey water and you are also not asking at all about quality of water or the drinking water.

Interviewer: No. I am taking that into account like in the broader... But if you look at like the water that is supplied by Hagihon, the quality of that is sufficient. So I mainly look at access.

Respondent 1: So the access to a sewage system that doesn't pollute?

Interviewer: Yeah essentially. Because I'm looking into sustainability. But that is an assumption, I guess.

Respondent 1: Okay. So feeling empowered in control of one's decisions is important to get access to infrastructure. Don't know if it's relevant. Now I don't know if it's relevant. Okay. So now number one is: Being literate in Hebrew is important when wanting to take grassroot initiative in the water sector.

Interviewer: Why?

Respondent 1: Why. Because the people who sit there and are in control are Hebrew speakers. In this country you have to know how to get through to them.

Interviewer: So it's access to data and information and communication?

Respondent 1: Documents are written in Hebrew. The other statements that were about being literate in Hebrew, I put that as irrelevant actually, most of it, but now that I've understood what you're talking about with bottom-up...

Interviewer: I also want to do the number three category.

Respondent 1: Possessing basic goods such as normal income is important when wanting to take a bottom up action in the water sector. You have to have strength to be able to do grassroots action. So

you need to feel that you're secure. However, in some places people are so desperate that they're the ones who go and bang on the table.

Interviewer: So it's like for two reasons you would take bottom-up action: From an emergency situation and a luxury position.

Respondent 1: Yeah.

Interviewer: So how do you think you could overcome that? Via certain channels or...

Respondent 1: The bottom up action usually comes out of need. That's like the bottom up action when we tried to stop building in a natural thing. It's, you know, people stand up to things and mostly those people are middle class. So I think that's why I do agree with that. But you know, mostly people who will stand up. Also for the greater good of things are people standing up who are more secure and want to do it.

Interviewer: Do you think that poses a problem to the outcomes or the results that follow from that are skewed.

Respondent 1: No because I think that you know already that if a society is... In every society there is poverty, I don't know any society which is not, so people in poverty struggle and don't necessarily have the way to get out of that hole. So that's what I mean about grassroots action or bottom up action doesn't come from that quarter.

Interviewer: OK but you still think they might benefit from that grassroot action

Respondent 1: Yeah.

Interviewer: Okay. Next one.

Respondent 1: Feeling valued and having a voice is important when taking bottom up action in the water sector. It's one thing to feel valued rather than feeling to be valued or being listened to. You want to be listened to.

Interviewer: But also feeling like people listen makes that you... If you feel like they won't anyway, you might not even begin to act.

Respondent 1: Yeah, I know. Exactly. They go together, these two: Possessing basic goods and then not so much and then feeling valued. It's the action to get things changed.

Interviewer: Yeah. So you think they're interrelated. Having the resources makes you feel listened to?

Respondent 1: No, it doesn't make you feel listened to, it means that you are able to make... if you are in a place where you believe somebody will listen to you. You will take the action because you want to be listened to. So it's important that you are listened to.

Interviewer: Yeah. OK. Because you might have the resources and you want to be listened to. But the system could be so top down that you feel like it's a hopeless mission to start with like and that's in that way feeling not listened to.

Respondent 1: Yeah but this is a pioneer country, people who have ideals.

Interviewer: Yeah. Okay, so people will do it anyway?

Respondent 1: Yeah. That is why everybody shouts.

Interviewer: Okay. And the last one.

Respondent 1: Okay, number three. Feeling empowered in control over one's decisions is important to get access to sewer infrastructure. Yeah. You need to know that there's an end that... But wait a minute... So sewer infrastructure is now we're talking about dealing with how the sewage is dealt with. I don't think so now we've discussed it. It's definitely in the hands of the companies who deal with it and are in power.

Interviewer: Yeah. Because I know that people can buy access to that they can get attached to the sewer that goes to the treatment plants but have to pay for it themselves, I think, certain connections, like they have septic tanks for instance, and they want to get connected.

Respondent 1: Okay. You have to in planning in West Jerusalem. I built a house that is just on the edge of Jerusalem. I mean it's like the suburbs. Before we were connected to the sewage system, we had a septic tank but in West Jerusalem a house cannot be built, any building cannot be built, and not be connected to the sewage system. That's the law. And in your water bill you pay for sewage according to how much water use. So there's no, in West Jerusalem there's no such thing anymore. I don't think there's such a thing as a septic tank anymore. Don't believe it. I think they use them. I really don't think so. Then it might be irrelevant. I don't know what's happening in East Jerusalem.

Interviewer: But that's fine. It is just what you know.

Respondent 1: Yeah. Okay. So that's not in the right place. I tell you what I was thinking is when you build a house you need to know how your house is going to get connected to the sewage and what you have to do to do that. You have to go and get the plans and the plans have to be accepted and it is sort of... it's empowered and control over one's decisions. That's what I was thinking about, so that's why it's there.

Interviewer: Yes, that makes sense. Is there another one you think then fits better?

Respondent 1: So feeling valued in like having a voice is important to get access to server infrastructure... [murmurs this to herself]. I am confused...

Interviewer: I will probably reformulate them a bit after this. But according to your perspective I don't think it matters then, the feeling valued, for the type of connection to the sewage network.

Respondent 1: No. For me it sort of leads me to think about the question about what's happening how the sewage is being treated and what's happening to it. And where is the influence. I have to tell you there's a huge thing with the Ministry of Agriculture at the moment. This week it has come out that the minister Ministry of Agriculture wants all our vegetables to be wrapped in plastic. And everybody's like how is this that possible. And that's the system where somebody has come up with this idea. We know that this going to be healthy, but not healthy to the planet. How can it be healthy to the planet and what are we doing and who's going to be earning the money and who's going to be lining their pockets with this. Because I believe that we live in a society where everyone can get water. But you're quite right. There may be different levels of control. Who's controlling it and what can people do about it. So if those are the questions, I think the questions need to be simpler. Yeah. Simplified.

Interviewer: Yeah, I already simplified it but... I am really bad at simplifying things in general. My thesis is going to be very hard to read. So you don't think you can get things you agree or more.

Respondent 1: I'm not sure about the natural under the surroundings ones. What you mean.

Interviewer: This is environmental awareness kind of and understanding the system you live in.

Respondent 1: Yeah. Okay. I think it's education as well.

Interviewer: Yes, I think that could be included in there or like a tool to...

Respondent 1: But I think we're definitely in the first world when it comes to poor people, the way we act about hygiene here. But I think I said it before, with a third world infrastructure. Maybe second world now. You know with sewage infrastructure it's got to do with health sickness. If we don't have diseases that are caused by having a proper sewage system and looking after our sewage, then isn't that an indicator?

Interviewer: For good infrastructure you mean? Yes, it is.

Respondent 1: Yes. If there's no typhoid or if...

Interviewer: Yeah. That is in my framework actually, waterborne diseases, that's an indicator for how the sanitation system works.

Respondent 1: Yes. So if we are okay, and we are I think, then...

Interviewer: Yes. But might be, according to where you live in the city or who you know, that there might be some different perspectives on that.

Respondent 1: But we would know. It would be on the news if there is a typhoid outbreak. They would stand out. There would be panic. It is not like we are in a place where it is occurring every day.

Interviewer: No, I think it is very well arranged. For instance, sewer pipes go underneath the water supply lines. They think about that stuff. Okay next one.

Respondent 1: Possessing basic goods is important to get access to freshwater for drinking and sanitation. I think the question access is, because there is access across the city...

Interviewer: So there are no differences? So it does not really apply?

Respondent 1: No it does apply. It definitely applies when you think about all the people who cannot pay their bills and they cannot clean themselves. So the second one, being mentally and physically healthy is important to get access to freshwater for drinking and sanitation. It is a difficult one. Okay. Being mentally and physically healthy is important to take bottom up action, I do not know if that is relevant. Mentally AND physically, they are two different things. Mentally healthy, well yes, it is important, isn't it? So you are top heavy here. Basically you need to have a basic income to be able to... Being aware and understand one's natural surroundings is important to get access to the sewer infrastructure.

Interviewer: So differences in that awareness or understanding does not lead to changes in access to sewer infrastructure.

Respondent 1: No. However, you could say that these are similar. Except physically healthy is important to get access to sewer infrastructure.

Interviewer: Okay. So we discussed the extreme categories. Do you think there are social factors that might not be included in this list of things that are relevant in this city?

Respondent 1: Where you live. Where you choose to live.

Interviewer: In what way?

Respondent 1: In that the Old City, I don't know what the sewage infrastructure is now. It is older, much older. How much it is looked after, how much it overflows. There are definitely times when there are storms and they are overflowing and there are places where... but not a lot when sewage overflows, it does not happen a lot. I am thinking city-wide. But there are different neighbourhoods in the city, which are newer and older, and the infrastructure obviously is. And highly populated. So it is obviously going to be different. So that is what I am thinking about. The social impact of living in a highly populated area. You are more likely to have more sewage problems. But it is not going to stop you having access to sewage or water.

Interviewer: Yes. Maybe just the state of it?

Respondent 1: Yes.

Interviewer: I noticed that they didn't end up in extreme categories, the statements on cultural services. Are there factors that are not included here that are important for those.

Respondent 1: I think it is cultural. There are not many swimming pools, recreational swimming pools, I think in either part of the city. It is also because of so much fundamental religion; people do not expose themselves. They don't go to swimming pools, only there is a religious... women go at a certain time to a swimming pool. So its recreational use, there are different patterns. But swimming pools are very expensive.

Interviewer: Okay. And for green spaces et cetera water is also needed for irrigation. How do you see the access to those areas? How that works, people accessing that.

Respondent 1: I think it has to do with population and how places are designed. And the way population uses it. I haven't thought about that. But in religious neighbourhoods you see very few trees. I think it is because of overpopulation and education issues, rather than water issues. Because there is water. There are urban parks and green spaces. And we are striving to save those green spaces from being built on. So, the cost of water I think is an issue to the municipality. But I don't think it has got to do with different neighbourhoods. Possibly it has got to do with different neighbourhoods, where wealthier neighbourhoods are greener.

Interviewer: Yes. Because you see it with community gardens for instance. Which are more plenty here than in East Jerusalem. That might also be connected to religious and cultural things...

Respondent 1: And political. But now there are more.

Interviewer: Were there other aspects that are important for bottom-up... we talked about education

Respondent 1: We talked about education. Cultural aspects of it. Religious aspect. Yes, the cultural, where your roots are, where you come from in the world and your expectations of administration.

Interviewer: So we already touched this subject a little bit. How do you see the relative importance of the different services and participation?

Respondent 1: Freshwater and sewage are interconnected. The cultural use is also being part of a wealthy, a place where you feel that you have enough water to have it for cultural/recreational use. There is always the example of... in the summer there is a particular park by the First Station. There is a

fountain of the park opposite, which is always called the fountain where the Arabs go. Because the children all go to play in the fountain. It is a cultural thing that there is this place with running water in the west of the city, where they come from the Old City or Abu Tor and they come to be where there is running water. It is like a place in an open park. It has become the place where they go. You don't see the people that live nearby, the Jewish community, you don't see them jumping in there. So, there is an interesting... you know it is cultural use. The way you do see, you see everybody together. There is a park with fountains that jump up and down, outside the old city. Teddy's park it is called. That is a childhood thing, it is made into a children's playground. That is also cultural as in age group defining. The kids will go and look to running water. What am I trying to say by that is that there is running water here recreationally that is inviting people to go and use it?

But coming back to the question. The relative importance. For a country that has no water, there are water sources for recreation. None of these questions have got anything to do with how people use water. Whether they use them wisely. How much they use it.

Interviewer: No, that is more in the framework. So, are the cultural services more important here than in other places? Given the cultural diversity of this city. Like the springs for instance, that have an historical importance.

Respondent 1: I don't know if I have told you about the spring that we are trying to protect. They want to build these 5,000 units and it is going to stop the water going down into the spring. They said we will open the tap, Hagihon's city water, and then it will still look like there is still a spring there. But then it has no holy relevance at all. So yes, there is special emphasis on those sights. The Muslim people wash their hands and feet before they pray. They will use any water source to do that, anywhere. The action is what is important.

Interviewer: It is not necessarily the staying intact of the places?

Respondent 1: When it comes to their prayer no. but when it comes to the Jewish side of it, it is supposed to be natural spring water, not from a tap that has been treated.

Interviewer: Okay, so it does matter.

Respondent 1: Yes it does matter, definitely matters. The spiritual baths are rainwater. That is the point, they have been collected. It is original source. That is what makes them holy. I don't know, it is an interesting question why not...

Interviewer: Okay, so that does make it... when I compare it to other places, I think, those water sources that also have a religious importance you would expect that they have more protection compared to other places?

Respondent 1: Yeah yeah. Definitely. But they don't.

Interviewer: Okay, but that is an interesting paradox.

Respondent 1: There is a place where there is a spring water source at the side of a major road and people just stop by the side of the road and fill their bottles at this source. And it is so dangerous. That is what I mean, there is this kind of euphoria about having spring water. It would be interesting to do testing of spring waters and what the quality is.

Interviewer: It is an awareness issue.

Respondent 1: Yes. What makes holy water holy. When you see a bottle of holy water, when the pilgrims come, what is that water for them. Why is that holy water? I don't know the answer to that one. You have to ask a priest.

Interviewer: Yes. It is important for the sustainability of the source. Do you protect it, or do you just fill it up with water and it is okay and just there?

Respondent 1: Yes. Or do you build on the water source.

Interviewer: Yes, thank you.

Respondent 2

Respondent 2: In Mesharim, or in East Jerusalem, problems of waters around will not be relevant to the fact that I am not part of a group or a community, for example. Problems may be coming from other reasons, water problems: Basic infrastructure, years of neglect... I don't know. Not necessarily because they are a very close community, for example. It goes back to historical, political reasons, neglect that haven't yet been overcome. Okay? It is just an example. We have to consider that I am not very related to water issues in general.

Interviewer: Okay. I am first going to discuss with you the minus four and plus four categories and why you put the statements there and what you were thinking. People that are mentally and physically healthy are more likely to have adequate access to freshwater... So you disagree, why?

Respondent 2: Actually I thought it was irrelevant. The fact that I am mentally or physically healthy or not. I cannot agree with it because if I get a physical or mental problem from one day on another, it won't change anything regarding these water issues.

Interviewer: Okay. Clear. The same applies then I guess to access to sewer infrastructure?

Respondent 2: Yes.

Interviewer: Okay. On the other side, the ones you most agree with, people that have environmental awareness and understanding are more likely to take grassroots initiative.

Respondent 2: Well. It is quite clear that when I am aware of the environment, I should take more initiative regarding anything that has to do with environmental issues or aspects. Whether it is water or something issue, from my point of view. So, it is part of a whole state of mind. It is not specifically related to water.

Interviewer: Exactly. So do you think there are differences throughout the city? Of people's awareness and understanding? In your experience.

Respondent 2: Of course. There are completely different ways of thinking. And I am not sure that the majority goes for environmental awareness. So definitely it is a minority, I don't know what size. And within this group, that is probably growing, especially with the youngsters I assume, there are also differences of what environment means and what is important within environment activities that can be undertaken. When it comes to water issues, I think most of us will think that it is something that is supplied by the authorities. Or somebody supplies it and I pay for it, and these are the water relations or my connection to water issues. Even within the environmentalists, water issues would not be the first thing to deal with. Because, one, because of objective limitations and, second, because maybe it needs a lot of effort sometimes and it is not worthwhile the effort.

Interviewer: Yes. Okay, so do you think it is important that environmental awareness and understanding is improved throughout the city?

Respondent 2: Of course. Very important.

Interviewer: How do you think that might be done in Jerusalem? The ways to do that?

Respondent 2: It is always a combination between starting from the youngsters through education. This is improving. In the municipality there is more awareness and more activity as far as I know. Together with, not crazy, but people that are leading, that are always the leaders. And probably mostly youngsters, the young generation, I mean people in their 20s and 30s. And adding to this, initiatives like community gardens, like other initiatives that assist people to join and be part of something that is environmentally oriented or at least with awareness. Adding to all this, probably some major projects that are anti-

environment that people would join in demonstrations and going against them on public activities. And through these public activities of theirs trying to prevent certain projects, they would without even noticing go into being more aware of environment, because it is close to their home. Because it is something that is gigantic and raises a lot of antagonism. Even though I am not environmentally aware, I don't have any environmental awareness, but this really sticks out to become a disaster in a certain neighbourhood, so I am part of a demonstration and then I am indirectly more involved in environment. So all this together probably, and maybe some other trends as well.

Interviewer: Okay. And the other one... Powerful and dominant communities are important for access to cultural services of water?

Respondent 2: Yes, I think so. If you have the awareness, which is the basic starting point, and then if you are not alone but with a community that you can join or be part of, of course it helps. It makes a difference. If I will start a community garden with just myself, nothing will happen, so it needs a group, it needs a community. It needs a strong community to be part of it.

Interviewer: Okay. Let's move over to the third category... Environmental awareness and understanding is important for access to green spaces.

Respondent 2: Yes that is kind of the same as the other one.

Interviewer: Okay. The next one, being part of large or close community...

Respondent 2: It is the same. The difference is very small between them. As we said, community is probably the most important... actually awareness and community are the most important elements for all this that you are interested in. Whether it is water issues or other environmental issues definitely. You cannot do it alone and you won't do it if you are not aware to the importance somehow. I assume that they both have the same level of importance.

Interviewer: Okay. So for instance, you can have a large or close community that does not have the resources and isn't powerful in that sense...

Respondent 2: Yes. That is why I think the two have to go together. Awareness and community and back-up. I mean, for putting these here, you can separate them, but if you are talking about practice, then the one cannot exist or cannot have an impact without the other. Awareness and community.

Interviewer: That is very nicely put. Okay, so the last one on the importance of being part of a large or close community is important to take grassroot initiative...

Respondent 2: Same applies.

Interviewer: Okay, so let's move over to the negative three.

Respondent 2: People that have environmental awareness and understanding are more likely to have access to adequate freshwater... The fact that I am aware does not mean that I will have access to anything to do with water per se, because the reasons in most cases would be other reasons. That is why I put it here. And for Hebrew it is the same. When you talk about Hebrew, probably you mean compared to Arabic. If yes, and if not, I disagree. Because I don't think... If you agree or disagree to the following is that if you have good connections with the mayor than you would have more access to, I don't know, water infrastructure. That is not part of the system. It is something that is irregular. That is why I don't believe that Hebrew is a factor. Although maybe sometimes because I know better Hebrew than you, I would get along better with the mayor or his people and somehow success to whatever I need to get from them. But I don't believe it is part of the system.

Interviewer: And if you think about, for instance, if you have a problem with your sewer or your freshwater supply and you have to go to the water utility site or whatever, do you think that Hebrew is a factor? That some documents or not available or...

Respondent 2: I don't believe that at the end of the day it will be different. Of course, if you don't know the local language you have a problem. You have a problem in the coffee shop, you have a problem when you want to cross the street and ask someone where to go to your destination. But somehow you will get along and you will get to your destination, the same here. You will ask your neighbour; you will somehow find someone in the calling centre that speaks your language. Informally, in some cases, and as I said, if I am a friend of the mayor, so I can get more maybe or faster.

Interviewer: But that is maybe almost a matter of like being part of a powerful community...

Respondent 2: More so that you can somehow get along and find your way, even if you have language problems.

Interviewer: So there are a couple of factors that we discussed here. So do you think that there are other things that aren't in here that determine your access to these services or involvement in the water sector? Are you missing important things?

Respondent 2: Maybe the element of need. Maybe it is different between different people. Need for water I mean. If you have a garden, you have a need for more water than someone who does not have a garden. If you are an environmentalist, let's put it even more problematic, and you want to grow your food at home... you need more water. Then someone who goes to the supermarket and buys everything there. The level of need for water maybe is a factor when you want to compare people. And maybe it is more relevant to, some of the elements that you mentioned here, whether it is language or mental or physical situation of mind, the level of need for water. Not the level, the amount. Whether it is quantity or quality wise, I don't know, maybe I am referring to quantity. So, it means that if I have a need for more water like my garden here or a garden at home where I grow my food, that I maybe will be more aware of water alternatives. Because I have to pay more if I use regular water, for example. So I think this can also be a factor in your analysis.

Interviewer: Okay. So your need for water also influences your awareness.

Respondent 2: First of all, your need. I mean, in anything that you analyse you did not refer to the need. You take water for granted that it is a need. And you take for granted, from the statements here, that each one of us has the same level of need for water. I am not sure if it is correct. If it is not, maybe it has an impact on some of the statements that you are trying to find out.

Interviewer: Thank you, I have not thought about it like this, but I am going to try and integrate it.

Respondent 2: So this is one element. The second element that I don't see here is the objective surroundings that sometimes have a major impact... objective infrastructure or situation where I live, and you live. Where somebody in Mesharim lives, someone in mid-city, someone in a ten-store building, private house. These objective differences sometimes also have an impact. If you are asking certain questions regarding awareness, regarding community, some of my dilemmas on where to put a statement was that I had in mind that I can be very active in the community, the community can be quite aware to a certain problem. But the objective situation there is completely different to someplace else. Those differences have an impact on what you are interested in. Whether it is because there is a major problem in the water system, I am more aware. Basic infrastructure, or standard of living has an impact also has an impact on environment and water issues. This will have a much bigger impact on things that you are trying to find out here. This is a second element that is somehow missing or hiding or lacking importance in your analysis.

Interviewer: Yes. So you are saying that where you live and the infrastructure you have determines what you think about and how aware you become of certain subjects?

Respondent 2: Yes. But more so I am saying that if you want to compare between me and you, you as a citizen here, you have to understand the objective differences between us in order to be able to understand our state of mind and the way we think about certain issues that you are trying to analyse. It not necessarily brings more or less awareness, but it is a different starting point for each of us. But if you want to compare and you don't take it into account than maybe you get a wrong result. Because I am much more aware to certain environment things because I live somewhere very close to a place where a big project is going to be build and this is going to change the whole environment. And I am against it, I am recruiting and building a community in order to protest against it. And I have no environmental awareness whatsoever before or after, just for this purpose. If you would ask me about environment and awareness, maybe at that point of time and life I would be very aware to certain things, not to other environment elements. Maybe a year after or a year ago I would have been completely different. And maybe not far from me lives somebody else who is much more aware to certain environment issues for years. So these objective elements also have an impact on the answers your get.

Interviewer: Yes. It is also a snapshot. So looking at the different water services and participation. What do you think are the most problematic areas in the city?

Respondent 2: I am not sure if I am the right person to answer. I live in Jerusalem not knowing about the problems that are in certain areas in the religious or Arab areas. I assume that they have much bigger water issues and problems than what I know we have here. I cannot generalise and answer for the city. I can answer based on what I know and have access to. We all know that Jerusalem is more problematic in terms of water access as a city than certain other areas in Israel. We know it from history, we know it from whatever. So this is in the back of our minds. As a consumer I don't have any complaints, I get my water, the community garden gets water supply. I don't see any, as far as I know, major infrastructure issues that the consumer feels at home. Maybe there are but they don't show up. From a specific example of community gardens, I know that there are problems in certain areas. That have to do with the water supply or in the infrastructure of water access that can be solved by people in the municipality. So it is more the infrastructure or the connection to the water system, and I know that there are problems of this kind in various places in Jerusalem, in community gardens and others, but I am not sure if it is a problem of water supply. It is more a problem of connection. So I don't have a lot of information.

Interviewer: Do you have any other remarks or things you like to add?

Respondent 2: I think that at least from my point of view, I think it is very difficult to bring people to the awareness of the need of water management at their home or wherever, I mean, where they have control over, where they can actually influence. The level of use of water, definitely it is much more important if you want to make them start using their water, reusing or recycling their water, I think it is very difficult. It is almost, maybe even more difficult than trying to make people drive more carefully, which is very difficult to do but it is a little easier because they can see accidents, which is something that makes it much more tangible. So probably here it has to come from educating the children and through them the parents. I don't see any other way, which means years and years. And another problem we have is that we somehow learned how to desalinate. From a situation where we really had no water or very low reserves, you come to a point where you go to the Lake of Galilee and have desalinated water from the sea. So from the point of view of education and making people change their behaviour, it is much more difficult, because we have water.

Interviewer: Yes. So it is also the taking for granted of water.

Respondent 2: Yes. You are like a crying wolf.

Interviewer: Do you think that is also because of the system. Because it is so top-down, you get your water and you don't think about it?

Respondent 2: Yes. We have never got to a point, at least in the last years but even before, like in California when they had no water, so people were entitled not to water their gardens. And they had to actually destroy their private gardens for a certain period of time, to dry them, because they had no water. It was by law or I don't know how, but something like this did not happen in Israel. Maybe not because we did not have to, but because we did not.

Interviewer: Do you think such a measure would help though, for awareness?

Respondent 2: No. Because most of the people don't have gardens. More and more high-store buildings where we all live. In addition, we don't need it objectively, because we are purifying water, so there is no objective lack of water. From the point of view of the consumer, I am not going to the back office and to see the numbers and figures, which I don't know.

Interviewer: So it would actually need an incident or event where it would become...

Respondent 2: In most cases I think major changes in the way we manage our life would be in two ways. Or a disaster where there is no option. Or education. Starting very patiently from the babies. I don't see any other way. I mean, you can talk a lot about awareness of the youngsters and changes that happen gradually. Community gardens and people like me and other people that are a little bit more aware and conscious, this will not make a major change long term. I hope disaster will not be the option. So of course we have to do everything we can, we have to talk, we have to bring more people to the community garden, talk about everything that we can talk about and open their minds about certain environment elements. Of course, it has to be done and it's and it is much better than it was before, the awareness in general, less so to water I think even within the environmentalist. At least the city environmentalists, maybe in some places where the specific issue that people develop or fight for has to do with water, then of course it is different. But if you are talking in general in everyday life in the city, community gardens, green areas, then it is I think a very limited scale; the awareness to water issues.

Interviewer: What do you think the awareness focuses on then?

Respondent 2: Recycling... and again, this is physical. You see it on the streets. You can do it at home very easily, you have all the elements, you just have to gather and separate them and bring it somewhere or do it at home. You get the supply from the municipality, so this is easier. And easier to manage with grown-ups I mean. It does not need tens of years of education from childbirth, although it is also important there, but you can do shortcuts. In water I don't see it, how shortcuts can happen.

Interviewer: Yes, it is easier to see the waste that you recycle than the water that you save.

Respondent 2: Yes. And you can go to see people wash their cars and wasting a lot of water. I can't see it, but people do it. I don't see major steps one can take that will influence a lot of people short-term.

Interviewer: Yes. So education on the long term without disaster.

Respondent 2: Yes. And a lot of other small... like around your house, being part of a community garden. But take me, I think I am more aware of the usage of water here than at home. Here I interact with water in a certain way. When I go home, I am not aware of it as much as I am aware here. So it is just a small example to see that we have a long way to go. And that it is not easy. But I am supporting any initiative, any people who want to lead changes in all these aspects. I will not tell them it is useless.

Interviewer: That might also be what you need, people that take the lead.

Respondent 2: Of course. You need them in Jerusalem, Israel, everywhere, these crazy people, crazy in the positive sense, that will lead changes here. But at least, this is me as a consumer, or a little bit as a more environmental activist at a very small scale, this is the way I see it.

Respondent 3

Interviewer: The first one in the fourth agree category. People that are part of a powerful/dominant community are more likely to take part in grassroot initiative. Why do you think that is?

Respondent 3: I am looking at grassroots initiatives in the city over the last 25 years. And I have seen the kinds of groups, and more of them have been stronger groups in the community. Not all of them, but more of them and you said more likely. It is one of the causes of urban inequalities, because the strong people will be strong, and the weak people will be weak. The strong people will improve things for themselves, they will get a greater political representation and a stronger financial hold on the city. And this happens all over the place. And the other group that I put into this category is the people with environmental awareness and understanding. They are the core of Jerusalem's environmental civil society. They are not a very powerful or dominant community, but they simply care. They will get involved in a grassroot initiative that is not necessarily of benefit to them. So, you have two different groups here. Dominant groups that are going to take advantage of their strength in the community to further something that is very important to them. And people who care about the environment at a global and local level and will act on behalf of all kinds of communities around the city.

Interviewer: So, are you then saying that people in the powerful communities are more likely to do what they do for themselves, while the other group is more altruistic.

Respondent 3: Yes.

Interviewer: What makes them powerful compared to others?

Respondent 3: They probably have a higher socio-economic level. Their houses are more valuable. They believe that their neighbourhood is better. They don't want the garbage to be thrown in their backyard. So, they will make use of all their influence to see that this does not happen.

Interviewer: Do you think it is important to change those differences?

Respondent 3: I have been working all my life to change those differences, it is very important. One of the most famous cases that we have been having in Jerusalem now has nothing to do with water, but it has to do with the environment. It was the issue of where a Light Rail route should pass through. And a street that needs to have a Light Rail was being fought by the people living along it. Because they did not want to lose their parking places. And they said when they came to court about it to take it around there, those are the people that use public transport. So, first, they did not understand where the city was heading for. We are heading to be a city where you will not be able to survive with private transport alone. In the large cities of the world you move from a phase where you cannot manage without a car and you gradually get to a phase where you cannot manage with a car. Jerusalem is just stuck in the middle at the moment. You are not happy with or without a car. I am without a car and I am very happy, because I know the system and my husband and I placed ourselves along a major transport route. Right now they are waiting to finish the contract with the company. The current company has not kept its commitment to bring more trams. They are waiting another few months, the contract will finish, and they will bring in a new company that will bring more trams. They will be more frequent, because they are needed. Soon we are going to have more lines too, they are all being planned and set up. So, we are in the middle of a difficult process for a city, but things are not too bad. And a lot was being delayed in court through this dominant group that was fighting not to have a Light Rail in their backyard.

Interviewer: How would you approach overcoming such a difference. How would you try to do involve the less powerful?

Respondent 3: The powerful voices are often people opposing something. One of things that Amanda and I have been involved in over the last 20 years, and I think the community gardens are particularly representative of this change, is that you can get less empowered people more involved with something

very positive. More easily than with something very negative. And in this instance, it was to get a group of people that really wanted it and realised that it was a good project for the Light Rail to come through their street and for them to speak up too. So, we worked on finding them and getting them to act. They would say, we don't have to say it, because the plan is to put a tram in our street, and we want it, so it is fine. So, I explained to them that a very powerful community group objecting, and I think that should be countered by a very powerful community group supporting it. And that is the place to bring the people who had less of a voice or thought that they did not need a voice at that point to come out and say something.

Interviewer: Do these people that have less of a voice in a sense, do they feel that they can get a voice in the end if they are opposing such a strong and more powerful group.

Respondent 3: In this case it made them particularly powerful, because they were supporting the establishment. This was a very funny upside-down situation, where what the planning system wanted to do, and believe me it does not often happen in Jerusalem, they wanted to do the right thing. They wanted to do the right thing and it was necessary to have a grassroot voice supporting them. I had a similar case many years back with the Jerusalem forest, there were a lot of plans that were taking bits of the forest and making it smaller and smaller. There was a plan from the Jewish National Fund, the afforestation organisation, to define the boundary of the forest so you could not encroach upon it. We, the grassroot and environmental organisation, came into court to support the plan, which was being opposed by all the people who wanted to build a neighbourhood, or a road, or something else. We created a very powerful voice for the forest. I am not sure if that case would have ended the same if there had not been that voice.

Interviewer: In these cases the plans of the government are in line with the less strong voice.

Respondent 3: Not usually. The problem with the planning system here is that, when I am talking with colleagues around the world it is not unusual, they are not in-sync with what would really make the city more sustainable and a better place to live in. I look at things very simply, I see the city as a product, and I am the client. Someone has to sell me a product that I want to buy. They need me to want to live in the city and with me I mean anybody. So, I have to be able to say what are the things that are going to make my city worth living in for me. To tell you the truth, in Jerusalem today, I have an awful lot of those things. I have a transport system, it is not at its most or at its best, but it is getting there. I have good health services all over the city. It is an urban problem in many parts of the water. I have access to food, water, energy. There are lots of things that I would like to see more and better in this city, but on the whole... First of all, voices are heard from all sectors. I forgot what your question was.

Interviewer: That in the cases you named the less powerful voices are in line with the establishment. But what if that is not the case?

Respondent 3: Let's put it this way. People opposing the plan were the stronger group and it was necessary to encourage mobilisation of a less strong group. But in many cases, the people opposing are the stronger people and they are opposing a bad plan. And then you will hear less capacity for the neighbourhoods to oppose bad plans. The cases I mentioned are the exception not the rule. The case of the Light Rail was people with a very loud voice trying to change public policy, which for a change was good. That very same community has opposed bad plans in its neighbourhood, but it is certainly true that the powerful communities have a stronger voice.

Interviewer: So, if you would say how to improve the voice of the less powerful than you would say create a community and get them together?

Respondent 3: Yes. I think it is the main way to do it. I think what we are all doing together now is very important. We have established a Sustainable Jerusalem Lobby and it is getting much stronger. Because of the POWER project we are going to have a water team within the lobby. I think that is a nice idea, because what that project wanted to do is to put water on the table as one of the issues that civilians and

citizens outside the decision-making process were having a voice. I think that is a very nice idea and that is why I am so happy to get involved with it.

Interviewer: Okay. Let's move to the positive three category. People that are part of a large or close community are more likely to get involved in grassroots initiatives.

Respondent 3: I would say that all of these belong in the same group really. So we have the powerful communities, part of a large or close community, people that feel valued, people that feel empowered. Those are the ones that take up arms and go out and fight. And all the ones with environmental understanding of the dangers of what they are fighting.

Interviewer: So you would say that these are interrelated? Are these the same people?

Respondent 3: These people will probably find it easier to find each other and join forces. And a lot of the weaker groups might be left behind, but they might also be included. These might be the leaders of the struggle, but I hope they would call their weaker brothers in. This is what we try to do in the lobby. I have a neighbourhood in the lobby that is an ultra-orthodox neighbourhood fighting for an open space that is very much threatened. And most neighbourhoods have not bothered with that open space, but now we have made it a lobby issue, so everyone is in it. And I am finding that very useful for the initiative. It is a stronger force.

Interviewer: The people taking these initiatives with those characteristics, in general do you think that their ideas and initiatives also benefit the groups that are not getting involved.

Respondent 3: Often yes. But there will be the rare cases where people with the strong voice are promoting the bad thing. We have to be very careful of that. But on the whole, I think they will be helpful to the weaker groups as well.

Interviewer: We talked about some being more selfish. But overall you think that whatever they strive for, it will benefit the broader public?

Respondent 3: If what they strive for is good, it will benefit the four groups that need that issue to be helped.

Interviewer: Okay. Let's move to the minus four category.

Respondent 3: People possessing basic goods are more likely to have access to sewer (treatment) infrastructure than people without basic goods. I don't think that is something that can be said in Jerusalem. I think the poorest neighbourhoods have access to water. And also, the neighbourhoods of the city are linked up to the sewage, but we have a problem with where the sewage goes to. However, for someone living in a house, what matters to them is that their sewage is not in the backyard but in a pipe and that the city is taking somewhere. By the way, there is breaking news about the Kidron Basin. The civil administration has, through the Joint Water Committee, signed an agreement with the Palestinian Authority that the sewage in the Kidron is going to be dealt with. Please. This has happened before, but I hope it is really happening now, that it is really going to be executed. For me this is game changing for Jerusalem. It affects the whole way we look at the Jordanian desert and the area between the city and the Dead Sea and the future welfare of the Bedouin communities there, and the poorer communities in East Jerusalem. It is very significant. But for the people living in houses it is no different whether the sewage is flowing near Nalsabat or not, just as it makes no difference to them as long as their garbage is taken away, and it is not being recycled. If you had asked about garbage, I would have had to answer differently, because not everyone is having their garbage taken away as they should, although that is improving now. There was an issue where the vehicles that collect the garbage were not able to get into some of the streets. The city could not afford to buy a fleet of smaller vehicles, but they have been giving money by the ministry of Environment and they are now purchasing those vehicles and they are beginning to change the whole way things are done. So that is good.

Interviewer: So there are no instances where people have to pay to get attached to the sewage system when it is topographically difficult?

Respondent 3: I do not know about that. You should speak to Hagihon about that. They know exactly. There has been a lot of progress there. The main difficulty has been houses that were built without proper planning process and building permits. Those houses, they were not entitled to link them up to the sewage. So, the issue is, I have a very dear friend and colleague who is working on getting legalisation of illegal housing in East Jerusalem. There is less of it now because are working with the authorities and going through proper channels. That is changing to but none of these things happen instantly or as fast as we might like. Who are you talking to in East Jerusalem? You should talk to someone who is the head of a community centre in East Jerusalem. There is one that has joined the lobby and the thing that they want us to fight for them has nothing to do with water, but they want to have an elderly home in their neighbourhood. They say that on that kind of institution they have been neglected.

I most disagree entirely that people who are mentally and physically healthy are more likely to have access. If you are mentally and physically healthy or unhealthy goes together with the society you are in. if you are mentally and physically unhealthy in a very primitive society you may get a hard deal. But you are in the same place as all your community, so I don't think it has to do with being mentally or physically healthy. That is why I put all the mentally and physically healthy things here in the minus 3 and 4.

Interviewer: Okay. And so also, possessing basic goods also does not make a difference for getting access to drinking water.

Respondent 3: I do not think it does in Jerusalem. Maybe if you go to the Negev and some Bedouin communities are cut off. There might be places, but you are talking about my city.

Also, I put the illiterate in Hebrew in here. I think it is irrelevant. I think I explained that, because all the services are available in all three languages. Not in Dutch, German or French, by the way there was a time that one million Russians came to Israel. That was in the early 1990s, so at one point everything was being done in Russian as well, because they were a fifth of the population. There was suddenly a new fifth added, it was ridiculous. You had a situation where lectures in the university were given in Russian.

I may be wrong here, maybe that Hebrew speakers to take on the establishment and take grassroots initiative. I lot of things have been led by English speakers. You have three languages here, all the road signs, all the instructions. But I am not sure about this relation, so it is in the right place.

Interviewer: I already heard you touch the subject. There are a few categories in here. Are there things that you think are missing and that are still important for access to water services and involvement.

Respondent 3: I think the socio-economic is key. There have been issues in Jerusalem over the years, some people thought it was important that there should be this kind of majority in the city or that kind. And a very wise professor that I know, said that the future sustainability of Jerusalem does not depend on whether there are more ultra-orthodox Jews or more Arabs or more secular and traditional Israelis. It depends on having a majority of people that can pay their taxes and take an active part in civil society and be a part of the city's community. It does not matter which of these three sectors they come from, but if they are not at that reasonable socio-economic level than the city is going to malfunction economically and continue to be the poorest city in the country. Because we are the poorest city in the country.

Interviewer: What exactly do you mean with a certain socio-economic level?

Respondent 3: To be able to participate in the city economy and pay city taxes. You have a job and you work. And it usually means that both you and your partner have a job and work. Because the main

problem in the ultra-orthodox sector is that the men are not working. The men study all day. They study their scriptures and texts and their wives are very proud of them for doing that. They have lots of children and the wives also earn a living. The wives work themselves to the bone and they live in great poverty and cannot pay their city taxes. We are a welfare state, so nobody punishes anybody who does not pay their city taxes. In the Arab sector it is the women are not allowed to go to work in many places, in strict Muslim society. So, you have only one breadwinner. The men are not well enough educated to get a high enough salary. Of course, all of these are generalisations. There are many ultra-orthodox men who are in the work force and there are many Arab women that are in the work force in the less orthodox part of the community. But, if you take the statistic, you will find a majority of Arab women not working and a majority of orthodox men not working or not contributing sufficiently. Therefore, you have two thirds of the city that is not contributing to the city's economy but taking from this economy without giving. That is how we end up being the poorest city in the country. The government does not give the city anything to make up for what it loses in the taxes that it is not getting. Because it is a national requirement that you do not make people pay taxes when they are too poor. It is all very tricky.

Interviewer: Does that relate to the statement on possessing basic goods and grassroots involvement?

Respondent 3: It certainly relates to grassroots initiative and it may relate to having access to green parks and things. Okay, so I want to change this, because I do not believe it is true that people that have environmental awareness and understanding are more likely to have access to freshwater. Instead, I believe more that people possessing basic goods are more likely to have access to green parks et cetera. There is something that is said by the municipality about that, that they pay more attention to parks and gardens in neighbourhoods where people pay taxes. Is that right or wrong, I do not know. If you live in a neighbourhood and pay all your taxes and the city gardeners do not bother with your park and they go to a poor neighbourhood, but you have paid your taxes.

Interviewer: Yes, I am not sure either. Although I think it might perpetuate the existing dynamics and the inequalities between rich and poor.

Respondent 3: Yes. That is one of the reasons that the community garden movement began. We have 75 community gardens in Jerusalem. A lot of them are public open space that the city did not do anything about. And if they were in poor neighbourhoods, it was because they were assisted by organisations like SPNI or Jerusalem Green Fund, things like that. Not because the city helped them.

Interviewer: Okay. So, you added the socio-economic aspect. You think that socio-economic extends beyond just basic goods?

Interviewer: Yes. So, a certain socio-economic status comes with the resources to take action.

Respondent 3: One of the main problems in the ultra-orthodox sector is the terrible cramped conditions of small houses and large families, overburdened and overcrowded neighbourhoods. So, there is garbage that is not being collected enough, the streets are dirty, everything is neglected. And it is bad. A lot of that happens in Arab neighbourhoods too. However, it does not have to do with the fact that they are ultra-orthodox or Arab neighbourhoods, but that they are poor neighbourhoods. There are rich parts of the ultra-orthodox and Arab neighbourhoods, where everything is just fine.

Interviewer: And they do have a greener neighbourhood also? Or is that something religious to live in a sober manner?

Respondent 3: Yes, they do. They are prepared to fight for their green spaces just like anybody else in this neighbourhood where I am working in Romema.

Interviewer: So, we talked about access to freshwater and sewer is not really an issue here. Looking at the three water services and grassroots initiative in the water sector. What do you think is a priority issue now here?

Respondent 3: I think the issue of open space is not sufficiently distributed around the city. I don't think garbage is treated as it should, that is a national issue. There is a big plant being planned now for the whole of the Jerusalem region and the centre of the country, which will recycle much more at source. So, the open green spaces. Trees, not only in the parks, but in the streets to give shade and cool the city. There is an inequality there between neighbourhoods. I would say that those are the major issues. Transport access. It is a city in metamorphosis, so I don't think you can criticise it, until it gets to where it intends to be and then see if the system is a good one or not. And these things take years in any city. It has been going on for years already.

Interviewer: Concerning the religious use of water and the sustainability of springs, what we talked about last time. Where does that fit in here?

Respondent 3: Concerning water, springs are an issue in the city. Springs have to be recognised as something... that is the meeting point between natural and cultural heritage. Because there is the cultural aspect to it. I might have told you about the spring in Ein Karim, which was flowing into the streets and into the drain. And it is now being taken under the road and into the wadi. But it took many years to do that. There are many springs now being threatened by all building developments in the southwest of the city, which is going to do great damage. I think that is an example of it being very fortunate that we have some very strong voices taking part in the fight against the plan. The green space issue is important because it is so irreversible. Once you have taken an important green space and you build on it... you don't unbuild it. So, any spaces that we can save in the process of unsustainable development, it is very important for future generations and for the future sustainability of the city. We need our people to live in cities, we cannot have them buy little houses in the country. We need to be an urban nation. Israel is 93% urbanised, which means 93% of people living in an urban context. I am not sure if I look at the city of Jerusalem whether it is sufficiently being made compact to the extent that it could. So, I think that is a very important issue. It is part of conserving the open spaces, we need to densify the city. You need to build very dense neighbourhoods, high-rise buildings. On the other hand, I do not want them to touch the Jerusalem forest. I want there to be little pocket parks in the neighbourhood for people to sit in. I do not want my neighbourhood to be the way through for cars to leave Jerusalem. I see children and older people walking around slowly in the neighbourhood and breathing bad air, so if the transport system is not sustainable and healthy then the neighbourhoods are not healthy. You clear your main routes for a Light Rail and then you send all your traffic into the neighbourhoods and that is bad. So there are a lot of pros and cons to everything and you have to make sure that your results are a triple bottom line and it is not always.

There are parts of the city where we cannot build high. We shouldn't do it in the Old City, and we shouldn't invade open spaces. For instance, in the Gazelle Valley, good use of natural water, treated sewage is used for irrigation. Now what you are seeing there is dense building all around it. I call it the Central Park syndrome. You want to live near Central Park in New York, so you are prepared to live in a high building, because you know you can go out into the park. And that is the future of cities basically.

Also, in the Old City there are 40,000 people living in it. There are digging under and adding bits on top and they are not obeying the planning laws and it is very hard to punish anybody for it. because they are living in such difficult conditions. On the other hand, it is very nice the Old City, it is nice to walk around there, and it is clean and nice. You have the four quarters and they really live in remarkable respect of each other, which is quite surprising in many ways. It is not the way the world talks about Jerusalem. There are many things that need to be improved.

I want you to talk to Ramadan Dabash. He ran for office in the municipality. He did not get in, he wanted to be a representative of East Jerusalem. He said it has nothing to do with the future political arrangements of Jerusalem. I want to represent to Arab population. But out of fear and under threats the Arabs did not vote. They do not take part in the elections and so they end up not being represented. They are under threat by the Palestinian Authority. It is so stupid. They could take the city over; they could have their own mayor. The ultra-orthodox did it, the Arabs could do it easily. I try to keep explaining to them. They are the ones living in these circumstances. I was deputy mayor and you change things by financial decisions that are made around the table in the municipality. So, the cleverest war to conduct

would be to take over the municipality of Jerusalem. It is almost as stupid as women. They should be taking over the world, but they are not. We are gradually, but you do not see a majority of women in parliaments. They are not going into politics. It is not so long ago that we got suffrage et cetera, it is less than a 100 years. We have to stop and remember it. We have to think that if we are not automatically taking over parliament right now, it is not the end of the world, we have to educate the kids.

When half of the parliaments are women, we might have a more balanced world. That is why I went into politics. But I found myself one of five women in the city council of 31. It made it much harder. Not only was I one of five, but I was the only environmentalist. Although I have been very successful running an environmental coalition and fighting environmental battles in Jerusalem. Before I became Deputy mayor after I came into office, it was much harder. It was one voice with 30 people automatically against me. And I have been much happier since I got out of there. I can do more outside the city hall than inside. But again, all of that has to gradually evolve and change. Arab society has to change too. It is misogynous.

Interviewer: Would it change? Women going to work for instance, because it is such a religious...

Respondent 3: I think it is a question of evolution. Whereas in Christianity and Judaism, you can be a so-called secular Christian. There was a vicar who said that there is no such thing a non-church going Christian. But there are many Christians who do not observe an awful lot. At one time, you could not be a secular Christian and be admitted in society, just as like for the Jewish community you could not be a secular Jew. And I think a lot of the Muslim community is in a situation where you cannot be a secular Muslim. That is why I think that is why the Muslim world, talking to the rest of the world, is apples talking to oranges. I think it is making things very difficult. All of the Western world, I think that is Europe's mistake today, is assuming it can talk to its Muslim citizens the same way that it talks to its Christian or Jewish citizens who have centuries of evolution behind them. Obama said that Muslim society is going through what Christian society went through 500 years ago. Everyone got very angry with him, but I actually think he was right. Because think of what was happening, Catholics were murdering Protestants and they were all together murdering the Jews. Jews were expelled from Spain in 1492 and if they remained there, they were burned and tortured. We made progress there, but somehow the least large sections of Muslim society are in that place or have taken themselves into that place and they got to get of it somehow. At that time, the Muslims were more enlightened than the Christian. What is known as the golden age of Spain, the 12th and 13th century, the Muslim and Jewish community wrote works of literature together, developed mathematical principles together, developed the whole grammar of the Semitic languages together. When Jews were expelled from Spain, they found refuge in Turkish and Muslim countries (and Netherlands, Mokka).

Anyway that is why I have stopped talking about peace projects, I no longer have on my agenda. But I very much believe in any project or initiative that brings people together to do something that is in all their interests.

Interviewer: Are there still other factors that you are missing? Or remarks?

Respondent 3: Religion and gender are not in here at all? It might correlate with these factors, but it is not consistent. In the non-orthodox neighbourhoods, you will find very poor and neglected neighbourhoods too. And you will find both in the Arab and ultra-orthodox communities you will find rich and poor neighbourhoods. So, I do not think that the divisions are not as clear as it might be convenient for us to have them be.

Respondent 4

Interviewer: Let's start over here at the plus four category. People that feel valued and like having a voice are more likely to have access to green spaces, why did you think that was most applicable in Jerusalem?

Respondent 4: In Jerusalem? It just sounded reasonable to me. Not from personal experience or something.

Interviewer: Okay. But do you think there are differences in Jerusalem between people that feel valued and like having a voice and people that don't?

Respondent 4: I don't know actually. In these matters, I don't see the difference between Jerusalem and other cities actually.

Interviewer: But why do you think they sound reasonable?

Respondent 4: People that able to sound themselves, that have a voice, probably will push more to get adequate water and sanitation. That is my reason.

Interviewer: Okay. But you put for instance here people that feel valued and like having a voice and the relation with cultural services, you put the same theme in different places. Why?

Respondent 4: Because maybe it sounds like this topic of drinking water and sanitation, as I see it, no matter what group you are talking about, they have less room to influence it. With green spaces, you have more influence.

Interviewer: Do you think there are large differences across the city in feeling valued and like having a voice?

Respondent 4: I don't really know.

Interviewer: And if there were, how do you think that can be improved, and is it important?

Respondent 4: Important yes. I am a socialist. I think it should be equal, but it is not of course.

Interviewer: What would be a way to level that?

Respondent 4: Maybe local organisations, like neighbourhood watch, those kind of things. It is a lot of local politics. I know it is very strong here in Jerusalem, but I don't really know the differences. But there are a lot of local politics that can influence those things.

Interviewer: Okay. So the second one was...

Respondent 4: Environmental awareness, yes, so it is more or less the same for me. Same reason. I feel like people that are environmentally aware and people that are loud in a good way, people that are loud and put their mind into action, they push the authorities. That is how I see it.

Interviewer: And those are the people that are environmental aware?

Respondent 4: Yes. Activists.

Interviewer: And the people with a loud voice, they could also be anti-environment.

Respondent 4: Yes. They know what they want. The other one, maybe they are mistaken with their needs.

Interviewer: People that don't occupy themselves with environmental issues they won't make their voice heard?

Respondent 4: Who are not aware of environmental issues.

Interviewer: Okay let's move to... people that are mentally and physically able are more likely to have access to drinking water and sanitation.

Respondent 4: Again it is more or less the same scale. Because I see them as less miserable as the unhealthy people. The unhealthy people have no voice here at all, as I see it. The low-grade of society they just focus on surviving.

Interviewer: Is it hard for them to get access to water?

Respondent 4: I don't think it is hard for them to get access to water, but the infrastructure definitely will be better. Usually I see, again it is a huge generalisation, but I see them as the low levels of society most likely won't have the voice to demand sanitation and freshwater, they will demand money for drugs and food, clothing, heating. Because they have water, maybe it is not the best water, but I think in their own scale it is less important now than heating the house or getting warm clothes and stuff like that.

Interviewer: And again, how do you think that might be improved?

Respondent 4: It is a million-dollar question. They are not really successful in improving the situation in the last few years.

Interviewer: Have there been attempts?

Respondent 4: Regarding water, I don't know.

Interviewer: Next one. Being healthy and access to cultural services of water.

Respondent 4: It is the same. People that are not healthy won't demand green spaces; they won't have it. Here, how I feel, you have to fight for it as a neighbourhood or whatever, otherwise the authorities will just run you over.

Interviewer: So you will also see differences between neighbourhoods.

Respondent 4: That is for sure. That is also where I am from, where there is a very loud in the neighbourhood that pushes things. So, this neighbourhood will get their gardens and everything. A neighbourhood that sits silent will just have concrete all over. Yes next one, environmental awareness and green spaces. So again, same for me.

Interviewer: Okay. So you think that environmental awareness and understanding and being healthy are one of the most important aspects overall?

Respondent 4: Yes, because it does translate for me that the highest percentage [regarding health] that will be in the higher level of society that also live in a better neighbourhood. Of course they have the awareness, so they will demand more from the authorities and they will get those things.

Interviewer: So it is also important kind of in taking grassroots initiative? Or how do you interpret that?

Respondent 4: Yes. It is the same for me.

Interviewer: Let's move over to the negative categories.

Respondent 4: People possessing basic goods are more likely to have access to sewer. This I put in most disagree, because sewer is the same everywhere. I don't see differences. More in green spaces, there are definitely huge differences from area to area and from group to group. In sewer I don't see any differences.

Interviewer: And do you see differences in where the sewer goes to? Whether it gets purified or...

Respondent 4: Or discharged in the river. Yes. But I don't think it is about society, I think it is more geography, history and money. Next one. Being literate in Hebrew and having access to sewer. Again, sewer I don't see differences.

Interviewer: Do you think language is an issue anywhere in the water sector?

Respondent 4: I don't see it. Difficult of course. I think in any aspect of life it is difficult to not speak the country's language. But in the services that I will get if I am English or French speaking, I don't see the difference.

Interviewer: Okay. So just move to the minus three and work your way down.

Respondent 4: Okay so people possessing basic goods and their access to freshwater for drinking and sanitation. Again, for freshwater I don't see the difference.

Interviewer: You will be connected anyhow?

Respondent 4: Yes.

Interviewer: Is there a reason for you to put this in the minus three category and this one in the minus four?

Respondent 4: No I think they are pretty similar. The last one is about being literate in Hebrew and access to green spaces. Also I don't see this as a factor.

Interviewer: Okay so here we discussed several factors. Are there factors that are not included here that influence the access to water?

Respondent 4: Money on the higher level. On the highest twenty or thirty percent or so. Probably I can get some, besides the public water that everyone is getting, which is good, but I can get some purified water, to put a purifier in my house or whatever.

Interviewer: Okay. So that is beyond basic access to a more additional level.

Respondent 4: Yes, a more high-end addition.

Interviewer: Quality more than quantity.

Respondent 4: Yes. A greywater system or whatever, it costs a lot of money and not everybody can afford it.

Interviewer: Is a greywater system allowed?

Respondent 4: Yes.

Interviewer: Are there other factors next to money?

Respondent 4: No mostly money. It is all about the money.

Interviewer: So here we discussed different water services and participation. What is the relative importance of these services?

Respondent 4: Of course water first. Otherwise nothing else will matter. Then the sewage and then the green spaces.

Interviewer: Okay. So that is the order you would give them. But in what field do you think lie the biggest issues in this city? What is the hottest topic?

Respondent 4: Water and sewage we have. Green spaces we don't really have. So maybe this will be the most important topic.

Interviewer: And how do you see the involvement of people in...

Respondent 4: In creating green spaces?

Interviewer: No for all different services. How important it is.

Respondent 4: Very important for all three of them. It is very important, because in the end it is the environment that we live in. Every one of these things influence the environment, it depends on where I'll draw my water and of course where my sewage goes and what I will do with it and green spaces of course for the quality of life.

Interviewer: Okay. That were all of my questions. Do you have any remarks about the interview?

Respondent 4: No. What is the purpose of what you are doing here?

Interviewer: [explains purpose study]

Respondent 4: So it is the concept of people actually. What people think as... maybe it is not really the most important thing here in Jerusalem, but what people see as the most important thing.

Interviewer: Yes. It is kind of subjective what I am doing.

Respondent 4: So there is one question that pops into my head. Are you talking also with people from different sectors in Jerusalem? Like with East-Jerusalem, Arabs, orthodox people.

Interviewer: Yes, I try to, but they also need to have a bit of knowledge on the water sector.

Respondent 4: Okay. Because I see it, I have no advantage answering this working in the water sector.

Respondent 5

Interviewer: So what I want to discuss now is a few statements in the more extreme category on the outer side of the spectrum, because to discuss them all them would be a very time intensive task. So let us start with the minus four category. Maybe you can repeat it.

Respondent 5: People that are mentally and physically healthy are more likely to take grassroots initiative in the water sector than people that are not. And the second: People that are mentally and physically healthy are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational use than people that are not healthy.

Interviewer: Can you tell me why you put it here? Why you disagree with this the most?

Respondent 5: As I mentioned to you, I mean it's difficult because everything here could belong... Any people that have some awareness and are educated, they are probably going to explore and try to go to a place where you know you have freshwater, but this is a general statement. But the question is that you can be mentally okay, however, doesn't mean that that's the reason I'm going to choose to go to a place where you have fresh water. I guess the rationale when people are looking for a place to go, fresh water is probably not the first thing they think about. I mean in Jerusalem they are coming from the point that fresh water is available everywhere. Usually in the Western world, so it's not going to be something that that will guide somebody to go and live in a place that it's recreation area or whatever. I'm not saying it's not but that's not that the main issue. Even when I look at the number four here, I mean we can talk about this one, where it says people that have environmental awareness and understanding more likely to have access to sewer (treatment) infrastructure than people that lack environmental awareness and understanding. Clearly, people that have some education and they have the awareness of what it means to have fresh water and what it means to have a wastewater treatment plant. I mean probably they would look into it before they make any decision. I can tell you, before I study anything about environmental issues, I probably wouldn't care about things like that. You know for me it was years of experience. And what I do, I probably would tell people that they shouldn't go here. Given that I have the information I would be more aware to tell people where to go. And that's basically the big crown that they have. I mean it is so clear to me that the awareness is the main factor.

Interviewer: So if you think about the people that have understanding and people that have not. Do you think they have a different degree of access than to the sewage treatment plants in the city?

Respondent 5: Very clearly not. You have all the people that live in East Jerusalem and these are people that live for many years already in their places. Some coming in the last few years, because they have relatives, they don't ask what type of water they have. Having said that, I would not say that people that come and move to Jerusalem, even educated people, I don't think they would ever ask what type of access they have. The notion here in Israel is that the water availability and the quality of the water are good, so people are not really asking this question. That is not really going to be a factor for them. If somebody would come with a big story in the newspaper and say that this neighbourhood is bad in terms of water access, then I would say it is a factor.

But as a statement, I would say for sure that's not going to be a main factor. And again, there are educated people who will look into it. But it's not the main factor. I would say that what motivates people more to go and live somewhere is what kind of school you have in the neighbourhood, what kind of kindergartens you have. Obviously, that's something that educated people would look into, but I wouldn't say that the water is going to be an issue.

So, I mean all your questions are very difficult. As you can see, I put the categories in such a way. I mean the way you ask the question is clear. You know you have similar question to one category, so that is what I am trying to do. I could probably move this as I mentioned to you.

Interviewer: Yes of course it can be interchangeable, there's an argumentation to be found for any division. Okay, so let's head back to the negative four category. The residents in Jerusalem and their mental and physical capabilities that doesn't change their access to water and their involvement.

Respondent 5: Yes. This is the least related to it. That's right.

Interviewer: So let's go to the negative three category. People possessing basic goods, such as a normal income, are more likely to take grassroot initiative than people that do not.

Respondent 5: It's a nice question and people with basic goods can live in a place with or without a lot of fresh water. But that's not something that anybody would ask. Again, income is important maybe in a place like India. As I mentioned, water quality is really not an issue here in Israel. So it has become less important. And even people with normal incomes, like me, I can tell you again they will look into a place where there is a school for children or with parks. So that's why I put it in there.

Interviewer: Yeah. So, for instance, if there are some development plans for water infrastructure and you don't agree with it as a resident, would basic goods, money and resources make a difference whether you get involved?

Respondent 5: Maybe me personally, because I have more awareness and clearly, I know more about that, I probably will get involved. But the regular person... nobody cares about it. I mean, they care about when you have a drought and there is no water. But the general things in Israel... I mean it's not an issue. Again, the issue is a drought, but nobody really has a concern when you drink water and when there is a neighbourhood being built. I can tell you there are plans to build on the Jerusalem forest in western Jerusalem. People get very much involved because they're going to kill the trees and they don't want that. But water does not become something that people will get involved with. They are very aloof and remote from things like that.

Interviewer: Yes. So that's what you said, that it is the environmental awareness and understanding that makes you get involved.

Respondent 5: More involved. That's right, absolutely. There's no doubt in my mind that if you tried to find people to get involved, it is going to be this category, number four.

Interviewer: If you have environmental awareness and understanding and you have no money you would still do it because of your awareness and understanding?

Respondent 5: Yes. I would say that I would try to get somebody that has the money and I would get in touch with some lawyer. Motivation is more important.

Interviewer: And the second one in the negative three category.

Respondent 5: People possessing basic goods, such as a normal income, are more likely to have access to adequate to fresh water for drinking and sanitation than people without. That's a statement that doesn't apply here in Jerusalem. Again, when I am talking about East Jerusalem, over there you will find that there are places in the area where the infrastructure is in very bad shape. Again, the water is okay there, you have to understand. I don't know how to really categorise the people that are living in East Jerusalem. I can tell you that the people in the area would prefer to have the water from Israel than having the water from the other side of the border. I mean, even though we sell the water to the Palestinian state. I mean basically, the water that's coming from Jerusalem is going to outside city to Ramallah. I mean, this statement is, there are nice villages in the size of Jerusalem, big villages of Palestinians living with a very high quality of live, the water is wonderful. But were the wall is, you know when they build the wall after all the terrorist attacks, the access to take care of the things on the other side became more difficult. So they have less. As I mentioned I think last time when we talked. But I can tell you that we

are doing a lot right now to reinforce their infrastructure. And in the last few years, there are a lot of things that they try to bring in the same way. But again, I don't think people within those areas have any preference. For them the question is do I have water in the tank during the night or not. So all this really does not apply in many ways to the question you ask here. Maybe you should go to Ramallah and look into what they have to say about that. Something to think about.

Interviewer: Yes. So there are some differences in that access you would say with some neighbourhoods in the municipality?

Respondent 5: Yes, but again the bottom line is that they have water. I mean there are some places that have a shortage of water, because of all kind of reasons. But in general we don't have thirsty people.

Interviewer: They can still access water, but maybe it's not the infrastructure but a different way.

Respondent 5: No. Pipes and distribution mains are there. I would say 95% of the coverage is very nice. Maybe 5%, we have some issue there, but we're pushing it now and there is a lot of things done right now to make sure that we don't have a problem on the other side. But again, sometimes we also have some problems in western Jerusalem for all kinds of reasons.

Interviewer: Okay. So, I just want to shortly zoom in on, because you said, sometimes are some shortage issues for all kinds of reasons, could you give an example of what those reasons are?

Respondent 5: Yes, I can give you some example. I mean we are getting from the coastal plain. The water is coming every night from the coastal plain, apart from the desalination plant, apart from the National Water Carrier, part of the groundwater. And there are two major water mains that supply the water through the night with a pumping station along the way. Sometimes the water main can fail. When that happens, we are getting a problem with our storage reservoir here, because they pump the water during the night about 6 to 7 hours and they fill the storage reservoir. And the storage reservoir is the main supplier during the day and they're doing it at night because this has less energy costs to pump in the night. So I can tell you couple of years ago that we had a problem where one of the pumping stations in the track main that there was a discharge main burst and they had to stop the water. And what happened is that the storage reservoir in Jerusalem started getting very low. It's very dangerous, because if you get a storage reservoir stop than air comes into the pipe, which can cause a dramatic stop of water around the city. So, we were at a point like this where we were stopping all the water in Jerusalem and then we had to go to some emergency mode. We have been doing exercise in such cases where when you have that. So, it was very close to that in the storage that went down very badly.

Interviewer: So that how long does the storage last?

Respondent 5: Our luck was that the discharge burst within the pumping station. So Mekorot, our National Water Company, they managed to fix it in about twelve hours. You have to realize we didn't stop the water in Jerusalem. But I can tell you that if this pipe and this track main probably going under the main highways to Jerusalem. And if that's what would have happened, where all the cars are going, and we had to cut the embankment there and fix it, then all Jerusalem would be without water. We had to go to emergency mode. So that was one issue one time and the second time we had a freezing situation one winter about six years ago. And what happened, is that in Israel we have the solar tanks on the roof to heat the water. And the temperature went down to minus 3 and there is a special valve that when the pipes freezes its blown away. And we got this call from Mekorot, we are in touch with them, we have sensors and we talk to each other, and they said that they were pushing so much water to Jerusalem and all our pumps are working at 100% but we cannot manage to fill the storage, what is going on? They were so upset, and they were freaking out about what was going on. But all of these tanks in all of Jerusalem blew up and the water started running onto the roof. Nobody sees that, I mean, I could see that because I am aware of that and saw water coming of the roof. But people went to work, and all the water was just... You have to realise that when the water in the storage reservoir was going down and

they pushed the water, we started facing a crisis here, because you can push water as much as you can, but if a pump station was failing again then Jerusalem would be without water. And it was also very close, because of the freezing situation we were like shaking it this time. So, that is one extreme story, but sometimes we get a burst of a pumping station that is pumping water to a neighbourhood and then there is no water. So it happens every once in a while, but it is rare. I would say that the water is reliable here. I can count a few cases where we were close to an emergency, but never in such a way that we had to start distributing water by tanks and stuff like that. But the point is that we have to give water in the case of emergency. We can have houses without water so we're bringing special tanks to the house, so there is not such a thing that people have no water.

Interviewer: So you would say that the access to water is always there but if there are some issues it's mainly due to infrastructure rather than other factors, such as basic goods.

Respondent 5: Yes that's right.

Interviewer: Okay and then this one.

Respondent 5: So, people that have environmental awareness and understanding are more likely to have access to green space and water sources for recreational, spiritual and educational uses than people that lack environmental awareness and understanding. You get basically the same answer I gave you on the fourth category. Again I'm not saying it's always like that. But people with awareness of environmental issues will be more likely to try to look and ask for the family to go and live in a place where they know that things are better. But again Jerusalem, I would relate it to a question like that if I would be in India where this difference would be more clear given lack of water, and quality of water. I mean it's so important. No need to tell you that.

Interviewer: So do you think it's important that the environmental awareness and understanding of the people in the city is improved?

Respondent 5: That's a tough question. When a country doesn't have a real issue with water all of these statements become less important. They don't take it as a consideration. But obviously if people would be more aware, if the public radio and people would talk about it more and more and people get to hear it than it would become more important to them. There's an example when we are talking about awareness, because we're doing desalination right now. There are two things that we are missing right now. One thing is a very important mineral, Magnesium, that is missing and right now they just put the Calcium in the desalinated water without the magnesium. Magnesium is a very important component for the water regarding health issues. That's one aspect of it. And there is one on Fluor, which is very important for teeth. You know they put it in the water here. So, the lack of these components is an issue, which for me is very important and as much as I try to tell people about the importance of it, it's very difficult because people are not aware of it. And I'm talking about educated people that have awareness. And I even went to the ministry of Health years ago. So, they know it's important, it is a point of budget things and they don't see this as important as it is to me. I mean in my position it's something that it's a shame that we don't have it. And so this is a difference between people that have their awareness and people that do not.

Interviewer: Do you think it might be improved? Certain solutions?

Respondent 5: Yes. First of all, it went to the Supreme Court. These people against use all kind of fake news unfortunately that we have right now and people in all this movement of anti-vaccination. And what's going on in there in the Internet, which is very concerning, because you know people are coming with all kinds of wrong information. You know people come from the academy, like you, become not as important as you used to be. We are kind of trying now to convince people that have no experience that don't know the subject. They come in saying they know based on all kinds of wrong research and we are in big trouble. And this is something that we need to fight and try to change this. I'm concerned

but that's because I'm aware of that. Most of the people don't. Even in the water sector there is somehow lack of fully understanding what it means (that there is no Fluor). After the election I hope that budget will come, and they will solve it.

Interviewer: So it is through education you would say they should change environmental awareness and understanding?

Respondent 5: Yes. Absolutely. I wish that they would come in schools and talk about these basic things and why it is important. Why it is important to have a water treatment plant, wastewater treatment plant. Unfortunately, very few people are into this. I am very concerned I can tell you. It is also difficult to explain it to educated people that are not in the subject.

Interviewer: So, we have one left. Being part of large or close community is important for access to adequate freshwater for drinking and sanitation. Could you elaborate on why you put it here?

Respondent 5: I feel like I am repeating myself. Again, clearly people with the knowledge and awareness they will be more motivated. They will try to find people with the same interest. Clearly, they feel probably safer than. People that know about environmental issues, they will be more willing to take steps and action against things that are not right. They take a stand.

Interviewer: When you look at differences between people that are part of a large or close community and people that are not, do you think there are differences in their access to freshwater?

Respondent 5: When you are part of large community, maybe when you have to many people maybe they are interested in different things. When you have a small community you know each other better and if you want to act it might be more efficient to fight against things. It is not something that we have in Israel. Maybe somewhere far away in the Galilee area where there is a small community. And I know that people there are more aware and have more experiments far away from cities. You can see some projects where people are more willing to take steps. Sometimes they are taking all kinds of ventures that do not meet the regulations, because they do not take it from school but from the internet. They have to convince the Health department. They have awareness but they do not fully understand what they do. So you see experiments like that in far places, not in cities like ours. Here in Jerusalem it is unique, we are the largest city in Israel, and we have this project with waste recycling with tertiary WWT plant and we supply the Jerusalem parks. That is also an experiment that has got the approval of the department of Health, but it took some time.

Interviewer: So, in the statements we mentioned a lot of factors that might influence access and involvement. And we talked about infrastructure that plays a role. Are there are other factors that are not here on the board that might have an influence?

Respondent 5: Good question. To get access to all kinds of city project permits, you are going through all kinds of processes within city hall. They come with all kinds of huge projects and then they publish it in the city hall. If people have any objections for such projects. I mentioned that there are some plans to build a lot of neighbourhoods outside Jerusalem that kill the Jerusalem forest. The question is, again, are people with awareness are they looking into these published things in the city hall to have their comments, are they involved? It is a minority of people that are involved. It is the question if we can have this access to the people. If there is any action that you could take, so more people look into all kinds of projects that might destroy the forest. Again, it is few people. Maybe with the internet now, that is one of the better things in the internet now. That people get more connected and can see.

Interviewer: So the network that you have is important?

Respondent 5: Yes, obviously the network is important. Maybe the question is what the internet can give us in terms of seeing what is going on in the municipality. But there is also a lot of fake news and

the question is where you take the right and the bad news. There are a lot of damaging things, but also good things. Where to find the balance is also part of all the questions you ask here.

Interviewer: So, access to data and information is important, but you have to ask what kind of data.

Respondent 5: Yes. Where is the balance between the truth and lies? In many ways we are in big trouble right now.

Interviewer: Would you say that is especially true in Jerusalem. This distinction between good and bad information?

Respondent 5: No. I don't think it is specifically in Jerusalem. This applies in general across the world.

Interviewer: So, given the different types of water services and involvement of people in the water sector. What would you say is their priority, what is the most important thing to focus on?

Respondent 5: Everything is important. The water is very important, but clearly if we do not take care of the wastewater it becomes a horror as well. Waste is far away basically outside of the city, so you are dealing with something that people take care of less, because they do not see it. Water supply is more important in this respect, because people use it every day for all kinds of purposes. WWT we have only one in Israel, and it is far away. Nobody knows that something like that even exists. But within the city, we send every month or two months the results of the water quality. Again, a minority looks at these results. But as long the news does not say that things are going wrong, then nobody cares. It is something that it is in the back of the minds. And maybe it is good that that is the way it is.

Interviewer: It is a good sign that there are no incidents.

Respondent 5: Also in East Jerusalem nobody is sick.

Interviewer: Would you say that any of these services or the participation itself is more of a hot topic right now compared to the others?

Respondent 5: From an academic point of view, I feel that category number four reflects the important things. I think the bottom line is that I am proud to say that I am happy with what we have here with respect to the water supply and what we give to customers. Clearly it would be nice that people are more aware, but I don't know how to do that really. Hagihon has some kind of project with children and teaching them, schools that come here. It might take an incident or a pressing matter, but I hope that is not to happen in my time nor in the future.

Interviewer: Are there things you would like to add to the interview?

Respondent 5: No, I tried my best to answer.

Respondent 6

Respondent 6: I think that some things might be true in other places. Specifically here. Maybe something's flip a little bit. I did put the mentally and physically. Kind of low on the scale. I don't think that it's so relevant to the issue here.

Interviewer: So I want to discuss with you the more extreme categories. See why you put them in there.

Respondent 6: So that the people that feel valued and like having a voice are more likely to take grassroots initiative. I think that probably the category that I mixed up the most is taking initiative because I think that the first three categories have to do with something you're supposed to receive and the fourth category is something that you should be active about, taking initiative. And I think that people have a different view about things they should receive. And what would motivate them to act is different. I think people have right to receive things and then whether or not they take action is more of a personal tendency, it is a little bit different. I don't necessarily think that feeling valued in the context here is what pushes people to act.

Interviewer: Okay. So if you look at differences in the city you don't think that's one of the factors that determine whether people would specifically take grassroots initiatives.

Respondent 6: I don't think so. Similarly, the people that feel empowered are in control are more likely to have access to adequate fresh water. I think that there are other reasons that were more prominent why people would either have access or not have access. And feeling empowered is subjective and I think there were issues that had to do more with being in the dominant group, that's more factual but feeling empowered is more subjective. And so I don't think that that is connected to whether or not you receive a service.

Interviewer: And also the minus 3 category.

Respondent 6: Yeah. Again the people that feel valued... I put the rest of that category here. And the one with taking action is all the way there. So that's why I moved the one about taking grassroots initiative even out of the rest of the group. But they're all here.

Interviewer: Because it's something you receive. Or the other ones, the services, are something you receive.

Respondent 6: So I think the ones that I most identified with were the one that... First of all, people that have environmental awareness and understanding are the ones that take grassroots initiative across the board, whether they're in a minority group or not. So I find that for taking grassroots initiative having to do with water then it's people with some sort of environmental awareness. Regardless of the conflict and all.

Interviewer: What kinds of grassroots initiatives do you think about then?

Respondent 6: Like a community garden. People who are doing that have a certain degree of awareness whether it's environmental or environmental and social.

Interviewer: Do you know anything about the type of people rising up against projects such as the Fifth Water Pipeline?

Respondent 6: I do not know enough about it. I didn't know here was such a big public uprising around it because we didn't hear about it. Depends on where you live maybe. But that does not serve East Jerusalem at all?

Interviewer: I mean it's fresh water to Jerusalem. Yeah, they're important to the infrastructure of Jerusalem.

Respondent 6: Yes but I think we talked about it last time that in neighbourhoods of East Jerusalem they get water oftentimes from the West Bank.

Interviewer: And do you think it's important to improve environmental awareness understanding, so that more people take action or in some way?

Respondent 6: Yes, to the degree that I think that all sectors of environmental participation or awareness are important, but I think it's because of the issues of access it's conceived as a privilege. But I do agree with the statement that those who take action are people who have awareness and I think it would be good to enlarge that circle. But I think that in the in the existing reality where issues of access are more prominent.

Interviewer: So it would not be possible to take grassroots initiative to improve access?

Respondent 6: Maybe but that's not so much stemming from environmental awareness but it's more stemming from need, basic need.

Interviewer: Okay. So then the underlying reason to take action would be different.

Respondent 6: And I think that there's a general feeling that that kind of action is less likely to succeed.

Interviewer: Why?

Respondent 6: Because the reasons for the discrimination and the differences in access are so deeply rooted. And when you take grassroots initiative for something much simpler, then you'd have more... like making a small community garden or education in the schools and then you have more possibilities to succeed.

Interviewer: So if you look at the different categories I mentioned it's easier to take initiatives in a section of green spaces and for recreational and cultural services, than for the ones about sewerage and drinking water infrastructure?

Respondent 6: Yes.

Interviewer: So how do you think environmental awareness and understanding might be improved in the city.

Respondent 6: Well, through schools but also small scale. But again I don't think that, also this is the other half of what I put that I most agree with, is that that the people who are part of the powerful and dominant community are the most likely to have access to adequate fresh water for drinking and sanitation. I mean, I think that these two complete the picture for me, because this is the flip side of the picture, which is that if you're not part of this dominant group then you don't have these two basic services of drinking and sanitation and sewerage and then all the rest of the you know... therefore you're less likely to be active in the third category. I guess I always considered the grassroots initiative part as the as part of this category for recreation, like you said. So, you are less likely to be active when you are not part of that group.

Interviewer: I mean, for instance, I think you told me last time, about you trying to involve the neighbourhood into integrative planning, would you consider that as grassroots initiative?

Respondent 6: Yes.

Interviewer: Would you then say that is an example of grassroots initiative that focuses more on water infrastructure?

Respondent 6: Yeah on the access to infrastructure. In an indirect way. It focuses on the ability to build quote unquote legally. To secure the right to secure your home. And once you have a building permit for your home then you are able to connect to infrastructure and everything, so that things are connected. But it's not exactly a grassroots initiative. It's sort of more... people who are involved in the planning are involved in planning issues with us, either because there are community leaders or they want to lead for change, but a lot of time also because they have demolition orders for their home. So they're being powered by or empowered, or what is motivating them is to solve their problem and not so much to necessarily change the access to infrastructure in the city but just to prevent their home from being demolished. The things are linked obviously.

Interviewer: One comes with the other, I guess. So how would you describe the differences that exist in the city? For instance with this one, with the differences in access against water between different communities.

Respondent 6: It's unfortunately pretty simple. The reason that I put for example the possessing of basic goods a little bit lower, because there are also poor people in West Jerusalem. You know there is Jewish poverty in Israel and in Jerusalem, but it doesn't so much impact on access to water. But certainly poverty is more prevailing in East Jerusalem than in most Jerusalem. Therefore I needed to keep it (possessing basic goods) on this side of the board and not on this side of the board. But I think that the fact of what group you belong to, what national group, is a stronger determinant. Just the simple fact that half of the Palestinians in the city live in units that are not permitted. And that isn't true for other groups. People don't live in unpermitted homes, maybe they've built an extension. Okay, so I think that's the most defining difference, that when you live in an unpermitted house, then you have issues with access to infrastructure including water. Yeah, you're exponentially more likely to live in that kind of house if you're a Palestinian in Jerusalem than a Jew in Jerusalem. Actually no Jewish Israelis in Jerusalem live in an unpermitted house. That's what I was starting to say, that maybe they've expanded their house and they didn't bother to get a permit for it, or they built a balcony or something. But their entire home, they will have a permit for it.

Interviewer: How do you think this can be improved? How do you see it? I mean it's a complex political aspect of the problem but how do you think you can overcome that? There will be the legalisation of the housing problem.

Respondent 6: Legalising of existing houses and provision for future building also, because it's not enough to just say okay everything that's built till now is legalised but then what about tomorrow. So there also has to be planning for future residential units for Palestinians the same way that there is planning for future units for Jewish Israelis. Well that brings us to the whole demographic question and the demographic policy of the country, because the planning policy is guided by the National Policy and demographic policy is a very major component of policy.

Interviewer: Okay. So let's move the third one.

Respondent 6: So the powerful and dominant community, the rest of them are all in this category except for initiative. Yeah. So again because I think that it was important for me, I mean, I still have the powerful and dominant community very close by. I think that in general I could have put them all here and get this one here also. These could be interchangeable. But I think that another reason that people would take grassroots initiative is because they feel in control and they feel empowered by or, you know, they feel that their actions will have influence.

Interviewer: So that's why you think people that feel like they're going on a hopeless mission from the start, they won't do it and they're less likely?

Respondent 6: Yeah. Very good analytical...

Interviewer: Yeah. And when you look at these factors that are on the board. Do you think there are important ones that might be missing here?

Respondent 6: No I think that the issue of dominancy, and culture, the issue of awareness, the issue of poverty.

Interviewer: Culture. How do you mean?

Respondent 6: I said awareness and culture together, I think. I mean, I think that culture is less important. Maybe culture is missing because I added that right, it's not here. But all the other separations have to do also with culture, so I think that culture is underlying to all the different separation.

Interviewer: How do you mean? Do you think that culture determines your access or the social factors?

Respondent 6: The social factors. I think that basically the access is a question of dominancy. I guess also the word nationality is not here. So I guess that people that are part of a powerful dominant community, that's another way of saying what national group they belong to.

Interviewer: Yes, here it does.

Respondent 6: Yeah. I don't know if you're studying other places. If this is just about Jerusalem, then you could put in the word national group. But if you're trying to make this relevant to other places too then I can understand why. So here the belonging to a powerful dominant community means belonging to one national group or another. That's what it means. So it is sort of here through that category.

Interviewer: Do you think there might also be differences within one national group, like the power of powerful communities within a national group.

Respondent 6: Well yes. Cause then I think poverty comes in. But actually, the reason this is here is that I think that poverty oftentimes doesn't preclude people from the possibility of becoming active in a grassroots initiative.

Interviewer: So in that sense, resources are not that crucial for grassroot action.

Respondent 6: Yes, right. I think so. Still the access is... I think still that the access is irrelevant to poverty, meaning that there are people who live or don't live under the poverty line, but because they belong to one national group, they don't have the ability to access. I mean, certainly money could buy anything, but not entirely in the local context in the sense that even people who can pay for a permit and can pay for planning and can pay for everything, they still reach the limits that the national structure is putting on them.

Interviewer: So, what would you say is the hottest topic right now for you in Jerusalem. If you look at access to the different kinds of services or involvement. What would you say has priority here?

Respondent 6: I think that there is priority and there is possibility. That's what we were saying before right? I think that priority certainly is equalising access, first of all, to drinking water and sanitation, but also sewerage and treatment.

Interviewer: Do you think this is for everyone their priority?

Respondent 6: People who have access, it's not their priority. Unless they have a very high awareness. But for the most part it's not. No. But I think that should be the priority of the authorities.

Interviewer: It's a human right.

Respondent 6: Yeah. But then I think that there's the possibility. The possibility of creating changes on a smaller scale is. You know, access to... it is this one cultural services for recreational, spiritual educational. There is more possibility for change there. I mean you framed it also as a question of access, access to green spaces. And it's true, there is a very big difference in terms of the access of one group and the access of the other. But if there is a place where people can claim their access, you can go to farther away park and claim your access even if it's not your open space. It's easier. You can't exactly claim access to fresh water in your home in ways you can claim access to open spaces by travelling and then being present in the further away open spaces. You still have the right to open spaces that are more in the appropriate proximity. So that's the kind of, it's not exactly grass root, it's just sort of human nature to kind of seek out the open space and if you don't have it you travel a little bit to find it. So you see that a lot in Jerusalem. You see Palestinians coming to parks in West Jerusalem. You don't see to the reverse because there isn't the need.

Interviewer: And there's not that many green spaces in East Jerusalem.

Respondent 6: No. And that's also a reason: There isn't the need and there isn't anywhere to go. I wanted to say something about the access and people literate in Hebrew. I think that if we were talking about the West Bank it would be more relevant, but since we're talking about East Jerusalem where most people are either literate in Hebrew or somebody in their family is who can help them, it's a little bit less of an issue. It's still true that women, older women especially, are the least literate in Hebrew. But you definitely have a larger percentage of people within this society who speak Hebrew. So I think it was a good additional category and it's still relevant, but it's just not as relevant as belonging to the powerful/dominant, or national, group. Because even if you speak Hebrew it helps you in certain things... it helps you with access to jobs, it helps you with other things, but not necessarily with access to water.

Interviewer: No. So you can still find your way around the system even if you don't speak Hebrew that well.

Respondent 6: Well, I'm not saying... there are people who work a lot on the issue of increasing the services, so that there would be more services in Arabic. And certainly that's needed. But in terms of the water I was trying to focus on water. I mean I didn't put it on the side of the board. I think it's still an issue trying to demand services and having it all in a language that you either don't understand at all or you understand it, but you can't read or... But I think that in terms of water it should be taken into account that even people who speak very good Hebrew don't necessarily, it doesn't necessarily help them with receiving the building permit. So if you speak good Hebrew there are other rights that that helps you with for example access to employment. But in the case of water it doesn't necessarily help you all that much more, it helps you a little bit more. But you know there are enough people who can help you out with the bureaucracy and the forms, but you're still going to be stuck with the planning limitations and the policy and the discrimination. And that's true also with employment. But if you speak Hebrew you step up above other people who don't speak Hebrew. So not that there isn't discrimination in employment, but it makes more of a difference.

Interviewer: Yeah. And just to get it on the record also. How would you describe the differences in access to sanitation and drinking water, because of the different suppliers in the city and the different degrees of access?

Respondent 6: Look I'm not sure I really know enough about it. In Palestinian East Jerusalem, when people don't have building permits... People can only connect to the Israeli water system if they have a building permit. Since we said that more than half or at least half of the housing units don't have a building permit. People who don't have building permits either put water tanks on top of their houses, private water tanks, and then they have to worry about them getting refilled and they use private companies. Or they connect their homes and their tanks to the Palestinian Authority, infrastructure, which comes from Israel (the water). So that's what I know about it. I mean, I don't know really percentages or how the water is divided exactly.

Interviewer: No. So you wouldn't know to which neighbourhoods the Palestinian Authority supplies?

Respondent 6: To the Palestinian neighbourhoods. I mean more to the northern ones, that comes from Ramallah. But I think also in the southern neighbourhoods. Both outside and inside of the wall. The ones behind the wall for sure, because there are no services being provided there.

Interviewer: Do you have any remarks about the interview or things to add?

Respondent 6: I don't think so. I wanted to ask what you meant with a large or close community? I put that in the undecided, but maybe in a different context it is important.

Interviewer: Yes, so you might think of Africa. Where people have to collect their water and have to rely on their community in that process.

Respondent 6: Right. It is interesting. I think that some of these things might be more relevant in the West Bank. But then you are studying Jerusalem. I think it is a very good job. It is a very good analysis and a creative way to do interviews.

Respondent 7

Respondent 7: I think that people that see the quality of the green spaces and the quality of the water and they are doing something to keep it. I think they will get there in the end. I think they will have more green places, because they are working for this. Everywhere. If you are an environmentalist and you see something that is really important, then you will go there and try to get there. And this is then your goal, you want to get there. If you have money, it is okay, but I am not sure that you'll get the better water. You will buy it.

Interviewer: You will be able to build a house in a better neighbourhood?

Respondent 7: I am not sure. Because I don't know if it means something for you. You have money I don't know if it means...The water in Jerusalem is good you don't have to buy it I just ask for the water from the tap. I think that somebody for whom It is important so they will go there if it's not important even if you have money, I am not sure that you will go there. I have money I don't buy it I'm using was in my house but when somebody feels empowered and feels good and that it's important you will go there. how you feel how you look at yourself as well as what is important it is two different things.

Interviewer: That makes me wonder you put environmental awareness and understanding in the undecided category

Respondent 7: I mean the quality of the water. I don't mean...

Interviewer: Ok so also for access to green spaces and stuff like that. what do you think is it important?

Respondent 7: If it's important to us. But perhaps I will change it.

Interviewer: To also structure the conversation I want to discuss with you the more extreme categories on the outer ends so maybe we can start over there. So people that feel valued and like having a voice I'm more likely to have access to fresh water for drinking and sanitation.

Respondent 7: Yes, the people that have a voice he wants to put his voice somewhere. And if it is important for him then he asks for it, he wants it, so he will go there.

Interviewer: Go where?

Respondent 7: Go there to receive the water.

Interviewer: So if there are differences between people in the city like people that feel valued and people that don't. Do you think there's a difference in their access to water for Freshwater for drinking and sanitation?

Respondent 7: Not access to water. It's for the need to go there to get it. If I have a voice and I want to use it, so I need to use my voice to get it. Not everybody has a voice or wants to have a voice. If he already has the voice or the power to do something, he does not use it. If you have the possibility to use your voice to get something, if you have the voice and you want to use it, then you can use it. So you will get access to freshwater.

Interviewer: But you don't think that there are differences in this city between people's voices and their access to water.

Respondent 7: A little bit yes. If you have money so you can buy mineral water, but not to use the water on the tap. The water that you get in the house is good for everybody.

Interviewer: And how does that apply to the second one about feeling valued and having a voice and access to sewer infrastructure?

Respondent 7: I think that if you have a voice and you want to use it than you get better things. No grassroots is better. People that are involved, people that care about it, they will go there and make it.

Interviewer: So if you want it, then you will do it. When you understand the importance.

Respondent 7: Yes. It is also the same. It depends on what you want. If you want to use the voice and the power that is given to you.

Interviewer: Yeah. So why did you now swapped these ones?

Respondent 7: People that have environmental awareness and understanding, I think that it means involvement, no?

Interviewer: Environmental awareness and understanding means whether you are aware of the importance of managing water sustainably. That we do not overexploit or overuse it, that the quality remains good for animals but also for humans. Whether people are aware of the importance of water in that sense. Whether you are aware, does it change whether you get involved? Or whether you have access to sewer (sewage treatment) infrastructure, for instance.

Respondent 7: If you have awareness, you can also use your voice.

Interviewer: You will take initiative.

Respondent 7: Yes. Mental and physical is less than feeling valued or empowered. Mental and physical is also less than environmental awareness and understanding and feeling valued.

Interviewer: So you think that being healthy does not really change the water services you get?

Respondent 7: No.

Interviewer: So do you think it is important that the differences in people's voices and feeling valued, do you think it is important to change that. And how would you say we could do that, to give everyone a voice?

Respondent 7: If you have awareness and you have a voice and you know that, then you can change it. If you don't have awareness and you don't feel like you have a voice, then you cannot change.

Interviewer: Yes. So how could we make people feel their voice? Is there a way to do that?

Respondent 7: I don't know. Perhaps explaining them. But if somebody does not want to be involved, they will not listen to you.

Interviewer: Maybe sometimes people want to get involved, but they don't feel that they have a voice and that they will be listened to, for instance.

Respondent 7: What I am doing with the people that are poor. We are thinking together. They have a situation that is not good for them. People that have debts and have no money to pay for water, electricity. And they take the water and electricity from me, and they come to cry to me. I say to them that I am not going to fight for them. You want to change something, let us change it together. It is important to you? I will show you how to fight. I will show you how to go to people to explain them what and why it is important. I will show you, learn you, how to make them partners. But I am not doing this for you.

Interviewer: That is a way to give them a voice.

Respondent 7: They have to find their voice by themselves.

Interviewer: Is there a way to improve environmental awareness and understanding and to overcome the differences in the city.

Respondent 7: It takes time to make them environmental. They have to look on the inside to see how they can find the voice inside. Then they will feel environmental aware.

Interviewer: Some people that have a voice might not feel that the environment is important.

Respondent 7: If you are not environmental aware, you do not use your voice. People that are not environmentally aware, they do not have a voice. They don't know how to use it and don't want to use it. First of all, you have to bring the environment up with the people, make the water of more value to them. Not through education, I don't think it will change it. I spoke with my student today; they have a situation where they don't have money for the rent for their house. They received from the state a piece of paper that said they get sometime in the future I will give you house. But the state does not have the houses or the money to buy the houses. So they give a paper and also some money to rent a house, but it is not enough. And the people that we are working with want to make a change to the situation. To put the state to buy and build houses for them, but they don't see the value of themselves, they don't see the value of their voice. So, they will not do something to change it.

Interviewer: So it comes back to changing your voice?

Respondent 7: Changing your environment. (awareness of your environment).

Interviewer: So I want to move over to the negative categories. People literate in Hebrew are more likely to have access to...

Respondent 7: Hebrew is not an issue. If you do or don't know Hebrew, it is not dependent on the situation or is something that you have to change. There are people that come to our groups who do not have a voice, but even they have the language.

Interviewer: And does education matter? Differences in education? Whether you finish a certain level?

Respondent 7: No. Maybe a little bit of education, yeah. Because when you are educated you can know the difference between water that is or isn't good, for example. But it matters not that much. You have to have a desire, a goal, a purpose.

Interviewer: So all Hebrew statements are in here.

Respondent 7: Hebrew is not important.

Interviewer: Okay. People that are part of a large or close community?

Respondent 7: Large or close communities give you power and a little bit environment. No not power, what is the word, interdependence... no... I will give you an example. If you are part of a strong community or a close or good community, then you feel blessed. You are more comfortable with the situation, with things that are not good. You are not angry; you don't have strong feelings. And strong feelings you need to fight. Somebody that is part of large or close community, they feel good and they don't want to fight.

Interviewer: Next one.

Respondent 7: Part of powerful or dominant community, it is the same, I think. I think that mental and physical health does not mean anything. Maybe powerful community is more than healthy.

Interviewer: Can you explain?

Respondent 7: If you are part of a powerful/dominant community you have power and if you have also purpose, you can change things. So, it is much closer to here than here [points towards agree then disagree].

Interviewer: So with all these things I see a theme coming back. These are important as long as you have the wish to change something, purpose is important in every one of them, so the having a voice.

Respondent 7: Yes.

Interviewer: So there are a lot of factors that we discuss here. Do you miss some aspects that might be important for access to water? Do you think that there are other factors that play a role?

Respondent 7: I will put water aside. I am looking at this... if you want to achieve something, perhaps it is water, perhaps it is good food, perhaps it is good air. I put it in different groups things that will make you to make a change in your life (environment).

Interviewer: Do you think there are social factors that are important if you want to make a change in your life that I maybe missed here?

Respondent 7: I think that if you are angry, if you are feeling that they don't give you things. Injustice. That the state gives more rights to people that have money and not to people that are poor, it will make them angry and want a change.

Interviewer: So you think that is an important factor also here in Jerusalem? People that feel this are more likely to come into action? Do you have an example of that here in Jerusalem?

Respondent 7: Yes. In the Arab part of the city. They are feeling that they are poorer than the Jewish community. They feel that the state does not look at them, they don't have rights like the Jewish. They think that they don't have the same rights that people from the north get, the Arabs from the north are getting. They feel that there is the environment of Palestine and Israel state, and both of them are not looking at the Arab people that stay in Jerusalem. They are angrier.

Interviewer: They are in between.

Respondent 7: Yes. They are angrier. Also the water. They think that Hagihon doesn't care about them. What else... So the political situation also gives some power to fight.

Interviewer: Okay, how do you mean? So you see a lot of those people becoming active? What do they do then? Demonstrate, run for elections?

Respondent 7: We make coalition with organisation of the community. So we make a coalition with free organisations in the community. They are law organisations that take care of poor people. We use the press; we use the court. We go to the court with the law organisations and say something on that there is no quality. Also we make lobby in the Knesset, the parliament. This is what we do to make environment. To make environment (awareness/understanding), to make people hear about the situation, the problem. You go and make a manifest paper; you learn them about the situation and then you make them partners.

Interviewer: Okay. What do you think is the hottest topic right now, the relative importance of the different water services and participation?

Respondent 7: I don't think that water is an issue now. Green places I think will be an issue in Jerusalem, because we don't have places for living. And most of the houses in Jerusalem will become high-rise

buildings. They don't leave green places for children, old people, people that want a little bit of green around the house. Electricity will be an issue, because it will cost more and more. Even the water. But you cannot cut the water for the houses, it is not allowed. But the electricity is higher and higher price to get it, so there are poor people that don't have the money and won't get the electricity.

Interviewer: Okay. So green spaces are more of an issue than the others right now you would say? Houses are an issue and therefore green spaces become an issue?

Respondent 7: Yeah.

Interviewer: Do you have things to add, remarks about the interview?

Respondent 8

Respondent 14: The issue is that one has to relate to Jerusalem, at least in the case of water, two cities or 60 neighbourhoods. Okay, and two cities means that in many aspects the Muslim/Arab population does not behave like the Israeli/Jewish population. And also geographically they're mostly by and large on the other part of the mountain. Therefore, there are unique problems especially with sewers there. So everything we answer we might have to split into at least two different answers. And sometimes the issue is not even between eastern and western Jerusalem but between the part of Jerusalem which is within the security wall and the part of Jerusalem that is external to it, which holds approximately, nobody knows, but probably 84,000 or 85,000 people. Some of them are East Jerusalem Arabs some of them are Palestinians that we do not have records of, so just bear in mind that there are quite a few complexities that might create an answer that is not just like a yes-no question.

Interviewer: Yes of course. The sorting of the statements would be a first generalisation, of course this is very black and white. So then afterwards I want to ask you some questions about statements where you can get more in-depth about what you actually mean and the exceptions to the rule, the nuances.

Respondent 13: Okay. So people possessing basic goods are more likely to have access to adequate freshwater for drinking and sanitation than people without...

Respondent 15: Here the focus is on quality of water and there are no differences between the parts of the city.

Respondent 13: This is not true in Jerusalem, because a lot of people have houses that according to the building codes have a problem getting access to water and sewage. It's a real problem in East Jerusalem.

Respondent 15: This is the water, not the sewage.

Respondent 13: They have to go to court in order to get water. And now we heard from the meetings that there are people actually getting water without paying because of this rule. So it's not totally agree, but I think it's three, because most people will get it, but some will not.

Respondent 15: Very few.

Interviewer: And when they do not it's because they lack income?

Respondent 14: No. Because they are living in specific neighbourhoods, which are all East Jerusalem Muslim Arab neighbourhoods. There, there was a historical problem of...

Respondent 15: No, usually because they are not permitted to build there.

Respondent 14: No. It is not, not permitted.

Respondent 13: She asked about poverty. People that are poor will have less access to fresh water.

Respondent 14: So it's absolutely disagree, because it's not about being poor. The poorest people in Jerusalem might also live in Meshe'arim, they get water. It's not about being poor.

Respondent 12: Yes, they are obliged to give water. The government has to supply them water by law.

Respondent 13: Yes by law, and even when they don't pay, they are not allowed to disconnect the water because basic... The same question about sewage, the sewerage is different.

Respondent 14: Sewage is not about income. It's about other denominators that have to do with historical, political issues to do with the differentiation between Muslim Arabs and Israelis.

Respondent 15: But not all the Arabs have the problem. We have problems in some neighbourhoods in East Jerusalem, especially...

Respondent 12: You have to understand that 30 percent or more are Arabs here and the situation is completely different from the western part, completely different.

Respondent 15: It does not regard to all of the Arab population, there is good infrastructure in some.

Interviewer: It is more about location?

Respondent 13: Yes. It has nothing to do with income, but there is some correlation. You'll find very poor people will go to live in such area where the infrastructure is actually also degraded. Rich people want to live in an area where rich people live. So usually, there's also a correlation. So sewage, we have more people that don't have sewage that don't care about it or they have septic holes and it's basically... I agree with this a little bit.

Respondent 14: There are other splitters like nationality... other ones.

Interviewer: Yes. So now we discuss income and more themes are coming along in the following statements

Respondent 12: You have to understand that this situation is much more complicated than that. This is a generalisation, which is a problem with this discussion.

Respondent 13: Infrastructure is a big problem. The same question... People possessing basic goods such as normal income are more likely to have access to green space and water sources for recreational, spiritual and educational use.

Respondent 15: Yes.

Respondent 14: The richer neighbourhoods has stronger likelihood to have green areas.

Respondent 13: Okay next question. People possessing basic goods such as normal income are more likely to take grassroot initiative in water sector than people without basic goods. As a statistic, it is almost here [points to end of agree spectrum]. Because people that don't have the income, they focus on survival and don't have the time to...

Respondent 12: Yes. Spare time, you have to understand.

Respondent 13: People literate in Hebrew are more likely to have access to adequate freshwater for drinking and sanitation than illiterate people.

Respondent 14: Again if you look at this as a national thing that also has to do with language, you could say that there's something into it but.

Interviewer: Okay. But here it is not per se about the national differences.

Respondent 14: But again, even between them, the neighbourhoods...

Respondent 13: The Arabs speak Hebrew.

Respondent 14: No, some of them, much less than the Israelis, and the young ones don't speak Hebrew, which is a catastrophe. But even within the Arab neighbourhoods there are major differences. So Beit Hanina and Shu'afat are pretty good neighbourhoods with more open space and with more clean water. Everything is much better. And the ones behind the wall are horrific. And theoretically speaking they

are under the municipality of Jerusalem. I think I just heard for the first time that maybe they get their water from the Palestinian Authority.

Respondent 13: Yes. But they don't have sewage, they don't have drainage, nothing.

Respondent 15: I think it's like the question that we were discussing. It's the access directly to fresh water. So it's still... people get fresh water, the sewage is not... It is a nice way to see Arabs, because she cannot phrase it as Arabs and Jews, Hebrew speakers...

Respondent 12: There are not enough people to pay taxes, I'll tell you.

Respondent 14: You have to understand whatever we're answering is in the level of creating an average at least for the 38 percent of Arabs and 62 percent of Jews. And when actually the stronger differentiator is between neighbourhoods. So we are kind of uncomfortable with each of those questions because it relates too general... even if we told you about the national split, it still doesn't cut reality in enough specific pieces.

Interviewer: Yes, because there is even more than the national split?

Respondent 14: Yes there's even more than that. So for example, in Beit Hanina and Shu'afat the only line of the Light Rail transit crosses those neighbourhoods and they are the only two Arab neighbourhoods where the line goes to. And except some problems that we had in 2014, the lines are very operational and works fine and there is no problem.

Respondent 13: They burned down the station twice. The station is not build anymore.

Respondent 14: Once. When there was this war in 2014, there was a big riot in East Jerusalem and much of them were to do not just with the specific war in Gaza, but because of a Jewish terror act against a Muslim youngster that created very strong tension amongst other things. There was severe damage to the stations in the Arab neighbourhoods of the Light Rail transit. But by and large there was a line there which crosses there. The next Light Rail transit that will cross in East Jerusalem, maybe in 20 years, we'll see.

Respondent 13: No. It is a new...

Respondent 14: The Brown Line. Come on. Should we put a bottle of whiskey on the table.

Respondent 13: A new road is becoming build according to the American model. A lot of infrastructure will be according to this.

Interviewer: What is the reason that some neighbourhoods do get the Light Rail for instance?

Respondent 14: You have to see the map of the city, but... So some little history. In 1948 the city was split by half Jordan, which is East Jerusalem and half western.

Respondent 15: But this is irrelevant. Because there was only one line that's active now, the Light Train, from north to the east and we did not believe in the light train and after it was activated and was operational it was great success. And now they are planning five additional lines. Now one is being developed and they are planning it. Most of Jerusalem is not connected with the Light Train. I don't think the Light Train has any connection with the Arab...

Respondent 12: Listen. After the independence war, after '48, it was called the city line, divided the city into two parts. And by the way the line here of the light rail goes through the historical city land. That is why they can use it in the western and eastern part of Jerusalem. But you have to understand that Jerusalem divided into east and west. And it is the after the '48 war that it started. Before that the Arabs

and Jews were living together more or less. But you have to understand now that there are separate neighbourhoods and they are very different from each other.

Respondent 13: People that are mentally and physically healthy are more likely to have access to adequate fresh water for drinking and sanitation than people that are not.

Respondent 14: Guys we can stop this. It's not important. OK. I'll tell you why. It's the same question over and over again. There are very specific reasons why you have or don't have fresh water and a good sewage system in Jerusalem. They don't have to do with any of these personal denominators. They have to do with an historical thing. And that's the only issue. Until 1948 there was a mandate in Israel a British mandate for 30 years, which controlled the whole thing as one political unit with tension between Jews and Arabs. Then there was the Israeli independence war which the Arabs called the Naqba, the national disaster. And then it split the city like you said for 19 years. At 1967 we reconquered the entire east Jerusalem plus Judea and Samaria and all the way to the Jordan River. It's important because the people who joined now, we told them that they are now part of west Jerusalem, the United West Jerusalem. They were not citizens but residents. So for example they don't vote in our Parliament. It's important because they don't have total full rights. Those 20 neighbourhoods out of the 60 neighbourhoods are maintained slower. So there's 50 years now that we're united and the gaps are still there. But some of the neighbourhoods in East Jerusalem, some of those 20 neighbourhoods are in pretty good shape for all kinds of reasons. They were less built on mountains for example, for example Beir Hanina is more surfaced. And Silwan is more like that. Some of them are more crowded than some of them are less. Some of them are more cooperation, some of them are less. One of the examples I gave is that that first and only line for now actually does cross and give a lot of good service to two very good big neighbourhoods out of the 20 in East Jerusalem. And that's the strongest... It is a thing about neighbourhoods, and it is a thing about East and West Jerusalem, meaning Hebrew or Arab and Jews is the stronger divider.

Respondent 13: Let's help her with her research. Let's talk about West Jerusalem. She is asking about people who are mentally and physically healthy are more likely to have access to water and sewage. And in West Jerusalem it has nothing to do with this. Next, people that are mentally and physically healthy are more likely to have access to green space water source or recreational... The access does not have to do with, you know...

Respondent 14: Because it's a personal issue.

Respondent 13: People that are mentally and physically healthy are more likely to take grassroot initiative in the water sector. Disagree. They're not going to have time to...

Respondent 15: I just wanted to say that regarding this two questions that are asking regarding the green spaces and water sources, in Jerusalem there is very little water, so recreational and green spaces are usually not containing water elements.

Respondent 13: It is changing. You don't know that because you don't see any park in the new park is coming with it have a water source all of them.

Respondent 14: I would say that in the very big point of interest, Ameram is right. But if you're speaking of the hundreds of small occasions of you know kids play in the pocket parks, usually we are lucky to have a drinking...

Respondent 13: No. You would be surprised. In the Old City, they take a very big park, ancient one, and doing water park

Respondent 14: Okay. But that's like a strong point of interest. It doesn't represent the little...

Respondent 13: Even if you go here in Jaffa. There is water.

Respondent 14: Okay, I guess in Nahal Tayasim they will do water to right, that is a big place. The big places might have water as he said, but the smaller ones.

Respondent 13: Okay. If you are more healthy. Yes. This is of course, people that are sick or disabled [places statement on board]. Next, people that feel valued and like having a voice are more likely to have access to adequate fresh water for drinking and sanitation.

Interviewer: Does the difference between residency and citizenship come in here?

Respondent 14: Yeah. There is a historical differentiator. But since you are asking some personal level questions, we have to divide between West and East. And answer every question for both parts.

Respondent 13: People that feel empowered and in control over the decision are more likely to have access to freshwater for water and drinking.

Respondent 14: Can I give you a general answer for this? Let's say you speak about West Jerusalem for once. Again, a general answer about people who feel, you know, listened to and empowered. There is an attempt in Jerusalem to create communication between the municipality, the community centre and the actual people in the neighbourhood. So if there was a strong connection like that, people are heard of generally.

[Respondent 15 talks in Hebrew]

Respondent 14: What are you saying. That's the same kind of answer to all of the...

Respondent 15: Yes, the problem is geographical and not a social problem.

[Discussion in Hebrew]

Respondent 12: He is saying that he is not sure she is reliable.

Respondent 15: Isn't people who are poor and with no rights and not empowered, do they access to clean water? Yes. So everything is here [points to disagree]. It is not correct for the sewage or for the green spaces, but for the access to drinking water.

Respondent 13: Okay, but we also have to answer to the range. Somebody empowered, somebody stronger, probably will demand it stronger, of course. 10,000 people did not have water.

Respondent 15: In the sink you have water.

Respondent 13: No, they did not have water. They have to go to court. If they did not empower, they would have never had water.

Respondent 15: Yes. If you see the whole population in Jerusalem... Okay so no minus 4

Respondent 13: No but it is a general... Always people that have more voice and are stronger, always will demand more. It has nothing to do with water, always try to demand more.

Respondent 15: Okay. And the fact is that the most unempowered people went to court and got free water without pay. These are the facts.

Respondent 14: The court did not say without pay. The reality said that once they got water, they don't pay.

Respondent 15: Because they cannot cut them from supply. And they are the most unempowered people in the city. So this is obviously the opposite.

Respondent 14: Again, this is what we said, you cannot answer with one general... you just cannot. So if you understand the difference. There is not only a difference between nationalities. But also within neighbourhoods. Everybody [of the respondents] is right in this neighbourhood, they are just arguing how to present it to you in this conversation. That is all. For example, by and large I think healthier people and people that are more empowered and listened to, generally in Jerusalem are more listened to in general. And they are more listened to in regard to how many parks they want and what kind of park in their neighbourhood.

Respondent 13: Doesn't matter which part of the city, always people that are stronger will demand more. Next, people that have environmental awareness and understanding are more likely to have access to freshwater... access to green space or water source for recreational, spiritual, education.

Respondent 15: I agree with this statement.

Respondent 13: People that have environmental awareness and understanding are more likely to have grassroots initiative... That is agree more. Next, people that are a part of the powerful or dominant community are more likely to access to freshwater for drinking and sanitation.

Respondent 14: That is again, now after the court decision, you could say that this is less agreed on because it was more the situation in the past and now it is not so strong.

Interviewer: So it still kind of applies but not as much, or it doesn't apply anymore?

Respondent 14: Again, Hagihon company was not giving service or not giving full service in eastern Jerusalem, because of problems of theft and the problem of stealing infrastructure, so there was a giant problem. Then they stopped giving water or enough water etc. They were sued in court and then they got much more water and in a much better way. But they are losing, I think they are complaining to lose approximately 15 million shekels yearly. For water and infrastructure that are either being stolen or leakage, things like that, in East Jerusalem.

Interviewer: Isn't it also because of illegal building?

Respondent 14: Yes of course. Exactly.

Respondent 13: People that are part of a large or close community are more likely to have access to adequate freshwater for drinking and sanitation...

Respondent 14: Since some of the strong neighbourhoods for example are small, it probably isn't a strong way to differentiate. Because sometimes you have a very strong rich small neighbourhood and it is getting all the stuff. And the very large neighbourhoods in East Jerusalem, like Silwan, that holds tens of thousands of people and they might be extremely weak that way, so size is not a... I disagree.

Respondent 13: People that are part of large or close community are more likely to have access to cultural services.

Respondent 14: It's like before. You could say that water that water is more of a basic product and therefore there is stronger access to freshwater, even if you're poor or Arab etc. And there's more connection with parks and stuff like that and green areas, because then it's more a political, local, professional decision that has to do with many things. For example, in East Jerusalem most of the land is privately owned. We don't have the public space to build a park or a school or a kindergarten, doesn't matter. It's the same problem. Why? Because when we came in 1967 all of the areas were told to be private. Some of them are not even documented as private, but still the people claim it's mine and it's

very hard to argue with them. Therefore the complexity creates more of a connection between a park and being poor or being Arab. But regarding water it is less of an issue.

Respondent 13: Water is a basic right. People don't pay, have to pay. It is very difficult to shut down the water because it is a basic need. Sewage is different, it is the responsibility of the municipality or Hagihon to put the pipes and have the service. But they will say I will not put the pipe and service if you do not pay me. Even if they want to do it, it is difficult to access. But most of the city has sewage and continues expanding because it's an environmental and health issue.

Respondent 14: Some Arabs in East Jerusalem tell us that they demand to have sewerage, but they will not allow Hagihon company to dig extremely deep under their garden or house. In the West it is usually a state-owned land and you just get a permission for 50 years to own the land. It's very normal. And then if the state comes and says, Hagihon in this case, guys they need to dig very deep under for a sewerage or drainage... that's accepted, no Jew would say not under my house. But in East Jerusalem it is a problem and it's not just a problem with the authorities. It's also a NIMBY problem. Physically it is not in my backyard.

Respondent 13: You can imagine two houses one above the other. This one needs sewerage. It needs to cross the other one's land. They will not allow it. So this person does not know what to do. So it is a big fight. If it is freshwater okay, but sewerage you cannot do that. Sometimes they tell us, please don't ask us... do it. As a community I cannot say yes. If you force me, okay then I can give the answer to the community that I was forced.

Respondent 14: Yeah. Sometimes it is more comfortable to work that way. For example in building a school sometimes it is easier for communities to say: no way that is my land, but then the states come and say I am confiscating it. And then they say ooh what can I do. And that works. So, it's a very delicate game between a community who's saying you are not actually my authority... I don't even accept you as my authority. And between the municipality who says listen guys we're not the state, we're not even into this thing about politically saying whether this is Palestine or Israeli Jewish or Arab. All we want is to build a park or put the sewerage or put the school. Can we do it? And then it's like [murmurs resisting sounds].

Respondent 13: The last big master plan...the families altogether they agreed. Eventually it took a long time. They give them a lot of building rights. And they agreed to have the road and have the area of the school... Actually it is private property, so you have to give it to the public. But everybody has to balance it. it is a big piece a long stretch of land and eventually... But in the past area they agreed, and they build a house on the place that was supposed to be a school. This house was then demolished, and they were angry. It is again and again, who represents you and which community do you belong to, it is a tribal situation. It is not easy.

Interviewer: Is it a big issue in East Jerusalem, people not wanting to acknowledge Israeli authority?

Respondent 14: Yes. The land is the strongest issue within the issue. The land for Muslim Arab communities is, I wouldn't say holy, but you could actually say it's holy. It's like the man and the land. These are the important things. Don't hurt my dignity, don't hurt my land. So it's like the pinpoint of the disagreement, land issues.

Respondent 13: And if you look on the development of neighbourhoods in East Jerusalem, those who develop by themselves... You can see it is irregular, it is not planned. It is because it is ownership, the property the ownership and the family lives together. So the roads are strange. The roads are a necessity, but we make it narrow, because we need to put a new house, because their family is expanding. So eventually you have little...

Respondent 14: And again, there are better and worse neighbourhoods.

Respondent 13: Two weeks ago I went to visit Wadi Al-Joz. A family is living in a cave. Haven't seen it for a long time. I've seen it in another part. One of the 20 neighbourhoods.

Interviewer: So how would you say we could overcome these land issues?

Respondent 14: I want to say that last year, in 2018, the government has decided of approximately 400 million euros for a five-year plan. Two billion shekels is approximately 400 million euros. And in this the biggest expenses are for roads and transportation: 585 million shekels. It's a big expense but it will make a small change because all we can do with that is patch, approximately 50 surfaces, 50 areas which are in extreme need for roads and safety reasons etc. And the other big expense is 445 million shekels for education. There is a smaller budget for sewerage, drainage and water.

Respondent 13: 42 million shekels that is all.

Respondent 14: No it is not exactly right. There's another 42, I think.

Respondent 13: No it is only 42 unfortunately.

Respondent 14: Okay. Tens of millions of shekels. There is no doubt that we will make good use of the money, but there's also no doubt that the need is much bigger. The good news is that once you've had 42 million shekels once. Next time we hope to have maybe 200 million shekels for that specific issue of drainage, sewerage and water. But does it mean that in five years we are going to be a paradise. No, the answer is no. It would probably take us a good 20 years, or one generation of 25 years, to create a major shift in East Jerusalem that puts most of the population on West Jerusalem level.

Respondent 13: One thing that I am missing is the level of education. The higher the education, the more demand people have. There is correlation between that. And what happens in education is that the student that goes to high school in East Jerusalem and studied according to Jordanian program/curriculum, but when you finish you get this document, they cannot accept into the Israeli university generally. And they don't learn Hebrew. And if they want to go to university, they get stuck.

Respondent 15: And if they go to a Palestinian university, they are not trained in the proper levels. So they must...

Respondent 13: There is a change in the community, there are more schools that will teach the Israeli curriculum. They are generally good students. We know from other sources that they are good students, especially the women. And for them education is a step forward. And eventually we are going to have a more educated community and they will demand more and get more. The one problem that they don't do is that they never elect for municipality election. They never vote.

Interviewer: Ramadan Dabash who ran?

Respondent 14: Yes. But he stopped in the middle, because he got threatened for his life.

Respondent 13: How do we just go and talk to anyone: go and become a voice. They don't have a voice and in democracy you need to have a voice in the Parliament and need to talk. If you're there...

Interviewer: They can have a voice?

Respondent 13: In Jerusalem, but they don't do it. All the Arab population in Israel vote and have a majority of mayors and whatever. Here's there is silence and they got, excuse me, fucked up because of this.

Respondent 14: And again, it is an issue of not accepting the Jerusalem municipality.

Respondent 13: They are divided. This is a service. You have to vote, come in, to get the service.

Respondent 15: When they go to vote, they can be under threat.

Respondent 14: At a personal level, but if they all vote...

Respondent 13: If all of them vote, you cannot threaten everybody.

Respondent 14: The percentage of voting in East Jerusalem is between 3 and 7 percent

Respondent 15: But I know that in the last elections in October, a minority of them voted but there were votes from East Jerusalem.

Respondent 14: But this election they were the lowest, they were approximately 3 percent voting in East Jerusalem. Which is the lowest not the highest. 7 percent was the highest in the early 80s. Maybe something like that.

Respondent 13: This political game, if you don't participate you lose. It is money. We have money, we want to allocate, how do you do it? In the political arena people vote. If somebody is silent you don't know what they are thinking.

Respondent 14: So for example, the Haredi, the ultraorthodox community votes... well not much more than the secular Jews, but they do vote. We always say they vote like a 100%, no they don't. Probably the same 70% as the secular population but that gives them a very strong voice which is very focused on helping their own communities. So, an Orthodox Jew in being a representative here would deal with a lot of subjects that are a problem for his community and look less at a very general broad subject etc. He would see himself as a representative of his community. And by the way, there are more than one party for the ultraorthodox communities.

Respondent 13: And if the Arabs would do that and have all sectors coming in, they will eventually have some [representatives]. So they also take care, they come and demand a budget. The allocation would be more uniform. But it takes some time. By the way, after '48 when the Jews came, the water in East Jerusalem came not from here, but the Jerusalem Water Undertaking. That whole thing would change.

Interviewer: It is still their infrastructure in some parts of the city, right?

Respondent 13: Yes. Also the electricity is divided. So now all the electricity is provided by an Israeli company but allocated by the East Jerusalem company, and it is a very good company.

[People have to leave]

Respondent 13: But you know a lot of background of the situation. It seems that you know what is going on. It is quite open, there has been a lot written about this.

Respondent 9

Interviewer: Starting with the positive category and the statements you put in the number four category. People that feel empowered and in control over their decisions are more likely to take grassroots initiative

Respondent 9: I totally agree. Everything in Jerusalem is more political and in control. So, if we have the power and positions, we are more likely to take grassroots initiative in the water sector, but also other issues.

Interviewer: What differences do you see?

Respondent 9: I see many more grassroots initiatives in West Jerusalem than in East Jerusalem, because who's controlling the city and who's running the municipality and the members are actually Israeli not Arab.

Interviewer: Do you think it is important to try and change that?

Respondent 9: I think it is important in order to change many things, not just initiatives for the water sector and environmental sector. In order to change things on the ground here you need to change things on the policy and policymakers level.

Interviewer: How do you think we can achieve that?

Respondent 9: I think we could achieve that when we try to involve the Arab sector, the Palestinian sector from East Jerusalem to be part of the municipality. Even though some of them still feel like it is an occupied municipality.

Interviewer: What do you mean? Voting?

Respondent 9: Voting, maybe to be running for election. To be members of the municipal committee. I think it can change a lot of things, not just environmental issues. But it is a big dilemma. We did a public poll in the Hebrew University for East Jerusalemites and if they are willing or not to participate in the municipality. Sixty percent of the East Jerusalemites said yes, we are willing to participate. But when the last elections happened, the percentage of participants was not more than two percent actually.

Interviewer: Do you know who participated in that poll? Maybe it is younger people because it is through the university?

Respondent 9: I think it depends on... East Jerusalemites never practiced democracy. It is normal for people to not take part in any elections or voting because they never used to. There is a generation right now that is living in East Jerusalem, even elderly and the new generation, that never practised democracy.

Interviewer: Are they then not aware of the effects and potential?

Respondent 9: I think it is a long-term action that we need to work on, and it is not an easy thing. It is political and individual. Many factors playing in this game, not just two or three, really a lot. Many reasons why it will take time to get them involved in such a process.

Interviewer: Do you have examples?

Respondent 9: No, I am sorry.

Interviewer: Okay. The second one, people that feel empowered and in control over their decisions are more likely to have access to green spaces and/or water sources for recreational, spiritual and educational uses.

Respondent 9: I think this is the same point as the last one. They have the power, so they can create more parks, more recreational areas in their communities. The others that do not have voices in the municipality, they cannot decide where the budget goes, so it goes to West rather than East Jerusalem. I guess it is kind of the same point as the previous one.

Interviewer: Yes. So a lack of representation?

Respondent 9: Yes.

Interviewer: Okay. Now also the third category.

Respondent 9: People that feel valued and like having a voice are more likely to have access to... it is somehow related to the previous here, they don't have the decision makers but at least they can feel that their voice is valuable. In East-Jerusalem we don't feel that our voice is valuable, this is normal. So that is maybe why we don't have the access to all these water sectors and for recreational, especially the recreational. This is more like green spaces.

Interviewer: So if you feel not valued and like having a voice, you feel like you are not going to make a change, so you are not going to try it.

Respondent 9: Somehow yes, let's say 99% of Palestinian East-Jerusalemites they feel the same.

Interviewer: Is there a way to change that feeling?

Respondent 9: To change that feeling, I think... here it is more a reaction from the other side. It builds on the reaction from the other side in order to build trust. Without building trust you cannot do anything. If we forgot about the trust, show me something, changes, on the ground in living conditions. Create more parks, better streets, paving the streets, all other issues. I don't believe in trust anymore between the municipality and the Palestinians in Jerusalem. It is more like a mutual benefit. You have to spend money because this is their right, so you will respect some kind of basic level of services.

Interviewer: So the feeling valued is also important for access to drinking water?

Respondent 9: Yes. I agreed with this because people that feel valued and like having a voice are more likely to have adequate access to freshwater for drinking and sanitation. I agreed with this because we don't feel we have a value of our voice. So we don't care to ask for more freshwater or better quality because we got used to get what they give us. They give us the basic services. In all my life, I don't remember anybody who did or thought about having water test quality in East Jerusalem neighbourhoods. Even though in such neighbourhoods, very dense neighbourhoods, such as Shu'afat refugee camps, I remember once or twice a couple of years ago they found out that the quality of freshwater was mixed with the sanitation water. I think they noticed that from the colour of the water, not from testing in the lab. After that, Hagihon and the municipality began to react to that because it is a hazard.

Interviewer: They changed it.

Respondent 9: Yes. It is basic.

Interviewer: So you would say that if people got a stronger voice or the feeling, then this would improve?

Respondent 9: I think so. People will start asking about the quality of the basic services. Here they are waiting for the basic services, they are not waiting to improve the quality of the services.

Interviewer: Isn't quality also a basic service?

Respondent 9: It is supposed to be, but not here.

Interviewer: So there is a difference between West and East Jerusalem in quality of the water, not in quantity?

Respondent 9: It is more like a quality of services. As a human being you provide people with basic services. And you have a voice, a strong voice, and decisionmakers will start asking for more quality of the services, like to be easier on entering the ministry of When you need to renew your ID. Same thing for the water.

Interviewer: That the process is difficult? The bureaucracy?

Respondent 9: Yes.

Interviewer: Okay. And the one about powerful and dominant communities and the influence on cultural services.

Respondent 9: I put it here, I agree with this, because I see that the community in West Jerusalem are more powerful and dominant. That is why they have more voices and that is why they have more green spaces.

Interviewer: So these are all kind of interrelated in that way, feeling valued, empowered and powerful communities.

Respondent 9: Yes. All of those three are really linked to each other somehow, between dominant communities, decisionmakers and voices and value of voices.

Interviewer: A solution to this is kind of building the trust again?

Respondent 9: There is no trust.

Interviewer: Is it feasible to regain trust?

Respondent 9: I used to believe in trust as something that can affect the future. It is not a game of trust right now. It is a game of giving me good services, quality.

Interviewer: When they will give you that, then it will be better? Will it give you the feeling of trust? Or feeling valued at least?

Respondent 9: Maybe it will.

Interviewer: I want to move over to the ones on disagreeing. Being part of a large or close community matters for getting involved in grassroots initiatives.

Respondent 9: I disagree with this because large community... here it is all about the definition of the community. If we say the community in East Jerusalem, Palestinians in East Jerusalem, they are about 40% of Jerusalem, why then do not have more grassroots initiative.

Interviewer: Yes. So it is not the size or density of the community that matters, it is the power they have.

Respondent 9: Yes. People that have environmental awareness and understanding are more likely to have access to cultural services. That is not necessarily in Jerusalem at all. Even though if you have environmental awareness and understanding, I know a lot of women in East Jerusalem that took environmental awareness training courses, and I don't see that many initiatives on the ground. So

awareness is not really... I feel that in East Jerusalem they are full of building capacity workshops, they are waiting for someone to be the engine of helping them to initiate something.

Interviewer: Would you say it is a condition but that resources are more important in that way?

Respondent 9: It is a condition, but you need the resources and they are missing them. Not only the physical resources, like money. Resources more like... I will give you an example, we are just opening a call for participants in East Jerusalem and give a training course for beehives in the city. Because in the flyer, in the call for participants we mention that each woman will take this course and to show us some kind of commitment she will need to get a beehive box. Without the resources from the pool of participants we will never get a 100 participants. So resources are an important issue.

Interviewer: Would you say that if you have the resources, but you do not have the environmental awareness and understanding than still nothing would happen.

Respondent 9: They complement each other. Awareness is good, but without the resources it is bad in East Jerusalem. Resources without awareness is bad as well. The next one, people that are part of a large or close community are more likely to have access to cultural services. It is very similar to the last one on grassroot initiatives. In East Jerusalem we are 40% of the population and we don't have green spaces. Not a 100% but compared to West Jerusalem. The next one, people that are part of a large/close community are more likely to have access to freshwater... Here I disagree because freshwater is a basic issue of the government/municipality, so they provide the basic services. It does not matter if you are a large community or not. Here it is more about the quality, asking for the quality of the freshwater is a different issue.

Interviewer: Yes, so that makes it complicated. People have basic services so you cannot really say anything about it, but there are still differences in the quality of those services.

Respondent 9: Absolutely. It is more like an elite-issue. It is an elite-service to ask for the quality of the water that you are providing me with. People started to complain about hazards in the water in the Shu'afat refugee camp and only through the colour of it. Nobody knows what is really in the water.

Interviewer: Because I know that Hagihon does testing on water quality and have these reports. I am not sure what the extent is of that coverage?

Respondent 9: I think they do. But the coverage and percentage and what areas they do, it matters. Do you go and test the water in the beginning of Shu'afat refugee camp or in the camp? Next one. People that are mentally and physically healthy are more likely to have adequate access to freshwater... not necessarily. I don't think so. I think it is more a matter of quality as well. If they are healthier, they will maybe start asking more. Getting more water filters in their individual houses. But they are not likely to have lacking access.

Interviewer: Yes, so again there will be a basic level of water service, but the extra services are questionable. So let's move over to the other side. [respondent hesitates]. Unless you want to say something about the statements in between?

Respondent 9: I think the main player in the game are decisionmakers, representation, authorities. Large communities and the number of communities does not matter here so much. Who has got more representation in the authorities, who has got better access to water, green spaces and whatever?

Interviewer: Okay. So it is more about the politics rather than...

Respondent 9: Yes.

Interviewer: We talked about a lot of factors here. Do you think factors are missing here that are important for access and involvement with water?

Respondent 9: Changing this game is more about trust between the same community first. I think that is something missing. I mean communities themselves, they put their hands together, they work together, they will try to change things on the ground. Even for water or green spaces. For example, in a small area in (?) neighbourhood we try to provide a new road that is paved. In order to make it two lanes we need to demolish part of people's house or to get two metres of a private church land. When the house is demolished the municipality cannot compensate because they build illegally. And to get the two metres we need permission from the owner of the land of the church. You need guys in the community to go to the church and ask them to write something that you need two metres for the road. There are only around 200 families living in this quarter of the neighbourhood. One or two of them went to the church to ask for this. We have been waiting as a planner to get the written formal permission from the church. We have been waiting for three months, because the community did not work together.

Interviewer: So even within communities there is a lack of trust or cohesion?

Respondent 9: This is an issue in East Jerusalem. In your case you are working on Jerusalem as a whole. This is one of the most issue right now in East Jerusalem, missing representations. Individuals do not trust each other, because this is the output of being living in Jerusalem from 1970 to today.

Interviewer: How does that happen when you know your neighbours and you want a better road?

Respondent 9: People did not work together because they do not trust each other and at the same time we need initiators. We need community initiators, an entrepreneur who can really work as an engine in the city in order to change things and to make smaller communities more community. And strengthening the communities within themselves.

Interviewer: Does this then not all come back to this feeling of not feeling valued and empowered.

Respondent 9: Yes, I totally agree with you. People think their voices are neglected anyhow, so they don't care.

Interviewer: It perpetuates the situation.

Respondent 9: It is a very beautiful tool you have been working on. I highly believe that this method can apply to any issue in East Jerusalem. Not just for water, but also for parks for instance. It is the same players.

Interviewer: Yes. So far, I see a focus of people that have a basic level of services that focus less on the power aspects and more on environmental awareness and understanding.

Respondent 9: They have the power and they are providing the basic services; people don't really know about the quality of the whole issue.

Interviewer: So you have all the types of water services and participation. What is the relative importance of these issues/hottest topic?

Respondent 9: For Jerusalemites, Palestinians in East Jerusalem, because of the service of providing water and sanitation already exist, and the whole game is more housing issues. Housing is a big issue in Jerusalem because it is more politics. In getting the building permits in Jerusalem it is not impossible almost, but it is expensive for many reasons. It is another topic. But this is people's priority. So when you go and talk to them about water and the quality of water, I don't think it is in their top priorities. They already have a basic level of services, they care a lot more about houses, building permits, roads. Yes. I think more or less building. Because the whole game in Jerusalem is a demographic ratio. If you give more building permits you are providing more room to more Palestinians in Jerusalem. And actually it was never written as a statement in Israel or in Jerusalem. Before they would say it, but in 2004 it was

the first time it was written. It says that we can get a maximum of 40% Arabs to 60% Jews. Terminology is a big issue here as well. They will never use Palestinian as a statement. They used to say 70% Jews to 30% 'others'. So the terminology is a big issue here, sometimes I even don't call it illegal building in Jerusalem, I call it unlicensed buildings, which has a more political and identity dimension. I mean, how can we have value of our voice if we are treated as refugee who came to this country five years ago, while we are from Jerusalem, our families born and raised in Jerusalem for many generations.

Interviewer: Restricted by policy.

Respondent 9: Yes. It is a game.

Respondent 10

Interviewer: So I want to discuss the statements in the extremer categories. Let's start with minus 4. People that are literate in Hebrew are more likely to have access to sewer infrastructure...

Respondent 10: No. It's most disagree, because here in Jerusalem we have an auditorium where we have a class from Jerusalem. From East, West and the Old City, all ages, from 8-9 years, who came to learn about the sewage, the plant and what we are doing with the water. How we make it to effluent. And get water to the community, to the gardens, here it is vegetable and fruit. We have a teacher that speaks Hebrew, English and Arab. A lot of people came here, the most of them were students, and I do not agree with that.

Interviewer: And if you look at connections of houses to the sewer and sewage treatment infrastructure?

Respondent 10: Yes, they have a connection. They came with a passion to learn, all of the students, Hebrews, Arabs, Christians also. I am talking about everyone that came here. In the holiday we are making an open space here, people from all over Israel came and studied. We have a movie where they see about the sewage purification. Not only students.

Interviewer: Okay. So there is a lot of sewage that comes in here from the city, that comes from people's houses. Are all those houses, how is that connection?

Respondent 10: We don't have a connection to all the houses. We have a pipe. 95% of the houses in Jerusalem... we have a little area here and there, most of the area is in the Arab... in the East Jerusalem. And now they start to connect them to the sewer. But the municipal authority sends trucks to this area to suck the sewage from the septic tanks and put them on the pipes.

Interviewer: Do you know why it is that these people aren't connected?

Respondent 10: Yes. Because the Old City is very complicated to build, all the pipes and stuff. Now the municipal authority started to put down pipes and connect the houses. The problem was geographic and very tight house to house. They have to build house pumps to suck the water up from the septic tanks.

Interviewer: The second one. People that feel valued and like having a voice are more likely to have access to sewer...

Respondent 10: No it doesn't have a connection to feeling valued or not.

Interviewer: Okay, because do you think there are differences across the city regarding the extent that people feel like they have a voice or feel valued?

Respondent 10: No. I don't think so.

Interviewer: Okay, so the minus three. People possessing basic goods are more likely to have access to adequate freshwater for drinking and sanitation...

Respondent 10: I am not sure that I must disagree with that, because maybe they have more passion to learn. It is very complicated.

Interviewer: Do you think there are differences between rich and poor?

Respondent 10: No. This is only a problem if you can go to study in a university or go to study in a college.

Interviewer: Okay. But access to freshwater it doesn't matter whether you are rich or poor?

Respondent 10: No.

Interviewer: Okay, so the same can be said for the second one on possessing basic goods and access to sewer and sewage treatment infrastructure.

Respondent 10: It is the same answer. And the third one, people that are literate in Hebrew are more likely to have access to green spaces... No. It again does not matter what your language is here in Jerusalem. You can already see it in the shops, three languages everywhere. These questions you are supposed to ask in Tel Aviv or some city that doesn't have half of its people speaking a different language. We work together here, people from East Jerusalem, Bethlehem, Christians and Jewish. And it happens everywhere in Jerusalem. In every shop that you go you most of the times can find Jewish and Arab people working together. And the language is not the problem. Because of that I think that these questions are not relevant here. The language and the religion in Jerusalem are not having a problem here. When we have a problem with terror, then a little bit, but not here, with the working people.

Interviewer: In politics more maybe.

Respondent 10: Yes, that is the problem.

Interviewer: Okay. Let's move over to the positive four category.

Respondent 10: People that have environmental awareness and understanding are more likely to have access to green spaces... We think that the people that have more education on the environmental issues, they have more passion to learn and come in contact with this area. The forest here and the plant. The plant gives the water to the forest.

Interviewer: Do you see big differences throughout the city regarding people's awareness and understanding?

Respondent 10: Yes. We don't see a big difference, but we see a difference. People with awareness and understanding have a closer connection to our process and want to learn.

Interviewer: Do you think it is important to improve this?

Respondent 10: Yes. Not to improve. But I think that what is important is to get the other people that don't have a good education, to get them here, take them by the hand and help them to study.

Interviewer: How would you try to do this?

Respondent 10: To bring them here to see a plant like this. To write about it online or offline in the newspaper, because they read. They read the newspaper, they want to see what happens in our village and in our world today. And if they open the newspaper and that there is a sewage plant that transforms sewage in good water for fruits and vegetables and we eat it, then maybe they want to learn more about it.

Interviewer: Next one, people possessing basic goods are more likely to have access to green spaces...

Respondent 10: It is the same. If you have the spirit and the passion to learn, then you are going to learn. If you don't have education like here, or you don't have a spirit about the environment, then you don't want to learn.

Interviewer: Does it matter then if it comes to money for instance?

Respondent 10: No. It does not connect to the money. The money gets you education. If you have money you go to study something that you like. If you don't have money then you have access to green spaces, but you go to open spaces. Not to learn through the museum or something, because it costs money.

Interviewer: Move to three. People that are part of a powerful/dominant community are more likely to have access to cultural services...

Respondent 10: Of course, if you now live in some Kibbutz or something here in Israel that makes vegetables, then you got environmental education from the beginning, about water and the process. Of course, if you in the community have more people that don't live in this kind of area.

Interviewer: And when you look at Jerusalem municipality.

Respondent 10: In Jerusalem we have a little in the neighbourhoods, people who make green gardens. They have more of a connection to the area. It doesn't depend on the money or where you come from, if you are Arab, Jew or Christian. Not in Jerusalem, maybe in some other place.

Interviewer: So the gardens are equally spread throughout the city?

Respondent 10: Yeah. The garden is for all the community in the area. Jewish, not Jewish.

Interviewer: So okay everybody can come in there, but...

Respondent 10: Yes. Everybody comes and helps a hand. They don't give money; they help with manual labour. Helping to make the vegetables or cleaning the gardens, something like that.

Interviewer: Are the gardens spread evenly across different neighbourhoods.

Respondent 10: Not in all neighbourhoods we have a green garden. Where the people want to make a green garden, they get a space from the authority and they make one. Not every neighbourhood has a green garden.

Interviewer: So you would say that it would come back to this one. About environmental awareness and understanding when it comes to your access to cultural services [points to statements on awareness in category 3 and 4 regarding access to cultural services and grassroot initiative].

Respondent 10: Yes. And if it is very important for some people in the neighbourhood, they will take after the whole neighbourhood.

Interviewer: Next. Being environmentally aware and have understanding, you are more likely to have access to sewer infrastructure and sewage treatment infrastructure.

Respondent 10: Same. If people that are part of... It depends on what the community does. If the community has a connection to the area, then yes, it is most agree with that. If they don't have a connection with the community, then they don't like it. For example, if they have in the neighbourhood a green garden, the people that are not part of the community, doesn't go the green garden. If they are part of the community, they will help. If they are not, they will not help.

Interviewer: So you see sewage infrastructure and green spaces as interrelated?

Respondent 10: Of course, if you have the connection you will go there to the green spaces. [connection refers to awareness and knowledge on sewage and sewer treatment]. Being part of a powerful community and awareness are two different things, but not all the time the people that are part of a community, know about the plant like we do or about the connection with treated sewage to the green gardens. They have to learn that.

Interviewer: Okay, just to clarify... How do you interpret the difference between the statements on powerful communities and large and close communities?

Respondent 10: They are not really different. Powerful then we are talking about a small group that wants to do something good... Powerful is neighbourhood and the other ones are on city-level. This is the difference. You cannot take the whole city to be part of the community.

Interviewer: We discussed several social factors, are there ones missing?

Respondent 10: All the authority, all the people in the city have most of... they need drinking water. And I cannot see in Jerusalem some part of the people without water at home. They have a good connection to Hagihon and some less connection to the wastewater treatment plant. Because we are in the end and we are not drinking water. They flush the water from the toilet, most of the people doesn't know where it goes. Now in Jerusalem, we are almost five or six years in the holidays providing a small study group for 2.5 hours with a movie and a tour. They go out and say that it is great, how did we never know about this. It will take a lot of time to learn all the people about the WWTP. But I don't see that something here is missing.

Interviewer: So looking at the different types of services and participation in water sector. What would you say is the hottest topic right now?

Respondent 10: Sewage, the treatment of it. It is much more important. The drinking water, people know about it. Drinking water is life, if you don't drink you die. People must know what happens to do sewage, all over the world. The trash that they put in the sewage is problematic. If they come to see, they learn.

Interviewer: So in the end it is the environmental awareness and understanding that is very important in that sense.

Respondent 10: Yes.

Interviewer: Okay. Those were my questions. Do you have any remarks or things to add?

Respondent 10: No.

Respondent 11

Interviewer: So you think they're all equally important?

Respondent 11: No difference between them.

Interviewer: Why not?

Respondent 11: I don't find any difference between the different definitions.

Interviewer: Okay. Because you made a difference between agree and disagree?

Respondent 11: Yes. There is a difference between agree and disagree. But. I disagree with all these different issues and I completely disagree. And I agree with this definition. But not in their totality. Does this make it complicated for you?

Interviewer: Yeah. Because normally I ask people about the statements they put in the extreme categories. So just to understand why they think those differences in particular are applied to Jerusalem and how they might be changed.

Respondent 11: For me the definitions are white or black. Yes or no. All this middle, all this grey area. For me it doesn't make any sense. If it is a little more or little less. There are nuances. But what is important is if I agree or disagree. And the nuances for me, as a man that came from politics, these nuances don't have any importance. The answer for all of these questions is no I don't agree that the access to fresh water, sanitation or sewage are something that is related to basic goods and normal income, literacy etc. They are not connected to these parameters. It's nothing to do with the basic goods, literacy, or to be part of a powerful or dominant community It doesn't work... Yes there is discrimination on the way that the municipality distributes water but it's not according to these parameters.

Interviewer: What is then? What are the parameters?

Respondent 11: Two parameters. One is relating to where you live. And this is not absolute. You can be a Palestinian that lives in East Jerusalem without incomes without goods without knowing one word in Hebrew. But you will be in an area, a zone, where the pipes of water are in very good condition, because these pipes take water to a Jewish settlement and you are located along this infrastructure. And even if you are a very poor man you can connect it to this pipe without any relations due to your nationality, belonging, religion, socio-economic situation. You have the luck to live near a settlement where modern water infrastructure goes.

Interviewer: So even if you are, for instance, a Palestinian and you live alongside infrastructure that goes to a Jewish settlement. But then isn't it determined by, of course it is luck, because this is the exception maybe, but isn't it then nationality or the difference between Jewish people and Palestinians that determines whether you get good infrastructure? Maybe people can profit from it because they live alongside it, but...

Respondent 11: Yes this is true what you're saying but it's not connected to these parameters. I agree with you. That in East Jerusalem that the infrastructures are a worse situation and that is the reason why the quality and quantity of water is different than in the West. But these cards don't talk about the national parameter. And even then, the national parameter is not enough. Because if you are a Palestinian and you have the good luck to live near a settlement you will get the same quality of water as a Jew without any relation to your nationality.

Interviewer: Yes. But isn't that ultimately when you go back to it, as a settlement wouldn't be there then the good infrastructure wouldn't be there.

Respondent 11: Oh yes of course.

Interviewer: So then it all comes down to nationality.

Respondent 11: Yes but you have to think about these two parameters together. Yes, it's true that without settlements, maybe that you will have good infrastructure if, for example, maybe that during the Jordan period the Jordanians prepared good infrastructures. But if you will not take both parameters together...

Interviewer: Nationality and which one?

Respondent 11: And the place where your house has been build. For sure, Jews don't have this kind of problem. But in the Palestinian society you should both situations in mind in order to understand what is going on. Yes in East Jerusalem the infrastructures are less developed than in the West. But it doesn't mean automatically all the people in East Jerusalem they will have water in the worst conditions. It's not enough to be Palestinian to be discriminated. You should be Palestinian but also you should live in a place where there is no Jewish population around it.

Interviewer: OK. So those are the... because I was going to ask later: Do you think there are factors that are included in this list. So those are two that you would say that are missing. Location and nationality.

Respondent 11: Yes.

Interviewer: OK. So you don't think that a powerful community correlates or is the same as nationality?

Respondent 11: No. First of all, I don't know what a powerful community in East Jerusalem is. They're no powerful communities in East Jerusalem. But even then, if you have a powerful community in a place where there are no Jewish people, and for the municipality to prepare infrastructures will be, so... the price will be so high. It would be so expensive to do it that they would not do it. Even if the community is powerful. For example, if a neighbourhood at the top of a hill and the land is just stone and it is hard to dig and expensive to bring the pipes there, they will not do it, even if the community is strong. But this is a very hypothetical question, because they are no powerful communities in East Jerusalem.

Interviewer: No but isn't then a difference between the powerful and unpowerful West and East.

Respondent 11: For sure if you are a powerful community in West Jerusalem. You will get better services than weak... This is clear. But in East Jerusalem it is not a parameter. You can find, we can talk about the Christian community around the Old City is a powerful community. But they don't have problems with the water supply because they are in the Old City, where the Israel wants to develop smaller Jewish neighbourhoods there. But it's not because they are powerful. It's because they are near a Jewish community.

Interviewer: Okay. So, do you think there are differences in water access throughout the city?

Respondent 11: Yes of course there are differences. Nobody can deny it. We know that there are many places in East Jerusalem that they don't have access to the water. I have checked it 10 years ago; I have numbers of places where the water doesn't arrive. Places where there is no sewer. All of them are of course in East Jerusalem. But I say again the chance that you have to access to water depends more than everything on the location where your house is. But no doubt that there is discrimination in the water supply in East Jerusalem.

Interviewer: So here I see a lot of statements that you agree with that are about grassroot initiatives and access to cultural services such as recreation. Why did you all agree with those?

Respondent 11: Well. Because one thing is to supply water and. Sanitation. And the other is initiatives cultural, social... This is something that really depend on people more than on the municipality. Poor people they can get grassroot initiatives, they can have a community garden and recreation, spiritual and

educational use for sure. It does not depend on the municipal initiatives. If you belong to an empowered community or to a very poor community. You can get from the recreational, spiritual or educational services without any relation to your national belonging or socioeconomic belonging. So I make a difference between services that the municipality supply. And initiatives that depend on personal initiative.

Interviewer: So you would say that these are things [points to disagree] that people don't have much influence on themselves and those [points to agree] are.

Respondent 11: Exactly.

Interviewer: Would you say it's important to improve people's access to cultural services and public participation in the water sector?

Respondent 11: Of course it's important to improve it. Yes of course. But it's something that depend more on the social values of each family than on the municipal practices. This depends on each family and this depends on the establishment [points to agree and disagree respectively]. This is the difference. All this activities that depend on the personal level. Yes. I agree that if you belong to an empowered community and if you have better incomes and you have are physical healthy etc. Yes this will improve the condition not just in the water sector, in every sector. But this is because it does not depend on the municipality supply.

Interviewer: I'm going to ask you one more. When you would for instance want to improve people's access to green spaces whatsoever, you need to stimulate that, as an organisation or whatever... Because here we have several factors that are important for access to green spaces such as basic income and all those things. But what would you focus on then if you want to improve that? Now you're saying they are all equally important, because black and white, you agree, or you don't. But if you want to improve something you want to maybe focus on one of those things. Maybe improve people's income, people's awareness. So you think they are equally important when you...

Respondent 11: You ask me which one of them is more important if I want to improve the access to water or...

Interviewer: Yeah, for instance, if you have your access to green spaces, that might be very dependent on how physically capable you are. If you can't get there you can't access the green space for instance. But it may also be dependent on whether you have money or not and you can buy the time.

Respondent 11: But to have access to green places you don't need normal income, you don't need awareness, you don't need to feel valued, you do not need to be part of a powerful and dominant community. Access to green places everyone can do it on the same level. If you are poor or rich, what is the difference when you talk about the green places?

Interviewer: Okay, maybe you are understanding me wrong.

Respondent 11: Maybe the problem Is that in Europe the concept of green places is something that is open for people in a good economic situation I don't know, but here in this city everyone can get access to green spaces. Even if you are a very poor. So, this is not a concept that changes according to socio economic situation.

Interviewer: Okay, so then you don't agree with that.

Respondent 11: No. I agree that people that feel empowered are more likely to have access. Yes. But also people that don't feel empowered and that don't feel in control over their decision. Also they are likely to have access to green spaces and other sorts of recreation, spiritual, educational etc. Okay so I disagree with the statement. There is no difference regarding what your socio-economic situation is in

these issues that are relating to access to the water sector. OK. Maybe that I should put them all of them in this part of the map.

Interviewer: So also for taking grassroots initiative?

Respondent 11: Maybe that we don't understand in the same way what an initiative is. You mean to go to a green place. If this is an initiative...

Interviewer: No that's a more passive use and has to do with access and using the resources that are there. Grassroot initiative is actually taking an active role in the water sector, such as starting a community garden.

Respondent 11: Okay, if you talk about being more active, then yes, if you have awareness, you belong to a powerful community... It makes sense that you will be more active than passive people. It makes sense. But it's not enough to be part of a powerful community or to have a good income. In order to organise a protest or manifestation you should suffer from something very hard. You need a cause and the cause should be in East Jerusalem in particular very hard to do it. So the social or economic situation is not enough in order to induce men to participate in protest. There are other parameters in East Jerusalem that are more important than the socioeconomic situation.

Interviewer: So, would you say that the nationality and location parameters apply again then if you want to take grassroots initiative?

Respondent 11: No. If you talk about grassroots initiative in particular in the last years since the short third intifada, that uprising in 2014 after the Palestinian guy was killed. The main parameter is whether participation in this protest can affect the security situation of the family. If you participate in the demonstration there is a good chance that in the same night the police will visit you and start to ask questions, make problems and they can also revoke your residency. So, I call it security reasons, but maybe that security is not the right word to use. The main parameter in East Jerusalem since 2014 is the question that what if I will take initiative to improve our situation what will be the consequences with the police or with the Ministry of Interior or something like this. This is the main issue. You can be a very healthy or poor person. The first question will be how this will influence my security situation. And that's the reason why in the last years you will not find any demonstration here in East Jerusalem... Just related to religious themes, related to the Temple Mount. But this is the only issue where Palestinians... they are still manifesting, in other issues relating to the quality of life in East Jerusalem, nothing, you will not find it.

Interviewer: For security reasons?

Respondent 11: For security, because they are afraid that the police will start to... [gets interrupted]

Interviewer: Where were we... So security is the most important reason not to take initiative? Would you then not in itself call Palestinians the not powerful community entirely?

Respondent 11: Of course. A very vulnerable community.

Interviewer: So if you would say that Palestinians, East-Jerusalemites, are the less powerful community and people in West-Jerusalem, or Israelis are the more powerful ones.

Respondent 11: Without any doubt yes.

Interviewer: You still don't think it applies whether being part of a powerful community or not determines your access to water? Not taking into account the exceptions based on location.

Respondent 11: Taking out this exception. Yes. I agree with you that for Palestinians it's more complicated to have access to water. Particularly if you live in a refugee camp like Shu'afat. But if you take out these exceptions, I agree with you. But the exceptions are very plenty. In principle, yes, I agree with you.

Interviewer: OK. And do you think there's a way to improve the situation of those that are not part of the exception?

Respondent 11: No. If the political situation will not change, there is no way to improve the situation in East Jerusalem. It just depends on the international and political situation and not on something that the people on the ground can do. Not Palestinians and not Jewish people.

Interviewer: Not even if they... I am trying to be hopeful. There is such a big mass of modern people in the city also that believe in a solution, I think. If you collect enough people that want something to be done, then at some point the voice becomes so large that things will have to change.

Respondent 11: How much are enough people?

Interviewer: I learned about the 20/80 rule where 20 percent is a critical mass.

Respondent 11: If you ask me theoretically if when a mass of people will fight for the rights that it will change, then yes theoretically. But it does not happen. It didn't happen in better times. When Palestinians used to demonstrate from time to time against house demolitions. When it wouldn't help then, it wouldn't help now.

Interviewer: Okay. Those were my questions. Do you have things to add? Because you named a few factors that you think are important that aren't in here. Are there more things that you feel like I am missing at this point?

Respondent 11: Location is a parameter that is missing. You also have to take into account the issue of the Master Plan. The municipality uses the Master Plan in order to supply services and to refuse. If according to the Master Plan an area is for residential purposes, so the municipality will develop infrastructure for water. If according to the Master Plan this is defined as green land, then they will not do it. So, I agree that the issue of the Master Plan is a [pretext]. Pretext is when you say something in order to... it is a lie. What I try to see is that they use the Master Plan in order to try to limit the amount of services they get. But you have to also say something about the way the municipality prepares Master Plans. Because the infrastructure depends on the definition of the land. So for the municipality this will be the main parameter, if the land has been designed for residents or other purposes. So, if you will ask someone of the opposition or the municipality... Someone from the ground or from NGOs, they will say that everything depends on nationality and location. But if you will ask people from the establishment, they will say that everything depends on the Master Plan. It is according to what the Master Plan says, if the land has been defined as residential, they will have access to water and sanitation, everybody. If they decided to build illegally in a zone that is not for residential use, so they will not have access, but it is not 'our' fault, it is their fault because they build without permit.

Interviewer: Okay, thank you for your time.

Appendix H: Individual scores Q-sorts

Table H1 displays the scores that every respondent (N = 10) attributed to each proposition. The numbering of the propositions is in accordance with the numbering of the propositions in Table 6. Table H1 also shows which perspective each respondent belongs to. 1 stands for Environmentalists, 2 for the Establishment and 3 for Egalitarians.

Table H1

Scores attributed to the 32 propositions by each respondent.

	Respondent (Perspective)									
	1 (1)	2 (1)	3 (1)	4 (2)	5 (2)	6 (1)	7 (2+3)	8 (1)	9 (3)	10 (2)
1	4	-2	-4	-3	-3	1	-2	-4	1	-3
2	4	-1	-4	-4	-3	1	0	-1	-2	-3
3	1	-1	1	2	0	2	-2	2	0	4
4	3	2	2	0	-3	2	1	4	2	-1
5	0	-1	0	-3	-2	0	-4	-3	2	-1
6	-2	-3	0	-4	-2	0	-3	0	-2	-4
7	-2	0	0	-3	-2	1	-4	2	2	-3
8	3	2	0	-2	-2	2	-3	3	1	-2
9	-1	-4	-3	3	0	-2	-1	-2	-3	0
10	-3	-4	-3	-2	0	-2	-1	-2	0	-2
11	-2	1	-3	3	-4	-2	-1	-1	-2	-2
12	1	2	2	1	-4	1	-1	2	-2	2
13	-2	-2	-2	1	-1	-3	2	-4	3	-4
14	2	-2	-2	0	-1	-3	1	0	-1	-2
15	-1	1	-2	4	-1	-3	1	-3	3	1
16	3	1	3	2	-1	-4	4	3	2	0
17	-1	-2	1	0	1	-4	1	1	1	0
18	-3	-1	0	-1	1	-1	0	0	-1	-1
19	0	0	2	1	1	-1	3	1	4	0
20	1	1	3	0	1	3	3	1	4	0
21	2	-3	-2	4	4	-1	0	-3	0	-1
22	-3	-3	-1	-2	4	-1	0	0	-1	0
23	1	3	1	3	3	-2	0	3	-4	4
24	2	4	4	2	3	4	4	4	0	3
25	0	0	0	-1	2	4	2	-2	1	2
26	0	0	2	-1	2	3	2	0	0	3
27	0	4	1	2	2	3	2	-1	3	3
28	-1	2	4	1	2	2	3	1	-1	2
29	-4	0	-1	0	3	0	-3	-1	-3	1
30	-4	0	-1	-1	0	0	-2	0	0	2
31	0	3	-1	-2	0	0	-2	-2	-3	1
32	2	3	3	0	0	0	0	2	-4	1