Envisioning a capability approach to water service development in urban informal settlements

Francesco Maria Gimelli

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Thesis submitted for the degree of Doctor of Philosophy

Student Number: ▮▮▮▮▮▮
Graduate Research Interdisciplinary Program (GRIP)
School of Social Sciences, Faculty of Arts
Monash University

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ABSTRACT

For the urban poor in the world's rapidly expanding cities, deficiencies in water services such as water supply are one of the leading causes of illness and premature death, hinder access to education (particularly for young girls) and reduce livelihood security. This reality has led to actions such as the enshrining of the universal right to drinking water and sanitation by the United Nations in 2010 and the adoption of water-specific goals, targets and indicators in the universally-adopted Sustainable Development Goals (SDGs). While these are important developments recognising the instrumentality of water services in ensuring human health and wellbeing, much water development practice homes in on just a part of the relationship between water services and human wellbeing. However, there is a growing body of scholarship grounded in the Capability Approach (CA) to human development initially articulated by Amartya Sen (1999, 2013), which argues that development must be measured by an expansion in the achieved and available opportunities available to individuals to live the kinds of lives that they have reason to value. Precisely what such an approach to water development might look like and how people's access to water services shapes their ability to expand their capabilities for wellbeing, however. This research project contributes to addressing this gap in our current knowledge by **envisioning a capability approach to water service development in urban informal settlements.**

This aim is achieved through three phases. The first phase of this research project entailed the critical analysis of the currently dominant approach to water development as found in the Sustainable Development Goals (SDGs), which will guide international, national and many local efforts to develop water services until 2030 and a complementary review of scholarship treating issues of political participation, rights, political ecology and water development and urban informality. This review frames the need for the articulation of a novel interpretation of the goal of securing access to water services that is better able to foster concern for the way that water service arrangements in low-income settings may facilitate or hinder the expansion of individual capabilities for wellbeing and argues that the disparate advances in the water development sector that recognise the multiple dimensions of wellbeing linked to water services need to be brought together to articulate a holistic approach to water development aimed at the expansion of human wellbeing .

The second phase of the research involved a qualitative, single, embedded case study of the experiences of water service arrangements of residents of urban informal settlements and development workers engaged in water development efforts in six informal settlements across the Indian cities of Faridabad, Delhi and Mumbai. The third phase of the research involved the analysis and interpretation of the case study data to address the radical

underspecification of the CA and to contribute to the translation of the three key dimensions of the CA for the water sector: 1) achieved functionings (where functionings are understood as various aspects of wellbeing that people value); 2) process freedoms (the agency aspect of the CA, broadly relating to freedom of actions and decisions, as well as procedural considerations); and 3) opportunity freedoms (people's freedoms to achieve valuable outcomes, which may be individual and systemic). The culmination of the second phase of the research is three empirical papers, with each one investigating and reporting the lived experiences of the relationship between water services in urban informal settlements and each of these three dimensions of the CA. The thesis concludes by synthesising the empirical findings presented here to envision what a capability approach to water development might look like.

THESIS INCLUDING PUBLISHED WORKS DECLARATION

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes 2 original papers published in peer reviewed journals and 2 submitted publications. The core theme of the thesis is the development of urban water services in informal settlements. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the student, working within the School of Social Sciences under the supervision of Dr Briony C Rogers and Dr Joannette J Bos. The inclusion of co-authors reflects the fact that the work came from active collaboration between researchers and acknowledges input into team-based research.

In the case of Chapters 2, 4, 5 and 6, my contribution to the work involved the following:

Thesis Chapter	Publication Title	Status	Nature and % of student contribution	Co-author name(s) Nature and % of contribution	Co-author(s), Monash student
2	Fostering equity and wellbeing through water: a reinterpretation of the goal of securing access.	Published	80%. Formulated research problem, located research within established literature, developed theory, conceptualised and structured paper, wrote paper	1) Briony C. Rogers. Supported the research conceptualisation, reviewed and edited the paper, 10%	
4	An Indian case study of water services and human wellbeing in urban informal settlements using the Fundamental Human Needs framework	Under Review		1) Briony C. Rogers. Supported the research conceptualisation, reviewed and edited the paper, 10%	1) No
5	The quest for water, rights and freedoms: informal urban settlements in India	Published		2) Joannette J. Bos. Supported the research conceptualisation, reviewed and edited the paper, 10%	2) No
6	Water for the integration of urban informal settlers	Submitted			

I have renumbered tables, figures and sections of submitted or published papers to generate a consistent presentation within the thesis.

_____Date:_____17/08/2018_____

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the student's and co-authors' contributions to this work. In instances where I am not the responsible author I have consulted with the responsible author to agree on the respective contributions of the authors.

Main Supervisor signature:_____ _____ Date:_____17/08/2018_____

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NOTICE 1

NOTICE 2

ACKNOWLEDGMENTS

It is common to hear that a PhD is one of the loneliest endeavours one can undertake. However, it is just as true that without the collaboration and support of many people, a PhD would not be possible. This is certainly true of this project.

First, this project would never have been possible with the mentorship, support, patience and experience of my supervisors. As such, I would like to thank Dr Briony Rogers and Dr Joannette (Annette) Bos. Briony, you have been a part of my doctoral journey from the very first day when you and Rebekah interviewed me for the position. You have patiently and consistently supported me with your feedback and knowledge throughout the meandering path that my candidature has taken, from Melbourne, to India, to London, and to Philadelphia. Annette, you have enriched this project through your no-nonsense, incisive feedback. More importantly, although I did not begin this project with you on my supervisory panel, you always made your enthusiasm for it clear, which led me to seek you as a supervisor. I am very glad I did. Most importantly, you were both always patient and professional with me, even during the times where my life circumstances and work led me to pass through very stressful periods. I want to thank you both for grounding me during these periods. Without you I would not be where I am today.

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you were no longer on my supervisory panel has helped me to gain perspective on my project and maintain the momentum towards completion. Thank you.

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scholarship, which made me able to devote myself fully to this project. The RTP is a world-class support scholarship and having received it makes me very grateful to be an Australian. Second, I want to thank the Australian Government for their award to me of a prestigious Endeavour Postgraduate Scholarship. This award showed great confidence in my ability to contribute both scholarly and practical insight and served to combat the perennial impostor syndrome that all academics appear afflicted by. Without this generous support I would never have been able to undertake the intensive fieldwork in India that I did. Thank you.

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LIST OF THESIS PUBLICATIONS

Journal Publications

Publication 1

Gimelli, F. M., Bos, J. J., & Rogers, B. C. (2018). Fostering equity and wellbeing through water: a reinterpretation of the goal of securing access. *World Development*, *104,* 1-9.

Publication 2

Gimelli, F. M., Rogers, B. C., & Bos, J. J. (under review). An Indian case study of water services and human wellbeing in urban informal settlements using the Fundamental Human Needs framework. *Water Alternatives.*

Publication 3

Gimelli, F. M., Rogers, B. C., & Bos, J. J. (2018). The quest for water, rights and freedoms: informal urban settlements in India. *The International Journal of Urban and Regional Research, 42* (6), 1080-95.

Publication 4

Gimelli, F. M., Rogers, B. C., & Bos, J. J. (submitted). Water services and the integration of urban informal settlers. *Water Alternatives.*

Conference Presentations and Proceedings

Gimelli, F. M., Rogers, B. C., & Bos, J. J. (2017). Understanding the role of non-state driven urban water development initiatives in informal settlements. Presentation at the International Sustainable Development Conference, 18-20 September, New York City, USA.

Gimelli, F. M., Rogers, B. C., & Bos, J. J. (2017). Fostering political participation for better water services: evidence from three cities in India. Proceedings of the 23rd International Sustainable Development Research Society Conference, 14-16 June, Bogotá, Colombia.

Gimelli, F. M., Rogers, B. C., & Bos, J. J. (2016). Do urban water development initiatives engage participants in the development of their capabilities? Reflections from India. Proceedings of the 22nd International Sustainable Development Research Society Conference, 13-15 July, Lisbon, Portugal.

CHAPTER 1: INTRODUCTION

This introductory chapter sets the scene for this research project. It begins by discussing how the challenge of securing access to water services in underserved settings is framed in globally dominant frameworks such as the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs). It will be shown that there is a gap between the current framing found in these frameworks and the lived realities of underserved populations such as residents of urban informal settlements. This leads me to argue for empirical research to bridge this gap, which this project aims to provide. Having outlined the rationale for this research project, I outline my research question, aim, objectives, and contributions to knowledge, as well as an overview of the research process and an outline of the thesis including publications constituting individual chapters.

1.1 SETTING THE SCENE: WATER AND WELLBEING

"…merely having access to water is not enough. Instead, a person needs a certain kind of access in order to derive certain freedoms or functionings (i.e., capabilities) which in turn depend on a host of factors and capabilities."
– Lyla Mehta (2014, p.67)

"Having better water for me means having a better life. A better life is a life in which there is good education, good facilities, people can go to work. They have the opportunity to meet their family and spend time with their family."
- Community development worker and resident in her 20s from Mumbai

Traditionally, the discourse on water development in low-income settings has focused on the goal of securing access to drinking water and sanitation based on the recognition that these aspects of access to water are essential to safeguarding human health and avoiding premature mortality (Goff & Crow, 2014). However, over the last two decades development thinkers and practitioners have increasingly emphasised that access to water supply is not only necessary to secure health benefits, but also a range of other wellbeing benefits. For example, water development has been framed as essential to securing people's access to education (Fontana & Elson, 2014; Marni, 2010), particularly for young girls through menstrual management enabled by secure access to water and sanitation (Ellis et al., 2016) and through attention to water-hauling time (Nauges & Strand, 2013), and the capacity of the poor to secure their livelihoods (Biggs et al., 2015; Nicol, 2000). In fact, empirical research has found that "…water service delivery failures have a constellation of other adverse life impacts— on household economy, employment, education, quality of life, social cohesion, and people's sense of political inclusion" (Subbaraman et al., 2015, p. 1). This crucial role that water access plays in such important life outcomes is now recognised in the notion found in the Sustainable Development Goals (SDGs) of 'leave no one behind' (United Nations, 2015) and is also enshrined in the recognition, in 2010, of the Human Right to Water and Sanitation (UN General Assembly, 2010).

While these outcomes are just as important in rural areas, it is not unreasonable to argue that residents of urban informal settlements (UISs), otherwise known as slums, are among the populations that experience the most severe hindrances to their wellbeing due to a lack of water access. The limbo that UISs inhabit, existing physically but not legally, means that their residents and the homes and service infrastructures they invest their meagre resources into building are perceived as illegal encroachments on public and private land (Bhan, 2009).

This common perception on the part of governing authorities enables them to justify the denial of water services to large sections of their urban populations.

Consequently, residents are typically left to negotiate ad-hoc access to water services by either constructing infrastructure themselves (including by illegal means such as tapping public water pipes) or by resorting to private vendors whose extortionate prices lead to them being commonly referred to in India as the "water mafia" (Sethi, 2015). Some residents of UISs in India and elsewhere do become 'authorised' by the state at election time, often in return for promises of electoral support (Benjamin, 2008). Such promises have resulted in some households securing water infrastructure in the shape of pipes and in-home connections in the community in Mumbai where the resident quoted above comes from. However, water is only available through these pipes at irregular times and with highly variable flow, severely reducing the ability of residents to benefit from them. These are the realities lived by more than 65 million people in India as of the last government census in 2011 (Government of India, 2011) and by approximately one billion people across low-income countries, with that number only set to grow in the future (UN-Habitat, 2013). It is for these reasons that this thesis focuses on the lived realities of these individuals, households and communities.

Most importantly, the brief snapshot of some of the water challenges faced by residents of UISs highlights another aspect of what, Mehta and the resident quoted at the beginning of the chapter are saying: not all access to water is adequate. While some residents can secure access to water services through legal and/or illegal means, this does not automatically mean that they are able to derive the sorts of benefits from these services that they require to achieve a satisfactory level of wellbeing. As already mentioned, water development literature does recognise that access to water is important to secure benefits such as education and livelihoods. In fact, this has become a more mainstream understanding. For example, the United Nations World Water Development Report for 2016, *Water and Jobs* (UNESCO, 2016), draws an explicit link between water development and livelihood security. While livelihoods are important, however, they are only one further dimension beyond health in the complex web of human wellbeing. Greater promise is shown by development approaches that emphasise the 'multiple uses' of water, particularly for domestic and productive uses (Meinzen-Dick & Bakker, 2001; Penning De Vries, 2007). Goff & Crow (2014), however, assert that global water development efforts continue to suffer from a singular focus on single dimensions of water access, particularly through an excessive focus on drinking water at the expense of other, productive uses of water.

Such critiques are important because they highlight the insufficiency of approaches to water development that focus on single dimensions of wellbeing. But they do not necessarily give way to a vision of an approach to water

development that responds to the multiple and overlapping needs and aspirations of the urban poor because they simply shift the focus from one dimension to another, rather than expand the perspective to simultaneously include multiple dimensions of wellbeing. What might an approach with such an expanded perspective look like? How can wellbeing be understood in the water sector in a way that does justice to its complexity? Is it adequate to approach water development as an opportunity to foster perhaps just one, or a few, wellbeing benefits or should as many benefits be sought as possible and simultaneously? Do distinct forms of access to water services enable people to work towards their aspirations for a good life in the way the resident quoted above envision? Such questions point to the need for pathways and frameworks to operationalise an approach to water development that does justice to its complex role on fostering or hindering human wellbeing. And yet, regardless of advances in our understanding of the myriad wellbeing impacts of water insecurity on these urban citizens, this thesis argues (particularly through Chapter 2) that current frameworks do not adequately capture these in their complexity.

That is not to say that there have been no efforts to integrate explicit consideration of wellbeing into the conceptual repertoire of water management and development. For example, the most often quoted definition of integrated water resources management (IWRM), one of the globally dominant water development approach[1], is,

> "…a process which promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment" (Global Water Partnership, 2012).

But what do values such as economic and social welfare and equity mean? Biswas (2008) asked this question a decade ago and lamented the unavailability of a clear answer; it still does not appear to have been answered, even though questions of wellbeing and equity or equality are considered essential to promoting just environmental and development outcomes (Schlosberg, 2013). This indicates a dilemma. Although values such as justice, equity, equality and wellbeing are increasingly hegemonic in water development discourse (Sneddon, 2013), precisely what they mean, how they are supposed to be achieved, and how they may be evaluated, remains unclear. This is inconsistent with the assertion of scholars of wellbeing such as Dodge, Daly, Huyton,

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[1] Such dominance is attested to by the inclusion of Target 5 of SDG 6, which seeks to "implement integrated water resources management at all levels" by 2030 as part of the strategy to "ensure availability and sustainable management of water and sanitation for all" (United Nations, 2015). The SDGs were universally adopted in 2015 and will guide global development efforts until 2030.

& Sanders (2012, p. 230), whose review of definitions of wellbeing and psychological research lead them to define wellbeing as "..the balance point between an individual's resource pool and the challenges faced". If wellbeing is the positive store of resources that individuals can draw on to meet the inevitable challenges that life throws at us, then this requires consideration of the entire constellation of resources that individuals draw on to meet these challenges. The water development sector might benefit from including an explicit definition of wellbeing that reflects this understanding. Although a fuller discussion of what constitutes wellbeing takes place in Chapter 4, the lack of its clear definition in the water development sector may be due to the fact that water development planning can often be "…predicated on sets of power relationships far removed from the sites of actual program implementation" (Sneddon, 2013, p. 21). In other words, while development initiatives can be driven by certain understandings of values such as wellbeing, these can often be disconnected from what wellbeing looks like in people's lives.

In this thesis, I argue that particular promise for overcoming this disconnection can be found in the Capability Approach (CA) to human development first articulated by Amartya Sen (2008, 2013), which frames development as the process by which people are able to have the freedom to "live the kinds of lives they have reason to value" (Sen, 1999, p. 10). This freedom is constituted of three sub-components: 1) achieved functionings, representing realized outcomes, e.g. being safe, employed, educated etc.; 2) opportunity freedoms, referring to the opportunities that people have and have reason to value, and; 3) process freedoms, which "are related to agency and the conditions in which people and groups can exert agency" (Alkire, 2010, p. 93). These freedoms closely correspond to the 'resource pool' mentioned in Dodge et al.'s (2012) definition of wellbeing.

In the water sector, the CA has guided the work of scholars such as Goff & Crow (2014), for example, who critique the global focus on drinking water as masking the productive and domestic uses of water, which they illustrate as essential for the realisation of capabilities for wellbeing; water, they argue, needs to be understood in relation to its impact on multiple dimensions of wellbeing beyond survival. In a similar vein, Mehta (2014) shows the necessity of viewing the issue of water scarcity as a challenge to wellbeing, rather than survival, while more recently, Jepson et al. (2017) and Crow & Swallow (2017) have illustrated the need to consider water services as necessary to prevent people's descent into, and provide pathways out of, poverty. These are important contributions to our understanding of the shape of the relationship between water and wellbeing. The CA, however, is renowned for being "radically *underspecified*: there are a number of theoretical lacunae that can be filled in a variety of ways" (Robeyns, 2006, p. 353; original emphasis). For example, while both Sen and Nussbaum discuss capabilities for wellbeing in their respective works, Sen (2004) steers clear of discussing

particular dimensions of wellbeing, while Nussbaum (2011) produces a basic capability set list with dimensions of wellbeing that she argues are universal and represent a minimum standard to be aimed at. Such lack of specificity have led to ongoing debates about the means to operationalise the CA for practice (Alkire, 2008; Fukuda-Parr, 2003). These important efforts and the visions of water development that they have contributed to illustrate the capacity of the CA to consider wellbeing in a holistic manner and the increasing recognition among scholars that it holds promise for a holistic approach to water development.

This thesis contributes to further refining this vision and operationalising it to achieve more holistic development outcomes through water service development by drawing on existing frameworks and thinking that approach wellbeing as a dynamic and complex whole. This, this thesis will demonstrate, is an important step towards the global aspiration for achieving equitable outcomes as found in the SDG notion of 'leave no one behind' and the Human Right to Water and Sanitation. This task requires critical engagement with both the institutional understanding of the confluence between water and human wellbeing and the lived experiences of those whose ability realise a good life is shaped by diverse forms of access to water services. This is the central task of this research project.

1.2 THIS THESIS

1.2.1 Research Question

How might water service development foster the ability of residents of urban informal settlements to meet their lived needs and aspirations?

1.2.2 Research Aim & Objectives

The aim of answering this question is to **envision a capability approach to water service development in urban informal settlements.**

This aim is achieved by meeting four research objectives, which are:

1. **To assess the way that dominant water development frameworks engage with issues of justice and wellbeing.**

2. **To characterise the relationship between water services and people's needs and aspirations (wellbeing) in urban informal settlements.**

3. **To examine the process freedoms by which residents and development workers seek to secure water services capable of meeting people's needs and aspirations in urban informal settlements.**

4. **To devise principles and strategies that may inform water service development approaches capable of fostering the ability of urban informal settlements to meet their needs and realise their aspirations.**

This aim and objectives are achieved through theoretical and empirical research, with the latter aspect constituting a case study of residents and development workers in six UISs in the Indian cities of Faridabad, Delhi and Mumbai.

It is important to note that this thesis focuses primarily on water supply, rather than sanitation and hygiene. While sanitation and hygiene undoubtedly contribute to people's wellbeing (as recognised in the Human Right to Water *and Sanitation*), a primary focus on water supply facilitates the delineation of the scope of this thesis. After all, water is but one factor among a large constellation of factors (e.g. food, transport, energy etc.) that help determine human wellbeing. However, research participants often talked about sanitation and hygiene while discussing water supply. These discussions are referred to in this thesis in cases where they shed light on important elements of wellbeing.

1.2.3 Contributions to Knowledge

By addressing the research objectives, this thesis makes several contributions to both the scholarship and practice of water service development in low-income settings. From a scholarly perspective, it:

1. Contributes to addressing the challenge of operationalising the Capability Approach for practice in the water sector by illustrating the role of water service arrangements in urban informal settlements on the expansion of human wellbeing, therefore highlighting potentially fruitful avenues of practice to foster such an expansion;

2. Challenges globally dominant approaches to water service development through an original critical engagement with the way that the goal of securing access to water services is the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs) is interpreted, leading to the articulation of a new interpretation of the goal that is better able to consider the realised benefits of water service development initiatives in low-income settings;

3. Critiques the prevalent and often vague understanding of wellbeing found in water development discourse and argues for, and draws on conceptual frameworks to operationalise an approach to water

development grounded in a holistic, complex and dynamic understanding of wellbeing such as that found in Max-Neef's (1992) fundamental human needs matrix;

4. Empirically demonstrates the utility of such frameworks by using them to inform the analysis of a case study of urban informal settlements experiencing deficiencies in water service access;

5. Challenges the characterisation of urban informal settlements as defined by their deficiencies by highlighting the aspirational character of these settlements and the role that water service arrangements and development efforts can play in either hindering or fostering the successful integration of residents into the cities they have sought to make their homes;

6. Addresses a dearth of direct narratives regarding informal settlers' experiences of water service arrangements by providing a rich set of such narratives, which may be of use to other researchers investigating these settings.

The findings presented in this thesis ultimately contribute to envisioning a capability approach to water service development in urban informal settlements that holistically considers both the basic needs and broader wellbeing aspirations of residents. This project questions the underlying assumptions guiding both thinking and practice in the urban water sector and highlights potentially fruitful new modes of thinking and practice that can shape the aims, objectives, and strategies guiding efforts to contribute to the flourishing of residents of informal settlements. This project also contributes to the practice of water development in urban informal settings by identifying principles and strategies by which efforts in the sector may more effectively realise the broadest positive outcomes for residents.

1.2.3 Research Overview

Addressing the research objectives required an in-depth theoretical and practical understanding of the role of urban water services in the lives of residents of informal settlements. A qualitative, embedded single case-study methodology (Yin, 2009) was adopted and undertaken across six water-insecure informal settlements in the Indian cities of Faridabad, Delhi and Mumbai India.

The research involved three phases. The first phase, 'Conceptual Development', sought to contribute to the achievement of Objective 1. This phase involved the characterisation of the way that the dominant frameworks guiding urban water development in low-income settings, the MDGs and SDGs, conceptualise the purpose of water development and the implications of this conceptualisation for the practice of water service development in informal settlements. This was achieved through a review of the literature on 1) current approaches to urban

water service development in low-income settings, 2) the Capability Approach to human development articulated by Amartya Sen (2008, 2013); 3) Ribot and Peluso's (2003) theory of access; 4) participatory and political approaches to development; 5) the political ecology of water, and; 6) water development and urban informality. The first part of the literature review culminated in Publication 1. The second phase, 'Data Collection' entailed undertaking a case study of the experiences of residents and development workers surrounding water service arrangements in six informal settlements across the Indian cities of Faridabad, Delhi and Mumbai, over a period of 8 months from March to October 2016. The third phase, 'Analysis and Interpretation', involved the analysis and interpretation of the case study data that resulted in Publications 2, 3 and 4, which report the findings of the research and achieve Objectives 2, 3 and 4.

1.2.4 Thesis Outline

This thesis is presented as a series of four scholarly publications embedded within thesis chapters, forming a thesis including published works. Table 1 summarises the content of the individual chapters, indicating the contribution of each chapter and publication to achieving the research objectives. Results chapters are thematically organised according to the three main features of the CA: 1) Achieved Outcomes (Chapter 4); 2) Process Freedoms (Chapter 5), and; 3) Opportunity Freedoms (Chapter 6). However, it should be noted that just as there is considerable overlap between these concepts within the CA, so do the individual chapters in this thesis. Since publications are formatted for stand-alone publication, some repetition is inevitable. This thesis has been prepared in accordance with the Monash University Faculty of Arts guidelines for theses including published works.

Table 1: Thesis Structure

Chapter	Title	Contents	Objective
1	Introduction	Problem statement, research question, aim and objectives, research overview and overview of thesis structure.	
2	Literature Review	Situates this research project within key debates in urban water development. Illustrates the need for clearer and more detailed engagement with questions of equity and wellbeing in the sector. **PUBLICATION 1** Gimelli, F.M., J.J. Bos & B.C. Rogers (2018). Fostering equity and wellbeing through water: a reinterpretation of the goal of securing access. *World Development, 104C,* 1-9.	1

3		Methods	Epistemological approach, research design, approach to data collection and analysis and strategy for ensuring validity of research findings.	
Results chapters	4	Achieved Outcomes - Water Services and Wellbeing in Urban Informal Settlements	First of four results and discussion chapters. Explores the relationship between water services and human wellbeing using Max-Neef's (1992) fundamental human needs matrix. **PUBLICATION 2** An Indian case study of water services and human wellbeing in urban informal settlements using the Fundamental Human Needs framework. Under review in *Water Alternatives*.	2, 4
	5	Process Freedoms - Water Services and Equity in Urban Informal Settlements	Examines the obstacles identified by residents and development workers as leading to water service deficiencies, the shape and outcomes of strategies adopted to overcome these, and implications for water service development thinking and practice. **PUBLICATION 3** Gimelli, F. M., Rogers, B. C., & Bos, J. J. (2018). The quest for water, rights and freedoms: informal urban settlements in India. *The International Journal of Urban and Regional Research, 42* (6), 1080-95.	3, 4
	6	Opportunity Freedoms - Water Services and Informal Urban Integration	Examines the relationship between people's access to water services in UISs and their ability to effectively integrate into the life of the city. Contributes to operationalising opportunity freedoms for the water sector. **PUBLICATION 4** Water services and the integration of urban informal settlers. Submitted to *Water Alternatives*.	2, 3, 4
7		Envisioning a Capability Approach to Water Service Development in Urban Informal Settlements	Discussion-based chapter synthesising the findings from the individual chapters of the thesis. Publication 1 reflects on the need to tell a different story about water development in informal settlements; this chapter tells that story.	
8		Review, Implications & Outlook	Summary of the study, how the objectives and aims of the project were realised, and a broad synthesis indicating how the research question has been answered. Also outlines scholarly implications of the study, its limitation, and outlines a future research agenda. The purpose of this chapter is to provide a succinct reference for examiners.	
		References	List of literature cited.	

CHAPTER 2: LITERATURE REVIEW

This thesis draws on key debates in five areas: the Capability Approach (CA) to human development, the political ecology of water, participatory approaches to development, rights-based approaches to development, and urban informality. The first part of this chapter constitutes Publication 1, *"Fostering equity and wellbeing through water: a reinterpretation of the goal of securing access"*. This publication engages with institutional and scholarly development literature to critically evaluate how two of the dominant frameworks guiding water development practice in low-income settings, the MDGs and SDGs, engage with the goal of securing people's wellbeing through water development. This critique highlights the need for a more nuanced and holistic understanding of wellbeing in these frameworks and, consequently, in water development practice. This publication conceptually addresses this gap by drawing on the CA articulated by Amartya Sen (2008, 2013) and Ribot & Peluso's (2003), culminating in the proposition of an alternative interpretation of the goal of securing access to water services that is better capable of engaging with the values of equity and wellbeing. Through this publication, the project meets Objective 1: to assess the way that dominant water development frameworks engage with issues of justice and wellbeing. Furthermore, Publication 1 lays the groundwork for the empirical research undertaken in this project by asserting the need for further investigation of the links between water services and individual and collective wellbeing and the social power dynamics that shape equitable and/or inequitable forms of access to water services in low-income settings.

As a standalone publication, Publication 1 cannot be an exposition of the five bodies of scholarship that this thesis principally engages with. Therefore, it is followed by a more detailed discussion of the Capability Approach to human development, the political ecology of water, participatory approaches to development, rights-based approaches to development and a discussion of the varied characterisations of urban inform

2.1 PUBLICATION 1: Fostering Equity and Wellbeing Through Water: A Reinterpretation of the Goal of Securing Access

Francesco M. Gimelli, Joannette J. Bos & Briony C. Rogers

Abstract: Current approaches to the development of water services such as water supply, sanitation, and hygiene in the Global South are driven by the aim to secure people's rights to such services. In this literature-based paper, we illustrate how such an interpretation of the concept of access limits the ability of development efforts in the sector to i) address power inequities mediating access to water services such as those based on gender and patron-client relationships, and; ii) acknowledge and strengthen wellbeing factors implicated with water services beyond basic health. We argue that maintaining the current interpretation of access limits the ability of development initiatives in the water sector to address pressing issues mediating people's ability to benefit from water services. To address these limitations we propose a reinterpretation of access in international development frameworks grounded in Ribot and Peluso's (2003) Theory of Access and Amartya Sen's (1999, 2008, 2013) Capability Approach to human development. Such a reinterpretation strengthens the capacity of global efforts to improve water services to not only foster good health, but also addresses inequity and other dimensions of human wellbeing such as livelihoods and education.

Keywords: water, development, access, wellbeing, rights, equity

2.1.1 Introduction

Although water service development is often approached as a health issue (Konteh, 2009; Subbaraman et al., 2015), water services are also implicated with other dimensions of wellbeing. These dimensions include economic and political participation (Joy, Kulkarni, Roth, & Zwarteveen, 2014; Larson & Lach, 2010; McMillan, Spronk, & Caswell, 2014; Nicol, 2000; United Nations, 2016b) and the ability to benefit from education and healthcare services, for example (Bartlett, 2003; Fontana & Elson, 2014; Koolwal & van de Walle, 2013). Recent work by Mehta (2014), Goff & Crow (2014), Subbaraman et al. (2015) and Crow & Swallow (2017) has challenged the current approach to water development in the Global South. These researchers point out the

cross-cutting nature of water supply, sanitation, and hygiene arrangements and the wellbeing of individuals, and explore the implications of shifting from a sole concern for public health to a broader understanding of human wellbeing, including health. Such efforts are contributing to an understanding of water services as necessary not only for human survival, but also for human flourishing.

The Sustainable Development Goals (SDGs), which were universally adopted in 2015 and will guide international development efforts until 2030 have sought to acknowledge this cross-cutting quality of water services across diverse areas contributing to wellbeing such as inequality, industrialisation and sustainable cities and human settlements (Sustainable Development Solutions Network (SDSN), 2014). Unlike the eight Millennium Development Goals (MDGs) that guided development efforts from 2000-2015 (UNDP, 2016), the seventeen SDGs also include a water-specific goal (SDG 6) that aims to "ensure availability and sustainable management of water and sanitation for all" (United Nations, 2015). This upgrading of water issues may be viewed as a recognition of the importance of water services to the lives of the poor and marginalised. However, both the MDGs and SDGs continue to privilege public health concerns by evaluating progress towards meeting SDG 6 and its constituent targets and indicators through the measure of access to drinking water and sanitation. In this paper, we argue that this interpretation of access masks two key elements contributing to the ability of individuals to flourish: wellbeing and equity.

Focusing on the public health dimension of water services to the exclusion of dimensions of wellbeing such as access to education and healthcare, political participation and livelihoods limits the benefits that development initiatives in the water sector seek to realise for their intended beneficiaries. Furthermore, the current interpretation of access does not acknowledge that the ability of people to benefit from water services is not only a question of inadequate infrastructure; people's access to water services is also mediated by social power dynamics. For example, while an individual or household living in an urban informal settlement may have the right to benefit from the nearest standpipe, in reality their ability to benefit from it may be limited by control of the standpipe by a locally influential individual (McFarlane, Desai, & Graham, 2014). Alternatively, their benefit could be limited by an the ongoing marginalisation of the community and/or women (N. Anand, 2017; Bapat & Agarwal, 2003).

These points indicate that to broaden the benefits to people, water development efforts should i) shift from the current emphasis on public health towards wellbeing and ii) seek to better understand and address inequitable power dynamics keeping some people from benefiting from water services. The current interpretation of access focuses on the right to secure health benefits from water services, while ignoring whether people require water

services to not only survive, but also to flourish. Furthermore, it does not acknowledge that people's inability to benefit from water services is also a result of marginalisation. What should water development efforts seek to achieve? Is survival enough? Or should water development be approached as an opportunity to foster the capacity of all people to both meet their basic needs and pursue their broader aspirations? In this paper, we propose an alternative approach to water development grounded in a reinterpretation of the notion of access so that efforts in the sector can equitably meet both needs and broader aspirations.

2.1.2 Method & Structure

To propose a new approach to water development in the Global South, we begin by critically discussing the interpretation of access in the MDGs and SDGs. To do this, we engage with grey literature such as institutional reports and websites from United Nations development agencies from the early 2000s onwards to coincide with the institution of the MDGs and SDGs. We then draw on scholarship critiquing dominant approaches to water service development and empirical evidence from diverse geographical settings to highlight the relationship between water services and human wellbeing. Our analysis is also informed by key debates in justice theory and public participation scholarship, which provide the basis for critical engagement with the capacity of the current interpretation of access to adequately consider questions of equity and wellbeing. Our critique leads us to propose a new interpretation of access informed by Ribot & Peluso's (2003) theory of access and the Capability Approach to human development articulated by the Indian economist Amartya Sen. These theories facilitate the development of a novel interpretation of access that seeks to overcome the shortcomings just identified. We argue that this interpretation allows development policymakers and practitioners to delve deeper into the lived experiences of intended beneficiaries of development initiatives and increase the potential benefits of these. Our argument leads us to reflect on the implications of our reinterpretation of the concept of access on the aims of the SDGs. It also directs us to reflect on its bearing on participatory approaches to development and more recent integrated approaches to water management that form increasingly important components of water development initiatives. We conclude by identifying a future research agenda that can contribute to the reorientation we argue for here.

2.1.3 The Interpretation of Access in the MDGs and SDGs

How is access to water services interpreted in the MDGs ad SDGs? Target 7.C of the MDGs sought to "[h]alve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation" (United Nations, 2016a), and was met in 2010, five years ahead of schedule (UNICEF/WHO, 2011, 2014). While this achievement represented a rare claim of success in efforts to achieve the MDGs, commentators such as Clasen (2012) and the Calgary Centre for Affordable Water and Sanitation Technology (2012) viewed this claim as premature. Clasen (2012, p. 1179) pointed out that the "water target does not fully address water quality, quantity and access – key components of the target that are fundamental to human health." Target 7.C was interpreted as relating to the goal of improved water services and sanitation (Satterthwaite, 2015; UNICEF/WHO, 2017); the ambiguity of the goals of either 'improved' or 'basic' water and sanitation, however, meant that the bar for the quality was set very low (Satterthwaite, 2016). For those beginning with no access to basic water and sanitation services at all, an improvement could equate to forms of access that do little to meet basic needs and enhance broader wellbeing.

Furthermore, while UN statistics record whether households have access to piped water on premises, they do not record whether this supply is reliable or safe (Clasen, 2012). This means that initiatives aimed at meeting Target 7.C interpret access as the right to water services, not the ability to benefit from such services. One can easily understand that having a piped water connection to the home is of little use if it unreliable and/or unsafe. Indeed, securing the right to water services does not evaluate how water services may hinder or enable "key capabilities required for lives, livelihoods and freedoms" (Goff & Crow, 2014, p. 169), nor how people actually access such services.

Disregarding such capabilities ignores that the nature and quality of water services is closely linked with the quality of life of people. In fact, former-Secretary General of the UN Ban Ki-moon acknowledged that a lack of sanitation impacts economic security (United Nations, 2016b) and the 2016 Human Development Report, *Water and Jobs* (UNESCO, 2016), underscored the relationship between water and livelihood security. Consistent evidence from across the Global South, including case studies from Fiji and Vanuatu (Carrard, Crawford, Halcrow, Rowland, & Willetts, 2013) and India (Agénor, Mares, & Sorsa, 2015) indicate that the amount of time spent by individuals – particularly women – in the collection of basic resources such as water impacts their capacity to engage in income-earning activities (Agénor & Agénor, 2014). A case study of the participation of women in income-earning activities conducted in Bangladesh also shows that the ability to engage in paid work has the capacity to increase the financial independence, status, and bargaining power of

women within the household (Anderson & Eswaran, 2009). This increase in financial independence also increases child welfare, since women are likely to invest extra income into their children (Koolwal & van de Walle, 2013). For many men and women, the unreliability of water supplies and sanitation in their locality also leads to a competing demand for time between work and water collection, which further erodes the ability to access water and to earn an income (Bapat & Agarwal, 2003).

Additionally, the configuration and quality of water services has a well-documented impact on the capacity of people to access social opportunities such as education and healthcare. Evidence from Kenya, Ghana and Malawi highlights that uncertain and/or lengthy water collection times in many communities can restrict the ability of women and children to access education and healthcare (Nankhuni & Findeis, 2003; Nauges & Strand, 2013; Ndiritu & Nyangena, 2011). Recent research from the Philippines also indicates that water service settings have a strong impact on the ability of young girls to manage their menses (A. Ellis et al., 2016). This inability for menstrual management, particularly when linked to inadequate toilet infrastructure in schools, leads to young girls not attending school while menstruating, thus putting them at an educational disadvantage in relation to male children (Cleaver & Hamada, 2010; Marni, 2010; UNICEF/WHO, 2014).

2.1.4 Moving from the MDGs to the SDGs

The MDGs were superseded by the SDGs in 2015, with the latter expected to guide international development efforts until 2030. The SDGs, similarly to the MDGs, consist of a set of goals, targets, and indicators covering a range of development areas including gender equality, health, education, poverty, and water, among others (United Nations, 2015) Goal 6 of the SDGs (SDG 6) maintains the focus on drinking water and sanitation evident in Target 7.C of the MDGs by seeking to "ensure water and sanitation for all." Two of the six targets measuring progress towards meeting SDG 6 are: i) to "achieve universal and equitable access to safe and affordable drinking water for all, and; ii) to "achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations" (United Nations, 2015). Unlike the MDGs, which largely came to be seen as 'singularizing' development issues such as water into distinct silos and therefore masking their complexity (Mollinga, 2014), the SDGs are credited with moving away from this tendency by formulating the expanded seventeen individual goals and constituent targets and indicators as an interconnected network (Le Blanc, 2015; Sachs, 2012).This networked quality is asserted by the Sustainable Development Solutions Network (SDSN) (2014) *Indicators and a monitoring framework for Sustainable Development Goals* report, which states that,

"[i]ndeed, many important issues, such as gender equality, health, sustainable consumption and production, and nutrition, cut across different goals and targets. This report therefore proposes tracking by indicators appearing under more than one goal and target. Similarly, the goals and targets are interdependent and must be pursued together, since progress in one area often depends on progress in other areas. As a result, an SDG indicator framework needs to effectively track cross-cutting issues and support integrated, systems-based approaches to implementation" (2014, p. 67).

The report goes on to explore 19 cross-cutting themes. Among these, seven refer to Goal 6 and three of its indicators: 6.1.1) Percentage of population using safely managed water services, by urban/rural (modified MDG indicator); 6.2.1) Percentage of population using safely managed sanitation services, by urban/rural (modified MDG Indicator), and; 6.3.1) Percentage of wastewater flows treated to national standards [and reused]. In this section, we have outlined some of the relationships between water services and these areas of concern to development practitioners. Table 3 illustrates that regardless of the effort by the SDGs to reflect the complex relationships between development sectors, water continues to primarily be framed as an issue of health to the exclusion of the broader factors of wellbeing explored in this paper such as education, healthcare and livelihoods.

Table 2: Understanding of water indicators across SDG cross-cutting themes (adapted from SDSN, 2014)

Cross-cutting theme	SDG 6 Indicators	Contribution to cross-cutting theme identified in report	Author comment
Food security and nutrition	6.1.1	Access to clean water for drinking and cooking	Appropriate in relation to food security and nutrition
	6.2.1	Access to sanitation improves nutritional status	
Governance	6.1.1	Service delivery	Focus on the delivery of services as an end, without elaboration of the benefits sought from the delivery of services
	6.2.1	Service delivery	
	6.3.1	Service delivery	
Health	6.1.1	Access to clean sufficient water, and protection from water borne illnesses	Appropriate in relation to health
	6.2.1	Access to sanitation and protection from related illnesses	
	6.3.1	Protection from pollution and illnesses related to wastewater	

Inequalities	6.1.1	Universal access to services	Based on current interpretation of access, universal access does not equate to universal ability to benefit from water services
	6.2.1		
Industrialization	6.1.1	Universal access to infrastructure and extension services	Appropriate in relation to industrialization
	6.2.1		
Sustainable Cities & Human Settlements	6.1.1	Access to clean water for drinking and cooking in urban areas	Continued focus on water for drinking and cooking, to the exclusion of water for productive uses
	6.2.1	Access to sanitation improves health status and upgrades slums in urban areas	Continued focus on health aspect to the exclusion of productive and domestic uses
Wellbeing	6.1.1	Health	Continued focus on health component of wellbeing, to the exclusion of other components of wellbeing such as livelihood, educational opportunities, and expansion of opportunities
	6.2.1	Health	

Other cross-cutting themes within the SDGs include gender equity and growth and employment. However, while there are well-documented relationships between these issues and water services, no link is identified in the report between these themes and water. Water and sanitation is also included in the report as a cross-cutting theme, where relationships are identified with Goals 1 (end poverty), 2 (zero hunger), and 11 (sustainable cities and communities). Within this cross-cutting theme, the relationship to Goal 1 is related to the Multidimensional Poverty Index (MPI) indicator (see Dotter & Klasen, 2017), an index grounded in the human development approach articulated by Amartya Sen (2008, 2013) that incorporates measurement of health, education, and living standards. While this feature of this cross-cutting theme can be seen as indicating a broader understanding of wellbeing than that prevalent in the other cross-cutting themes presented in Table 1, the SDSN (2014, p. 90) report goes on to clarify the link between the MPI and water and sanitation as "access to safe drinking water and sanitation." Although the MPI engages with the dimensions of health, education, and living standards, the only link between these dimensions and water and sanitation is ultimately revealed to be health. Goff & Crow (2014, p. 161) critique the exclusion of water for domestic and productive uses, highlighting that "'[d]omestic' and 'drinking' refer to the same household water, but the focus on drinking water has fostered a single-minded concern for the health aspects of water, and the acceptance of an access index that fails to measure other important characteristics for domestic water." Ignoring the domestic and productive use of water masks the lived realities of the people that development efforts are supposed to benefit by assigning no value to water for doing the laundry, cleaning the house, running a small business, cooking,

and being able to fish, for example (Crow & Swallow, 2017). This helps to underline the way that the current interpretation of access hinders the ability of development efforts in the water sector to advance efforts across multiple dimensions of the SDGs.

Another indication of the inability of the current interpretation of access to consider wellbeing impacts of water development efforts is the vagueness of the indicators within the individual targets. For example, Indicator 6.1.1 is the "[p]roportion of the population using safely managed drinking water services", while Indicator 6.1.2 is the "[p]roportion of population using safely managed sanitation services" (United Nations, 2017). Collecting data on the proportion of the population using such services does not indicate the reliability or ease of such usage, nor its impact on daily lives. SDG 6 no longer uses the vague terms 'basic' or 'improved' that could be found in Target 7.C of MDG 7 (Satterthwaite, 2015, 2016). These terms have been replaced by the concept of 'safely managed', which UNICEF/WHO (2017) define as "the proportion of population using an improved basic drinking water source which is located on premises and available when needed and free of faecal (and priority chemical) contamination."

The new terminology in SDG 6, however, is still somehow confused: 'safely managed' is interpreted to be synonymous with 'improved' and 'basic.' In fact, UNICEF/WHO (2017) explicitly assert this by stating that the concept of 'safely managed' is "defined the same as used for MDG monitoring i.e. piped water into dwelling, yard or plot; public taps or standpipes; boreholes or tubewells; protected dug wells; protected springs and rainwater". Further confusion is created by simultaneously measuring 'safe management' as access to a basic drinking water source which is located on premises and forms of access including public taps, standpipes, bore wells, and even protected springs. It is unclear how protected springs can be accessed on premises.

While the MDGs and SDGs represent an important effort towards engaging with the cross-cutting nature of development issues, the analysis we have presented here highlights that components of these frameworks guiding the development of water services are not framed in a way that seeks to foster equity or multiple dimensions of wellbeing. One implication of the current interpretation of access is the privileging of top-down interventions, which while frequently improving water services, may in fact lead to a deterioration in overall wellbeing. For example, the Indian government (along with many others across the Global South) seeks to improve access to services by informal settlers through what are termed 'rehabilitation' initiatives, which provide new housing in tenements constructed in partnership with private developers, and generally located in urban peripheries (Nijman, 2008; Restrepo, 2010; Sheth, Velega, & Price, 2009). The tenements provide residents with piped water connections and latrines along with other services, although inadequate

maintenance and a lack of regularity in water supply experienced across many cities in the Global South often leads to limited usability (N. Anand, 2011; Lanjekar, 2010; Subbaraman et al., 2015). Efforts to rehabilitate informal settlements are often vigorously resisted by residents due to a perceived threat to wellbeing in areas such as livelihood and community ties, a deterioration in which can entrench existing inequalities and create new ones (Desai & Loftus, 2013; Doshi, 2013; R. Ellis, 2011; Nijman, 2008; Takeuchi, Cropper, & Bento, 2008). While these latter impacts are undesirable, rehabilitation initiatives may nevertheless be judged successes according to the current interpretation of access evident in SDG 6 and its targets and indicators.

2.1.5 Making Access About Equity and Wellbeing

The implication of our discussion thus far for policymakers and development practitioners is that there is a need to shift the current approach to water services from a single-minded focus on securing rights towards a multi-dimensional approach. It is important to consider the ability of people to access services in manners that contribute to their wellbeing. Also, we believe it is crucial to foster equitable choreographies of power in the quest for appropriate water services. In this section, we engage with the work of Ribot and Peluso (2003) and Amartya Sen (1999, 2008, 2013) to articulate an interpretation of access that i) promotes consideration of the social power dynamics that shape the ability of people to benefit from water services, and; ii) defines benefit as an increase in individual capabilities to flourish.

Equity: Ribot & Peluso's (2003) Theory of Access

Ribot & Peluso (2003) developed their influential theory of access as a critique of the notion of access prevalent among natural resource and property analysts. Through their work they demonstrate that the dominant notion of access in this sphere relates to property rights, and is therefore defined as "the *right* to benefit from something" (2003, p. 153, original emphasis). They point out that the ability to benefit from something, unlike the right to do so, can be mediated through a range of processes, which they discuss in detail through two categories: i) rights-based access, and; ii) structural and relational mechanisms of access (2003, pp. 162–72). Rights-based access can include legal access through pathways sanctioned by the law, custom, or convention, and also illegal access, which they define as "a form of direct access defined against those based on the sanctions of custom, convention, or law" (2003, p. 164). According to this analysis, rights-based access represents a "bundle of rights." Structural and relational mechanisms of access, on the other hand, refer to access mediated

by technology, capital, markets, labour, knowledge, authority, identities, and social relations, and therefore refer to what the authors term "a bundle of powers."

According to the property rights definition, access can be achieved by the presence of a piped connection, standpipe, latrine, basin, and so on in a previously underserved setting. Whether individuals can benefit from these services, and what these benefits might be, is irrelevant. This understanding of access has practical advantages, since the presence of water infrastructure is considered adequate to claim success. This approach, however, ignores the social power dynamics governing such access, or the way that people use water services to meet basic needs and broader aspirations. The authors argue for a redefinition of access in the property and natural resource sectors as "the *ability* to benefit from something" (Ribot & Peluso, 2003, p. 153, original emphasis). Redefining access in this way highlights the need to consider how some people can benefit from resources and services, while others may not be able to do so, thus bringing into focus the processes and power dynamics governing access and determining the equity of outcomes. However, Ribot & Peluso's (2003) theory does not delve into the meaning of 'benefit.'

What does it mean to benefit from water services? The current privileging of public health benefits may lead to the measurement of success according to metrics that do not reflect both the needs and aspirations of people. Access to a source of water supply may be ensured by interventions seeking to overcome unequal power relations in a community or household, such as those governed by gender, caste, or ethnicity. However, the benefit derived may be limited to drinking water, as mentioned before, which masks its domestic and productive uses (Crow & Swallow, 2017; Goff & Crow, 2014; Jepson et al., 2017). For this reason, the concept of 'benefit' needs to be clarified in a way that encompasses not only basic needs, but the broadest range of benefits for people. For this task, we turn to the Capability Approach to human development, which constitutes an approach to development that seeks to foster the opportunities for human beings to flourish.

Wellbeing: The Capability Approach to Human Development

The Capability Approach (Sen, 2008, 2013) is a normative framework which asserts that social policies and institutions should foster people's capabilities to function (Robeyns, 2005). 'Function' refers to people's 'beings and doings', such as working, being politically active, being respected, safe, well-educated, and so on (Robeyns, 2003, 2005), while 'capabilities' are "the genuine opportunities or freedoms to realize these functionings" (Robeyns, 2006, p. 351). The aim is to foster the capabilities required for people to "live the kinds of lives they have reason to value" (Sen, 1999, p. 10). Capability-focused initiatives therefore measure success in terms of i)

what a person has concretely achieved, such as being healthy, safe, politically active, and having livelihood security (achieved functionings), and; ii) "… the opportunities that are available to people and that they value and have reason to value – their freedom to achieve valued outcomes" (opportunity freedoms) (Morris, 2010, p. 192). Within the context of water services, the adoption of a capability perspective would lead to the evaluation of success not by the presence of water services *per se*, but rather in the expansion of actual and potential opportunities hindered or enabled by water services.

The goal of fostering the opportunity to pursue one's own goals alongside achieved functionings highlights the centrality of freedom in the Capability Approach. This focus on freedom has led to the critique that the approach is overly individualistic, and therefore does not adequately consider groups and social structures (Robeyns, 2005). Robeyns (2005) addresses this critique in detail, saying that i) the Capability Approach entails an ethical rather than ontological individualism, and therefore places ultimate moral importance on the individual while recognising the existence and potential impacts of collectives on individual wellbeing; ii) there is a rich body of scholarship exploring the capabilities of groups, including women (e.g. Fukuda-Parr, 2003; Nussbaum, 2001), and lastly; iii) that the Capability Approach places importance on identifying the social determinants of capabilities.

The Capability Approach can accommodate consideration of the relational aspects of water and human flourishing. In recent scholarship from the water sector, Crow & Swallow (2017) have illustrated such accommodation with reference to Mosse's (2010) work on relational poverty, while Jepson et al. (2017) have done so through the lens of hydro-social relations (Boelens, 2014; Boelens, Hoogesteger, Swyngedouw, Vos, & Wester, 2016; Linton & Budds, 2014; Mollinga, 2014). These examples share their concern for the power dynamics mediating access to resources and services with Ribot & Peluso (2003). However, while Crow & Swallow (2017) and Jepson et al. (2017) make important contributions to the task of reorienting efforts in water development towards human wellbeing, they do not consider the impact of the current measures of success in frameworks such as the SDGs. The SDGs are intended to guide international development efforts in a wide range of areas, including in relation to water services; the measure of success defined within the goals therefore become the aims of governments, international aid agencies, NGOs, and other social actors. For this reason, a new interpretation of access that reflects concern for both equity and wellbeing is required.

2.1.6 A New Interpretation of Access

Ribot & Peluso (2003) underscore that access is not only a question of rights, but also a question of power. The ability to benefit from something is dependent on the capacity of people to turn rights into actual benefits, which is dependent on the existence of equitable power relations. However, the authors do not engage with the question of what a 'benefit' entails. Sen's (2008, 2013) Capability Approach, conversely, argues that a benefit be understood as an expansion in the capability of people to live the kinds of lives that they have reason to value. Since we have demonstrated that rights to water services are of limited use unless people can actually benefit from these, and that water services are a key factor in the expansion of people's capabilities, we propose a new interpretation of access as 'the ability to benefit from water services.'

Adopting this interpretation of access as the measure of success in development frameworks such as the SDGs has a range of implications for the aims and practice of water service development in the Global South, which we represent in Figure 2 below. We envision this interpretation of access as leading to a greater focus on multidimensional development initiatives. Such initiatives may continue to be focused on improving water services, but would entail better coordination with actors and institutions engaged in other sectors such as education, livelihood, and empowerment, among others. Furthermore, initiatives would adopt an evaluation approach that includes measures of wellbeing beyond basic needs, along with measures of equity. Such a shift would represent an intentional effort to move away from the 'singularisation' of water as an either/or issue of health, productivity, opportunity, economic security, etc. (Mollinga, 2014). Since, as previously highlighted, the SDGs can be understood as a network of goals and targets (Le Blanc, 2015), explicit effort could be placed on creating interventions whose measure of success would be based on working towards multiple goals simultaneously; an intervention in the water sector could not claim to have met Target 6.2 ("achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations") without also addressing and measuring its contribution to meeting Target 5.2 ("[e]liminate all forms of violence against all women and girls in the public and private spheres") (United Nations, 2015).
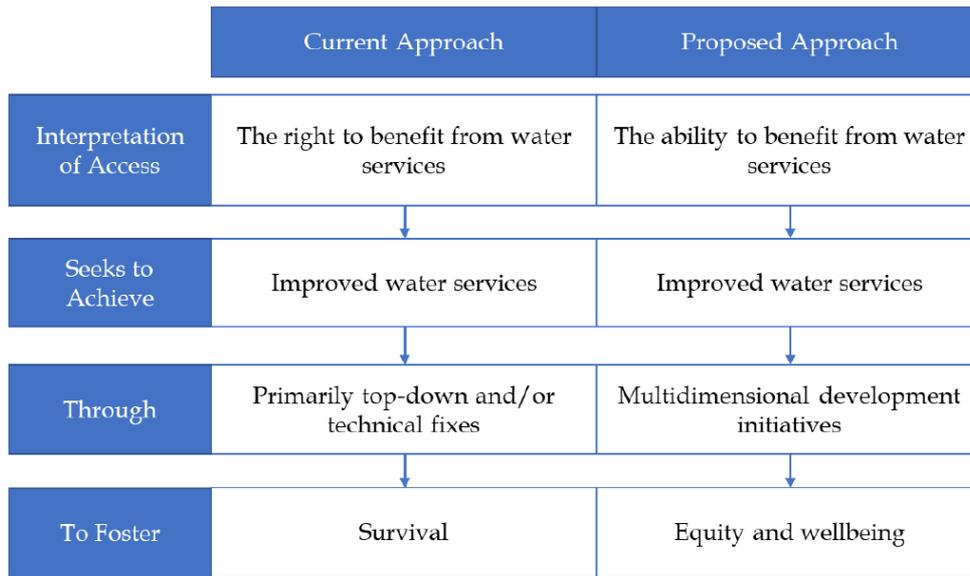
Figure 1: Comparison of current and proposed approach to water development based on interpretation of access

The shortcomings of common approaches to urban development notwithstanding, it is important to note that there have been efforts to articulate more effective approaches. The last three decades have witnessed what has been termed 'the participatory turn' (Bill Cooke & Kothari, 2001; Hickey & Mohan, 2004a), which is representative of a shift from the positivist approach to development that views the development practitioner as the technical expert, towards more democratic forms of governance with a stated emphasis on stakeholder participation (Allmendinger, 2001; Holden, 2011; Partpart, 2000). This shift has led to a move away from top-down interventions guided by government and towards a focus on institutions for local governance emphasising bottom-up, mixed approaches to planning and governance predicated upon the involvement of multiple stakeholders including the community, state, non-governmental organisations, and international organisations such as the World Bank and Asian Development Bank (Das, 2008; Fischer, 2010; Holden, 2011; Williams, 2004). It is rare to come across water development frameworks and/or initiatives that do not appeal to the principles of participation. Participatory approaches to development are so dominant, in fact, that Henkel & Stirrat (2001) refer to participation as the "new orthodoxy", noting that by the early 1990s most major aid organisations espoused participatory policies.

One example of how effective participatory water governance can provide tangible benefits to marginalised population can be found in Caracas, Venezuela. Similarly to many other cities in the Global South, informal areas - or *barrios* - in Caracas have typically relied on illegal connections to the formal system or on infrastructure secured through client-patron networks for supplies of water (Spronk, 2016). In the early 90s, under the guidance of a progressive mayor, the city government began organising forums to hear the concerns

and experiences of residents regarding water and sanitation. These forums resulted in the creation of Technical Water Committees (*mesas técnicas de agua* or MTAs) comprised of representatives from municipal government, water utilities, and *barrio* residents. MTAs were established at the national level in 2000, and there are currently over 9000 MTAs operating across cities in Venezuela, which have initiated 1500 community-managed infrastructure projects (McMillan et al., 2014). MTAs have been found to improve the relationship between residents and water utilities, and have contributed to an increase in water service coverage in Caracas from 82% to 89% between 1998 and 2003, and sewerage from 64% to 72% over the same period (McMillan et al., 2014). While MTAs have been successful at improving access to water and sanitation to informal settlements in Caracas, they have also been found to empower the communities they are instituted in by meaningfully involving them in decision-making in a way that values their lived experiences and their needs and aspirations (McMillan et al., 2014; Spronk, 2016). Rather than relying on top-down interventions or technical fixes, the institution of MTAs in Venezuela sought to address the challenge of providing water services to marginalised populations by creating a forum through which a more equitable choreography of power could be realised.

It is important to note that while MTAs represent a particularly deep form of participation, the orthodox position of participation within development discourse and practice does not preclude considerable criticism. Partpart (2000), Cornwall (2004) and Rowe (2005) point out that not all participation is equal, and may in fact often used as a means to legitimise predetermined courses of action rather than redistribute power between power-holders and the marginalised. While participation has been broadly adopted in development interventions, many scholars and development practitioners highlight that participation cannot be considered a panacea. White (1996, p. 6) emphasises that participation must be seen as a political term, since it can "be the means through which existing power relations are entrenched and reproduced." According to such critiques, "…participation is simply another means of pursuing traditional top-down development agendas, while giving the impression of implementing a more inclusive project of empowering the poor and the excluded" (Parfitt, 2004, p. 538). Ellis (2011) highlights this in relation to the Adyar Poonga restoration project in Chennai, India. While the government claimed to have undertaken a participatory planning process to restore a section of the Adyar Poonga river, Ellis (2011) found that the residents displaced by the project felt they had little influence over the decision-making process that led to the 'rehabilitation' of their neighbourhoods. Furthermore, there is often a gap between the willingness of the public to participate in the governance of water and their ability to do so, whether due to a lack of what Tropp (2007) refers to as "sociocratic knowledge", meaning the knowledge necessary to manage people and processes, or what Das (2014, p. 216) refers to as "individual- and community-level socioeconomic and sociocultural factors" such as prescribed gender roles or other social power dynamics.

Again, these points underscore the need to foster more equitable choreographies of power in the quest for equitable development that reflects the lived needs and aspirations of the marginalised.

More recently, innovative technical interventions and water management approaches have been articulated to address the deficiencies in water services in the Global South. Reflective of this shift, Target 6.5 of SDG 6 aims to "implement integrated water resources management at all levels" (United Nations, 2017). Integrated water resources management is part of a broader global move towards more holistic water management approaches that comprise mixtures of centralised and decentralised technical interventions and efforts to foster synchronicity between governments, communities, policy and scientific spheres of knowledge and action (Ferguson, 2013) This shift includes the approaches of Integrated Urban Water Management (Mitchell, Deletic, Fletcher, Hatt, & McCarthy, 2007), Green Infrastructure (Keeley et al., 2013), Ecological Engineering (Francis, 2014) and Water Sensitive Cities (Wong & Brown, 2009). Although the application of these approaches to the Global South may be promising, it thus far appears to remain marginal. Furthermore, while these approaches acknowledge the importance of fostering equitable outcomes, their development in high-income settings means that adaptations capable of addressing the entrenched nature of inequity in the Global South need explicit articulation. Another critique that may be levelled towards such approaches is that they are predominantly concerned with achieving the equitable distribution of infrastructure and services, while ignoring the injustice of underlying social structures that give rise to current conditions in the first place (Budds & Sultana, 2013; Jepson et al., 2017). While it could be claimed that these approaches are primarily technical and/or management focused, we argue that the rationale for water services development being approached as an opportunity to foster the capacity of all people to both meet their basic needs and pursue their broader aspirations applies all the same.

While the participatory turn and the arising of novel water management approaches may represent advances in comparison to previous approaches, their outcomes are often assessed according to the interpretation of access in globally influential frameworks such as the SDGs, and not according to their ability to foster more "equitable choreographies of social power" (Swyngedouw, Kaïka, & Castro, 2002, p. 134) or their capacity to foster the wellbeing of people. If access continues to be interpreted as the right to benefit from a water source, the success of development initiatives in the water sector will continue to be assessed according to their capacity to meet the basic needs of people rather than their ability to equitably foster their capacity to flourish.

2.1.7 Conclusion and Outlook

International development efforts are driven by guiding frameworks such as the MDGs and the SDGs. Therefore, the ideologies, theories, concepts, and definitions constituting each goal, target, and indicator within these frameworks determine the shape and outcomes of development interventions across the world. Within the water sector, SDG 6 (like Target 7.C of the MDGs that preceded it) interprets access as the right to benefit from water services. In this paper, we have shown how this interpretation does not consider whether people are able to benefit from water services, however, or consider benefits beyond health.

Continuing to interpret access as the right to benefit from water services will continue to restrict the potential benefits of development interventions for people. Our articulation of the interpretation of access as the ability to benefit from water services Ribot & Peluso's (2003) theory of access and Sen's (2008, 2013) Capability Approach, on the other hand, holds promise for an approach to water development that explicitly seeks to foster equity and wellbeing. Interpreting access as the ability to benefit from water services beckons us to overcome the asymmetrical power relationships hindering access to water services by certain individuals and groups, and measures success as an increase in the capabilities of individuals to live the kinds of lives that they have reason to value.

Lastly, it is important to note that although we have not addressed environmental concerns in this paper, we recognise that water challenges across the globe are multidimensional; concerns for environmental health are inextricably linked with those for human health and wellbeing. While it is beyond the scope of this paper to engage in depth with environmental concerns, we assert the need to balance consideration for human wellbeing with that of the broader ecological systems in which people are embedded.

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2.2 THE CAPABILITY APPROACH TO HUMAN DEVELOPMENT

Although some of the basic features of the CA have been discussed in Section 2.1.5 above, it is important to discuss some of the broader debates within CA literature to adequately frame engagement with these debates in subsequent sections of this thesis. This is the purpose of this section of the literature review, beginning with a discussion of the conceptual constituent components of the CA. Two of these components (achieved functionings and opportunity freedoms) are mentioned in Publication 1, while a third concept – process freedoms - closely related to opportunity freedoms is introduced and discussed here.

In discussing the need to go beyond achieved functionings, Alkire (2005) points out that measuring success solely in terms of the functionings that an individual has effectively pursued and realised should be viewed as inadequate. Such an approach sidelines consideration of the freedom to pursue goals that one considers valuable, regardless of their explicit connection to wellbeing (Alkire, 2008; Fukuda-Parr, 2003). According to Alkire (2005, p. 120), viewing wellbeing as defined exclusively by the achievement of functionings,

> "…does not necessarily incorporate the freedom to decide which path to take, or the freedom to bring about achievements one considers to be valuable, whether or not these achievements are connected to one's own well-being or not (reducing national carbon emissions, for example)."

Alkire's point here serves to highlight the centrality of *freedom* in the CA. Sen (1999) outlines two equally important aspects of freedom: 1) process freedom, and 2) opportunity freedom. *Process freedom* relates to "freedom of action and decisions" (Sen, 1999, p. 17), and is closely related to the concerns expressed within the procedural and interactive justice literature (Wendorf, Alexander, and Firestone, 2002; Paavola, 2007; Lawrence, Daniels, and Stankey, 1997; Thibaut and Walker, 1975; Cropanzano, Prehar, and Chen, 2002; Masterson, Byrne, and Mao, 2005; Rowe and Frewer, 2005). *Opportunity freedom*, on the other hand, "relates to the opportunities that are available to people and that they value and have reason to value – their freedom to achieve valued outcomes" (Morris, 2010, p. 192); while opportunity freedoms are more closely related to capabilities, process freedoms are more closely related to agency (Morris, 2010). This focus on freedom differentiates the CA from a strictly distributive approach by recognising that ''[t]he 'good life' is partly a life of genuine choice, and not one in which the person is forced into a particular life — however rich it might be in other respects" (Sen, 1996, p. 59).

Sen remains vague about which capabilities individuals need to exercise to enable their functionings. Conversely, another strand within the CA scholarship has sought to define fundamental capabilities to be fostered; Martha Nussbaum (2001, 2006), for example, proposes a basic 'capability set list' that she considers

essential for functioning and flourishing (Table 2). Such lists have been critiqued by various scholars as being paternalistic, Western-liberal, and lacking in legitimacy for proposing what is universally and objectively good (Deneulin, 2002; Mehta, 2014; Sen, 2004). While Sen (2005, p. 158) does not endorse "one pre-determined canonical list of capabilities, chosen by theorists without any general social discussion or public reasoning", he does not rule out the utility of lists when these are determined by some sort of democratic process and public reasoning (Crocker & Robeyns, 2010).

Table 3: Martha Nussbaum's Capability Set (Nussbaum, 2011)

Capability	Description
Life	Being able to live according to a normal life span
Bodily health	Health, nourishment, and shelter
Bodily integrity	Freedom of movement, respect for physical boundaries, ability to be sexually satisfied, have reproductive choice, and be secure against assault
Senses, imagination, and thought	Being able to use one's intelligence and creativity (adequate education, freedom of expression, and freedom of religious expression)
Emotions	Be free to express basic emotions
Practical reason	Ability to determine one's own idea of the good life
Affiliation	Ability to live with and toward others, show concern, and enjoy the social bases of self-respect and being treated with a dignified individual with equal self-worth
Other species	Being able to 'live with concern for and in relation to animals, plants, and the world of nature'
Play	Ability to play, laugh, and enjoy recreational activities
Control over one's environment	Political (right of political participation) and material (ability to own and control property).

However, the details of the debate relating to the possibility of deriving capability lists, and their utility, is beyond the scope of this thesis. Ultimately, both Sen's undefined approach and Nussbaum's alternative have their respective merits; since this project is concerned with envisioning an approach to water development in informal settlements that is aligned with the experiences, needs, and aspirations of informal settlers, I maintain an unspecified approach. This study does not investigate the capacity of water services to realise a pre-determined set of capabilities. Rather, it endeavours to allow the research participants to define what benefits they are seeking from water services and how these are related to their sense of wellbeing. The result may be a context-specific list of capabilities, but this does not claim universal applicability.

It is important to note that although the CA and its view of wellbeing have informed development theory and measuring and reporting in development instruments such as the UNDP's (2015) Human Development Reports and the Human Development Index (Pressman & Summerfield, 2002), the Happy Planet Index (Abdallah, Thompson, Michaelson, Marks, & Steuer, 2009) and Social Progress Index (The Social Progress Imperative, 2017) the approach is frequently charged with inadequately considering groups and social structures, therefore being overly individualistic (Robeyns, 2005). However, the Capability Approach is only ethically individualistic, rather than ontologically individualistic; while the individual is of ultimate moral importance, collectives and social structures are viewed as impacting on individual capabilities (Robeyns, 2005). For example, Jepson et al. (2017) and Crow & Swallow (2017) have recently provided examples of how the Capability Approach can shed light on the relationship between water and relational poverty (poverty rooted in historically established political and economic relations). This point is important, in that explorations of water and wellbeing need to take account of the social structures underpinning water service arrangements.

Only in the last five years has the potential utility of the CA to frame water service delivery challenges in low-income settings been recognised. Nevertheless, this recognition has led to several important contributions to the literature on water and justice and wellbeing. Mehta (2014, p. 67), for example, uses the CA to challenge the dominant approach to addressing water scarcity by showing how "…merely having access to water is not enough. Instead, a person needs a certain kind of access in order to derive certain freedoms or functionings (i.e., capabilities) which in turn depend on a host of factors and capabilities." Her conclusion is that policymakers need to focus on the "…multidimensional aspects of water and their links with human well-being and how individuals and communities can play an active role in shaping their water futures" (ibid.). Goff & Crow (2014) also employ the CA to critically assess global water development policy, and in so doing find that the global focus on securing access to drinking water sidelines consideration of the domestic and productive uses of water that people rely on to achieve wellbeing. More recently, Jepson et al. (2017, p. 3) have extended Mehta's call to reconsider water scarcity in terms of capabilities by making a normative claim to "a 'right to water security', or a right to the ability of individuals, households, and communities to navigate hydro-social relations and secure safe and affordable water particularly in ways that support the sustained development of human capabilities and wellbeing in their full breadth and scope." Crow & Swallow (2017) agree with this conclusion, and focus their analysis on ways that the provision of water for irrigation, access to safe drinking water, and access to adequate domestic water provides pathways out of poverty and can contribute to preventing descent into poverty. Interestingly, Crow & Swallow (2017) identify that participatory, grass-roots action contesting water injustice may have a poverty-reducing capacity, while also asserting that the

construction of water infrastructure may in fact entrench or worsen poverty. Such insights, grounded in the application of the CA to water development challenges, call into question the assumption that the goal of water development interventions to secure water infrastructure, which I critically engage with in Publication 1 in this chapter, can automatically provide benefits to people.

These scholars have made important contributions to extending the current understanding of the relationship between water and wellbeing. However, the literature in this area is primarily theoretical in nature and is yet to engage in-depth with the lived experiences of the individuals whose lives are impacted by their access (or lack thereof) to water services daily. As a result, there is a lack of empirical knowledge regarding how individuals experience the impact of water service arrangements on their wellbeing. Furthermore, no investigation has taken place exploring this relationship in urban informal settlements, although their residents face severe water service deficiencies. This research project seeks to address these gaps by investigating the experiences of residents of urban informal settlements and development workers engaged in water development efforts on the ground to understand how varied water service arrangements impact individual wellbeing in these settings.

2.3 THE POLITICAL ECOLOGY OF WATER

Publication 1 underscores that realising more equitable choreographies of power should be central to any initiative seeking improvements in water services. This task is central to ensuring that those that are supposed to benefit from improvements in water services have the *ability* to do so. This concern is a central feature of scholarship on the political ecology of water. In this section, I delve into this literature to outline the scholarship which frames the investigation of the power dynamics that shape water and people's relationship in Chapter 5.

2.3.1 The Political-Ecological Perspective Of Water

According to Swyngedouw (2002, pp. 124–125) et al., political-ecological approaches share a number of common elements, which can be summarised as follows:

1. The view that environmental and social changes co-determine one another;

2. Built environments are not "unnatural", but rather specific historical results of socio-environmental processes;

3. Particular environmental conditions cannot be separated from specific historical social, cultural, political and economic conditions and the institutions that accompany them;

4. Socio-spatial processes are dependent on the transformation or metabolism of physical, chemical, or biological components;

5. These metabolisms produce a series of both enabling and disabling social and environmental conditions, which can often be contradictory – an improvement in social and physical environmental conditions can, in certain places and for some people, lead to a deterioration in social and physical conditions in other places and for others;

6. Processes of socio-environmental change are therefore never neutral;

7. Specific attention is therefore paid to the social power relations by which socio-environmental change takes place;

8. This, in turn, frames issues of socio-environmental sustainability as political issues;

9. Class, ethnic, and gender power struggles cannot be separated from issues of environmental transformation, and lastly;

10. "The political programme, then, of political-ecology is to enhance the democratic content of socio-environmental construction by means of identifying the strategies through which a more equitable distribution of social power and a more inclusive mode of environmental production can be achieved" (Swyngedouw et al., 2002, p. 125).

Political ecology, as defined by the preceding ten points, helps to shed light on the power dynamics and institutional factors that lead to a lack of urban water development, particularly in the Global South. In a paper outlining the political ecological perspective on issues of urban water, Swyngedouw et al. (2002, p. 134) assert that,

> "[a] political-ecological approach would be more concerned with analysing and proposing the substantive and procedural mechanisms through which a more equitable choreography of social power is achieved in terms of the particular kinds of socio-ecological environments that shall be produced."

In other words, political ecology is not only concerned with outcome, but also brings into focus *how* particular socio-environmental outcomes may be achieved, whether detrimental or beneficial to individuals and the environment. As such, political ecology displays considerable overlap with the CA's focus on process freedoms and emphasis on wellbeing. Swyngedouw and Heynen (2003, p. 914) reassert this point, describing political

ecology as an "integrated and relational approach" that seeks to uncover the complex environmental, social, political and economic processes by which unjust (and consequently, just) urban environments are created.

Perhaps the first notable political ecological exploration of water and power was undertaken by Karl Wittfoegel (1953), who employed a dialectical Marxist approach in his historical study of the role of irrigation in securing power in ancient civilisations ranging from Egypt, India, China and Mesopotamia (Banister, 2014), which he went so far as naming 'hydraulic societies.' In this study Wittfoegel showed how the elite secured their power by coordinating and constructing large-scale hydraulic infrastructure projects, eventually developing despotic regimes (Linton & Budds, 2014). Noted urban geographer Erik Swyngedouw (1997) continued along Wittfoegel's dialectic approach, exploring the complex power dynamics leading to a lack of access to water by slum dwellers in the Ecuadorian city of Guayaquil, highlighting that access to water (or rather lack of access) is often used by the powerful to exclude sectors of society from the life of the city. Matthew Gandy (2008) has also explored the impact of authoritarian political actions and the hegemony of middle-class interests on the waterscape of Mumbai. Meehan's (2013; 2014) case studies of illegal water provision in Mexican cities also highlights how the alternative tolerance and suppression of such forms of water provision by the authorities serve as a means to secure control over populations otherwise outside of traditional state control. These case studies underscore how water is employed to produce socio-environmental states that benefit the powerful and further exclude the marginalised.

These are but three examples of the many political ecological studies that have been undertaken to explore the power dynamics inherent in urban and rural waterscapes (e.g. Bakker 2007; 2008; 2012; 2013; Barnes 2014; Heynen et al. 2006; Swyngedouw 2009). As can be seen, a prominent component of this body of literature is rooted in Marxism, with prolific authors such as Swyngedouw (1997, 2005), Swyngedouw & Heynen (2003) and Bakker (2007, 2008, 2013) explicitly focusing on the relationship between flows of capital and flows of water in urban landscapes. Whether rooted in Marxist analysis or not, one of the key contributions of literature on the political ecology of water is that water is not only physical substance (H_2O), but also an entity imbued with social meaning and functions, and representative of the power dynamics that shape its circulation in any given environment (Goff & Crow, 2014). While this vision of water is broadly accepted within the literature, debate exists regarding what the relation is between the physical and social aspects of water, with Linton & Budds (2014) highlighting the notion of the 'hydrosocial cycle' as a particularly notable advance in this area.

2.3.2 The Hydrosocial Cycle

Water researchers are typically familiar with the term 'hydrological cycle', relating to the cycle depicting "the circulation of water in, on, and over the Earth's surface" (Horton, 1931, p. 192). The development of this notion by Robert Horton in the 1930s gave birth to the science of hydrology. Horton (1931), in consonance with the vast majority of natural scientists working in the same period, sought to portray the hydrological cycle as a value-free, objective depiction of reality, independent of human involvement. This depiction enabled state agencies to manage water as a resource, with water management being equated with hydraulic engineering (Linton & Budds, 2014). This purely technical approach is increasingly seen as inadequate considering the evident social dimensions of water and has led to alternative conceptualisations of water. Among these is the notion of the 'hydrosocial cycle', initially articulated by Erik Swyngedouw (1997, 1999, 2004, 2005, 2009b). Unlike previous attempts to conceptualise the relationship between the social and physical aspects of water – such as that undertaken by Integrated Water Resources Management (IWRM), which treats the social and physical dimensions of water as *distinct* but *interrelated* – Swyngedouw (1997, 1999) asserted that water and social power are related *internally* rather than *externally*, and should therefore be considered as *hybrids* rather than as distinct entities existing a priori. In an important paper conceptually defining the hydrosocial cycle, Linton & Budds (2014) clarify what this development means for understanding water:

> "[u]nderstanding things as related internally means that the properties that constitute them emerge as a function of their relations with other things and phenomena. It implies a shift from thinking of relations *between* things – such as the impacts of humans on water quality – to the relations *constituting* things – such as the cultural, economic and political processes that constitute the particular character of desalinated water, treated drinking water or holy water."

The notion of the hydrosocial cycle has helped to shed light on how the power relations inherent in instances of water have shaped certain realities. For example, Wilson's (2014) case study of the Koyukon Athabascan village of Ruby, Alaska revealed how the hydrosocial relations of some communities were privileged over others, giving rise to particular water management regimes that marginalised the interests of certain groups. In a case study of the remote Andean community of Mollepata, Boelens (2014, p. 245) draws attention to how,

> "[i]rrigation systems…in Mollepata [are] more than just ditches linking the hydrological cycle to agro-productive, institutional management systems, are simultaneously political and cultural constructs embedding local knowledge, values, property arrangements, power relations and

bonds of belonging. They are also the result of ongoing internal negotiations and harsh conflicts

with 'outsiders' – local views, truths and norms are shaped in multiscalar contexts of struggle."

These are but two examples of a growing corpus of case studies producing useful insights on the social and natural hybridity of water, and its impact in terms of producing socio-environmental outcomes. Other examples include Mollinga's (2014) case study of contested water control in the Tungabhadra Left Bank Canal, South India; Meehan's (2013) exploration of illegal water sourcing as a means for authorities to secure power, and; Budds' (2009, 2013) case studies of water politics in Chile.

The theoretical and analytical concepts provided by the literature on the political ecology of water, and those defining and utilising the concept of the hydrosocial cycle specifically, help to shed light on the power dynamics that constrain the ability of the marginalised to access water in a way that makes their livelihoods, political and economic participation, social opportunities and capacity to scrutinise governing institutions in a transparent manner possible. In an editorial introducing a special issue of *Environment and Planning D: Society and Space* on the political ecologies of water and development, Budds & Sultana (2013, p. 275) highlight the purpose of research in this area as,

> "[d]irect[ing] research on water-related development interventions in the Global South in new and productive ways, by showing how water and power relations intersect to shape differential access and outcomes among diverse social groups, to configure particular discourses around water management, and to produce uneven waterscapes."

Political ecology has therefore helped to shift the conceptualisation of water as a socially neutral physical entity requiring solely technical attention to be managed towards an understanding of water as being representative of and productive of often unequal socio-environmental realities. This understanding helps researchers such as those referenced in this section to uncover the power dynamics shaping the creation of such socio-environmental realities and is therefore a key contribution to the aim of this project of understanding how more just socio-environmental conditions can be fostered for the marginalised through urban water development. However, just socio-environmental realities must also reflect the lived needs and aspirations of individuals. For this reason, the question of how individuals can participate in development processes is essential to understanding the dynamics by which these needs and aspirations can be fostered through urban water development initiatives.

2.4 PARTICIPATORY APPROACHES TO DEVELOPMENT IN THE WATER SECTOR AND BEYOND

Another body of scholarship that informs the research in this thesis is that on participatory approaches to development in the water sector and beyond. Participation first became an explicit concept in international development and urban planning with Arnstein's (1969) formulation of a conceptual 'ladder of citizen participation.' However, Hickey and Mohan (2004b) point out that participation has a long history in development thinking and practice, having been regenerated around new agendas, political exigencies, and schools of thought over the years. In her seminal paper, Arnstein (1969, p. 216) asserts that participation is essentially about 'citizen power', since "it is the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately included in the future." However, Arnstein (1969), along with more contemporary scholars such as Partpart (2000), Cornwall (2004), and Rowe (2005), highlight that not all participation is equal, and may in fact often used as a means to legitimise predetermined courses of action rather than redistribute power between power-holders and the marginalised.

In an approach that is consonant with Arnstein (1969), Rowe & Frewer (2005) characterise public engagement mechanisms as composed of three types: 1) public communication; 2) public consultation; and 3) public participation. However, unlike Arnstein (1969), Rowe & Frewer (2005, p. 251) differentiate these types of public engagement by factors such as 'the nature and flow of information between exercise sponsors and participants.' Rowe & Frewer (2005) assert that the quality and effectiveness of public engagement mechanisms is determined by 1) the ability to draw out efficient and relevant information from all useful sources; 2) the way in which this information is transferred to – and processed by – all appropriate stakeholders; and 3) the way this information is combined and processed to give a suitable and consensual response to the problem at hand. Another important distinction is made by Mansuri & Rao (2004), who categorise participatory development programs as either community-based, or community-driven. The former denotes programs in which communities are involved in the design and implementation stages, whereas the latter denotes programs in which communities have near-control over key project decisions.

The prominence of participation is also representative of a broader shift from the positivist approach to development that views the development practitioner as the technical 'expert', towards more democratic forms of governance with a stated emphasis on stakeholder participation (Allmendinger, 2001; Holden, 2011; Partpart, 2000). This shift has led to a move away from centralised interventions guided by government and towards a focus on institutions for local governance emphasising bottom-up, mixed approaches to planning

and governance predicated upon the involvement of multiple stakeholders including the community, state, non-governmental organisations, and international organisations such as the World Bank and Asian Development Bank (A. Das, 2008; Fischer, 2010; Holden, 2011; Williams, 2004). Participatory approaches to development are so dominant, in fact, that Henkel & Stirrat (2001) refer to participation as the "new orthodoxy", noting that by the early 1990s most major aid organisations espoused participatory policies. This is evidenced from the fact that the World Bank, one of the world's largest and most influential development organisations, undertook a large-scale project called The Voices of the Poor as part of its World Development Report 2000/1: Attacking Poverty (World Bank, 2000); this project was active in over 100 counties, and explicitly sought to make the views of the poor present in development planning.

Participatory approaches to development are a key ingredient in the broader shift towards decentralised decision-making that is a hallmark of contemporary planning and development in the Global South. However, while governments are increasingly adopting participatory approaches, NGOs remain the most prominent representatives of civil society that seek to meaningfully engage stakeholders in the development process (A. Das, 2008).

While participation has been broadly adopted in development interventions, many scholars and development practitioners highlight that participation cannot be considered a panacea. White (1996, p. 6) emphasises that 'participation' must be seen as a political term, since it can "be the means through which existing power relations are entrenched and reproduced." Developing this insight further, White highlights that governments employ participation to either a) legitimate policies, b) for instrumental purposes in cases of budgetary constraint, and c) at times to represent the interests of communities. Participation may also be used for transformative purposes, although this form of deep participation remains rare (White, 1996).

Each distinct approach towards participation in development has its critiques and counter-critiques. However, most critiques of participatory approaches to development share a scepticism of the emancipatory or transformative capacity of participation (Hickey & Mohan, 2004b; Parfitt, 2004). According to these critiques, "…participation is simply another means of pursuing traditional top-down development agendas, while giving the impression of implementing a more inclusive project of empowering the poor and the excluded" (Parfitt, 2004, p. 538). Indicative of the value of this critique is the case study of the Adyar Poonga river restoration project in Chennai, India by Rowan Ellis (2011). Through this case study, Ellis found that the inclusion of participation effectively depoliticises conflicts around the urban environment, therefore paving the way for developments the outcomes of which can often lead to further economic and social marginalisation for the

urban poor. He finds that the consultation process in this case served to "enlist actors into already-devised programmatic aims as opposed to soliciting wider input in the formulation of projects" (R. Ellis, 2011, p. 197). The project led to improved environmental outcomes, although long-term benefits are unknown due to a lack of attention to upstream factors impacting on water pollution; however, the project also displaced a large community that had been established in the area over decades.

This approach to urban development is common in India. Nevertheless, even in cases inclusive of notable resistance from local communities such as these, authorities generally tout the 'participation' of communities as a praiseworthy aspect of local development initiatives (Jagtap, 2010). While this evidence helps validate the critique of participation levelled by scholars such as Parfitt (2004) and Hickey & Mohan (2004b), it is important to note that these criticisms are generally directed at the more 'superficial' forms of participation, rather than the 'deeper' forms of participation that include a degree of decision-making and management authority for participants. The critiques notwithstanding, the majority of sustainability scholars and practitioners assert the need for participation in environmental management as a means to maximise equitable outcomes for communities and ensure that responses to particular problems are context-specific and effective (Fraser, 2009; Honadle, 1999; Ingram, 2009; McMillan et al., 2014; Poricha & Dasgupta, 2011). In this context participation is viewed as a key ingredient in the development of water resources.

2.5 RIGHTS-BASED APPROACHES TO DEVELOPMENT

While the view that access to water services is a fundamental human right can be found in participatory approaches to development, political ecology and the CA, there is a distinct body of scholarship and development practice that outlines rights-based approaches (RBAs) to development in the water sector and beyond. This section discusses these approaches, which help frame the work in this thesis, particularly in Chapter 5, which argues for a more politicised approach to water development that seeks to foster rights as much as it does improved infrastructures.

RBAs to development have been treated in scholarship and informed practice for over two decades (Nelson & Dorsey, 2018). Before then, Uvin (2007, p. 597) argues, "…the development enterprise lived in perfect isolation, if not ignorance, of the human-rights system and its implications for development." This started to change in the early 2000s, when the potential of human rights standards and principles to overcome the shortcomings of the then-dominant neo-liberal – or what some, such as Albrechts (2013), term 'needs-based' – approach to development became increasingly recognised (Nelson & Dorsey, 2018). It is beyond the scope of this review of

the literature to delve into the complex intellectual development of rights-based approaches. Nelson & Dorsey (2018), Uvin (2007) and Cornwall & Nyamu-Musembi (2004) together provide a comprehensive discussion of the development of RBAs. For our purposes, this section of the review discusses what these look like in practice.

Gauri & Gloppen (2012) identify four approaches to rights-based activities:

1. Global Compliance approaches: these are primarily focused on pushing for the ratification of, reporting on, and compliance with human rights standards by state and non-state actors;

2. Programming approaches: these are focused on expanding the capabilities of responsible actors and/or rights-holders;

3. Rights talk: this refers to advocacy and educational work seeking to foster awareness of individual and collective rights, and;

4. Legal mobilisation: this sort of practice relies on litigation, typically before domestic courts but also in supranational bodies, to have distinct rights recognised and/or expanded.

This typology can give the impression that these are distinct RBAs. In practice, however, these approaches are simultaneously drawn upon to seek positive development outcomes for individuals and communities considered to be suffering from marginalisation. This is reflected in the two-part definition of RBAs put forward by Theis (2003, p. 3) from Save the Children, who clarifies that RBAs have not only a set of standards, but also political objectives and methods,

> "A rights-based approach to development makes use of the standards, principles and approaches
> of human rights, social activism and of development to tackle the power issues that lie at the root
> of poverty and exploitation, in order to promote justice, equality and freedom."

In a sense, RBAs have the same aim as the CA: an expansion in the freedoms that people depend on to achieve valued outcomes. RBAs argue that achieving this expansion requires the establishment and/or strengthening of human rights to things like education, water and sanitation (Gauri & Gloppen, 2012; Harris, Rodina, & Morinville, 2015; Uvin, 2007), and has influenced contemporary approaches to water development considerably.

Broadly speaking, an RBA to water development seeks to establish the rights of populations theretofore excluded from formal access to services such as water supply, sanitation and hygiene. This might be achieved through efforts to [re]define water rights through formal (hard) institutions such as state law but also through informal (soft) institutions such as religious law, customary law and local norms (Meinzen-Dick & Bakker,

2001). Jepson et al. (2017) identify some of the major critiques of RBAs to water development as that it is 1) overall compatible with efforts to privatise water (Spronk, 2016); 2) does not address underlying inequalities that give rise to denial of access in the first place (Truelove, 2011), and; 3) reifies the individual according to Western philosophical traditions. Such critiques lead scholars like Linton (2012) to ask: "the human right to what?" In posing this question, Linton (2012) draws attention to whether development practice should focus on securing the right to water as a physical entity (H_2O) or on securing the benefits that people seek from their access to water (e.g. health, education, livelihood security, amenity etc.). This question, Jepson et al. (2017), Crow & Swallow (2017) and Goff & Crow (2014) argue, can be answered by the CA, which seeks to realise social arrangements that secure individuals' "effective opportunities to undertake actions and activities that they may want to engage in, and be who they want to be" (Robeyns, 2005, p. 95).

2.6 CHARACTERISING INFORMAL URBAN SETTLEMENTS

Last, it is important to situate this thesis within the body of literature concerned with urban informality. I begin by outlining the dominant institutional conceptions of informality as evidenced from key reports, as well as legislation guiding policy on informality in India. I follow this by a discussion of the key debates in the body of scholarship and practice concerned with formalising the informal through efforts to *upgrade* or *rehabilitate* slums. Lastly, I delve into the body of scholarship, much of which originates from low-income settings, that seeks to shift the current understanding of urban informality as defined by its deficiencies towards a view of informal urban spaces as aspirational in character and at times as sites of resistance to social, political and economic orders that marginalise large sections of people. Engaging with this body of literature is essential to this study in that it frames the necessity to undertake water development not only as a measure to address existing deficiencies in water services, but also to foster the aspirational quality that characterises urban informal settlements.

2.6.1 The Institutional View of Urban Informality

Answering the question of how to define urban informality appears an easier task than it is. One often cited definition of an informal settlement is that furnished by UN-Habitat (2003, 2013, 2016, p. 1), which defines it as a residential area,

"…where 1) inhabitants have no security of tenure vis-à-vis the land or dwellings they inhabit, with modalities ranging from squatting to informal rental housing, 2) the neighbourhoods usually lack, or are cut off from, basic services and city infrastructure and 3) the housing may not comply with current planning and building regulations, and is often situated in geographically and environmentally hazardous areas."

Another of the most influential and cited reports on urban informality is UN-Habitat's (2003) *The Challenge of Slums* report, which views informal settlements as symptomatic of multiple failures. Chapter 1 of the report (2003, p. 6) asserts that "[s]lums must be seen as the result of a failure of housing policies, laws and delivery systems, as well as of national and urban policies." The report goes on to characterise the existence of slums as a failure of governance, institutions, and the law, and to identify the defining characteristics of slums as: 1) a lack of basic services; 2) substandard housing or illegal and inadequate building structures; 3) overcrowding and high density; 4) unhealthy living conditions and hazardous locations; 5) insecure tenure; 6) poverty and social exclusion, and; 7) minimum occupied land size according to local guidelines. Informality, according to this report, represents a state of deficiency.

This line of thinking remains evident in more recent institutional reports on slums and urban informality; UN-Habitat's (2013) *State of the World's Cities 2012/2013: Prosperity of Cities* report frames the high incidence of slums as a key impediment to the prosperity of cities, and highlights one aspect of UN-Habitat's (2013, p. 11) approach to fostering urban prosperity as "reducing the incidence of slums and new forms of poverty." However, a shift can be discerned in the *2016 UN-Habitat III Issue Paper: 22 - Informal Settlements,* which asserts that "recognition of the informal settlement" by urban authorities is a key driver for action towards improving the lives of residents (UN-Habitat, 2016, p. 6).

States and development actors have grappled with the realities of urban informality for decades, if not longer. Over the years, numerous avenues have been explored to stem the growth of informal settlements. Most of these avenues are firmly rooted in the view, highlighted in the preceding section, that informal settlements are a blight on cities (Sverdlik, 2011). A common example is the prevalence of *slum rehabilitation/redevelopment* initiatives. These initiatives involve the clearance of informal settlements and the relocation of residents to newly built, planned settlements, often on the urban periphery (N. Anand, 2017; Sheth et al., 2009; Weinstein & Ren, 2009). Increasingly, these initiatives take the form of public-private partnerships with urban developers who are provided rights to build private developments in the cleared settlements in exchange for the provision of basic housing to displaced settlers (Lanjekar, 2010; Nijman, 2008; Zérah, 2014). Although the new developments

promise to provide residents with tenure over their homes, improvements in services, and greater security, slum rehabilitation is often forcefully resisted by informal settlers for numerous reasons. First, residents of informal settlements spend years establishing social and economic support networks that they rely on for security, to seek better job opportunities, and to access services (Saunders, 2012). Informal settlers, therefore, view the prospect of being displaced to the urban periphery as a danger to these support networks and their ability to aspire to more secure, prosperous and meaningful lives (Nijman, 2008; Restrepo, 2010). Second, adopting resettlement as a solution to the challenges of informal settlements has been found to lock individuals and households into poverty by diminishing the socio-economic mobility afforded by informal settlements (Bhan, 2009; Varley, 2013). This finding is applicable to numerous settings, including in high-income settings. Development agencies including UN-Habitat (2003) and commentators such as Saunders (2012) recall efforts to formalise large communities of immigrants in cities such as Paris (to the *banlieus*) and London (to the *estates*). Over the years, these efforts have been found to entrench intergenerational poverty by creating ghettos with limited socio-economic mobility, with consequences ranging from criminality and even religious radicalisation (Saunders, 2012). Such cases highlight that while well-intentioned, improvements in access to basic services through rehabilitation can have unintended consequences with negative impacts across multiple generations.

Development actors have become increasingly aware of these negative impacts. This awareness led to the articulation of initiatives to improve services in-situ, most notably through *slum upgrading* projects first put forward by the World Bank in the 1970s and 80s (Werlin, 1999). Although these projects have remained marginal in India because development actors, especially states, are reluctant to legitimise informal settlements (Burra, 2005), they nevertheless represent a notable shift towards recognising the worth of informal settlements. One notable example of an upgrading project can be found in the *Favela-Bairro* ('Slum-Neighbourhood') programme implemented by the local government in Rio de Janeiro, Brazil. This program provided in-situ improvements to infrastructure and services, including water services, to some of the most underserviced areas of the city. This was done with a view to fostering the capacity of the area and its residents to transition from being an informal settlement to being a neighbourhood fully integrated with the wider city (Atuesta & Soares, 2016). The program has been found to have reduced inequality in the areas in which it is active, although little evidence exists to indicate concrete benefits from such projects in either health or socio-economic indicators (Turley, Saith, Bhan, Rehfuess, & Carter, 2013). Atuesta and Soares (2016) also highlight that since the Favela-Bairro program did not include a land titling component, it did not result in the appreciation of housing values. The disputed nature of land ownership and tenure in many informal settlements, however, means that securing

tenure rights for residents in certain cases is difficult. In cases where ultimate land use or ownership rights of residents remained unrecognised, in-situ improvements have often led to the displacement of residents due to gentrification (Lees, Shin, & López-Morales, 2016). For many residents, improvements can lead to their being priced out of their homes, communities and ultimately out of a potentially brighter future.

2.6.2 Rethinking Informality

As can be seen from Section 2.2.1, it is common in development discourse to see informal settlements framed as "slums of despair" (Owusu, Agyei-Mensah, & Lund, 2008), marked primarily by their deficiencies (Varley, 2013). However, the resistance offered by residents to efforts to displace them, even in cases where they are offered what may be considered better facilities, indicates that for many residents, informal settlements are 'slums of hope' (Owusu et al., 2008; Toomey, 2010). Informal settlements can be viewed as what Saunders (2012) terms "arrival cities", primarily transitional spaces where new arrivals to the city are able to affordably get a foothold into the city, access its services, its jobs, its support networks and its opportunities; informal settlements are communities that provide much more than just a shack. They provide the poor, often from destitute rural areas, with the resources and networks required to realise their aspirations for a better life (Lombard, 2014; Porter et al., 2011; Roy, 2009c; Varley, 2013). This insight is not new. In her decade-long ethnography of the *favelas* of Rio de Janeiro, the renowned urban ethnographer Janice Perlman (1976, p. 15) found "communities striving for elevation…inhabited by dynamic, honest, capable people who could develop their neighbourhoods on their own initiative if given the chance", and that would "evolve naturally into a productive neighbourhood, fully integrated into the city." What Perlman (1976) also found, however, was that the antagonism of the state and development discourse and practice towards urban informality means that these communities are rarely afforded the opportunity to realise their aspirations. In other words, informal settlers are rarely provided with the tools that they need to expand their capabilities to flourish.

Perlman's (1976) research spawned an intense scholarly interest in the dynamics and politics of urban informality, much of which has contributed to the reframing of informal settlements as legitimate forms of urbanisation driven by legitimate human desires for better lives. More fundamentally, much of the scholarship in this area has challenged the dichotomy between formality and informality that is frequently implied in development thinking and practice. Through an analysis of the catastrophic 2005 Mumbai monsoon flood, McFarlane (2012) reframes informality and formality as practices, rather than qualities, and shows how this framing facilitates the breaking down of the assumption that informality belongs to the poor and formality to

the better off. This argument echoes the findings of Ghertner (2008), whose analysis of urban planning policy and practice in Delhi led him to conclude that most of Delhi could be considered unauthorised, or in other words, informal. Ghertner (2008) found that even in the 'planned' sectors of the city, most individuals had altered their environments in ways that violated planning laws. According to such findings, the boundaries between the formal and the informal are imagined. And yet, governments cling to this boundary, which has been a "multifaceted resource for naming, managing, governing, producing, and even critiquing contemporary cities" (McFarlane, 2012, p. 89). McFarlane (2012) and others such as Varley (2013), Brenner & Schmid (2015) and Roy (2005, 2009b, 2009c, 2011) also show the insurgent quality of urban informal settlements as sites where those at the margins of the planned city and its economy are able to contest spaces for themselves. Such research shows that without recourse to informal housing, the services, jobs and opportunities for realising aspirations for advancement that cities provide would simply be inaccessible.

The right of people to live in informal settlements, however, remains widely unrecognised in India and in much of the rest of the world. For example, in the state of Maharashtra, in which Mumbai is located, the development of informal settlements is governed by the Maharashtra Slum Areas (Improvement, Clearance and Redevelopment) Act, 1971 (Government of Maharashtra, 1971), which makes provisions for "improvement works" that include "laying of water mains, sewers and storm water drains" and "provision of urinals, latrines, community baths, and water taps." The Municipal Corporation of Greater Mumbai (MCGM), on the other hand, stipulates that settlers who cannot provide documentation proving that they were resident in their location prior to the year 2000 are not eligible for basic services or for compensation when their homes are bulldozed (N. Anand, 2017; Björkman, 2014; Graham, Desai, & McFarlane, 2013). The MCGM policy means that most settlers do not receive basic services or compensation when they are displaced, often because they lack formal documentation even though they may have resided in their location prior to the year 2000 (Doshi, 2013; Murthy, 2012). Similar policies can be found in both Delhi (Dupont, 2008, 2011) and Faridabad (Narayan, 2013a). Although a survey of all local, state and federal laws and regulations pertaining to urban informality are not feasible in this study, the prevailing attitude towards informal settlers can be illustrated with reference to legal decisions by the Supreme Court of India from 1985 through to the mid-2000s. In Olga Tellis vs. Bombay Municipal Corporation (1985), the Supreme Court ruled that "…the right to livelihood is an important facet of the right to life", and that the urban poor do not,

"…claim the right to dwell on pavements or in slums for the purpose of pursuing any activity which is illegal, immoral or contrary to public interest. Many of them pursue occupations which are humble but honourable."

Bhan (2009) points out that while this judgment did not stop demolitions of informal settlements *per se,* it did nevertheless express a view that settling in informal settlements was not an illegitimate action. By 2000, however, the Supreme Court drastically changed tone. In Almitra Patel vs. the Union of India (2000), the court asserted that "…slums", rather than serving the needs of the urban poor, are "…large areas of public land, usurped for private use free of cost." In the space of 15 years, the Supreme Court shifted from viewing informal settlers as legitimate residents of Indian cities to characterising them as encroachers.

This varied body of research underlines that urban informality is not only characterised by its deficiencies, but also by the opportunities that it affords populations whose lack of resources would negate a place in the city. It is this complex understanding of urban informal settlements as both marked by their deficiencies and their capacity to foster the aspirations of the marginalised that drives this study. If water development efforts are to meet both the needs and aspirations of informal settlers, then they must provide services such as water supply and sanitation in ways that meet people's basic needs, such as health, as well as provide benefits in ways that enable people to work towards realising their broader personal and collective aspirations.

CHAPTER 3: METHODOLOGY

This chapter outlines the methodological strategy adopted in this thesis to achieve the aim of articulating an approach to water service development in urban informal settlements that fosters justice. I begin by discussing my epistemological stance as a researcher, which is intended to clarify my positionality as an outsider seeking to gain insight into realities that are beyond my own individual experiences. This discussion takes place particularly in relation to the interview method that forms the crux of this research project. In this discussion, I address the questions of *what* I seek to understand of the experiences of the research participants and *how* I seek to do so. I follow this discussion with an outline of the single embedded qualitative case study design, case selection, approach to data collection, analysis, reporting and considerations of research validity.

3.1 EPISTEMOLOGICAL STANCE

3.1.1 Relational Constructionism

This project is guided by a relational constructionist epistemology. This approach moves beyond the traditional subjective-objective, realist-relativist divide in scientific inquiry, and instead centres processes of relating through which relational realities are constructed (McNamee & Hosking, 2012). McNamee & Hosking (2012, p. 37) summarise five key themes that define the 'territory' of relational constructionism, as outlined in Table 3.

Table 4: The five key themes of relational constructionism (adapted from McNamee & Hosking 2012, p.37)

Theme	Description
1	Not individual self and private interiority, but relational processes.
2	Not self-existing entities and knowledge of the same, but relational processes making multiple local rationalities.
3	Not a unified, singular self, but multiple self-other relations in ongoing construction.
4	Not inevitably subject-object relations ("hard" self-other differentiation), but soft self-other differentiation as a possibility.
5	Not change from one stable state to another, but processes that close down and open up possibilities.

These five themes can be summarised in two assumptions identified by Hosking & McNamee (2007, pp. 11–12) as underpinning a relational constructionist stance:

1. "[T]hat constructions of knowledge, truth and ethics, and constructions of science – are local, relational realities", and;

2. "[T]he critical relational constructionist discourse is open-minded about any and all claims to know what is and what is best for other. So this stance is not used in order to pursue what some communities of science call 'scientific knowledge' and it is not grounded in an interest in liberating what some communities regard as 'oppressed' groups."

The emphasis on the *relational* aspect of knowledge-making differentiates relational constructionism from other constructionist epistemologies. As Hosking (2011, p. 51) points out, debate among the latter traditions remains "directed towards individual objective-subjective knowledge about independently existing, real objects." A relational constructionist stance, on the other hand, puts a concern with what *is* aside, and instead focuses on *how* things are known in a context. This approach,

"…opens up and legitimizes ways of working (a) that neither separate inquiry and intervention (b) nor privilege one local rationality (e.g. science) above others, and (c) that centre transformative possibilities (d) through ongoing dialogues and reflexive practices. Relational constructionism provides *a way of orienting to practice, with an interest in facilitating (local) practical effects* and developing practical wisdom" (Hosking, 2011, p. 61, original emphasis).

Adopting this approach in this project is based on the centrality of four factors in this topic, which correspond with those in the above quote:

1. The objective to distil both practical and conceptual insights from the findings;

2. The relinquishment of the assumption that 'scientific' and/or technocratic approaches to water service development are superior or more legitimate than other practices (while being open to the possibility that they may provide greater benefits);

3. The objective to identify principles and strategies by which to guide water development in urban informal settlements towards meeting the needs and aspirations of residents (research Objective 4), and;

4. The recognition that my positionality as an outsider influences the responses I will garner through my research and the subsequent need for conscious reflexivity in acknowledging this.

My relational constructionist stance also influences my approach to data collection and analysis, beginning with my positionality in the interviewer/interviewee relationship, which I now discuss.

3.1.2 The Interviewer as the Traveller

This research project primarily relies on in-depth, loosely structured individual interviews as the primary method of data collection. Brinkmann & Kvale (2015) use two contrasting metaphors to discuss the potential epistemological stance of the interviewer: the miner and the traveller. As a miner, the researcher conceives the purpose of the interview to be knowledge collection. As a traveller, the purpose of the interview is knowledge construction. In this project, I approach the interview process as a traveller. Whereas the miner views knowledge as an objective reality awaiting discovery, the traveller "walks along with the local inhabitants, asking questions and encouraging them to tell their own stories of their lived world", with the "potentialities of meanings in the original stories…differentiated and unfolded through the traveler's interpretations of the

narratives he or she brings back to home audiences" (Brinkmann & Kvale, 2015, p. 58). As a 'traveller', I am interested in people's experiences, which are inter-subjective and complex.

As such, this thesis follows Gadamer's (2004) hermeneutical assertion that meaning is created through intersubjective communication, rather than through penetration to some objective reality; understanding is determined by *pre-judices* (Gadamer, 2004), and the meaning of every text from a "con-text" (Brinkmann & Kvale, 2015, p. 60). Brinkmann and Kvale (2015, pp. 63–65) identify seven features of interview knowledge, which shed light on how I approached the interview process and the collection of knowledge through other means such as informal discussions and field observations:

1. *Knowledge as produced:* this perspective underscores that the interview is the production site of knowledge, where the knowledge is "co-authored" by interviewer and interviewee and continues to be produced through transcription, analysis and reporting of the interview data (Brinkmann & Kvale, 2015, p. 63);

2. *Knowledge as relational:* knowledge produced through the interview process is inter-relational and inter-subjective. As such, the knowledge produced is neither objective nor subjective, but is rather the result of the interaction between interviewer and interviewee, and therefore coloured by the worlds of both;

3. *Knowledge as conversational:* attention must be paid to "discourse and negotiation about the meaning of the lived world." This perspective beckons the researcher to adopt a reflexive stance that frames data as a "cooperative product" influenced by the "knowledge claims of social researchers themselves" (Aull Davies, 2008, p. 9);

4. *Knowledge as contextual:* the knowledge gained from one context is "not automatically transferable to, nor commensurate with, knowledge within other situations" (Brinkmann & Kvale, 2015, p. 64). The knowledge that is gained from the interviews provides a *snapshot* of a particular time, place, and issue, rather than a universal understanding of a situation;

5. *Knowledge as linguistic:* this point underscores that "[k]nowledge is constituted through linguistic interaction, and the participants' discourses and their effects are of interest in their own right" (Brinkmann & Kvale, 2015, p. 64). This point is particularly salient in the context of research projects, such as this one, that are undertaken in a linguistic context that the researcher is not familiar with. As many of the interviews were undertaken with the assistance of an interpreter, some loss of linguistic

nuance is inevitable. However, this was partially addressed by debriefing with interpreters regarding the more nuanced meanings within interviews;

6. *Knowledge as narrative:* "stories are a powerful means of making sense of our social reality and our own lives" (Brinkmann & Kvale, 2015, p. 65). This perspective led me to seek ways to allow interviewees to fluidly express their own stories, rather than seeking to only cover pre-defined themes for discussion. This perspective also led me to adopt a narrative approach to reporting, which according to Moen (2006, p. 56) is appropriate in cases "where the challenge for the researcher is to examine and understand how human actions are related to the social context in which they occur";

7. *Knowledge as pragmatic:* in other words, "[g]ood research is research that works" and "ideas and meanings derive their legitimacy from enabling us to cope with the world in which we find ourselves" (Brinkmann & Kvale, 2015, p. 65). This perspective led me to focus both the production and analysis of research data on action to address the lived experiences of interviewees.

This brief snapshot of my stance as a researcher indicates that I focus on research as a relational process aimed at producing insights with pragmatic implications. While the view of knowledge outlined in this section is explicitly related to the interview method, it also permeates my approach to field observations discussed in Section 3.2.3.

3.2 RESEARCH DESIGN

3.2.1 Case Study Design

To meet the objectives and aim of this research project, a qualitative case study approach was adopted. According to Yin (2009), a case study is an appropriate research approach in cases where the behaviour of those involved in the study cannot be manipulated; the researcher wishes to include contextual conditions in the study because they are relevant to the phenomenon being studied; and the boundaries are not clear between the phenomenon and context. This research project meets each of these three criteria, as it: 1) is concerned with understanding the relationship between water service arrangement in urban informal settlements and the experiences of residents; 2) seeks to include contextual conditions such as distinct local water service improvement efforts into the study because these help to determine the sorts of benefits or detriments experienced by residents, and; 3) the individual and collective experiences that are the focus of this study cannot

be separated from the water service arrangements that serve as the context of this project. For these reasons, a case study approach was adopted.

Following Yin's (2009) typology of case studies, this case study is an embedded, single case study. As can be seen from Figure 3 on the next page, the context of this case study is urban informal settlements in India. This case includes two units of analysis: 1) experiences from the perspective of residents, and 2) experiences from the perspective of development professionals engaged in water development efforts. This distinction is somewhat porous in many cases, as many residents are also either employed by, or volunteer for, local development organisations such as NGOs and CBOs. This aspect of the case study is reflected in Figure 3.

It is important to note that this case study does not seek to lead to *statistical generalisation* by providing generalisable findings based on a representative sample. In fact, Stake (1995) is sceptical that such a case study is possible - a perspective with which I agree. This case study, rather, aims to provide a snapshot of the relationship between water service arrangements in selected urban informal settlements and the ability of residents to meet both their needs and broader wellbeing aspirations. As a result, this case study is intended to lead to *analytical generalisation,* which is based on an analysis of the similarities and differences between multiple settings (Brinkmann & Kvale, 2015). Yin (2009) terms this *inductive generalisation* and describes it as a process by which the reader is left to judge the validity of the arguments for generalisability put forward by the author. The aim is to articulate a theory, but not necessarily to seek its replication within the study. As Smaling (2003, p. 53) succinctly puts it, "[t]he theory that is ultimately formulated must then become the vehicle for generalization to other cases that have not been studied." Due to the difficulty (or perhaps impossibility) of case study research to generate statistically generalisable findings, Stake (1995, p. 4) asserts that "[c]ase study research is not sampling research." Nevertheless, we sought to diversify our research sample to ensure a "balance and variety" (Stake, 1995, p. 6) of perspectives and experiences, and to facilitate the identification of commonalities and differences resulting from different approaches to improving forms of access to water services across similarly water-insecure informal settlements. Ultimately, the choice of the indefinite article in the title of this thesis indicates that the vision of a capability approach to water service development generated through this research is likely to be only one of many potential iterations.
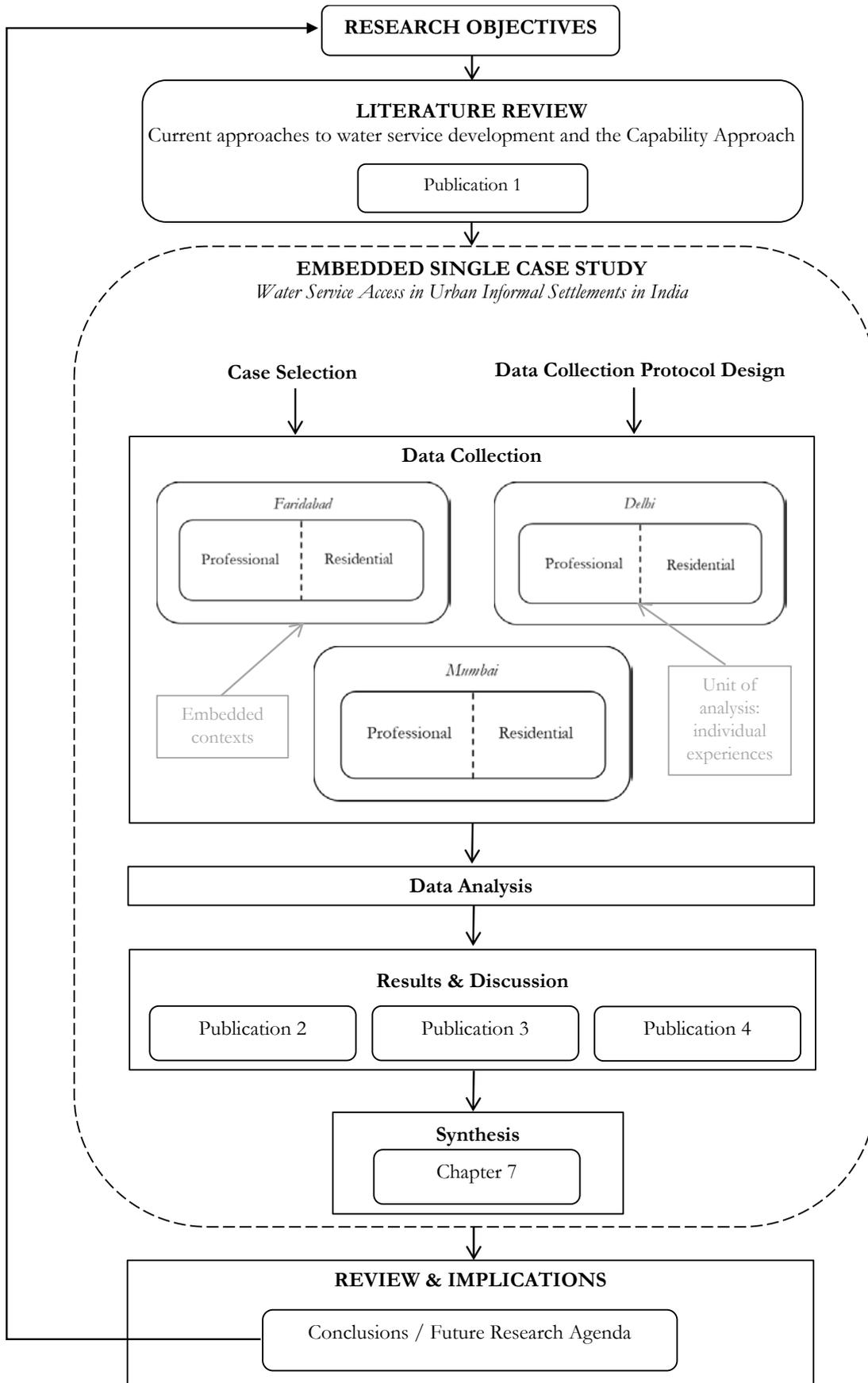
Figure 2: Research design

3.2.2 Case Context Selection

This embedded case study of water service arrangements was undertaken across six informal settlements in the Indian cities of Faridabad, Delhi and Mumbai. Settlements from these three Indian megacities were selected because of four factors: 1) the prevalence of informal urban development among these cities (Dupont, 2011; Government of India, 2011; Narayan, 2013b; UN-Habitat, 2016); 2) the typically antagonistic attitude of local, state and federal governments towards these communities (Björkman, 2014; Dupont, 2011); 3) similar historical and present common water insecurities among the settlements chosen, and; 4) established institutional relationships between the researchers and organisations working on water development within these communities.

Each of the settlements selected is non-notified (unauthorised), meaning that they are officially denied access to basic services such as water supply, sanitation, electricity, and waste management by governing authorities, although over the years small clusters of households within these settlements have become notified because of electoral promises, occasionally leading to the provision of piped water supplies that were generally found to be unreliable. All settlements have been settled for at least two decades and are primarily composed of migrants from less socio-economically developed regions of India such as Bihar, Uttar Pradesh, Rajasthan and in Mumbai, from migrants from rural Maharashtra. Most households in the settlements depended on unreliable deliveries of water tankers either from local government or private providers for most of their basic water needs and community-installed standpipes. According to local non-governmental organisations (NGOs) and residents, every source of water supply across the settlements requires further treatment to become safe for human consumption. At the time of data collection only a handful of households had access to latrines on premises, leaving most people to openly defecate. However, all settlements apart from one in Mumbai had access to a communal toilet block, although these were not adequate to cater to the sanitation needs of the entire population. While marked by ongoing water service deficiencies, all settlements have also been the target of water development initiatives, facilitating the investigation of how improvements in water service delivery impacted people's ability to meet their needs.

In Faridabad, the efforts of the local arm of a large, international development NGO (NGO 1) aim to improve access to water and sanitation by focusing on four key areas: 1) awareness and empowerment programs; 2) the provision of low-cost water filtration systems to households; 3) a program focused on constructing bio-toilets and training individuals on their maintenance; and 4) a school sanitation and hygiene program seeking to improve infrastructure and services in public schools. In Delhi, NGO 2 is a local, water-focused NGO that also

acts as an implementing partner for a large, international water development-focused NGO. NGO 2's stated vision is to make communities water secure. To achieve this vision, NGO 2 adopts an approach which seeks to bring together 1) the community, 2) technical experts, 3) funding partners, and 4) the government in seeking to create water security. More specifically, NGO 2 has implemented a range of rainwater harvesting programs, water, sanitation and hygiene (WaSH) programs, awareness programs, and impact analyses in their target communities. In Mumbai, NGO 3 seeks to assure the human right to water. The main issue that NGO 3, a local, community-driven organisation with no formal ties to outside NGOs has traditionally engaged with was the refusal by the municipal government to supply water to households that have settled in unauthorised settlements after the official cut-off date stipulated by the municipal government. This remains the focus of its activities, which are primarily focused on placing pressure on governing institutions through a mixture of on-the-ground activism and legal action.

3.2.3 Data Collection, Analysis & Reporting

<u>Secondary Data Collection</u>

A range of secondary data was engaged with to understand the demographic, governance and infrastructural context of this project. Demographic data for each of the three cities and the six informal settlements within them was collected primarily from data from the last national census, conducted in 2011 (Census Organization of India, 2011). Secondary data sources such as Kumar (2016) and demographic data discussed in other peer-reviewed publications were accessed to interpret some of the census data.

The policy, legal and on-the-ground public engagement structures surrounding the governance of water services in Indian cities is a mixture of official and unofficial policies, statutes and practices. As such, understanding this context involved both secondary and primary data collection. The governance of water sources is primarily the responsibility of state governments, one of three levels of government in India (along with Central and local government). As a result, state legislation related to the management of informal settlements and the provision of services to their residents (e.g. the Maharashtra Slum Areas (Improvement, Clearance and Redevelopment) Act, 1971) for the states of Delhi, Haryana (in which Faridabad is located) and Maharashtra (Mumbai) were accessed online. No translation was required as the language of government in India is English. Access to local statutes was more challenging, as many of the policies (such as the setting of cut-off dates for notification/regularisation of households) are unpublished online or in English.

Documentation regarding these policies was accessed through secondary sources such as peer-reviewed publications and monographs.

Mapping the water governance context was more challenging. Local development workers and water rights activists in each city explained that water governance is not the responsibility of a single entity, but rather of dozens of actors ranging from urban development authorities, municipal corporations, state and Central government departments, water and transport utilities (particularly the railway and port trusts whose land migrants often establish settlements on) and the private sector (typically landowners and developers, but also private enterprises with either philanthropic or commercial investments in infrastructure and services). As a result, a full accounting of the water governance context in the case study locations was not possible.

Nevertheless, a partial picture of the arrangements in each context was gained through grey literature such as reports, case studies and strategic papers outlining water service challenges in urban informal settlements in the case study cities and the strategies adopted to address them. These were accessed online from government websites, industry, and international development actors such as the World Bank and Asian Development Bank, or directly from the three NGOs outlined in Section 3.2.2. Some of these sources were publicly available, while others were made available by NGOs on the proviso that they would not be discussed publicly in a way that would enable the identification of the NGO responsible for its preparation.

Another secondary data collection strategy adopted during the initial scoping period involved asking senior staff members in the three partner NGOs to provide me with resources sourced from outside their organisations (e.g. scholarly articles, policy papers, working papers and institutional reports) that they considered representative of the water service challenges faced by the communities that they worked in and in some cases lived in. These materials were indispensable in gaining an insight into the approach of development professionals and residents working towards water security.

<u>Sampling Strategy</u>

Initial contact with research participants was facilitated by local development NGOs, community-based organisations engaged with water development and the Faculty of the Tata Institute of Social Sciences' Centre for Water Regulation, Policy and Governance. In total, 44 participants (20 female and 24 male) over the age of 18 with diverse positions in their communities and organisations were selected for participation. The key criteria for participation were that individuals be or have been: a) explicitly involved with water development

issues and/or impacted by water service deficiencies, and; b) be willing to discuss their experiences of these. The first criterion was essential in ensuring that individuals, and particularly residents, had thought explicitly about their access to water services and its impact on their daily lives, while the second criterion was important to maximise the likelihood of gathering rich data.

It is important to remind the reader that, as Figure 3 shows, the unit of analysis in this research is individual experience. Single individuals often were both residents and development professionals, whether as paid staff members or volunteer support staff. Therefore, individual participants could share both residential and professional perspectives.

Although interviews with residents included six community leaders (one per informal settlement), the rest of the interviews with residents were undertaken with a mixture of housewives, students, day labourers, small business-holders, cottage industry workers, unemployed individuals, and domestic workers. The same strategy was adopted with regards to interviews with development workers, which included individuals with varied roles within their organisations and communities, including NGO managers, community development workers, education coordinators, water rights activists, technical specialists, and community-based volunteers. The inclusion of this variety of individuals was intended to derive insight into the impact of water services on the aspirations of individuals with diverse experiences, perspectives and positions, and is in line with the recommendations for balance and variety in case study research made by Yin (2009) and Stake (1995). At this point it is important to emphasise that this sample was not intended to be representative of the populations of urban informal settlements in India in any way. As Stake (1995, p. 4) emphasises, "Case study research is not sampling research. We do not study a case primarily to understand other cases. Our first obligation is to understand this one case." The focus on experiences as the unit of analysis in this project necessitates recognition that such experiences are derived from the unique life history and current situation of the individual.

It should be noted that no individual currently working for government institutions was formally interviewed, as informal discussions with such individuals were found to indicate an unwillingness to share details about the governmental approach to urban water development beyond highlighting that the government has no legal obligation to provide infrastructure and services to settlements that are considered illegal. Since evidence indicates that many improvements in water services in informal settlements happen *despite,* rather that *because* of government (N. Anand, 2011; Bapat & Agarwal, 2003; Björkman, 2014), a decision was made to focus on the experiences of non-state actors such as residents and development workers from NGOs. Furthermore,

information regarding government strategies is relatively easily accessible to the researcher in the form of reports, strategic papers, legislation, and policy frameworks. On the other hand, there is a dearth of narratives of the lives of informal settlers in relation to water services. For these collective reasons, government officials were not interviewed as part of this research project.

Ethics

In this section, I outline the approach adopted in this project to ensure that it adheres to the highest standard of human research ethics. The Monash University Human Research Ethics Committee (MUHREC) approved the research strategy and interview protocols in December 2015 (project CF15/4720 – 2015002028) (approval certificate available in Appendix A1). Written informed consent (Appendix A3) was gained from participants for all interviews after reading and discussing a MUHREC-approved research explanatory statement (Appendix A2). In cases where the participant was not literate, verbal informed consent was gained and witnessed in writing by a third party. The explanatory statement presented in Appendix A2 outlines details about the potential risks and benefits to participants envisaged from participation and the confidentiality and data security strategies adopted in this project.

Any discussion of ethics must also recognise two further issues pertinent to this thesis: 1) the ethics of conducting cross-cultural research, and; 2) the oftentimes asymmetrical power dynamics that can shape the researcher/participant relationship and outline strategies adopted to acknowledge the potential impacts of these on the findings, data analysis and interpretation. In relation to the first issue, Papadopolous & Lees (2002) and Struthers & Peden-McAlpine (2005) point out that one of the necessities of doing cross-cultural research is the acquisition of knowledge of the social group that researchers wish to learn from. According to Jackson & Niblo (2003, p. 24), this must include extensive knowledge of "…social, familiar, cultural, religious, historical and political backgrounds." My choice of India for this research project was in part shaped by this consideration. In my undergraduate degree I majored in Studies of Religion with a focus on India. This experience meant that I approached India with an existing knowledge of its history, culture, religious traditions, social and familial norms and aspects of its political structures. While it is impossible to claim a full knowledge of these, my experience is that this existing knowledge enabled me to show an appreciation of Indian traditions and culture to research partners and participants that quickly endeared me to them and led to more open and frank interactions. Importantly, my existing knowledge meant that I was able to communicate in a culturally appropriate manner. My capacity in the local languages, however, was limited. For this reason, I relied on the

services of interpreters and embraced them, following the advice of Hennink (2008, p. 30) as "research collaborators" that go beyond the task of translating "…to involve the development of meaning from the data." This approach led me to ask interpreters to brief me, post-interview, on whether the language used by participants carried particular sociocultural meaning and inherent values and beliefs that might be important to know to accurately interpret the data.

In relation to the second point about asymmetrical power dynamics, K.E. Smith (2006) argues that such asymmetries do not detract from the utility and power of qualitative research methods such as the interview. In fact, Anyan (2013, p. 6) argues that "a perfect and unequal relationship in the prospects of the qualitative research interview seem unrealistic." It was not possible to completely neutralise such asymmetries in this project; both development workers and residents often associated me with a 'professional' role and began their interactions with me by stating their hope that I would be able to catalyse attention to the plight of locals. There is no consensus on methodological strategies to avoid such perceptions (Smith, 2006), although a degree of reflexivity on the part of the researcher is the typical strategy called for (Aull Davies, 2008). However, precisely what reflexivity looks like in practice is contested in qualitative research scholarship, although the overarching approach is for the researcher to reflect on the potential impacts of perceptions such as the one discussed above on the information that participants share. In a widely cited paper on this theme, Rose (1997, p. 319) concludes that,

> "We cannot know everything, nor can we survey power as if we can fully understand, control or redistribute it. What we may be able to do is something rather more modest but, perhaps, rather more radical: to inscribe in our research practices some absences and fallibilities while recognizing that the significance of this does not rest entirely in our own hands."

I adopted this broad reflexive approach to my data analysis and interpretation by annotating transcripts with my notes indicating non-verbal cues such as tone of voice, physical stance, use of colloquialisms and so on. Interviews were conducted in English in instances where residents could express themselves in the language with confidence. In most cases, however, interviews were undertaken in Hindi and Marathi with the assistance of an experienced interpreter. When interviews were undertaken through an interpreter I asked her/him to note such factors during the interview and added these reflections to my notes after a debriefing session immediately after the interview.

As a researcher, I did my best to reflect on the potential and experienced perceptions of the individuals that participated in my project and used these reflections in my data analysis and interpretation phases. I clearly

stated my role to participants as a doctoral researcher at the outset of interactions and sought to dampen any unrealistic expectations about the potential impact of my research. I also sought to build a degree of rapport with people by talking about my personal life and asking about theirs in a way that (hopefully) helped to equalise perceptions of my 'power' to influence action on the ground and their perceptions of me as an 'elite'. It is not realistic, however, to expect all such perceptions to be neutralised during the research process.

According to Elwood & Martin (2000), another important ethical consideration when conducting interviews is "placing": considering and ameliorating the influence of location when conducting interviews. Individual interviews were undertaken in settings that would be most comfortable and convenient for participants, whenever possible. For residents, these often took place in their homes or in communal spaces offering privacy. There were frequent attempts by development workers to sit in on interviews with residents, which posed a challenge to the ability of the interviewee to provide candid responses. In such cases I had to either discontinue the interview or had to explain (often several times) to the staff member intruding that this would not be possible. In the case of development workers, most interviews were undertaken in their office or in communal spaces in the settlements in which the individual worked.

Last, it is essential to respond to the fact that ethics in research is not only about not doing harm (non-maleficence), but also about doing good (beneficence) (Rabbie, 2015). This was an explicit consideration in the design and conduct of this project. Being a thesis including published works, one strategy to provide a benefit to communities involved in this study was to make the publications resulting from the fieldwork available to key stakeholders in the community that could communicate the findings to participants and inform their water development practice. For example, the paper in Chapter 5 finds certain practices among NGOs to be ineffective at tackling the political reasons for denial of access to water services for residents by local government while finding other practices somewhat effective. The reflections resulting from this finding are aimed at influencing practice. Therefore, sharing them with local NGOs, community leaders and stakeholders engaged with community-based organisations provides an opportunity for reflection on why some strategies might work better than others and furnishes evidence to inform any subsequent re-orientation. While I do not have control over how the findings presented in this thesis are used, each paper is explicitly framed as aiming to inform both water development thinking *and* practice.

I also want to reflect on the benefit that well-conducted interviews among populations that experience marginalisation can provide. In a multiple-case study of qualitative research interviews, Wolgemuth et al. (2015, p. 8) found seven benefits of participating in qualitative research,

"…including the opportunity to: 1) talk to someone; 2) self-reflect; 3) emotionally cleanse; 4) become knowledgeable about a topic of personal/professional interest; 5) connect with a broader community based on shared experience; 6) advocate for a community/cause, and; 7) help someone else down the road."

Several participants expressed that they experienced these benefits through participation in this project. For example, participants frequently thanked me for listening to what she had to say and for valuing it, saying that they had felt like few people had taken their plight seriously and sought to understand it and communicate it to the outside world. Some participants also stated that they found the interview format useful for them to reflect on their own lives and situation and said they gained insight from it.

Scoping Interviews

The first phase of the research involved two loosely-structured scoping interviews per location: one with a development program manager and the other with an individual from the community that had been living in the area for over a decade and had been involved with efforts to improve water services. Program managers are well-positioned to provide insight into the history, activities, driving ideologies, and trajectories of water development efforts in local communities. Community members, on the other hand, can provide an overarching perspective on the water-related issues that their community has faced as well as a community-based perspective on local engagement with water development efforts. The primary purpose of these scoping interviews was to inform the development of a relevant and focused interview approach, as well as begin the process of developing narratives around the key issues faced by individuals in communities because of deficiencies in water services.

Semi-structured, In-depth, Individual Interviews

The main means of data collection involved conducting semi-structured, in-depth interviews with residents of informal settlements marked by deficiencies in water services and development workers from NGOs with water development programs. My epistemological approach to the interview process is discussed in detail in Section 3.1, with more detail discussed on how interviews were conducted in the publications comprising the results section of this thesis. The schedules guiding the conduct of interviews are available in Appendix B.

Field Observations

This project is interested in the lived experiences of people living in informal settlements and development workers engaged in water development efforts on the ground. While individual interviews provide rich narratives regarding people's lives, it is through field observation that these expressions of people's narratives can be concretely connected with the broader sociospatial realities that individuals and communities inhabit.

Gold (1958) suggests that an ethnographer may adopt one of four postures during fieldwork: complete observer; observer-as-participant; participant-as-observer, or; complete participant. Regardless of the posture adopted by the researcher, ethnographic participant observation has some overarching features,

> "In many ways, this method appears simple and straightforward: it could be seen as merely an extension of how you engage with the world around you on an everyday basis…It involves the recording of interactions, thoughts, reflections, (un)certainties, (mis)behaviours, (in)actions and other symbolic or ephemeral phenomena to build up a picture of everyday life. To keep track of everything that is happening, and, indeed, not happening, and then seeking to unpack and question the reasons behind and the meanings generated through the observed phenomena…You are not only recording and analyzing the exceptional and the mundane, but also building up your understanding of daily life and tacit knowledge about a new and different context, and participating in the daily life of your research participants" (Hammett, Twyman, & Graham, 2015, p. 168)

Hammett, Twyman & Graham (2015) also point out that participant observation typically requires a considerable time commitment. In fact, participant observation is typically reserved for single case studies due to this factor, with writers on ethnographic methods such as Aull Davies (2008) and Hammett et al. (2015) asserting that for a project to be considered an ethnography the minimum time commitment should be 12 months. In this project, I adopted a single embedded case study approach across six informal settlements in three cities to ensure balance and variety (Stake, 1995), making a 12-month time commitment to each settlement or city unfeasible. My approach sought a balance between breadth and depth. While undertaking this case study in a single location would have led to deeper engagement with a particular context, the design adopted enabled me to triangulate my findings across diverse locations with similar sociospatial features. Nevertheless, I found myself adopting the posture of a complete observer (Gold, 1958) to enrich my understanding of people's narratives. These field observations were used to clarify context and frame further data collection.

Individual interviews with residents, and occasionally with development workers, were conducted directly in informal settlements. Having conducted formal interviews, I visited the community with interviewees, who eagerly showed me their homes and neighbourhoods, including water supply infrastructure, sanitation facilities, and other features that they considered salient. During these visits, interviewees often brought to life the experiences that they had recounted through the formal interview. I documented these visits by journaling reflections on the content and manner of conversations about infrastructure and services, relationships between what I was shown, and the themes discussed in interviews, and occasionally by photographing sites. These reflections deeply enriched the process of annotating interview transcripts and facilitated reflection on the sociospatial manifestations of the themes discussed in the interviews. Although this project may not be formally considered an ethnography due to its engagement with multiple locations over a period of eight months, it does nevertheless draw on the methodological repertoire of ethnography by undertaking field observations.

Data Analysis

In this section, I outline the general approach to data analysis adopted in this project. Further detail about the three rounds of data analysis can be found in the methodology sections of the individual publications following this chapter. Interview and observational data was directly transcribed by me and analysed through a mixture of thematic and open coding using the NVivo qualitative data analysis software. This mixture of open and thematic coding enabled a focused approach to data analysis while maintaining the flexibility to encounter themes of importance not immediately evident in the literature-derived themes (Bazerley & Jackson, 2013).

The data analysis process began with transcribing interviews myself. This task enabled me to gain an intimate knowledge of the data and begin to identify themes of potential importance to the topic prior to formally coding the data. The open identification of these themes informed the selection of the literatures on which the thematic schemes outlined in Appendix D were based. The scheme articulated for Publication 2 was primarily derived from engagement with human wellbeing literature and Max-Neef's (1992) fundamental human needs framework in particular. The scheme articulated for Publication 3 was derived from engagement with scholarship on marginalization, political participation, rights. political ecology, water development, and urban informality.

Research Reporting

Brinkmann & Kvale (2015, p. 219) assert that the question guiding the reporting of research grounded in people's stories is: "How can I reconstruct the original story told to me by the interviewee into a story I want to tell my audience?" To be as faithful as possible to the stories told by research participants, I adopted a narrative approach. According to Moen (2006, p. 56), narrative research is appropriate in cases "where the challenge for the researcher is to examine and understand how human actions are related to the social context in which they occur." As such, this project makes generous use of direct quotes from participants, particularly in Publications 2 and 3. Since this thesis is focused on understanding the experiences of informal settlers and development workers engaged with improving water services on the ground, this approach was deemed appropriate. Research reporting also encompasses consideration of the ethics of reporting. In reporting my findings, I paid attention to the three ethical guidelines of *informed consent, confidentiality,* and *consequences,* as outlined in Table 5 below.

Table 5: Ethical Reporting Guidelines in this Study

Ethical guideline	Description	Application to this project
Informed consent	Interviewees should have a clear understanding of the eventual use and publication of their interviews, ideally with written agreement.	An explanatory statement outlining the nature and aims of the project was read to each interviewee, with an opportunity provided for discussion and clarification. All interviewees provided written consent to the interview, its audio recording, and the publication of its contents. In cases where participants could not provide written consent, verbal consent was received and witnessed by a third party.
Confidentiality	Names and other identifying characteristics should not be published.	Names of interviewees, informal settlements and NGOs have not been published and other identifying characteristics have been elided from reports of findings.
Consequences	Reporting should not lead to negative consequences for research participants.	No negative consequences from the content of interviews were foreseen, either for individual interviewees or for the NGOs involved, in part due to the attention to maintaining the confidentiality of interviewees and NGOs.

3.2.4 Research Validity

Brinkmann & Kvale (2015, p. 283) frame the question of validity as "quality of craftsmanship", and assert that it should pervade the whole research process. This question relates to both the *internal* and *external validity* of the project, which I have assessed across seven stages, as outlined in Table 6.

Table 6: Validation at Seven Stages in this Thesis (adapted from Brinkmann & Kvale 2015, pp. 283-284)

Internal or External Validity	Validation stage	Description	Application to this project
Internal	Thematising	The validity of an investigation rests on the soundness of the theoretical presuppositions of a study and on the logic of derivations from theory to the research questions of the study.	I framed the problem that dominant approaches to the development of water services in informal settlements do not adequately operationalise the values of equity and wellbeing.
	Designing	The validity of the knowledge produced involves the adequacy of the design and the methods used for the subject matter and purpose of the study. From an ethical perspective a valid research design involves beneficence – producing knowledge beneficial to the human situation while minimizing harmful consequences.	The focus of this project on the *experiences* of settlers led me to choose in-depth, loosely structured individual interviews as the most appropriate research method capable of drawing out narratives from research participants (Moen, 2006). The research design is geared towards generating insights to inform approaches to the development of water services that are more beneficial to meeting the needs and aspirations of informal settlers, therefore meeting the criteria of beneficence.
	Interviewing	Validity here pertains to the trustworthiness of the subject's reports and the quality of the interviewing, which should include a careful questioning of the meaning of what is said, and a continual checking of the information obtained as validation in situ.	I placed emphasis on clarifying the meaning of concepts and experiences discussed in the interviews (see Appendix B for an example of two interview transcripts). In each case study, I validated the claims and experiences discussed by consistently seeking clarification and drawing out illustrative examples from participants.
	Transcribing	The question of valid translation from oral to written language is involved by the choice of linguistic style of the transcript.	Interviews in this project were undertaken either directly in English or in Hindi and Marathi through interpreters. This led to multiple linguistic styles to be transcribed. I transcribed all interviews myself to ensure consistency and deepen my familiarity with the transcript data. In transcribing, I was faithful to the exact words of the interviewees, even in cases where the grammatical construction was awkward. Furthermore, I annotated transcript data to identify emphasis and to integrate the reflections of interpreters on the use of colloquialisms and emphasis in the original language.
	Analysing	This involves the question of whether the questions put to a text are valid and	The analysis strategy adopted in this project is discussed in detail in Section 3.2.3.

		whether the logic of the interpretation is sound.	
External	Validating	This entails reflective judgment as to what forms of validation are relevant in a specific study, the application of the concrete procedures of validation, and a decision on the appropriate community for a dialogue on validity.	The findings of this project can be *analytically generalised*, as discussed in section 3.2.2. Discussions were held with my supervisory panel regarding procedures for validation, including the possibility of running workshops with research participants to seek comment on my findings. Through these discussions I concluded that the internal validity of the project could be ensured through attention to the seven stages of validation addressed in this table. The validity of interpretations of interview data was ensured by triangulating responses across interviewees and supplementing these interpretations with field observations. Furthermore, the findings are presented as a thesis including publications. Each publication was submitted to the peer-review process of respected academic journals, therefore maximising the *external validity* of the research.
Internal & External	Reporting	This involves the question of whether a given report gives a valid account of the main findings of a study and the question of the role of readers of the report in validating the results.	The reporting strategy of this project is discussed in detail in Section 3.2.3. Research outputs are further externally validated through submission of stand-alone publications to peer-reviewed journals.

3.3 Limitations of the Research

Last, it is important to acknowledge several limitations to this research. As emphasised this project, the case study that comprises the primary method of data collection in this study cannot be considered representative. Each informal settlement and its population is characterised by distinct sociospatial dynamics. It is important to note that since this case study was undertaken in India, with its distinct socio-economic and environmental features, religious make-up, cultural traditions, political system and ideologies, and trends in urbanisation, aspects of the findings discussed in this study may not be as applicable to other settings. Research conducted in other geographical, cultural, and political settings may well uncover different experiences. In this sense the aim of this project has not been to identify a universal list of capabilities/wellbeing dimensions that water development initiatives should consider. Rather, it has sought to underscore the need to undertake efforts to develop water services guided by an understanding of what these services mean to the people they are meant to

benefit. While effort was made to link the findings with broader literature from diverse geographical contexts other than those explored here, it is important to note that certain dynamics will be different in other contexts.

This study sought to include a balance and variety of perspectives through a sampling strategy that explicitly included diverse occupations, genders, ages, and positions within communities. This strategy is in line with the recommendations of Yin (2009) and Stake (1995). However, the range and depth of interviews was limited by the fact that all fieldwork was conducted by a single doctoral student. India presented a challenging setting in which to conduct doctoral fieldwork on one's own, in great part due to the relative concept of time guiding a lot of professional relationships and the oftentimes challenging environmental conditions (e.g. monsoon) impacting the ease with which data could be collected. A similar project undertaken as part of a team of researchers may be able to overcome such obstacles more easily, and potentially facilitate the collection of a greater range of interview and observational data, as well as the potential inclusion of quantitative survey data over a series of time points to furnish longitudinal insights. Such data could provide insight into the expansion and/or contraction of capabilities linked to improvements and/or degradation in water services over a longer period and across more locations than was feasible in this project.

As mentioned earlier in the chapter, no individual currently working for government institutions was interviewed as part of this research. This decision was based on the outcome of informal discussions with such individuals, during which they illustrated an unwillingness to share details about the governmental approach to urban water development beyond highlighting that the government has no legal obligation to provide infrastructure and services to settlements that are considered illegal. Since evidence indicates that many improvements in water services in informal settlements happen *despite,* rather that *because* of government (N. Anand, 2011; Bapat & Agarwal, 2003; Björkman, 2014), a decision was made to focus on the experiences of non-state actors such as residents and development workers from NGOs. However, the insights gained through this study may be deepened, and more effectively operationalised, by validating them with government and other institutional actors such as international development organisations and funding agencies such as the Asian Development Bank and other similar bodies with competencies in the urban informal sector and in infrastructure development.

It is also important to note that this project has been primarily engaged with human development. However, as was recognised in the conclusion to Publication 2, the realisation of human needs and aspirations through water service development needs to be balanced with consideration of the broader ecological systems in which people are embedded. While it is beyond the scope of this project to engage with the environmental dimensions of

water development in any depth, these should continue to form an essential component of any effort to develop water services.

Lastly, this study has explored the obstacles to securing equitable access to water services in informal settlements. As discussed in the conclusion to Publication 3, the obstacles uncovered were primarily political obstacles between communities and the state. However, there are also intra-community dynamics governed by factors such as gender, caste, language, religion and community hierarchies that impact the equitable access to water services in informal settlements. While it was beyond the scope of this study to engage with these questions, these factors should be considered relevant in articulating strategies to improve access to water services.

CHAPTER 4: ACHIEVED OUTCOMES - WATER SERVICES AND WELLBEING IN URBAN INFORMAL SETTLEMENTS

This chapter is the first data-driven chapter in this thesis, consisting of the publication '*An Indian case study of water services and human wellbeing in urban informal settlements using the Fundamental Human Needs framework'*. This publication presents the first set of findings from the empirical case study conducted in the Indian cities of Faridabad, Delhi, and Mumbai. Publication 1 in Chapter 2 established the need for research to investigates the types of water services that informal settlers seek to secure, and how these are linked to the capabilities required for them to realise their aspirations for wellbeing. This publication presents the findings resulting from this analysis to address this gap.

There is an emerging body of scholarship on water that seeks to reframe water as a question of wellbeing, which has furnished the development practice and scholarship communities with invaluable insights. In the last decade, scholars such as Crow, Swallow & Asamba (2012), Mehta (2014), Goff & Crow (2014), Jepson et al. (2017) and Crow & Swallow (2017) have argued for a focus on the multiple connections between water services in low-income settings and the capabilities required by people to escape, and safeguard against, poverty. And yet, precisely what constitutes wellbeing remains either vaguely defined or unarticulated. This paper extends the call by the foregoing scholars to view water as a question of wellbeing by arguing for the adoption of a holistic understanding of wellbeing that considers both the intrinsic and instrumental value of multiple dimensions of wellbeing. Most importantly, this publication analyses water service arrangements in urban informal settlements through the lens of such an understanding of wellbeing, thereby illustrating the important insights and potential avenues for transformative action that can be identified by doing so. This paper achieves Objective

2 of this project: to characterise the relationship between water services and people's needs and aspirations (wellbeing) in urban informal settlements.

4.1 PUBLICATION 2: An Indian case study of water services and human wellbeing in urban informal settlements using the Fundamental Human Needs framework

Francesco M. Gimelli, Briony C. Rogers & Joannette J. Bos

Abstract: Although water service challenges in urban informal settlements have traditionally been linked with public health, development scholarship increasingly emphasises the relationship between water services and broader human wellbeing. Nevertheless, how wellbeing is defined in the literature remains unclear, leaving questions about what dimensions of wellbeing are to be fostered through water service development. In this paper, we argue that prominent interpretations of wellbeing in the water sector do not adequately represent the range of impacts of water services on the ability of informal settlers to meet their needs beyond survival. To address this gap, we make the case for the adoption of Max-Neef's (1992) fundamental human needs (FHN) framework in the water sector, which presents a clear, holistic and dynamic understanding of wellbeing. We illustrate how using the FHN framework uncovers potential pathways by which water service development can satisfy a broad range of fundamental human needs through a case study of water service arrangements across six informal settlements in the Indian cities of Faridabad, Delhi and Mumbai and reflect on the key implications of our findings for how water service development is approached in urban informal settlements.

Keywords: urban informal settlements, water services, wellbeing, fundamental human needs, India

4.1.1 Introduction

Residents of low-income settings such as urban informal settlements (UISs) are burdened with deficiencies in water services such as water supply and sanitation. In India, where this study is situated, governing authorities typically deny residents of UISs access to basic services based on the view that they are illegal encroachers on public and private land (Bhan, 2009). Residents are left to negotiate ad-hoc access to water services, either constructing them themselves, including by illegal means such as tapping public water pipes, or by resorting to private vendors whose extortionate prices lead to such vendors being commonly referred to in India as the "water mafia" (Sethi, 2015). This is the reality lived by more than 65 million people in India as of the last

government census in 2011 (Government of India, 2011) and by approximately one billion people across low-income countries (UN-Habitat, 2013). The lack of access to safe, reliable, affordable and adequate water services contributes to negative outcomes in health and other measures of wellbeing such as livelihoods, access to education, social cohesion, and political inclusion (Subbaraman et al., 2015; UN-Habitat, 2016). However, development discourse and practice primarily focus on water service deficiencies as a public health issue. For example, the right to safe drinking water and sanitation was enshrined by the UN General Assembly (2010) in 2010, which framed the necessity of this step with reference to rates of morbidity and mortality. While it is true that deficiencies in drinking water and sanitation are leading causes of disease and premature death in low-income settings, water development discourse increasingly acknowledges water service deficiencies as challenges to multiple dimensions of wellbeing beyond health (Mehta, 2014).

In fact, wellbeing has become a central element in integrated water resources management (IWRM), which serves as the central approach towards the achievement of Sustainable Development Goal (SDG) 6 "to ensure availability and sustainable management of water and sanitation for all" (United Nations, 2015). The Global Water Partnership (2012), for example, defines IWRM as "a process which promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment." But, what constitutes 'economic and social welfare'? The ambiguity of these terms as they are used in water development literature has been recognised for a decade (Biswas, 2008), but appears not to have yet been comprehensively addressed.

Recently, a body of scholarship has sought to address s this ambiguity by employing the Capability Approach (CA) (Nussbaum, 2011; Robeyns, 2005; Sen, 1999, 2013) to human development, a normative framework which asserts that social policies and institutions should foster people's capabilities to function (Robeyns, 2005). 'Function' refers to people's 'beings and doings', such as working, being politically active, being respected, safe, well-educated, and so on (Robeyns, 2003, 2005), while 'capabilities' are "the genuine opportunities or freedoms to realize these functionings" (Robeyns, 2006, p. 351). CA-informed water development scholarship argues that social policies and institutions should be geared towards fostering the capacity of individuals to "live the kinds of lives they have reason to value" (Sen, 1999, p. 10). Mehta (2014, p. 67), for example, challenges the dominant, primarily technical approach to addressing water scarcity by showing how "…merely having access to water is not enough. Instead, a person needs a certain kind of access in order to derive certain freedoms or functionings (i.e. capabilities)…" such as being safe, working, politically active, educated, and so on. Her conclusion is that

policymakers need to focus on the "…multidimensional aspects of water and their links with human well-being and how individuals and communities can play an active role in shaping their water futures" (ibid.). Goff & Crow (2014) critically assess global water development policy, and in so doing find that the global focus on securing access to drinking water sidelines consideration of the domestic and productive uses of water that people rely on to achieve wellbeing. More recently, Jepson et al. (2017, p. 3) have extended Mehta's call to reconsider water scarcity in terms of capabilities for wellbeing by making a normative claim to "a ''right to water security," or a right to the ability of individuals, households, and communities to…secure safe and affordable water particularly in ways that support the sustained development of human capabilities and wellbeing in their full breadth and scope." These scholars strengthen the call to approach water service challenges as challenges to wellbeing. However, the existing CA water literature is not clear on what constitutes wellbeing, nor how water service arrangements are linked to it. In this paper, we argue that what is missing from current capability-focused discourse is a clearly-defined, holistic and dynamic understanding of wellbeing. We demonstrate how this gap can be filled by an understanding of wellbeing such as the one found in the Chilean economist Manfred Max-Neef's (1992) fundamental human needs (FHN) framework and show how adopting this understanding of wellbeing in the sector strengthens the potential of water development initiatives to maximise wellbeing benefits through a case study of water service arrangements and fundamental human needs in UISs across three Indian cities.

4.1.2 Maslow, Alderfer & Max-Neef: Three Frameworks of Human Needs

Before undertaking our analysis, however, it is important to a) acknowledge and outline some of the influential social psychological conceptualisations of human needs that have informed research into the relationship between services and wellbeing, and; b) to justify our assessment that the FHN framework helps to fill some of the gaps found in the scholarly engagement with the this relationship to date.

Psychological research widely accepts that human beings have a set of constant needs across all cultures and periods (Tay & Diener, 2011), and that these needs are grounded in the condition of being human (they are ontological), are few, finite, and classifiable (Max-Neef, Elizalde, & Hopenhayn, 1991). Several frameworks have been put forward to represent such needs in human development literature, two of the most prominent of which are Maslow's (1943) hierarchy of needs (HoN) - famously represented as a five-tier pyramid representing physiological, safety, love, esteem and self-actualisation needs - and Alderfer's (1969, 1972) refinement of the original five-tier typology into the three needs for existence, relatedness and growth (ERG). While there are

some differences between these two frameworks that do not relate to our current analysis, both frameworks ultimately view the satisfaction of basic, physiological needs such as water, air, food, and shelter as the prerequisite for the pursuit of higher needs such as social belonging and self-development, hence their presentation as hierarchies.

Both the HoN and ERG frameworks have informed analyses into the relationship between services and the realisation of human needs, of which there are two examples that reflect on water services. While it is beyond the scope of this study to delve into these examples in depth, it will suffice to say that both studies agree that there is a hierarchy of needs in relation to water services. The first study is Parikh, Chaturvedi, & George's (2012) study of the role of basic infrastructure (particularly water and energy) in UISs and the ability of residents to pursue what are categorised in the HoN as higher-order aspirations. Parikh et al. (2012, p. 478) find that access to drinking water, sanitation, waste management, flood protection, affordable energy and roads/transport "represent the basic physical infrastructure required to function and survive", and should therefore be classified as "aspirations for hygiene needs as lower order aspirations." This view continues to suffuse development discourse, including in globally influential development frameworks such as the Sustainable Development Goals (SDGs) that primarily frame water service challenges through the lens of public health while sidelining other dimensions of wellbeing (Gimelli, Bos, & Rogers, 2018).

The second study is de Haan et al.'s (2014) stretching of the originally individualistic ERG framework to the societal scale to claim that societal systems are intended to fulfil societal needs. In keeping with the hierarchical conceptualisation of needs found in the ERG framework, de Haan et al. (2014, p. 125) assert that,

> "[i]t seems that, in the context of societal systems, some needs should be considered to take
> precedence over others…Think for example of supply of drinking water, electricity for critical
> infrastructures or emergency health care services."

It is not difficult to see the value of the claims of both Parikh et al. (2012) and de Haan et al. (2014); some services are more effective than others at satisfying human needs. However, unlike the HoN and the ERG framework, Max-Neef (1992, p. 17) distinguishes between *needs* and *satisfiers* of those needs:

> "…food and shelter, for example, must not be seen as needs but as satisfiers of the fundamental
> need for Subsistence. In much the same way, education (either formal or informal), study,
> investigation, early stimulation and meditation are satisfiers of the need for Understanding".

Agreeing with this distinction leads us to claim that services such as a supply of drinking water, electricity for critical infrastructures or emergency health care services are not needs *per se*, but rather satisfiers of broader, overarching needs. After all, it is possible to imagine how fundamental human needs could be satisfied without electricity, even though having it might make their satisfaction more complete or likely. For these reasons, we distinguish between satisfiers of human needs and the broader needs in our case study.

If drinking water is framed as a need, then it is viewed as a self-contained entity and the goal of water development efforts; if it is viewed as a satisfier of human needs, then it could in theory satisfy more than one need at a time. Acknowledging this distinction helps to address Neher's (1991) critique of hierarchical conceptualisations of human needs such as those found in the HoN and ERG frameworks for lacking acknowledgment that needs are dynamic and overlapping in nature. This clear distinction between needs and satisfiers is similar to the distinction in the CA between functions and capabilities, although the latter is often vaguely articulated (Pelenc, 2014). This is one of the reasons why we base our analysis on the FHM framework.

A further reason is that unlike the CA, the FHN provides a clearly-defined, holistic and dynamic understanding of wellbeing. As Table 1 indicates, the FHN framework is composed of nine dynamically-related, non-hierarchical needs defined on the basis of four categories representing potential satisfiers: 1) being (personal and collective attributes); 2) having (institutions, norms, mechanisms and tools such as laws); 3) doing (personal or collective actions), and; 4) interacting (refers to locations and contexts as times and spaces), resulting in a matrix of 36 cells. The formulation of these needs and satisfiers as a matrix results in the articulation of dimensions of wellbeing with considerable overlap, therefore addressing Neher's (1991) critique of hierarchical formulations of wellbeing. The FHN matrix led to the formulation of the *Human-Scale Development* (H-SD) model (Max-Neef et al., 1991, p. 8), examples of which include Bryce et al.'s (2016) operationalisation of a cultural ecosystem services (CES) framework defining potential cultural benefits stemming from 151 marine sites in the UK through and a project to map the hurdles to actualising human needs presented by perceived patterns of unsustainable consumption in the Catalonian city of Lleida (Guillen-Royo, 2010). These studies, among others, indicate the capacity of the FHN framework to map a broad range of wellbeing benefits related to sustainable development issues. However, this paper presents the first case study of the relationship between water services and wellbeing through the FHN framework.

Table 7: Max-Neef's (1992, pp. 206-7) Fundamental Human Needs Matrix

Need	Being (qualities)	Having (things)	Doing (actions)	Interacting (settings)

Subsistence	Physical health, mental health, equilibrium, sense of humour, adaptability	Food, shelter, work	Feed, procreate, rest, work	Living environment, social setting
Protection	Care, adaptability, autonomy, equilibrium, solidarity	Insurance systems, savings, social security, health systems, rights, family, work	Co-operate, prevent, plan, take care of, cure, help	Living space, social environment, dwelling
Affection	Self-esteem, solidarity, respect, tolerance, generosity, receptiveness, passion, determination, sensuality, sense of humour	Friendships, partners, family, partnerships, relationships with nature	Make love, caress, express emotions, share, take care of, cultivate, appreciate	Privacy, intimacy, home, spaces of togetherness
Understanding	Critical conscience, receptiveness, curiosity, astonishment, discipline, intuition, rationality	Literature, teachers, method, educational and communication policies	Investigate, study, educate, experiment, analyse, meditate, interpret	Settings of formative interaction, schools, universities, academic groups, communities, family
Participation	Adaptability, receptiveness, solidarity, willingness, determination, dedication, respect, passion, sense of humour	Rights, responsibilities, duties, privileges, work	Become affiliated, cooperate, propose, share, dissent, obey, interact, agree on, express opinions	Settings of participative interaction, parties, associations, churches, communities, neighbourhoods, family
Idleness	Curiosity, receptiveness, imagination, recklessness, sense of	Games, spectacles, clubs, parties, peace of mind	Day-dream, brood, dream recall old times, give way to	Privacy, intimacy, spaces of closeness, free time, surroundings, landscapes

	humour, lack of worry, tranquillity, sensuality		fantasies, remember, relax, have fun, play	
Creation	Passion, determination, intuition, imagination, boldness, rationality, autonomy, inventiveness, curiosity	Abilities, skills, methods, work	Work, invent, build, design, compose, interpret	Productive and feedback settings, workshops, cultural groups, audiences, spaces for expression, temporal freedom
Identity	Sense of belonging, consistency, differentiation, self-esteem, assertiveness	Symbols, language, religions, habits, customs, reference groups, roles, groups, sexuality, values, norms, historic memory, work	Commit oneself, integrate oneself, confront, decide on, get to know oneself, recognise oneself, actualise oneself, grow	Social rhythms, everyday settings, settings which one belongs to, maturation stage
Freedom	Autonomy, self-esteem, determination, passion, assertiveness, open-mindedness, boldness, rebelliousness, tolerance	Equal rights	Dissent, choose, be different from, run risks, develop awareness, disobey, meditate	Temporal/spatial plasticity (anywhere)

4.1.3 Methodology

<u>Case Study Approach</u>

Our case study aims to understand how water service arrangements in UISs are experienced by residents as hindering or satisfying their ability to meet their needs. For this, we undertook a single embedded qualitative case study of the experiences of residents surrounding water service arrangements across six water-insecure urban informal settlements in the Indian cities of Faridabad, Delhi and Mumbai. Individual and collective experiences are by their nature grounded in the unique perspectives and experiences of the people that recount them and are temporally dynamic. As such, we do not claim that the data we collect and relay here is representative of the aspirations of all urban informal settlers. Making such a claim would ignore the

individuality and complexity of human beings. What we do provide is a snapshot of how water service arrangements hinder or enable the ability of a set of individuals to satisfy their fundamental human needs across diverse locations and at a particular point in time. Stake (1995, p. 4) asserts that "[c]ase study research is not sampling research" based on this recognition of human subjectivity and dynamism. Nevertheless, we sought to diversify our research sample to ensure a "balance and variety" (Stake, 1995, p. 6) of perspectives and experiences based on the following criteria.

Location and Participant Sampling Strategy

We selected participants from two informal settlements marked by long-term and ongoing water insecurity in each city. The settlements selected for this case study are all non-notified (unauthorised), meaning that they are officially denied access to basic services such as water supply, sanitation, electricity, and waste management by governing authorities, although over the years small clusters of households within these settlements have become notified because of electoral promises. In such cases, notification occasionally led to the provision of piped water supplies that were nevertheless generally found to be unreliable. All settlements have been settled for at least two decades and are primarily composed of migrants from less socio-economically developed regions of India such as Bihar, Uttar Pradesh, Rajasthan and in Mumbai, from migrants from rural Maharashtra. Most households in the settlements depended on unreliable deliveries of water tankers either from local government or private providers for most of their basic water needs and community-installed standpipes. According to local non-governmental organisations (NGOs) and residents, every source of water supply across the settlements requires further treatment to become safe for human consumption. At the time of data collection only a handful of households had access to latrines on premises, leaving most people to openly defecate. However, all settlements apart from one in Mumbai had access to a communal toilet block, although these were not adequate to cater to the sanitation needs of the entire population. While marked by ongoing water service deficiencies, all settlements have also been the target of water development initiatives, facilitating the investigation of how improvements in water service delivery impacted people's ability to meet their needs. All settlements are the targets of ongoing initiatives by NGOs, ranging from the implementation of low-cost home water filters, bio-toilet construction, sanitation and hygiene training, and technical assistance for community construction of water tanks and communal water taps. All the communities included have also undertaken community-driven improvements (always unauthorised by the state) to secure infrastructure such

as water storage tanks and communal water taps, while the communities in Mumbai have also undertaken litigation to have residents' right to water services legally recognised.

Initial contact with research participants was facilitated by local development NGOs, community-based organisations engaged with water development and the Faculty of the Tata Institute of Social Sciences' Centre for Water Regulation, Policy and Governance. In total, 15 men and 14 women over the age of 18 with diverse positions in their communities were selected for participation based on snowball sampling resulting from initial contact. Although interviews included six community leaders, the rest of the interviews were undertaken with housewives, students, day labourers, small business-holders, unemployed individuals, and domestic workers. The inclusion of this variety of individuals was intended to derive insight into the impact of water services on the aspirations of individuals with diverse experiences, perspectives and positions, and is in line with the recommendations for balance and variety in case study research made by Yin (2009) and Stake (1995).

Data Collection, Analysis & Reporting

Collection, analysis and reporting of data was guided by the Consolidated Criteria for Reporting Qualitative Research (COREQ) 32-item checklist (Tong, Sainsbury, & Craig, 2007). Written informed consent was gained from participants for all interviews after reading and discussing a research explanatory statement. In cases where the participant was not literate, verbal informed consent was gained and witnessed in writing by a third party. The first author undertook 29 semi-structured, in-depth individual interviews averaging one hour in duration, numerous field visits, observations and informal individual and group discussions with residents over a period of eight months from March to October 2016. Individual interviews were undertaken in the home of participants wherever possible, or in communal spaces offering privacy. Interviews were conducted in English in instances where residents could express themselves in the language with confidence. In most cases, however, interviews were undertaken in Hindi and Marathi with the assistance of an experienced interpreter. Interviews began by asking individuals what water means to them in their daily life and progressively focused in on responses that indicated the relationship between participants' access to water services and their ability to satisfy their needs. Guiding interview questions were formulated so as to facilitate an open and fluid discussion of individual and collective experiences of water service arrangements, rather than to focus on the dimensions of Max-Neef's (1992) FHM framework. Doing so enabled the evaluation of whether participants discussed satisfiers and needs found in the framework without prompt.

Interviews were audio recorded and transcribed by the first author using the NVivo qualitative data analysis software, followed by a process of theoretical coding based on the FHM framework. It is important to note that the references coded refer to *satisfiers*, rather than the overarching categories of *needs;* references to individual satisfiers contributed to an assessment of the role of water service arrangements on facilitating the satisfaction of needs. It is also important to note that we coded references to both physical infrastructures (e.g. bore wells, pipes, water tanks, drains etc.) and social infrastructures (e.g. communal support networks, common management structures etc.) that impacted or mediated forms of access to water services. This is in line with Gimelli, Bos, & Rogers' (2018) assertion that people's ability to benefit from water services is partially determined by social power dynamics and social mechanisms of access. References were also coded for water service delivery failures and improvements, which provided a useful anchor into considering the shape and quality of water service arrangements across our case study locations and the impact of such factors on the ability of individuals to satisfy their needs. This approach follows that found in Subbaraman et al.'s (2015) mixed method study investigating multidimensional household water poverty; in that study, the authors identify the importance of water service delivery factors of *ease of access, equity, price or affordability, quality* and *quantity* on quality of life impacts. These factors are interrelated, leading to individual responses being frequently coded in relation to multiple factors, which is reflected in our findings below.

4.1.4 Findings

Through our analysis, we coded 237 references to satisfiers of fundamental human needs. Figure 1 represents the percentage of these references coded in relation to each of the nine overarching fundamental human needs found in Max-Neef (1992), which we describe with illustrative quotes in order of frequency below. It is important to note that many, if not most, of the illustrative quotes presented in the following sections could also fit in sections relating to other needs. If anything, we feel that this demonstrates the dynamic and overlapping nature of the fundamental human needs surveyed in our study, which validates the approach presented by Max-Neef (1992).
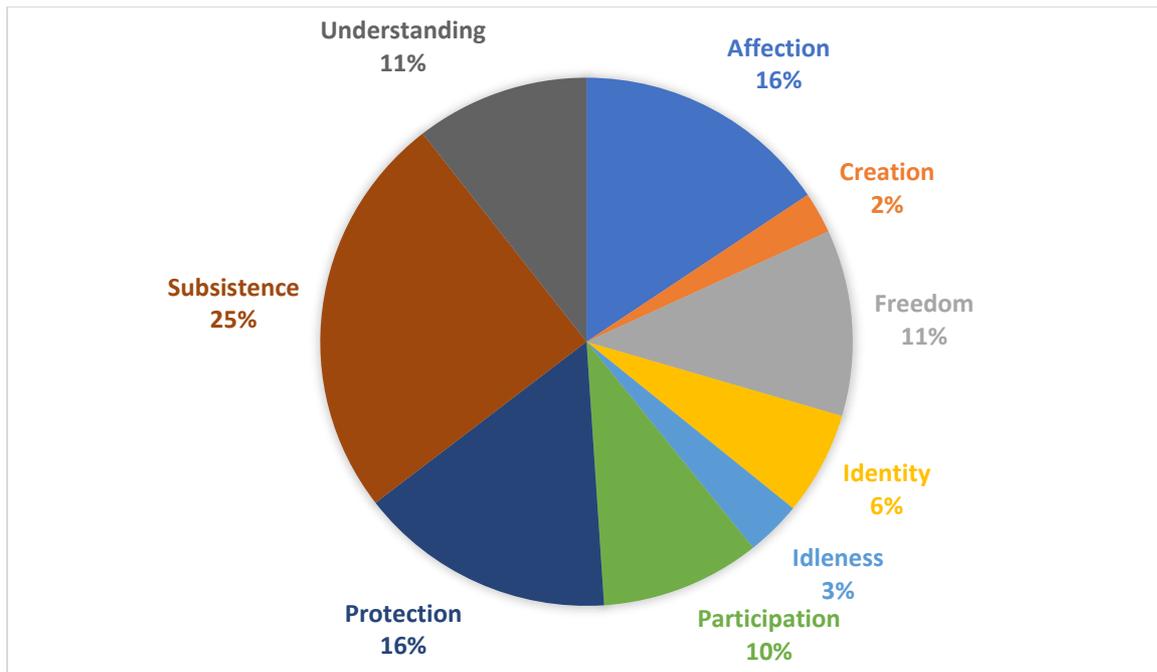
Figure 3: Percentage of total coded references to fundamental human needs

Subsistence

Perhaps unsurprisingly, the most frequently cited impact of water service arrangements on wellbeing was found to be on satisfiers of the need for subsistence. Individuals consistently identified polluted water sources as the main cause of illness in their households, while people cited improvements in both the quality and reliability of water services as the main reason for improvements in health. This finding is consistent with recent epidemiological studies that show that the greatest improvements in gastrointestinal and related health outcomes for residents of low-income settings result from an uninterrupted supply of water in the home (Ercumen et al., 2015; Kumpel & Nelson, 2016). However, health impacts were not the only hindrances to meeting the need for subsistence cited by participants.

Another commonly identified hindrance to meeting this need was the effect of unreliable or difficult-to-access water connections on people's capacity to secure steady employment. As one community leader from Delhi pointed out,

> "People who oversee getting water cannot work elsewhere. It's an unpaid job. And most of them work as daily labourers, so there's no job security there either. So, not showing up for a few days could mean the difference between getting a job or not getting it entirely."

This was a common experience among many participants across the case locations, with individuals frequently citing the increased opportunity to hold a steady job as one of the key benefits of having reliable, easily-accessed water services. Water service arrangements were also found to have an impact on people's ability to maintain a satisfactory living environment and social setting, as indicated from the following comments from these two residents from Delhi and Mumbai respectively:

> "The problem is that these days people don't have water [to drink]. [At the same time] there is water standing in front of all our houses. You can't go out. You can't move much."

> "We all want a really good life. Everybody wants to live a better life. We would be able to live like the people outside in the other communities, how they live with all the better facilities. And they have basic facilities, it's not better, it's just basic what they have. Kids would have the opportunity to go to school, women would have safety, they would have proper facilities. People who work could go to work on time."

Protection

The second most frequently cited wellbeing impacts of water service arrangements were on satisfiers for the needs for protection and affection, which comprise both self-directed (e.g. autonomy and self-esteem) and other-directed (e.g. taking care of, prevent, cure) satisfiers. In terms of protection, housewives often expressed anguish at being unable to take care of their families by cooking for them on time, facilitating their development, keeping the home clean, and providing a safe environment for their children. This is the point made by a housewife in Delhi,

> "I have a one-month old child and one older one. Now what do I do? Do I ask my older child not to go to school to collect water? How can I compromise on his education?"

Participants also identified the impacts of having to rely on expensive private water supplies on their capacity to save money for other things. This inability to save was framed by many participants as decreasing their sense of social security, particularly in relation to their ability to access health systems and pay for other basic services such as electricity. For example, one resident and water rights activist in Mumbai pointed out that,

> "The people over here are poor. They make maybe around 100-200 rupees per day. But just imagine that they are going to be paying 25 rupees for this water, for drinking water. So, this

causes a lot of problems for us. It's not just the drinking water, they are also paying for the water from the bore well. They are paying for drinking water, they are paying for bore water. They must look after their families, they must look after the health issues, they have to pay electricity. So, there is a lot of problems that we face."

Paying such a high percentage of a household's daily income on water alone can have serious effects on the ability of residents of UISs to access services such as healthcare. In India, healthcare services overwhelmingly require out-of-pocket payment, including by the poor. Berman, Ahuja, & Bhandari (2010) found that such payments are a leading cause of impoverishment in India. Therefore, the erosion of the financial margins of poor households due to exorbitant costs related to necessities such as drinking water can diminish the ability of people to access social services such as healthcare.

<u>Affection</u>

The need for affection, which includes having qualities such as self-esteem, solidarity, respect, passion and determination, among others, was impacted by water service arrangements across multiple dimensions. Participants frequently implicated the denial of basic water services with their sense of self-esteem and respect, expressing the feeling that this denial made them feel inferior. Female participants related this experience to their reliance on open defecation, while arrangements ranging from access to communal toilets to the less-common in-home latrines satisfied this need for affection by providing privacy and self-esteem. As one young woman from Faridabad reflected when talking about the local communal toilet block,

"Before, there was a lot of eve-teasing [harassment of women]. And we go in the morning and the night, because in the daytime we cannot go. Everybody is looking. And we used to get problems. Boys used to pass dirty comments. Now it's less, because girls are not going out."

While this was a common reflection from women across the case locations, many participants also implicated the social, rather than physical, infrastructures in place in their communities with an increase in their ability to satisfy their need for affection. For example, participants from Mumbai often reflected on the growing self-esteem caused by their water rights activism. One long-term resident and activist reflected that,

"First, they [the residents] got the confidence that they are legitimate citizens of this country. They are. And they have a right to this city, and they have a right to the resources of the city, and they have a right to the water and sanitation. So, that confidence now, so previously these communities were very threatened. They are very vulnerable condition. And they always begging

water. Now they are saying 'we're not begging. This is our water and we want it. And you are only the agent as the government, to distribute water. This is our water.'"

The same participant pointed out that for many residents, this increase in self-esteem based on solidarity and determination has resulted in an improved capacity to negotiate with both public (e.g. local government) and private (e.g plumbers and water vendors) actors for improved access, with concrete improvements in water services for many households. A similar finding was made in Faridabad, where a group of more than 150 local women formed a Self-Help Group (SHG) with the assistance of a local NGO. This SHG provides microcredit loans from the pooled donations of the women and provides a network of support that members can draw on as a safety net in times of need, as asserted by one member,

> "The change is that all us women, we all live together, and are very unified in our approach to many things. So, if I get a pain, my friend will also get affected by that, that love and bond is very strong. Many times, when fights happen in the community we try and go to solve, so maybe the other people they come and say 'why are you interfering in their business? let them fight, it's not going to solve your purpose.' But still we try to go and sort it out."

The SHG has also been a key platform through which residents launched campaigns to secure access to water services. One member, for example, recounted how a group of 150 women forced their way to a state government minister's office to demand the provision of basic water services. Although the minister's secretary tried to deny the women access to the minister, they refused to be ignored. The women stayed in place and eventually managed to see the minister and secure his support. He promptly contacted the local government authority and secured a commitment for the construction of piped water supplies to the women's community. At the time of data collection, several of these connections had been constructed.

Understanding

The fourth most frequently cited impact of water service arrangements was on the need for understanding. Most references to this need were made in relation to the ability of individuals to access and benefit from settings of formative interaction, schools, communities and family, as well as the ability to investigate and study. In particular, participants consistently identified the extra time resulting from improvements in the reliability and ease of access to water services as one of the main satisfiers of this need. For example, one parent from Delhi

reflected on the reality before her household gained access to a reliable water supply: "Parents could not send the children to school. They told them to stand in a queue for water."

Another commonly referenced hindrance or satisfier for this need, simultaneously with time efficiency, was the frequency and severity of illness resulting from water quality. As one mother and resident social worker from Mumbai respectively explained,

> "In terms of my kids, every other day they are sick because they cannot have a shower. So, they cannot go to school, they cannot go to college because they are never on time."

> "Because of the lack of facilities there was a big dropout in children going to school, because none of them could go to school. The thing is that they wished to go to school. The children of course wanted to go to school. But they couldn't because they didn't have basic facilities like no roads, no electricity, no water, no sort of basic amenities to live."

Another satisfier of the need for understanding was participants' collective efforts to improve the community's water services. For example, members of the SHG and a Youth Parliament facilitated by a local NGO with the aim of providing a setting for young residents of UISs in Faridabad to learn to navigate political structures expressed their sense of empowerment at learning to navigate complex bureaucratic systems in their quest to challenge perceived inequities in their access to water services. Local NGOs in Faridabad, Delhi and Mumbai focused attention on raising the awareness of residents on the relationship between water and health, as well as the rights of residents to water services according to local, state and central government policies. Residents that took part in these awareness-raising activities reported a positive improvement in their sense of being able to be critical of government policy and expressed a sense of gratitude for having such settings of formative interaction. As one young man from Faridabad reflected,

> "After the awareness programs people know what their rights are. How they can pressure the government agencies…to give them the basic facilities that we need. Now they know what their rights are. If you don't provide them the necessities, they will go to the higher authorities, they will complain…Now they can complain to anyone…So, most of the people in our community are aware."

Participation

The need for participation has considerable overlap with the needs for affection (particularly in relation to satisfiers such as solidarity and determination) and understanding (particularly in relation to settings of communal and formative interaction). Coded references to this need were primarily made in relation to the satisfiers of solidarity, adaptability, determination, respect, rights responsibilities, duties, privileges and work. Broadly speaking, residents reflected on how efforts and social structures aimed at overcoming water insecurity galvanised their communities to support one another. For example, as one resident from Mumbai reflected on his community's water rights activism,

> "There are different problems that we face over here in terms of our housing, in terms of water. In these terms I have seen that everyone gets together, we help each other out and I have seen that everyone gets together, and we have a lot of unity. And that's how we live here. And we move forward."

Such capacity for participation can have concrete impacts on the reliability and ease of access of water services available to residents. For example, one young woman in Faridabad recounted how water rights awareness meetings run by a local NGO made her and dozens of other local women feel empowered to directly intervene with a local gatekeeper that controls access to the community's water supply,

> "Through those meetings we learned how to live together and work together for one purpose. Before we didn't have water availability. 20-30, and 50 ladies we come together. We go to the one that operates the tube, we went to him, and after talking to him he sends the water in the community."

The equity of water service arrangements was also implicated with the need for people to interact and cooperate; participants often bemoaned the conflicts that arise at points of water collection as creating unsafe atmospheres and animosity between residents, leading to a decreased sense of community. As one woman from Delhi asserted,

> "If you actually did a kind of survey to find out what were the primary sources of conflict you would find sanitation and water being the top of that list, actually. It's all about your drain bringing dirty water to my house, or it's just about you taking more water than me. So, 90-95% of the fights are actually about water and sanitation-related issues."

Conversely, where these existed, collaborative community-based water management were praised by residents as satisfiers for the need for participation, along with needs for protection and affection. In Delhi, for example,

one community leader recounted that his settlement had refined one such arrangement over the previous two decades. This process began with some members of the community noticing improvements in services in neighbouring settlements and collectively deciding to scope opportunities for improvements by measuring the groundwater level in their own settlement. Having found a substantial amount of groundwater, the community collectively funded the installation of water pumps and articulated a water-sharing program by which households would be allotted an amount of water that is monitored. One long-term resident explained the nature of the arrangement and emphasised its capacity to satisfy the need for protection through adaptability,

> "Everyone has a connection to the tank. There is a valve that decides how much and how long. And essentially there is an operator there that closes it at various times. So essentially, if the time of someone falls during a period when there is no one at home, they can make that information know, and they will be given time later in the day to make up for it…While there have been evolutions in people's demands, for example people have got larger homes, have started taking people on that pay rent, have larger families, so we have made adjustments here and there giving people 10 minutes more or less. There have been adjustments that have been reflected in the access to water, but broadly speaking conflicts have been managed in a pre-emptive fashion, that involves the entire community in a meeting together being publicly aware of what adjustments are being made and implemented."

Freedom, Idleness/Leisure, Creation & Identity

Although not as frequently cited as the foregoing needs, water service arrangements were also found to impact participants' need for freedom, identity, idleness or leisure, and creation. Of these four needs, freedom was the most frequently referenced, particularly with reference to individual autonomy, self-esteem, equal rights and the freedom to be in any location without restriction. This link was particularly emphasised by women, who felt restricted in their freedoms by the harassment that they frequently experienced at the point of collection for water supplies and when openly defecating, as discussed in Section 4.3. However, this need was also satisfied from the realisation of what residents felt was their ability to assert their equal rights, as also discussed in Section 4.3.

In terms of identity, residents expressed how the denial of water services to their settlement often dented their self-esteem and sense of belonging, both of which overlap with the assertion of residents' right to the city made in Section 4.3 and as recounted by a young man from a settlement in Faridabad,

> "[The local government] is not bound to give us the water. We have managed through the bore wells, but the quality of water we are accessing from the bore wells is not fit for consumption…so, you know, if you are living in poor conditions…it is, you know, some type of inferior feeling."

Another way that water service arrangements impacted the satisfaction of identity needs was by hindering or enabling the expression of one's religious identity. In Delhi, a Muslim resident expressed his dismay at not being able to provide for the needs of his guests because of an unreliable and inadequate water supply,

> "You have to utilise water very conservatively. As I am Muslim, if I have a guest coming over I must provide for his bath. You need to. If they have clothes to be washed you must make sure they are done well, or you have to make sure that they are washed routinely."

The need for idleness and leisure was most frequently impacted by the unreliability of water supplies. For example, several respondents cited their inability to relax, and even to sleep, "We cannot sleep well. In the middle of the night we have to check if the water has come or not." However, residents also cited the opportunities for the beautification of their landscapes created by a secure and reliable supply of water. In Delhi, one woman recounted how,

> "…when we first got direct water to our house, I planted a small papaya tree, and I got 7kg of papaya from it recently. Without water that was unthinkable! And now we have fairly big trees, and all of this is a product of the fact that 15 years ago we started getting water more easily. This is something that makes me very proud."

The ability to grow one's own food, which is dependent on the availability of adequate water supplies as well as free time, can also be framed as a satisfier for the need for creation, which includes having abilities, skills, methods and work. In relation to this need for creation, some residents also identified their water insecurity with their inability to be determined in pursuing their life goals, as explained by one young man in Faridabad,

> "The water situation affected our studies and our daily life routines…it affected whatever we are going to do in a particular direction, in a particular manner…Continuously effected our direction, our goals, whatever we put our mind to achieve our goal, and all these factors. If we get sick then

we must definitely devote our time to our sick condition, and that's why we couldn't be able to give our 100% in that particular goals…"

4.1.5 Implications of our Case Study for Water Development Practice

The preceding analysis has shown that water service arrangements are to varying degrees implicated with the satisfaction of the whole range of fundamental human needs. While we note that this is beyond the scope of this paper, each of these relationships is worth further investigation. Nevertheless, in this section we discuss four key insights stemming from the findings from our case study that challenge current approaches to water service development in UISs.

Water services are about people's aspirations, too

First, our case study underscores that water services are not merely linked with individuals' ability to survive, but with their broader aspirations for flourishing, too. This conclusion is in step with the understanding presented by prominent urban planning theorists such as Roy (2005, 2009b, 2009c), Varley (2013) and AlSayyad (2004) that urban informality should not be understood merely as a state of desperation, but of aspiration. This assertion is validated by our case study in that residents sought the satisfaction of every fundamental human need through their access to water services, even though they frequently lived in areas without even the most basic of these. In contrast to Parikh et al.'s (2012, p. 478) study, we do not find that residents seek improvements in water services to fulfil "aspirations for hygiene needs as lower-order aspirations", nor simply because they "lack safe drinking water and fall ill with waterborne diseases" (Global Water Partnership, 2013, p. 3); residents seek water services that will facilitate the satisfaction of their needs for affection, protection, understanding, freedom, identity and creation alongside their need for subsistence.

Our case study underscores that residents experience their access to water services as both a remedy to living in what development discourse often frames as "slums of despair" and as a factor shaping their ability to benefit from living in what many residents simultaneously see as "slums of hope" (Owusu, Agyei-Mensah, & Lund, 2008). And yet, water development remains firmly focused on the despair, rather than the hope. This is the view reflected in the common but incomplete claim made by the Global Water Partnership (2013) that strategies such as IWRM are needed because people are getting sick. Such claims singularise consideration of drinking

water quality and quantity while sidelining factors such as reliability, cost, collection time, and equity and ease of access that our case study shows are linked with the satisfaction of the whole range of fundamental human needs. According to Goff & Crow (2014, p. 161), the sidelining of factors beyond quality and quantity "means that an opportunity to reduce poverty may be overlooked", adding that such "a narrow focus on health has encouraged international agencies to believe that the goal of access has been achieved." Indeed, this finding concurs with the understanding of poverty found in the FHN framework, which frames any analysis of fundamental human needs in terms of *poverties* and *wealths* (Max-Neef et al., 1991). Our analysis shows the capacity of water services in UISs to either enrich or impoverish communities in terms of wellbeing.

Wellbeing is both an inherently and instrumentally valuable resource

Second, we find that the satisfiers of fundamental human needs surveyed in our case study possess both inherent and instrumental value. For example, wellbeing scholars Dodge, Daly, Huyton, & Sanders (2012, p. 230) point out that the strengthening of psychological, social and physical resources (once again, poverties or wealths) is what enables individuals and communities to achieve a sense of stable wellbeing, which they define as "when individuals have the psychological, social and physical resources they need to meet a particular psychological, social and/or physical challenge." As our findings frequently highlight, individuals and communities draw on satisfiers for needs such as affection, protection and understanding as resources by which to provide support to one another, foster resilience, and challenge perceived injustices in government provision of basic water services.

This evidence strengthens our call for a shift away from the water sector's singularisation of public health concerns towards a focus on fostering wellbeing in all its complexity and dynamism. This shift may better address multiple needs of residents of UISs by revealing how particular configurations of water services can enrich or impoverish their lives. Instrumentally, being able to pursue water service arrangements capable of increasing the wealth of communities measured in fundamental human needs may also strengthen their capacity to secure improvements through their own agency. For example, our case study reveals that water service arrangements can either foster or hinder self-esteem, solidarity, critical thinking, the capacity to challenge authority and to dissent and to participate in settings of formative participative interaction, among others. In turn, these satisfiers were found to be essential to individuals and communities seeking and securing improved water services. And yet, such factors are not linked to water services in global instruments driving water development efforts, such as SDG 6 to "ensure availability and sustainable management of water and

sanitation for all" (United Nations, 2015)(Crow et al., 2012; Crow & Swallow, 2017). In SDG 6, the main reason for pursuing water development remains to avoid morbidity and mortality, rather than the capacity of people to pursue good lives (Gimelli, Bos, et al., 2018).

Water services should be better linked to other development sectors

Nevertheless, there is scope within instruments such as the SDGs to facilitate the consideration of the complexities highlighted in our case study in the water sector. The SDGs are formulated as seventeen individual goals with constituent targets and indicators functioning as an interconnected network (Le Blanc, 2015; Sachs, 2012). While the current formulation privileges the public health dimensions of water, clearer linkages between SDG 6 and its constituent targets and indicators and those from SDGs such as SDG 4 (quality education), 8 (decent work and economic growth), and 10 (reduced inequalities), among others, should be explicitly drawn. The result should be development initiatives that are driven by a broader understanding of wellbeing than that found in existing approaches to water development such as IWRM. Since 'economic and social welfare' remain undefined within IWRM, it might be possible to interpret these values according to the FHN framework. Doing so would be an important step towards operationalising the wellbeing-focused approach to water service development called for by Goff & Crow (2014), Mehta (2014), Jepson et al. (2017) and Crow & Swallow (2017) by bringing the multiple potential wellbeing benefits of water service development to the fore of practitioners' and policy-makers' minds. However, effective operationalisation would also require the identification of appropriate indicators for monitoring and evaluation, a task that should occupy future research in this area but which could draw on the existing instruments such as the Human Development Index (Giannetti, Agostinho, Almeida, & Huisingh, 2015; Kubiszewski et al., 2013), Social Progress Index (The Social Progress Imperative, 2017) and Happy Planet Index (Abdallah et al., 2009).

The impact of water development on wellbeing cannot just be measured by the presence of pipes and toilets in the home

Our fourth and final insight is that the impact of water development cannot be measured exclusively by the presence of in-home piped water connections and latrines. Our case study is filled with examples of physical infrastructures that satisfied a range of needs but are not considered as fulfilling the measure of access according to international standards (Dombroski, 2015), such as communal toilet blocks (as referred to in Section 4.3),

and community-driven water supply arrangements not approved by the state (as referred to in Section 4.5). Our case study also presents examples of social infrastructures such as the SHG in Faridabad that enabled local women to secure improvements in water services for their communities. Dombroski (2015) attributes the exclusion of such arrangements from evaluations of access to water services to a Western-centric conception of water and sanitation that is out of step with the diverse realities lived by populations in low-income settings. And yet, such infrastructures represented forms of access that satisfied a range of fundamental human needs for our participants. Nevertheless, development discourse does not typically consider improvements secured through the agency of residents if these are not undertaken collaboratively with the state. This approach is problematic in UISs, which are often defined by their distinction from the formal, state-sanctioned city (Johnston, 2014). In the face of an almost completely absent state, it is the initiative of individuals and the community that makes it possible for residents to access water services capable of satisfying their fundamental human needs, even if this may not result in arrangements that look like those in New York or Melbourne.

AlSayyad (2004) goes so far as asserting that urban informality is "a new way of life" that cannot be understood simply by the parameters of primarily European/North American understandings of urbanity. If this is indeed the case, the water sector also needs to understand that the configuration of water services capable of satisfying fundamental human needs in UISs may look very different than those in other settings. Our case study shows that fundamental human needs can be met, even if only partially, by water service arrangements unique to certain communities. If communal toilets can satisfy these needs, would it not be appropriate to evaluate the positive impact of such services and promote their diffusion?

4.1.6 Concluding Remarks

There is an emerging consensus in development discourse that water services are strongly linked with human wellbeing. Precisely what constitutes 'wellbeing', however, remains mostly unclear. In this paper, we have shown that replacing this ambiguous notion of wellbeing with the clear, holistic and dynamic understanding of wellbeing found in the FHN framework highlights the truly transformative potential of water service development in the lives of residents of UISs and perhaps for others living with water service challenges.

This potential relates to residents' ability to satisfy needs for affection, protection, participation, understanding, leisure, freedom, identity and creation as much as it does to their survival. It is the satisfaction of these complex and dynamically interacting needs that makes it possible for people to realise their aspirations for a good life, or

at least to make genuine progress towards doing so. Our case study shows that water services and the way that people access them shapes this ability in a variety of ways. This understanding should form the basis for the planning and evaluation of strategies to improve access to water services in UISs. While our research indicates the potential shape of such strategies, future research should be geared towards articulating, testing and evaluating such strategies.

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4.2 CONCLUSIONS FROM PUBLICATION 2

Publication 2 moves beyond the argument that water service development should be considered a question of wellbeing to ask what constitutes wellbeing, and how water service arrangements in urban informal settlements either enhance or deteriorate it. This task enhances the specificity of the argument that water is an issue of wellbeing and achieves Objective 2 of this project: to characterise the relationship between water services and people's needs and aspirations (wellbeing) in urban informal settlements. By using Max-Neef's (1992) fundamental human needs matrix, this publication has shown that water service arrangements in urban informal settlements are implicated with the ability of individuals and communities to meet physical needs such as subsistence – the typical focus of water development interventions – as well as social and psychological needs, such as protection, affection, understanding, creation, idleness, participation, and freedom. This insight validates the assertion by scholars such as Mehta (2014) and Jepson et al. (2017) that water challenges are challenges to the entire sense of individual and collective wellbeing. However, the paper extends this assertion by providing insight into *how* water service arrangements in urban informal settlements can impact the universal and fundamental needs that constitute human wellbeing.

The insights presented in the paper are not intended to provide a universally applicable template of the relationship between water services and wellbeing. In fact, the paper repeatedly emphasises that all it can provide is a snapshot of this relationship that is specific to the individuals and communities constituting this project's case study. Nevertheless, the analysis presented in this publication highlights the need to adopt a clear, specific and operational definition of wellbeing to guide water development practice. Approaching the goal of wellbeing in water development through the multidimensional, dynamic and complex approach found in Max-Neef (1992) and Dodge et al. (2012) reveals the transformational potential of water service arrangements in urban informal settlements. By appealing to such an understanding of wellbeing, this paper shows that water service arrangements can foster, or hinder, capabilities such as solidarity, determination, self-esteem, critical faculties, and the capacity to challenge decision-makers, among others. Such capabilities have intrinsic value by fostering a sense of self-worth and autonomy. However, they are also instrumental in enabling individuals and communities to tackle the physical, social and psychological challenges to their wellbeing that they face. Such insights beckon water development scholars and practitioners to consider a range of water service delivery factors beyond the traditionally dominant consideration of quality and quantity. Reliability, equity of access, and affordability are instrumental in facilitating the ability of individuals and communities to benefit from water services but are currently at the margins of water service development planning and evaluation.

CHAPTER 5: PROCESS FREEDOMS - WATER SERVICES AND EQUITY IN URBAN INFORMAL SETTLEMENTS

Having investigated the relationship between water service arrangement and the wellbeing of residents of urban informal settlers in Publication 2, Publication 3 in this chapter turns to understanding what stands in the way of informal settlers' access to services contributing to the expansion of wellbeing. This task is essential to translating the notion of 'process freedoms' found in the CA for the water sector. There is a rich body of research and practice literature exploring barriers to securing equitable water services in cities and urban informal settlements. Scholarship in this area ranges from exploration of the technical challenges of providing water infrastructure and services to informal settlements (e.g. Brown & Holcombe, 2004; Engel, Jokiel, Kraljevic, Geiger, & Smith, 2011), supportive governance reforms required (e.g. Appadurai, 2001; Earle, 2014; Moretto, 2007; Roy, 2009a, 2009b), and the political dimensions of water service provision in informal settlements (e.g. Budds, 2009; Chaplin, 1999; Sultana, 2007; Swyngedouw & Heynen, 2003; Zérah, 2014).

In this publication, and in this thesis more broadly, I let the research participants tell me, through their experiences, what the biggest challenges to securing water services in informal settlements are. This is done by capturing a range of professional and lay perspectives. As such, this publication makes an original contribution to scholarship by relying on the experiences of residents and development workers engaged with these issues on the ground to gain insight into these obstacles. This publication engages extensively with water development scholarship, urban planning theory, social justice theory, participatory development theory and political ecological theory to unpack the narratives of the research participants and derive conclusions about the obstacles standing in the way of water services capable of providing multiple benefits to informal settlers. The conclusions derived from this research highlight the necessity of engaging with the political dimensions of water service deficiencies to address some of the root causes of these deficiencies. In this paper, I ask: what obstacles keep residents from having access to water services that provide the benefits that they need? In answering this question, this chapter achieves Objective 3 of this project: to examine the process freedoms by which residents and development workers seek to secure water services capable of meeting people's needs and aspirations in urban informal settlements. It also contributes to the achievement of Objective 4: to devise principles and strategies that may inform water service development approaches capable of fostering the needs and aspirations of urban informal settlers.

5.1 PUBLICATION 3: The quest for water, rights and freedoms: urban informal settlements in India

Francesco M. Gimelli, Briony C. Rogers & Joannette J. Bos

Abstract: In this paper, we draw on the narratives of residents and development workers to understand what freedoms hinder and enable access to water services in informal settlements in the Indian cities of Faridabad, Delhi and Mumbai. We show that although development practice and thinking in the water sector often frame water deficiencies as politically neutral, technical and/or governance challenges, residents and development workers on the ground identify a lack of freedoms relating to a) residents rights to the city and it resources and 2) meaningful engagement between residents and the political establishment as key causes for inadequate access to water services. Our findings indicate that water service development efforts can be more effective if they include strategies to strengthen informal settlers' rights to the city through a politicization of public engagement. We discuss the implications for practice of our findings and outline a future research agenda geared towards operationalizing our key findings.

Keywords: water services, informality, India, development, capabilities

5.1.1 Understanding Water Services and Capabilities in Urban Informal Settlements

Residents of informal settlements are typically denied land tenure, leaving them vulnerable to eviction; are often marginalized in decision-making; face poverty and social exclusion, and; are denied basic infrastructure and services such as water supply and sanitation (UN-Habitat, 2016). Such conditions contribute to lower quality of life for the majority of informal settlers, and severely curtail their abilities to live secure, prosperous lives (Giri, 2000; Subbaraman et al., 2015). Among the disparities between the formal and the informal city, access to water services such as water supply and sanitation represents one of the most marked. According to the noted urban geographer Matthew Gandy (2008, p. 108), the "…tortuous flow of water through contemporary Mumbai presents one of the most striking indicators of persistent social inequalities." The same may be claimed of many, if not most, cities in low-income settings. Such deficiencies have a range of impacts on health (De

Albuquerque & Roaf, 2012; Konteh, 2009), people's livelihoods (Bhandari & Grant, 2007; Crow & Swallow, 2017; Joy et al., 2014; Nicol, 2000), access to education and healthcare (Koolwal & van de Walle, 2013; Marks, Komives, & Davis, 2014; Subbaraman et al., 2015; United Nations, 2003), and reflect asymmetries in power dynamics within households, localities, cities, and beyond (Budds, 2013; Jepson et al., 2017; Linton & Budds, 2014; Swyngedouw et al., 2002).

Nevertheless, governments across the world have traditionally engaged with informal settlements antagonistically (Nijman, 2008; UN-Habitat, 2003). For example, they frequently clear informal settlements and relocate residents to new localities located on urban peripheries (N. Anand & Rademacher, 2011; Björkman, 2014). In the last two decades, in-situ slum upgrading projects have also become more common, although governments remain reluctant to support such projects for fear of legitimizing informal settlements (Burra, 2005). Furthermore, without adequate provision of tenure, upgrading projects have been found to lead to displacement of settlers through gentrification (Lees et al., 2016). Such projects may secure the right to better services such as piped water connections and latrines, but often disrupt social support networks and livelihoods by displacing people from communities that they have often spent decades building (N. Anand & Rademacher, 2011; Desai & Loftus, 2013; Doshi, 2013; Nijman, 2008).

A rich body of scholarship has articulated the importance of investigating and addressing such forms of marginalization in the quest for more just modes of water service delivery. Budds and Sultana (2013, p. 275) underscore that such investigation is needed to "…direct research on water-related development interventions in the Global South in new and productive ways, by showing how water and power relations intersect to shape differential access and outcomes among diverse social groups, to configure particular discourses around water management, and to produce uneven waterscapes."

The task of more clearly articulating the relationship between informality, water and justice has been taken up by numerous scholars. McFarlane (2004), Anand and Rademacher (2011), and Doshi (2013) have provided rich empirical examples of how the poor in Mumbai resist efforts that claim to improve their access to services while in reality further marginalizing them; Bakker (2007) and Mirosa and Harris (2012) have explored the evolution of the concept of the human right to water, and its capacity to address pressing issues of marginalization hindering access to water services; Joy et al. (2014) assert the need to re-politicize water governance to address the marginalization of the poor. More recently, Crow and Swallow (2017) and Jepson et al. (2017) have illustrated the need to view water in marginalized settings as a key factor in ameliorating poverty and fostering wellbeing. What these scholars, among many others, ultimately share is the quest to understand how water

development efforts can foster more just environments for those whose capacity to meet their basic needs and work towards realizing their broader aspirations are curtailed by deficiencies in water services. Much of this literature is rooted, or at least influenced, by the Capability Approach (CA) to human development first articulated by the Nobel Prize-winning economist Amartya Sen (1999, 2013). The CA argues against unidimensional measures of development such as Gross Domestic Product (GDP) in favor of a more holistic vision of development as fostering the *freedom* of individuals to "live the kinds of lives they have reason to value" (Sen, 1999, p. 10). This freedom is constituted of three sub-components: 1) achieved functionings, representing realized outcomes, e.g. being safe, employed, educated etc.; 2) opportunity freedoms, referring to the opportunities that people have and have reason to value, and; 3) process freedoms, which "are related to agency and the conditions in which people and groups can exert agency" (Alkire, 2010, p. 93). Although the utility of this understanding of development for the water sector has been recognized and discussed by scholars such as Mehta (2014), Goff & Crow (2014), Jepson et al. (2017) and Crow & Swallow (2017), operationalization of the CA remains a challenge, in part because it is so "radically *underspecified*: there are a number of theoretical lacunae that can be filled in a variety of ways" (Robeyns, 2006, p. 353, original emphasis).

In this paper, we build upon the insights of CA-focused water development scholars and contribute to the task of operationalizing the CA for the water sector by drawing on the direct narratives of residents and development workers engaged with water service challenges. These narratives provide insight into the process freedoms that individuals draw on, fight for, and/or lack in their quest to secure access to water services. Although not originally specified in CA literature, we interpret these process freedoms to go beyond the strictly political to include "any form of participation through which the poor gain access to services and other means of problem solving" (Banks, 2008, p. 366). This interpretation is essential in settings actively shaped by their marginalization from the state such as urban informal settlements and leads us to ask what process freedoms residents and development workers aim to secure to ensure residents' access to water services that meet both their basic needs and broader aspirations for wellbeing.

5.1.2 Methodology

Case Study Design

The empirical foundation of this project was a single embedded qualitative case study of the experiences and reflections of residents of urban informal settlements and development workers from three non-governmental

organizations engaged with water development efforts on the ground across six informal settlements in the Indian cities of Faridabad, Delhi and Mumbai. Although Mumbai and Delhi are renowned megacities and Faridabad is not, the latter forms the southernmost part of the Delhi National Capital Region (NCR) and cannot therefore be meaningfully separated from the city of Delhi. We selected settlements from these three Indian megacities because of four factors: 1) the prevalence of informal urban development (Dupont, 2011; Government of India, 2011; Narayan, 2013b; UN-Habitat, 2016); 2) the typically antagonistic attitude of local, state and federal governments towards these communities (Björkman, 2014; Dupont, 2011); 3) similar historical and present common water insecurities among these communities, and; 4) established institutional relationships between the researchers and organisations working on water development within these communities.

We selected two non-notified (unauthorized) settlements per city for our case study to facilitate the identification of common themes and experiences across diverse locations with similar demographics, political challenges of marginalization and water service arrangements. Non-notified status means that residents are denied basic services such as sanitation, water supply, electricity and waste management, although small numbers of households within each settlement have become notified due to electoral promises. Local governments often deny services based on the argument that informal settlements are unauthorized even though state legislation may make provisions for the delivery of basic services to informal settlements. For example, in the state of Maharashtra, in which Mumbai is located, the development of informal settlements is governed by the Maharashtra Slum Areas (Improvement, Clearance and Redevelopment) Act, 1971 (Government of Maharashtra, 1971), which makes provisions for "improvement works" that include "laying of water mains, sewers and storm water drains" and "provision of urinals, latrines, community baths, and water taps." The Municipal Corporation of Greater Mumbai (MCGM), on the other hand, stipulates that settlers that cannot provide documentation proving that they were resident in their location prior to the year 2000 are not eligible for basic services or for compensation when their homes are bulldozed (N. Anand, 2017; Björkman, 2014; Graham et al., 2013). Similar policies govern urban informal development in Delhi and Faridabad, and mean that most settlers do not receive basic services or compensation when they are displaced because they typically lack formal documentation even though they may have resided in their location prior to cut-off dates (Doshi, 2013; Murthy, 2012). Roy (2009c, p. 76), however, illustrates that India's planning regime is itself an "informalized entity" characterized by "deregulation, ambiguity, and exception." Roy (2009c, p. 80) highlights that "[i]nformality is inscribed in the ever-shifting relationship between what is legal and illegal, legitimate and illegitimate, authorized and unauthorized." For example, Ghertner (2008) and Dupont (2011) point out that

most of Delhi violates planning and building laws, and can therefore be considered unauthorized. Although the distinction between the formal and the informal is somewhat fictitious in India (as in many cities in the Global South), governments use these categorizations to try to control urbanization, leaving residents to negotiate these fictitious distinctions to secure services (Darling, 2017; Parnell & Pieterse, 2010).

Dwellings with notified status in our case study were found to have typically been provided with on-site water connections, although these were often reported to be unreliable. This led virtually all residents to continue relying on unreliable deliveries from water tankers from either state or private providers and stand-pipes, both of which required further treatment to become fit for human consumption. At the time of data collection most residents practiced open defecation due to a lack of in-home latrines and the insufficiency of communal toilet blocks. The material histories of infrastructure in our case study settlements indicate an abiding and long-standing struggle to secure water services in the face of marginalization by the state, with the latter providing regularization for a minority of households within them to secure electoral support.

The identification of locations was undertaken with assistance from the faculty at the Tata Institute of Social Sciences Centre for Water Regulation, Policy and Governance in Mumbai and management staff from three NGOs and community-based organizations engaged in water development issues across our case study cities. We did not adopt a sampling strategy intended to result in universal generalization of our findings; the social, spatial and political dynamics of informal settlements are too varied to be adequately represented in a case study. In this regard, we agree with Stake (1995, p. 4) that "[c]ase study research is not sampling research." We nevertheless aimed to diversify our research sample to ensure a "balance and variety" (Stake, 1995, p. 6) of perspectives and experiences. This quest for balance and variety led the first author to conduct a total of 44 in-depth individual interviews over a period of 8 months between March and October 2016. Although we set out with a strict conceptual distinction between development workers and residents we found that these identities frequently overlapped. This finding led us to focus on including the voices of individuals with diverse positions within both residential and development practice communities. In total, 24 men and 20 women ranging in ages from 18 to over 60 were interviewed. Although some of these individuals held positions of authority within their communities and organizations (e.g. community leaders and program managers), other residents were housewives, unemployed, students, day laborers, or self-employed, while individuals working in development held a range of roles including community liaison officers, educators, outreach and empowerment officers, technical assistance officers and engineers. We are confident that the inclusion of this variety enriched our findings.

Interview and observational data collected during field work were analyzed by the first author through a mixture of theoretical and in vivo thematic coding (Bazerley & Jackson, 2013) using the NVivo qualitative data analysis software. Theoretical themes for coding were derived from scholarship on marginalization, political participation, rights. political ecology, water development, and urban informality, while in-vivo coding led to the validation and refinement of the theoretical coding scheme by extracting codes directly from the transcript data. This approach to coding led to the consolidation of thematic codes into the two overarching themes discussed in the findings and discussion section.

In reporting our findings, we adhere to the narrative research approach, which privileges the relaying of narratives arising from qualitative research (Moen, 2006). According to Moen (2006, p. 56), narrative research is appropriate in cases "where the challenge for the researcher is to examine and understand how human actions are related to the social context in which they occur." With the narrative approach in mind, we have sought to identify narrative threads arising from the whole of the interviews rather than presenting the totality of individuals' narratives. Where possible, we have maintained the responses of the interviewees verbatim. Some of the interviews were undertaken in English and the rest in Hindi and Marathi through a professional interpreter. In cases of the former, we have corrected only for grammar where required for clarity of the response and indicated this with square brackets. While some responses may at times appear awkward, we felt it important to preserve the language of respondents as faithfully as possible.

5.1.3 Interpreting the Voices of Informal Settlers and Development Workers

Our analysis of the data collected through the case study led to the identification of two dominant recurring freedoms discussed by respondents across the case study settlements as shaping residents' access to water services: 1) informal settlers' rights to water and to the city, and; 2) the capacity of informal settlers to make their voice voices (and needs and aspirations) heard by the political establishment.

<u>Settlers Have a Right to the City, its Resources and its Water</u>

Of 44 interview respondents, more than half discussed the fight for recognition of their rights to water, and to the city more broadly, as instrumental in the quest for better water services. It is here important to note that 'rights' can be variously understood. In a strictly legal sense a right is a political, economic or social entitlement enshrined in law (Janoski, 1998). However, rights claims are often based on moral arguments. Bhan (2009), for

example, points out that the urban poor in India have traditionally based their claim to belonging and citizenship on the right to the city, which Harvey (2003, p. 939) asserts "is not merely a right of access to what already exists, but a right to change it after our heart's desire". Such claims are moral and aspirational in nature, although a component of this aspiration is to have the right to the city enshrined in law.

This claim is evident in the words of a senior development worker and resident in Mumbai, who asserted that "[settlers] have a right to this city, and they have a right to the resources of the city, and they have a right to the water and sanitation." This was echoed by a development worker in Faridabad: "[y]ou are a citizen of this country. The government cannot neglect that you are staying in an unauthorized slum. They must provide all the facilities." Our research participants did not talk about the right to access the formal city, but the right to belong to the city in a way that, being viewed as outside of the norms of urban planning, is currently neither understood nor sanctioned by the authorities. One resident from Faridabad pointed this out when reflecting on the reasons why they are denied water services,

> "[the] government is also not implementing the water tank because our community is unauthorized. That's why government is not taking initiative to implement a lot of water tanks."
>
> ,

This common experience led many residents to pressure the municipal government for access to water services, since the mechanisms state representatives use for the provision of water services in Indian cities indicate that they seem unwillingto acknowledge the needs and aspirations of a population and urban setting that does not conform to the prevailing notion of the city as a planned setting. In part, the process of applying pressure that non-state actors – particularly residents – engage in seeks to realize the "good city….that now embraces universal service access, allowing basic human rights to be realized" (Parnell & Robinson, 2012, p. 608). However, appeal to this vision of the city goes beyond the scope of legal rights alone towards an aspirational, even moral, understanding of rights that transcends both legal and human right to water discourses. In talking about the lack of recognition of rights, our research participants expressed their desire for a good city and asserted it through collective actions such as establishing a Youth Parliament in Faridabad and the bringing forward of Public Interest Litigation (PIL) in the Bombay High Court to have informal settlers' right to water enforced (since it is, in fact, already recognized).

Participants also talked about the lack of recognition of rights both in relation to their own understanding of their rights, and the lack of acknowledgment of these rights on the part of governing authorities. Numerous respondents point out that a lack of awareness by individuals regarding their rights presented an obstacle to

securing improved services. One respondent working as a community liaison officer for an NGO in Delhi pointed out that "the different types of problems that the community are facing related to water [are] because they don't know what are their rights." In fact, some respondents asserted that politicians took advantage of the lack of formal education in informal areas to continue to deny residents their rights. One senior staff member from an NGO in Faridabad with decades of experience in the water sector stated that while politicians have the means to provide residents with all the facilities that they require, "…they are not providing [these] because the people are village people, uneducated, voiceless people", stating explicitly that "they want to cheat the people." Such statements indicate that there is a perceived correlation between a lack of education about informal settlers' rights on the part of both residents and decision-makers and the securing of water services in informal settlements.

This perceived lack of education led water development interventions in all three cities to begin their interventions with awareness-raising programs aimed at educating individuals about their rights. In Faridabad, awareness about individual and collective rights was fostered through drama-based activities such as short plays, puppet plays, and interactive problem-solving group activities. The local NGO also specifically sought to raise awareness among young people in informal settlements through a Youth Parliament, which aims to sensitize young people to political decision-making processes. Such activities have resulted in a range of perceived benefits by residents. One 18-year-old resident involved with the Youth Parliament reflected on how this forum enabled young people to directly approach politicians to discuss their grievances, including in relation to water service deficiencies,

> "…through the programs of [the local NGO] most of the persons in our community are now
>
> connected. And you know…first we were not able to talk this first to MLA [Members of the
>
> Legislative Assembly]. We feel that shy, facing others. And now, most of the members of our
>
> youth group can talk to the MLA. You can just sit with anyone…our youth group do this. We can
>
> do this."

As in the case of Mumbai, participatory engagement seeking to strengthen recognition of people's rights and the political decision-making process is linked with the ability to directly engage with decision-makers. The local NGO in Delhi also began its activities with awareness-raising, although this is focused on the impacts of inadequate water services,

> "…we are doing a lot of general awareness rallies, poster-making, wall-painting is there, because
>
> we also make it…the language of the community so that they will understand better, we are

distributing pamphlets as well in that particular community, so that they will understand the issues, they will come up with their own problems and make it voiceable to different stakeholders also."

Participants frequently expressed how the experience of disempowerment could be overcome through education and activism. One resident and long-time social worker in Mumbai emphasized,

"So, basically in terms of schools, the children need to go to school, the children need to get the certificates. The importance of education and how it will help them [residents] progress. We have a lot of parent-teacher meetings, women and parents get together, we discuss, and we train them. So, the basic thing that I understand out of it is that it's awareness that helps people move forward and helps people to do stuff and come out without fear to take an action towards securing their rights."

Through awareness-raising initiatives, people seemed to express how "dialogue and the emergence of consciousness" are "critical elements of an educational experience that would empower the oppressed" (Kuenzi, 2006, p. 3). One social worker and 20-year resident of one informal settlement in the northwest of Mumbai reflected on the process of residents realizing their rights to water: "[w]e realized that our rights have been taken away from us, so by conducting many meetings, many trainings, we all got together. It was a continuous process."

Individuals sought to address this barrier in a variety of ways. In Mumbai, one prominent NGO began its activities by seeking to strengthen residents' recognition of their moral and legal rights to water and to the city. As one resident and senior water rights activist in Mumbai stated,

"[w]e have to build that confidence in the people that they are having a right to water, and they should ask for that right to water. So, building that awareness, building that confidence into the people, that was the first step."

However, this strategy did not lead to any compromise on the part of the municipal government, leading activists and community development workers to explore a range of other strategies to secure water services,

"[we] said to the municipal corporation that 'see, these are the adverse effects on the people's life because of your denial [of water services]. And that is why there is a need to give a connection, because this the municipal corporation is having ample of water. So, there is no water scarcity in

the municipal corporation…So, let's do that, but because of political reason they don't want [poor migrants] to get settled in the city, so they say, 'we will not give it.'

This realization led residents and activities to approach state and national Human Rights Commissions, which reiterated the municipal governments' responsibility to provide water services regardless of notification status. Such a frustrating process highlights the perception that governments deny settlers right to be in the city. This perception led residents and development workers in Mumbai to seek recognition of settlers' right to water through the constitutional provision recognizing the right to life (Article 21); the right to life, they argued, must include the right to water. This aim led one local NGO to commence a PIL case in the Bombay High Court seeking to overturn the local government's denial of water services to informal settlers that arrived after 2000. The NGO won the case, leading to recognition by the court that the state and municipal governments in Mumbai are obliged to provide water connections to everyone, regardless of date of settlement. This decision, however, is yet to be implemented, with the authorities claiming that they require years to formulate an effective policy response to the court's decision.

Getting Negotiating Power: Meaningful Engagement with the Political Establishment

The second freedom impacting residents' access to water services that respondents consistently identified as lacking was meaningful engagement with the political establishment. The perceived lack of this freedom highlights that while some individuals and communities may become aware of their rights, they may nevertheless feel that they are unable to effect change. When asked whether people in the community were aware of who is responsible for the management of water services in their local area, one resident from Delhi stated that "[e]veryone knows, but they're just unwilling to approach the politicians. Everyone knows what the problems with water are, but nobody is willing to do anything about them." In part, this was framed through a perception of the political process as stacked against the interests of residents of informal settlements, which is usually rooted in the lived experience of marginalization at the hands of governing authorities.

In some cases, this lack of meaningful engagement led development workers to intercede directly with decision-makers to secure water services. For example, when we queried Delhi residents about the forms and outcomes of the interventions of the local NGO, they relayed that certain improvements had been secured or promised through the intervention of one particularly well-connected staff member (referred to by participants simply as 'Madam') with ministers and other decision-makers, rather than through their own efforts. One resident

highlighted that "[t]here is slight improvement, but the tanker that comes in the night is highly unreliable. Only when I call Madam is that assured that the tanker will come on time." Another resident of the same locality relayed a similar experience with regards to sanitation, "[w]e spoke to Madam, and she also said that 'I will try to fight on your behalf'. She has given us the reassurance that by 2017 we will have a permanent water supply, and a toilet."

Other respondents, on the other hand, cited the ability to act collectively as a key means of overcoming the lack of engagement with the political establishment. One member of a local women's Self-Help Group (SHG) aimed at providing a forum for women to discuss issues of importance to them, share knowledge and skills and provide a platform for collective low-interest monetary lending from Faridabad stated that, "[w]e need that solidarity, that sense of oneness. People are afraid when we are 15 of us. Everyone is afraid of women these days! So, we essentially collectivize and make ourselves more intimidating in certain spaces, and we are less likely to be pushed over." A senior manager from a local NGO in Faridabad recounted an instance in which women from the SHG sought improvements to their water services and managed to be heard regardless of the barriers placed before them by the establishment,

> "…nearly 150 SHG women, they went and approach[ed]…the central [government] minister. [The] central minister is gone outside, his personal assistant also came and met with the people, he counselled the people and said '[The minister] will go and do all the program for the community.' They insisted: 'No, no, we need to meet the minister.' [And] finally…[the minister] had a meeting with the community people and [said] 'We give the facilities for your people.'"

This example not only reiterates the importance of access to politicians and political processes as a means of securing improved water services, but also reinforces the importance of fostering the confidence of individuals and collectives to effect change through political processes. According to interviewees, the intervention of the women from the SHG led to an increase in the frequency of water tankers. In Mumbai, an increase in the confidence of residents is viewed as a key aspect of putting pressure on governing institutions and maximizing the negotiating power of the marginalized. One resident and long-term water rights activist highlighted this perception explicitly,

> "[f]irst, they [residents] got the confidence that they are legitimate citizens of this country. They are. And they have a right to this city, and they have a right to the resources of the city, and they have a right to the water and sanitation. So, that confidence now, so previously these communities were very threatened. They are very vulnerable condition. And they [are] always begging water."

The same respondent went on to highlight that confidence in the ability of people to influence decision-making processes provided them with a new perspective of citizenship, as well as the negotiating power necessary to secure improved services through both formal and informal channels,

> "[n]ow they are saying 'we're not begging. This is our water and we want it...This is our water.'
>
> So, that confidence is there...They are getting the negotiation power."

This last example from Mumbai highlights how confidence in the ability of informal settlers to influence decision-making is an important enabling factor in securing such services, whether through formal or informal means. However, residents felt alienated from the political establishment in other ways. Respondents across the three case studies viewed the common political practice of using informal settlements as vote banks as symptomatic of this alienation. One senior development worker from Faridabad highlighted this experience,

> "[t]he government investment is very poor in unauthorized communities. They are just using the people as a vote bank. At election time, they make lots of promises: 'we will authorize the slum', 'we will use some wonderful water filtration system', 'we will provide pipes for the supply of water.' Once the election has passed they don't go to see people in the community anymore."

The practice of using communities as vote banks has been a long tradition in India, with politicians often promising benefits to communities such as improved water infrastructure and services in exchange for collective support (Chakrabarti, 2008; Nijman, 2008; Breeding, 2011). However, as a resident and senior convener of the local NGO in Mumbai pointed out, such promises are not followed through: "[e]very time there is an election they [the politicians] come and make promises, that they'll build a road, they'll build a proper sewerage connection, and they'll get water for us. But then no one does anything at the end of it."

Respondents also highlighted that it is widespread practice for local candidates to offer money to residents in exchange for their support, as exemplified by one community liaison office from the local NGO in Faridabad, who pointed out that "[s]ometimes they offer money to us, isn't it? They offer money 'you give us vote', they will give you money. That is how they will sell their vote." While this practice may be common in India, it may imply that individuals willing to take money from politicians see this financial gain as a greater benefit than any gain resulting from promises of action made by other politicians. This implication is evidenced by the way respondents often voiced the view that although they knew that politicians typically did not follow through with their promises to improve water services, they felt they had no choice but to continue to place their trust in the promises of politicians in the hope that this might change. One resident and water rights activist in Mumbai

highlighted this perception by illustrating the approach of the community to the most recent set of promises made to them in the last election,

> "…we are waiting for 1 or 1.5 years to just see what they [the politicians] are doing. Because they have already given us a promise that it's going to benefit [residents]…because the procedure [documenting the dates of settlement by households] has already started. So, we are going to just see how this works, and if it doesn't then I am going to go directly to the minister and we are going to catch them and see."

While the Bombay High Court asserted the right of all individuals to water connections irrespective of date of settlement, the local government continues to adhere to its policy of only providing connections to those that settled prior to the year 2000. Regardless of legally recognized rights and the consistent failure of politicians to follow through with promises made, people continue to place their hopes in these promises. For other residents, the corrupt practices of politicians seeking election, along with the false promises made, leads them to lose trust in the political process altogether. One resident from Delhi illustrated this lack of trust by stating,

> "I [would] vote for whoever is doing my work. I am not partisan to any party. They coerce you, they initially bribe you and then coerce you into voting, but I don't care much about all of that. I am not interested in those people. They are not going to do much for us. I have never taken a bribe from any politician. That's why I just don't go to vote."

The evidence we present here indicates that there is a lack of meaningful engagement between residents of informal settlements and the political establishment. While politicians continue to make promises of improvements in water services that are not followed through with once elected, residents adopt a wait-and-see strategy that appears to have had little success to-date.

Respondents consistently indicated that even in cases where they felt informed and confident enough to assert their rights to urban water services, they often felt derailed by a lack of accessibility to political decision-makers. Intervention by politicians was consistently viewed as a key element in securing water services by respondents. This is testified to by one resident from Delhi who, when asked whether there is a difference in the ability of individuals and collectives to secure improvements in services by recourse to the formal processes in place for this purpose, stated that,

> "…the government officer will listen to you, they will take a note, they will keep it. But again, they will say 'So and so officer has to approve it. I am not the right person.' So, you will wait for it, so if

you know the big guy, if I know the minister I will call him up directly. He will make sure he is my friend, please do it. So, they will make sure they do it. That's it…it is [like] the big godfather sitting on the top, a minister or somebody. If he pulls the string, they will definitely move."

While there is recognition of the instrumental role of politicians in facilitating improvements to water services, individuals generally feel that these politicians are inaccessible. This point is illustrated by the account of another resident from Delhi,

"[w]e won't be able to go and directly speak to the minister. But these are the people that we need the help of. So, we need to find the people who gave us the information…We need to use the same path that we used last time. Essentially approach power step by step. Write a letter, get the signature of everyone in the area, and make sure that we identify the space in which the letter will make most impact. And make sure that we go there, and get listened to, and take the matter higher and higher up by stages."

Development workers in Faridabad sought to overcome this lack of meaningful engagement between residents and political decision-makers by instituting a monthly interface meeting composed of bureaucrats, politicians, community members and NGO staff with the aim of fostering open dialogue and participatory planning. However, thus far the initiative has had limited success due to a lack of engagement from politicians, with the senior staff member responsible for the initiative stating that "[o]ne thing is some of the meetings the politicians, their attendance is very poor. Bureaucrats are there, but the politicians are missing." Although three meetings had taken place by the time this interview took place, no tangible results had been secured through the interface meetings. The same member of staff was more optimistic about the involvement of bureaucrats, while bemoaning the negative impact of the transient nature of many bureaucratic postings in India,

"…the bureaucrats are very different from the politicians. The politicians are the lawmakers, they have to give the funds. The bureaucrats are different. This month they will be here, next month they will get the transfer to another place. That's the biggest challenge."

Arnstein (1969, p. 216), in her seminal work outlining the ladder of citizen participation, points out that public engagement in decision-making is about 'citizen power', since "it is the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately included in the future." However, the lack of meaningful attention provided to informal settlers evident in the reflection on

the interface meeting quoted above could also, and we argue should, be understood as a form of exclusion. This does not negate the agency of residents, however. As one resident in Delhi pointed out,

> "[w]hen nobody will listen to them they have no alternative but to fight for themselves collectively. If there is some work that needs to be done in my camp, and nobody is doing it, and the people really want it to be done there is no option but for them to come together."

Residents are left to rely on what Roy (2009a) terms 'civic governmentality', in which NGOs and resident collectives mediate the exclusion of the urban poor by taking on the functions of the state. This approach is understandable, since the literature is filled with cases where the urban poor are included in decision-making only to find themselves relocated to urban peripheries and faced with their subsequent dislocation from livelihoods and social support networks (e.g. Ellis, 2011; Nijman, 2008; Sheth, Velega, & Price, 2009). The literature in this area underscores that public engagement is often used to legitimize predetermined courses of action rather than redistribute power between the powerful and the marginalized (Arnstein, 1969; Cornwall, 2004; Cornwall & Brock, 2005; Partpart, 2000; Rowe & Frewer, 2005). As we have previously highlighted, governing institutions do not recognize the legitimacy of informal settlements in India. As such, the planned, formal city (as imaginary as this may already be in India) is the desired outcome for the state (Dupont, 2011). Public engagement becomes one of the means to achieve this end.

Numerous efforts at facilitating the engagement of informal settlers in decision-making processes driven by NGOs and resident collectives are nevertheless evident in our research. While these efforts are driven by the aim of securing water services, they rarely achieve this. In a review of empirical evidence of participatory approaches to development, Hickey and Mohan (2005, p. 237) concluded that efforts to foster participation are most likely to succeed when situated within a radical project aimed at securing the citizenship rights of the marginalized, and when they approach development "as an underlying process of social change." This finding is echoed by Lombard (2013), who finds that formalized participation frameworks can often lead to the reproduction of social and spatial marginalization. Among our case study, only participants in Mumbai explicitly framed the challenge of securing water services as an issue of broader social change. To this end, the Bombay High Court decision to assert the universal right to water services can be considered a considerable victory for an effort that can be viewed as overtly political and primarily adversarial, even if it is yet to be implemented by the municipal government. This achievement is an illustration of Joy et al.'s (2014, p. 969) finding that "seeing water control issues as basically political is…a precondition for making the justice dimensions of distribution, participation, and recognition stand out."

5.1.4 Implications for Practice

What are the implications of our findings for the practice of water development in urban informal settlements? The first implication relates to the fact that the prevailing approach to water development practice among development actors is to frame deficiencies in water services as a biophysical issue. This view helps portray water issues and their solutions "as politically neutral, technical and/or managerial issues which can be 'objectively' solved according to technical knowledge, 'rational water use' and 'good governance'" (Boelens et al., 2016, p. 2). Our research highlights the need to shift from viewing water as a biophysical entity towards viewing it as what Swyngedouw (1999) terms a 'hybrid', a part social/part natural entity that is simultaneously composed of natural and social processes. This is not the same as saying that water management should seek to integrate social and physical considerations, but rather that these are "related internally", signaling a shift from considering the "relations *between* things" to "the relations *constituting* things" (Linton & Budds, 2014, p. 173, original emphasis). This understanding is evident in the frustration of one resident when reflecting on the government's reasoning for not providing water,

> "[t]he municipal authorities said that the water pressure that we have is very low. When the authorities said that they don't have enough pressure for the water to reach our homes, we asked them why they can provide water to 15-storey buildings and the water perfectly reaches there, why they don't have the pressure to give water to people living in the slums, and people who have their houses a little bit high on the hills?"

Such a statement does not mean that we can negate the technical challenges that may exist in providing adequate water infrastructure to informal settlements. Rather, it points to the possibility that the denial of services on technical grounds can mask the political grounds for such denial. In fact, such political grounds are well documented by Anand's (2011) study of what he terms the "politechnics of pressure" in Mumbai. This statement ultimately represents an understanding that water services are hybrid socio-natural entities, rather than purely physical infrastructures. The production of water services, therefore,

> "…entails a more complex (internal-relational) process by which any change in the physical presence of water, in institutional arrangements, in discursive constructions of water, or in the uses to which water are directed, has the potential to shift constellations of socio-nature towards a different set of relations" (Linton & Budds, 2014, p. 174).

The hybridity of water services in informal settlements necessitates a more equitable balance in attention in practice between the dominant engineering goal of building infrastructure and the essentially political task of fostering more just waterscapes that are characterized by a "more equitable choreography of social power" (Swyngedouw et al., 2002, p. 134). Our participants, whether residents, development workers or both, experience their inadequate access to water services as the result of unjust power dynamics not because they theorize this to be the cause, but because they have seen their neighbors gain water connections at the stroke of a political decision at election time. This lived reality points out that waterscapes are more than the materiality of water and engineered infrastructure; they express "physical flows, patterns of access, technologies, institutions, practices, legislative reforms, governance frameworks, and discourses around water, which are mediated by social and political processes and collectively constitute the waterscape of a given context" (Budds & Hinojosa, 2012, p. 120). The effort to realize more just waterscapes requires attention to more than infrastructure; it requires that development practitioners, policymakers, activists and residents more clearly and explicitly articulate how the daily life of informal settlers, like those of everyone else, is a hybrid of cultural, political, economic, and social forces both within and without the community (Gottdiener, Hutchison, & Ryan, 2015). Acknowledging these forces enables the imagination of water development efforts that can facilitate a more equitable choreography between the forces constituting the waterscapes of informal settlements.

Such a shift in development practice requires that the problem framing, objectives and strategies adopted in the water sector become more coherent with those in other areas of development such as political empowerment, education, and livelihoods, among others. This shift also beckons water development practitioners to approach the task of securing water services as a broader process of social change, as asserted by Hickey and Mohan (2005), and to foster the capacity of informal settlers to agitate for change in the quest for more equitable power dynamics. Viewing water services through the lens of the waterscape "helps take the hatchet to apolitical narratives" (Acharya, 2015, p. 374) on water such as the ones often guiding development efforts at the moment. Unless this shift takes place, hard-won infrastructural improvements will continue to be removed as quickly as they are built (see Anand, 2011; Bapat & Agarwal, 2003; Björkman, 2014).

Ultimately, the task of securing water services for informal settlements and their inhabitants demands that greater attention be paid to fostering process freedoms that enable residents to secure their rights to the city and fosters meaningful engagement between residents and decision-makers. Such efforts should complement the traditionally technical focus of water development initiatives in urban informal settlements, rather than replace them. It is also important to note that although the insights we have gathered may be specific to the Indian

context, the marginalization of informal settlements is a well-documented phenomenon across the world (Saunders, 2012; UN-Habitat, 2003, 2016). As such, the importance of process freedoms in residents' quest for services that enable them to meet both their basic needs and work towards their broader aspirations is of global importance. Informal settlements need to be approached by water development actors not as sites of despair, but as incubators of aspiration (Owusu et al., 2008; Perlman, 1976). Whereas water development practice is often driven by the quest to provide infrastructure, it should instead begin with the question: what freedoms do residents require to secure and maintain their access to water services?

5.1.5 Concluding Remarks

While water deficiencies in informal settlements are often treated by the development community as a technical or governance issue, our findings show that both development workers on the ground and residents experience these deficiencies as the results of ongoing marginalization. Participants consistently identified informal settlers' lack of rights to the city and their subsequent political marginalization as the primary causes of water service deficiencies. While building infrastructure may secure short-term benefits for residents, without the right to the city this is often removed as quickly as it is built. Therefore, we have argued for a shift from viewing water service deficiencies as physical and governance challenges to viewing them as the result of unjust social and political structures. This shift requires that efforts to improve water services in informal settlements be understood as part of a broader process of social change focused on fostering process freedoms that guarantee more equitable and inclusive power dynamics.

Lastly, it is important to note that the ability of people to benefit from water services is not only hindered by political marginalization, but also by unjust power dynamics within informal settlements and households, such as those based on gender (P. Das, 2014; Marni, 2010; Ray, 2007; Truelove, 2011; UNICEF/WHO, 2011), class/caste (Doshi, 2013; Gandy, 2008; Joy et al., 2014; Perkins, 2011), and unequal positions of influence within communities (de Wit & Berner, 2009; Mansuri & Rao, 2004; McFarlane et al., 2014). While it is beyond the scope of this paper to explore this form of marginalization, the literature highlights the role of such factors in mediating access to water services. Future research should continue to clarify the role that such dynamics play in water service development and propose means to foster more equitable choreographies of power within households and informal settlements alongside those between informal settlements and the political establishment.

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5.2 CONCLUSIONS FROM PUBLICATION 3

In this publication, I set out to achieve Objective 3 of this project: to examine the process freedoms by which residents and development workers seek to secure water services capable of meeting people's needs and aspirations in urban informal settlements. The participants in this project highlight that the cause of the lack of access to water services in their locales is twofold: 1) lack of recognition of informal settlers' rights to the city, and 2) lack of engagement between informal settlers and the political establishment. In summary, residents and development workers frame water service deficiencies as the result of inequitable relationships between informal settlers and governing authorities. The finding of this paper that the principal obstacles experienced by residents and development workers are of a political nature challenges the perspective that service deficiencies in informal settlements are primarily apolitical challenges requiring the application of technical and governance fixes (Boelens et al., 2016).

There are several implications to this finding. First, in communicating a perceived lack of right to the city, participants are expressing a desire to shape, and belong to, the city in a manner that meets their needs. Such needs may not be aligned with the expectations of governing authorities for the planned, ordered and formal city. This divergence creates a tension between informal settlers and the government, the result of which is the adoption of typically antagonistic postures by the government based on the view that informal settlements are 'unauthorised.' Water services become a means by which to exclude informal settlers from the life of the city, or, as one respondent said in Publication 2, water becomes a "weapon" used against informal settlers. In the broader scheme of this project, these findings point out that urban informal settlers have a distinct way of belonging to the city; while the desire of residents is to eventually fully belong to the formal city, or as Doug Saunders (2012) terms it, "arrive", it is the liminality of the informal that facilitates this eventual capacity for many. When urban informality is understood this way, the purpose of water service development in these settings shifts from the fostering of planned, orderly, 'formal' infrastructures and services necessary to meet the needs of the average resident of the formal city to the realisation of services that can foster the specific needs of urban informal settlers, and eventually, arrival. Understanding urban informality in this way beckons water development practitioners to understand their task as part of a broader political project that seeks recognition of the distinctiveness and legitimacy of the urban informal as a site of transition, often from rural to urban life, for many individuals and communities with lower access to social resources. The next and final publication develops this point further by investigating the instrumental role of water development issues in fostering or hinder the successful integration of residents of UISs.

CHAPTER 6: OPPORTUNITY FREEDOMS - WATER SERVICES AND INFORMAL URBAN INTEGRATION

Objective 4 of this project is to devise principles and strategies that may inform water service development approaches capable of fostering the needs and aspirations of urban informal settlers. To achieve this objective, this chapter presents the fourth and final original publication in this thesis: "*Water for the integration of urban informal settlers*".

This publication relates most explicitly with what are termed *opportunity freedoms* in the CA. These are the opportunities that individuals have to pursue goals of importance to them, which are central to the understanding of wellbeing found in the CA. This publication argues that such opportunity freedoms within the context of UISs can be understood through the lens of *integration.* Urban planning theory has long argued that the primary goal of those that move into the sprawling UISs that characterise most low-income cities is successful integration: to become fully-fledged urban citizens. This paper is the first to bring together the insights on what constitutes successful integration derived from migrant and refugee studies and the insights of a case study of water development issues. The result is unique insight into the transformative potential of water development initiatives to foster the successful integration of residents of UISs and the potential wellbeing benefits attached to that.

6.1 PUBLICATION 4: Water services and the integration of urban informal settlers

Francesco M. Gimelli, Briony C. Rogers & Joannette J. Bos

Abstract: Water development in low-income settings such as urban informal settlements (UISs) is typically approached as a question of public health. However, a growing chorus of scholarly voices is shifting focus onto the way that water services impact on the ability of people to secure benefits across multiple dimensions of wellbeing. For residents of UISs, a key concern for their wellbeing is their ability to successfully integrate into the economic, social and political fabric of the city. However, the potential relationship between people's access to water services and their ability to successfully integrate has not yet been empirically investigated. This paper seeks to address this gap by investigating the relationship between residents' access to water services across six informal settlements in the Indian cities of Faridabad, Delhi and Mumbai and the ten domains of integration found in Ager & Strang's (2004, 2008) authoritative Indicators of Integration framework. Our study finds that water service access is implicated many aspects of integration and recommends that fostering successful integration become a guiding principle by which to plan and evaluate water development initiatives in UISs to ensure that these are of maximum benefits to residents.

6.1.1 Introduction

Traditionally, the lack of water services such as water supply and sanitation in low-income settings such as urban informal settlements (UISs) has been framed as a challenge to public health because of the well-documented links between inadequacies in such services and rates of morbidity and mortality (Konteh, 2009; Sverdlik, 2011). This focus on public health, for example, permeates Sustainable Development Goal (SDG) 6 to "ensure availability and sustainable management of water and sanitation for all" (Gimelli, Bos, et al., 2018; United Nations, 2015). This singularisation is increasingly challenged by scholars such as Goff & Crow (2014),

Mehta (2014), Jepson et al. (2017) and Crow & Swallow (2017), who demonstrate that people seek forms of access to water services that can contribute to the expansion of their capabilities, or what Amartya Sen (1999, p. 10) defines as the ability of people to "live the kinds of lives they have reason to value". In a similar vein, Gimelli, Bos, & Rogers (2018) argue that the universal goal in the water sector of 'securing access' to water services should be measured according to the ability of people to benefit from such services in ways that expand their opportunities to work towards – and achieve – a good life by fostering benefits across multiple dimensions of wellbeing.

For residents of UISs, the struggle to realise a good life is often linked to a broader struggle for their right to be in the cities that many of them and/or their parents migrated to (Bhan, 2009). This view has been put forward since Janice Perlman's (1976) groundbreaking ethnography of the *favelas* of Rio de Janeiro, in which she found "communities striving for elevation…inhabited by dynamic, honest, capable people who could develop their neighbourhoods on their own initiative if given the chance", and that would "evolve naturally into a productive neighbourhood, fully integrated into the city" (1976, p. 15). Doug Saunders (2012) goes so far as calling informal urban settings "arrival cities", primarily transitional spaces where new arrivals to the city are able to affordably get a foothold into the city, access its services, its jobs, its support networks and its opportunities. UISs can provide the poor, often from destitute rural areas, with the capabilities required to realise their aspirations for the good life by becoming fully integrated urban citizens (Lombard, 2014; Porter et al., 2011; Roy, 2009c; Varley, 2013).

This paper investigates whether, and how, residents' access to water service such as water supply, sanitation and hygiene can hinder or facilitate their successful integration into the life of the city. This is achieved by adapting Ager & Strang's (2004, 2008) authoritative Indicators of Integration (IOI) framework, which was originally articulated through UK-based research, and the findings of a case study of experiences of water service access issues across six informal settlements in the Indian cities of Faridabad, Delhi and Mumbai. Our analysis illustrates that water service issues are implicated with almost all domains of integration found in the IOI framework, leading us to call for the inclusion of concerns for integration into the planning and evaluation of water development initiatives. Doing so may provide an opportunity to maximise the ability of residents of UISs to gain a broad range of wellbeing benefits from their access to water services and to achieving the measure of 'access' argued for by Gimelli, Bos, et al. (2018) as the ability of people to benefit from water services.

6.1.2 What is 'integration', and why focus on it?

But, what is integration, and why should the water sector focus on it? In urban informality scholarship, integration is widely understood to entail both spatial, social, economic and political integration of UISs into the broader fabric of the city (AlSayyad, 2004; Roy, 2005; UN-Habitat, 2003). Development practice in low-income settings, however, focuses primarily on the spatial integration of neighbourhoods through improvements in infrastructure and services (Roy, 2005). Roy (2005, p. 150) points out that this approach underscores "…the limitations of the ideology of space. In such policy approaches, what is redeveloped is space, the built environment and physical amenities rather than people's capacities or livelihoods". For example, many rehabilitation (clearance and relocation) and even in-situ upgrading efforts can displace residents and dislocate them from the social and economic networks on which they rely for their livelihoods (Atuesta & Soares, 2016; Nijman, 2008; Restrepo, 2010; Werlin, 1999). This lack of focus on multiple dimensions of integration beyond the spatial can result in residents' further social, economic and political marginalisation even in cases where physical infrastructure and services may have been improved (Changoiwala, 2018; Dupont, 2008; Nijman, 2008; Restrepo, 2010).

However, urban informality scholarship does not offer a clear definition of what the markers of effective integration might be in UISs. Conversely, there is a well-developed body of scholarship stemming from migrant and refugee studies that recognises that there are specific domains that determine whether refugees and migrants feel integrated (Ager & Strang, 2008; Le Blanc, 2015; Phillips, 2006; Strang & Ager, 2010). Ager & Strang (2004, 2008) articulate ten such domains of integration (Table 1) in their IOI framework. These are derived from an extensive review of grey and scholarly literature supplemented with empirical fieldwork conducted in settings of migrant and refugee resettlement in cities in the UK. The paper outlining this framework is the most read and cited paper in the widely-respected Journal of Refugee Studies, while the British Government's Research Excellence Framework (2014) recognised that the IOI framework "has become a foundational framework for refugee integration policy, for the measurement of integration and for critiquing policy and practice".

Although this framework is derived from research conducted in formal urban settings, it is important to note that UISs are overwhelmingly composed of migrants and refugees (UN-Habitat, 2003). Therefore, we assume that although their manifestation may differ in informal settings, at least some of the dynamics of integration will be universal to migrant and refugee populations regardless of whether they are living in formal or informal settings. Ager & Strang (2008, p. 185) recommend that "in any given context indicators of local or national

relevance be negotiated for each domain". As a result, they do not put forward universal indicators by which to measure success in each domain. This feature of their work affords the framework a high degree of flexibility, which we seek to take advantage of in this paper by investigating whether and how water service arrangements in six urban informal settlements in Indian cities hinder of facilitate the achievement of these domains of integration. Table 1 sets out the original definitions of each domain of integration in the IOI framework alongside questions to guide exploration of their applicability to the water sector.

Table 8: Dimensions of Integration (adapted from Ager & Strang 2004; 2008)

Theme	Domain	Description & Significance	Guiding Questions for Research
Foundations	Rights & Citizenship	The extent to which individuals "are provided with the basis for full and equal engagement within society" (Ager & Strang, 2008, pp. 176–177).	[How] does the status of residents' rights shape their access to water services?
Facilitators	Safety & Stability	Relates to personal safety and the stability of communities. Stability described in relation to the ability of residents to remain in the locality and experience continuity with their neighbours.	[How] do water service arrangements hinder or facilitate the safety and stability of communities in UISs?
	Language & Cultural Knowledge	Refers to the capacity to communicate in the local language. Also relates to knowledge of "national and local procedures, customs and facilities…" (Ager & Strang, 2008, p. 183).	[How] does knowledge of national and local procedures, customs and facilities related to water service provision in UISs impact residents' access to water services?
Social Connection	Social Links	The "connection between individuals and structures of the state, such as government services" (Ager & Strang, 2008, p. 181). Includes consideration of accessibility of such services.	[How] does the connection between structures of the state such as government services linked to water service provision and residents shape the latter's access to water services?
	Social Bonds	Bonds with family and 'like-ethnic' groups that can contribute to individuals feeling 'settled'.	[How] do water service challenges in UISs impact the social bonds between residents?

	Social Bridges	Refers to the bridge between migrants and refugees and their host communities understood through the lens of social harmony and participation in society.	[How] do water service challenges in UISs impact the social bridges between residents living in formal and informal settings?
Markers and Means	Employment	Adequate employment. Linked with a range of benefits, including the development of language skills, promoting self-esteem, self-reliance and economic independence, enabling planning for the future and the opportunity to build networks with longer-term residents.	[How] does residents' access to water services in UISs shape their livelihoods?
	Housing	Appropriate housing defined according to indicators of physical dimensions, quality and facilities within the home and financial security of either tenancy or ownership.	[How] does residents' access to water services in UISs shape the quality of their housing?
	Education	Access to educational facilities and services. Linked with providing skills and capacities that support employment and the capacity to be "constructive and active members of society" (Ager & Strang, 2008, p. 172).	[How] does residents' access to water services in UISs shape their access to education?
	Health	Reliable access to health services. Good health consistently viewed as a key resource for active engagement in society.	[How] does residents' access to water services in UISs impact their health?

6.1.3 Methodology

We undertook a single embedded case study of the experiences of access to water services of residents and development workers across six non-notified (unauthorised) informal settlements in the Indian cities of Faridabad, Delhi and Mumbai. Governing authorities in these cities have traditionally adopted an antagonistic approach towards residents of UISs, viewing them as 'encroachers' on public land (Kudva, 2009). This approach has resulted in the official denial of access to residents of our case settlements to basic services such as electricity, sewerage, water supply and waste collection as well as the frequent bulldozing of settlements. As

a result, residents are left experiencing various levels of water insecurity amongst shortages of other services, and ongoing political marginalisation and physical insecurity. However, each settlement has also experienced improvements in their access to water services due to either community-led or NGO-led water development initiatives. This feature of the case study locations facilitates the examination of the impacts of both improved and unimproved water services.

It is important to note that we do not claim that the locations or participants selected for our case study constitute a sample that represents either the scope of water service challenges across UISs or demographic features. Stake (1995, p. 4) asserts that "[c]ase study research is not sampling research", based on a recognition that individuals and locations are unique. However, Stake (1995, p. 6) also emphasises the need to include a "balance and variety" of perspectives in case studies, a point reiterated by Yin (2009). We included both residential and professional perspectives (those of water development practitioners), recognizing that several individuals were simultaneously residents and development workers or volunteers. We interviewed 44 individuals (24 men and 20 women) between the ages of 18 and 60, including housewives, cottage industry workers, day labourers, students, NGO managers, community liaison officers, education officers, technical water, sanitation and hygiene advisers, unemployed individuals and community leaders. Interviews were conducted in the homes of residents, community meeting areas and in the offices of local development NGOs to ensure that the setting was familiar for participants. Interviews were semi-structured and free-flowing, to allow participants to discuss the impacts of access to water services on the individual and collective lives of residents as well as the strategies adopted in local areas to improve access to water services. Interviews were conducted in English with the aid of a local translator, audio recorded and transcribed by the first author. Data analysis followed a process of thematic coding based on the ten domains of integration found in Ager & Strang's (2004, 2008) IOI framework.

6.1.4 Results and Discussion

Our analysis found links between residents' access to water services and nine of the ten domains of integration in the IOI framework. Participants did not identify a relationship between access to water services and the domain of Social Bonds. While participants discussed relationships between access to water services and the remaining nine domains of integration, we found that this discussion often pointed to the need to narrow or reinterpret the original dimensions. This leads us to present an amended list of nine domains of integration. We explicitly state and justify our reinterpretation of these wherever this has occurred. This section presents

the links that we found between these domains and people's access to water services in our case study locations. We have sought to synthesise the main findings across locations and present a selection of illustrative quotes from participants. For each finding, we reflect on its implications for planning and implementing water development interventions in UISs in practice and propose broad guiding questions that may be valuable for practitioners in considering how to adopt a broader range of considerations that speak directly to the integration of urban informal settlers in to the city as part of their development practice.

<u>Foundations</u>

Rights & Citizenship → *Right to the City*: Participants often discussed how their access to water services, or lack thereof, was symptomatic of a lack of recognition of both their citizenship rights and their right to the city. For this reason, we define this foundation as the Right to the City. As one water rights activist and resident in Mumbai asserted,

> "…[residents of informal settlements] are legitimate citizens of this country. They are. And they have a right to this city, and they have a right to the resources of the city, and they have a right to the water and sanitation."

The same participant is the convenor of a local water rights organisation that has organised several campaigns, civil disobedience activities and has brought forward and won a Public Interest Litigation case in the Bombay High Court to have settlers' right to water services legally recognised. The activities of this organisation have not focused on seeking technical solutions to water service deficiencies, with one active participant in the organisation's campaigns asserting that the local government's objections to service provision on the grounds of inadequate water pressure were an excuse to exclude the poor from the city. This finding was consistent across the case locations; when asked to identify the causes for their households' and communities' lack of access to adequate water services, residents consistently made statements to the effect that "it's because our community is unauthorised". This claim is validated by Bhan (2009), who argues that the poor in Indian cities typically make claims to belonging and citizenship through the discourse of the right to the city. Nevertheless, development discourse often sidesteps these considerations to frame water service delivery challenges as technical challenges require technical and governance fixes (Boelens et al., 2016). This point is further reiterated by Gimelli, Bos, et al. (2018) and Gimelli, Rogers, & Bos (2018), who illustrate that the ability of residents in

UISs to benefit from water services is dependent on equitable power dynamics between residents and decision-makers.

The implication of this finding is that water development initiatives in UISs must work towards building foundations of political empowerment among residents of UISs that result in formal recognition of their right to the city. As a result, interventions should be guided by questions relating to the actual and potential role that political [dis]empowerment might play in mediating access to water services and foster greater empowerment as a development strategy wherever possible.

Facilitators

Safety & Stability → *Safety & Community Harmony*: In our case study, participants often linked their access to water services to questions of safety and community harmony, rather than stability as discussed in the IOI framework. For this reason, we have reframed this domain of integration as Safety & Community Harmony. For female participants, safety was most frequently linked with their continued dependence on open defecation in lieu of a lack of sanitation facilities. Women consistently reported cases of 'eve-teasing' (harassment) during which men would catcall or, in some cases, attempt to physically harass them.

Community harmony, on the other hand, was most explicitly implicated with forms of access to water services that became flashpoints for conflict among residents. For example, two large water tanks had been installed in one settlement in Delhi. These tanks physically provided the bulk of the drinking and domestic water available to residents. However, residents from that locale reported that "the water tanks are the main source of conflict in the community". We found that the fact that the water tanks were connected to only two communal taps presented access challenges. The long and slow-moving queues for the taps became the source of frustration for many locals, often spilling into open verbal and physical conflict and particularly in the bullying of women and children by men and boys. Local development workers, however, asserted that the tanks mean that the local community is "water secure". This is indicative of a primary concern for securing the quality and quantity of water services in the development sector (Goff & Crow, 2014) without recognition that people require "a certain kind of access in order to derive certain freedoms or functionings" (Mehta, 2014, p. 67).

The implication of this finding is that in the planning and evaluation of water development interventions, practitioners should be guided by questions relating to how current or proposed water service arrangements hinder or facilitate the physical and psychological safety of residents and the harmony of the community.

Language & Cultural Knowledge → *Structural & Procedural Knowledge*: Within the IOI framework, the domain of Language & Cultural Knowledge refers to the capacity of refugees and migrants to speak the language of their host country and gain knowledge about its culture and traditions. However, it also includes knowledge of "national and local procedures, customs and facilities…" (Ager & Strang, 2008, p. 183), which may be interpreted as understanding 'how things work'. It is this second aspect of this domain of integration that participants linked with their ability to secure access to water services. For this reason, we have reframed this domain as Structural & Procedural Knowledge.

Our case study found that residents consistently reported that improved knowledge of the governance structures and procedures through which they could complain about inadequate services with government officials contributed to securing improved services and infrastructure. One prominent community leader in Faridabad, for example, highlighted the instrumentality of the local women's self-help group in nurturing this capacity with concrete improvements in access to water services,

> "…the government was refusing to supply a hand-pump on the side of the nala (drainage channel). But this lady joined the self-help group started by [the local NGO] and became aware about the procedure to approach the local government corporation and what to do so they can find a solution to this problem. She went there with the other self-help group members, approximately 12-13 ladies, and they approached the government officer and told him their problem. He initially denied their concerns, but eventually agreed with their request [for new pipes] when it became clear that these ladies knew every procedure surrounding this problem."

Although the self-help group was not explicitly a part of the NGO's water development strategy, it nevertheless had a concrete impact on residents' access to water services. The implication of this finding is that water development initiatives in UISs should include explicit strategies to ensure that residents feel informed about structures and processes implicated with water service delivery in their neighbourhood and feel confident in their capacity to engage these processes and institutions, including in an adversarial manner if needed.

Social Connection

The IOI framework presents three domains of integration under the theme of Social Connection: 1) Social Links; 2) Social Bonds, and; 3) Social Bridges. Our research found a relationship between access to water services

and Social Links and an amended version of Social Bonds. However, no clear relationship was identified by participants between their access to water services and Social Bridges. Therefore, this third domain is not discussed below.

Social Links: Ager & Strang (2008, p. 181) define social links as the "connection between individuals and structures of the state, such as government services". Gimelli, Rogers, & Bos (2018) find that a lack of meaningful engagement between residents and decision-makers is a contributing factor to diminished water services in UISs in Indian cities. In our research, we found that participants frequently identified the lack of such social links as a cause of water insecurity in their communities. Therefore, this domain of integration remains as in the original IOI framework.

Participants reported that residents are often treated as 'vote banks' by local politicians that make wide-ranging but unfulfilled promises of improved water services on the condition of communal electoral support.

> "The government investment is very poor in unauthorised communities. They are just using the people as a vote bank. At election time they make lots of promises: 'we will authorise the slum', 'we will use some wonderful water filtration system', ' we will install pipes for the supply of water.' Once the election is over, they will never see people in the community again."

The practice of vote banking is widespread in India (Breeding, 2011). The superficial and unsustained engagement between residents and decision-makers that results from this practice was regularly recognised as a reason why residents experienced water insecurity. As one resident from Delhi asserted when discussing what needed to be done in her community to secure better water services, "[w]e won't be able to go and directly speak to the minister. But these are the people that we need the help of."

The local NGO in Faridabad has sought to forge social links between decision-makers and residents through a monthly face-to-face interface meeting between representatives of the community, the NGO, local bureaucrats and politicians. Four meetings had taken place at the time of data collection, making it difficult to evaluate their effectiveness. Nevertheless, the senior manager of this NGO asserted that this forum represents an opportunity for potentially meaningful engagement between decision-makers and residents of UISs.

The implication of our findings in relation to this domain of integration is that water development efforts should include explicit strategies to foster social links between residents of UISs and structures of the state responsible for the delivery and improvement of water services in these areas. In many ways, this is already occurring thanks

to the participatory shift in development practice, including in the water sector (Fung & Wright, 2003; Llano Arias, 2015; Mohan & Stokke, 2000). However, it is important to note that not all participation is equal; participatory practices can – and often are – used to legitimate top-down decision-making (R. Ellis, 2011; Hickey & Mohan, 2005; White, 1996). Therefore, initiatives such as the monthly interface meeting from Faridabad should be structured in ways that promote equitable and meaningful interactions between participants with the goal of securing concrete improvements in residents' access to water services.

Social Bonds → *Collective Endeavour:* The IOI framework originally defined Social Bonds as bonds with groups that can make people feel settled. In the context of water services, we found that collective endeavours at water management were praised by residents of all six settlements as fostering 'unity' amongst residents. As a result, we propose Collective Endeavour as a domain of integration within the context of water services. One example of such endeavours comes from Delhi, where one community has instituted a household-level monthly water service charge and makes decisions regarding the management of water infrastructure and other services collectively. One female resident from this community identified this arrangement as the main reason why her community has become more water secure,

> "Collectively it allows us greater deal of flexibility in dealing with problems as well, because the cost of problems is borne across groups of people, so that when pipes burst, or when a motor needs to be replaced, or electricity costs are higher, in those situations we can fix those much more quickly than we could if one person oversaw them. Simply because everyone is now contributing. And everyone understands. There is a culture of contributing. Everyone understands that's just what needs to happen to make things better. And whatever money we save from our monthly maintenance we put towards building a temple."

The implication of this finding is that water development initiatives should be guided by questions regarding how access to water services may be improved and managed through collective mechanisms and how these mechanisms can contribute to the overall capacity of the community to undertake collective endeavours. Research from Burra, Patel, & Kerr (2003) found that community-designed, built and managed toilet blocks in the Indian cities of Pune and Mumbai brought not only effective sanitation services to previously underserved areas. However, they also found that these initiatives can "bring communities and governments together to work in new ways" (Burra et al., 2003, p. 32), therefore also strengthening social links.

Markers & Means

Employment: Participants consistently reported water insecurity as a leading cause for unemployment or underemployment. People across the case study locations pointed out that the unreliability of water supplies often caused the breadwinners in their households to be late for work. As the manager of a local NGO in Faridabad with over two decades' experience in the water sector pointed out,

> "The menfolk were not able to go to the job properly, on time properly because they spent most of their time on getting drinking water; the water supply is very far away. They need to travel 15-20 minutes, they must stand in the queue and so on. Their whole livelihood collapses."

The same was also found for female residents, many of whom work in domestic service in neighbouring middle-class neighbourhoods. As one domestic worker from Delhi explained,

> "People who are working, especially women who are working as a servant, as a maid in some houses, have to wait in a queue for the water. Because sometimes they have to wait for a long time they can't go to the house and the employers complain and say: 'you don't have to come any more.'"

This relationship between water security and livelihoods is increasingly recognised in the development sector. For example, the 2016 World Water Development Report: Water and Jobs engaged with this theme explicitly (UNESCO, 2016), with the then-UN Secretary General Ban Ki-moon asserting in the report that "it is increasingly critical that governments develop and adopt employment policies that take account of the limitations imposed by water availability" (UNESCO, 2016, p. v). However, mainstream development practice is yet to grasp the role of access to water services in providing pathways out of poverty by fostering livelihood security (Crow & Swallow, 2017; Jepson et al., 2017). This may partly be because of the focus in development practice on securing the quality and quantity of water services at the expense of factors such as ease of access, reliability and equity of access that our participants linked with their ability to secure and maintain employment. Previous studies such as that of Subbarraman et al. (2015) also indicate that reliability and accessibility of water services are key water service delivery factors impacting residents' livelihoods.

The implication of this finding is that greater focus needs to be placed on explicitly planning water development interventions that will enhance the livelihoods of residents of UISs. The planning of projects, for example, should be guided by an understanding of how residents' current and potential interactions impact / may impact their ability to look for, and maintain, steady employment. The success of interventions may also include

indicators tracking improvements / deterioration in rates of steady employment in target communities and the causal relationships between such indicators and residents' access to water services.

Housing → Living Environment: Ager & Strang (2004, 2008) initially identified Housing as an important marker of integration. We have broadened this marker to Living Environment in recognition that our participants discussed the impact of water services on both their households and their broader surroundings. For example, one resident from Delhi recounted how the settlement she lives in used to be dreary, unsafe and dirty. Over the past 10 years, the community has collectively mobilised to build a reticulated water supply system linked to a large tank whose supply is fed by a mains pipe that residents illegally tapped when it accidentally burst. The community now has plentiful supplies of water, and as a result has planted a range of fruit trees around the neighbourhood to both beautify it and provide residents with food. Our respondent beamed with joy and told us that "[t]his is something that makes me very proud".

The implication of this finding is that water service development initiatives should be planned and evaluated according to their potential and/or actual capacity to improve the quality of residents' living environments. For example, factors such as cleanliness and residents' aesthetic perceptions could be used to plan and evaluate the effectiveness of particular interventions.

Education: Our participants reported several links between their access to water services and the ability of both adults and young people to gain an education. For young girls, the reliability of water services in schools was the key factor determining attendance, particularly when menstruating. In Faridabad, the local school had enough toilets and running water for 3-4 hours per day; the unreliability of the water supply, however, meant that girls could not be sure that they would have access to working toilets whenever required. During an informal discussion, the school's headmistress explained how this situation means that many young girls would not attend school during their menses, putting them at a disadvantage in relation to male students and stunting their education, a finding echoed in research by Fontana & Elson (2014).

Children are also often responsible for water collection because parents are either at work or unable to attend to water collection points because of other duties. This is a well-documented fact in the literature (Koolwal & van de Walle, 2013; Nauges & Strand, 2013; Ndiritu & Nyangena, 2011) and is illustrated in our research by the reflection of an experienced development worker from Faridabad,

> "Children often have to collect water from the collection point in the morning. They take at least 15-20 minutes to get there, then they have to wait their turn in the line, get back home, they have to eat, they have to go to the school. Again, all this time passes. Because of this, children are regularly not going to school."

The implication of these findings is that water development initiatives should be guided by a concern for how proposed or actual arrangements impact the ability of people – particularly children – to consistently attend school. Particular focus should also be placed on the impact of water service arrangements on this capacity for young girls, who appear to be further disadvantaged by a lack of access to water services in schools once they reach puberty.

Health: This is the most well-established marker of integration implicated with access to water services. In fact, the human right to water and sanitation was recognised in the last decade by the UN General Assembly (2010) because of the recognised link between water and sanitation and rates of morbidity and mortality in low-income settings. It should come as no surprise, therefore, that participants in our case study consistently reported improved health as a key benefit of improved water services. This related to both gastro-intestinal complaints such as diarrhea and waterborne diseases. As one resident in Mumbai reported,

> "…people are getting sicker the more water there is in the area. It's just increasing every year, and there are so many new sicknesses that are also coming into place like chicken pox, chicken gunny, and dengue, which are now becoming a very common things. If you look at my body I also have all these bites all over me. As the water problem increases the more sicknesses come into our places."

Water development issues are typically singularised as public health issues in development practice (Konteh, 2009; Mehta, 2014; Sverdlik, 2011). While health should remain a central focus of water development practice, this should be balanced with concern for the other domains of integration discussed in this paper. Since this dimension of access to water services is already the focus of much water development thinking and practice, there is no need for further guiding questions.

6.1.5 Conclusion and Outlook

While the original IOI framework was developed through empirical research undertaken in formal urban settings in the UK, the fact that both the original setting and UISs are overwhelmingly composed of migrant and refugee populations leads us to assume that although the manifestation of individual domains of integration may different across these contexts, their relevance will be consistent across these. These differences, and the fact that we have engaged with the individual domains specifically through the lens of access to water services has led us to adapt some of the original domains of integration found in the IOI framework based on the findings of our empirical case study. While we are confident that these adapted dimensions continue to reflect the definitions of the original domains, we recognise that further research conducted in other national, regional and local settings may lead to further refinement of the adapted domains we have presented here.

Overall, our case study highlights that certain forms of access to water services can hinder or facilitate the realisation of key domains of integration. Water insecurity in UISs across the locations of our case study is often experienced as the result of political marginalisation that denies residents their right to the city and therefore hindering residents' effective integration. Conversely, the experience of successful integration into the life of the city is facilitated by safety and community harmony ensured by equitable and easily accessible water services such as sanitation and water supply, as well as the empowerment that results from residents' possession of the structural and procedural knowledge necessary to seek improvements and agitate for their rights. Water service development initiatives can also foster integration by nurturing effective social links between residents and structure of the state, as well as management approaches reliant on collective endeavours, which we found to nurture a spirit of unity among communities with flow-on effects in other areas of life. And last, the impact of water services arrangements can be measured by the full range of integration markers: employment, the quality of the living environment, education and health. These findings highlight that water development is as much a question of integration as it is of public health. It is important to note that our findings may be specific to the Indian context in which our empirical research took place. Other locations in which governing authorities adopt a less antagonistic approach to UISs and their residents may highlight other manifestations of the relationship between access to water services and the domains of integration. Nevertheless, we are confident that our case study indicates the potential applicability of an integration focus in water development efforts across diverse low-income settings and recommend further research to explore this applicability in different settings.

These findings help to reveal the truly transformative potential of water development in areas such as UIS that are often actively marginalised by the state with a range of negative inter- and intra-generational impacts such

as ongoing poverty, livelihood insecurity, reduced opportunities and a lack of access to social resources such as education and healthcare (UN-Habitat, 2003, 2013, 2016). We propose a set of guiding questions and considerations to inform the planning and evaluation of water development initiatives so that these may foster the integration of residents of UISs. These questions and considerations are a starting point for the articulation of a new approach to water development that seeks to expand the capabilities of residents of UISs to live lives that they have reason to value. We argue that posing such questions beckons development practitioners to expand their view of why, and how, water development is important in UISs.

Gimelli, Bos et al. (2018, p. 2) call for the globally accepted goal of ensuring universal access to water services enshrined in SDG 6 to be interpreted as "the ability of people to benefit from water services". Residents of UISs aspire to becoming fully-fledged urban citizens, and our research shows that access to water services impacts their capacity to achieve this goal. Therefore, if residents are to achieve the goal of access as interpreted by Gimelli, Bos et al. (2018), then water services should benefit residents' capacity to be effectively integrated into the city.

Further research could explore processes by which indicators of integration related to residents' access to water services could be development. In part, this is in keeping with Ager & Strang's (2008, p. 185) assertion that "in any given context indicators of local or national relevance be negotiated for each domain". The application of our insights into practice should keep this assertion in mind when considering ways to develop sets of targets and indicators by which to plan and evaluate water development initiatives that can foster integration. It is also important to note that while we have not engaged with environmental considerations related to water management and development in urban areas, these should be kept in mind when planning any intervention.

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6.2 CONCLUSIONS FROM PUBLICATION 4

In this publication, I set out to achieve Objective 4 of this project: to devise principles and strategies that may inform water service development approaches capable of fostering the needs and aspirations of urban informal settlers. The paper shows how the concept of *integration* can be an effective linchpin by which to direct water service development practitioners, local communities and even the state towards planning and evaluating initiatives in UISs that expand the opportunity freedoms that residents have to live meaningful lives.

The participants in this project discussed the relationship between their access to water services and the domains of integration initially outlined by Ager & Strang (2004, 2008) in their IOI framework. Participants, however, talked about these domains in ways that required some reworking, leading to the articulation of nine domains of integration related to access to water services. The findings in this paper may inform water service development approaches capable of fostering the aspirations of urban informal settlers for effective integration into the cities they have sought to make their homes.

In the conclusions from Publication 2 (Section 4.2) I reflected that residents of UISs have a distinct way of belonging to the city, but that ultimately they are all driven to "arrive", as Doug Saunders (2012) put it. This finding has been consistent in studies of urban informality since the days of Janice Perlman (1976) and has been echoed through to the present by the likes of Nezar AlSayyad (2004) and Ananya Roy (2005). This understanding of urban informality is yet to penetrate into the water sector, however, which remains steadfastly focused on securing public health benefits. This is beginning to shift towards wellbeing, although as discussed in previous sections of this thesis, precisely what wellbeing is understood to be in the sector remains vague. The findings presented in this paper contribute towards making this shift and will hopefully provide an anchor for water development practitioners, water rights activists, planners and advocates of equitable urban development to plan and evaluate improvements to water services that provide the broadest range of benefits for residents.

CHAPTER 7: ENVISIONING A CAPABILITY APPROACH TO WATER SERVICE DEVELOPMENT IN URBAN INFORMAL SETTLEMENTS

The aim of this project has been to envision what an approach to water service development that expands the capabilities of residents of urban informal settlements to "live the kinds of lives that they have reason to value" (Sen, 1999, p. 10) might look like. This chapter brings together the insights from the three empirical publications to give shape to such a vision. As I have commented throughout this thesis, development practice increasingly recognises that people's access to water services shapes their ability to achieve a range of wellbeing outcomes such as health, access to education, livelihood security, and so on. However, these wellbeing outcomes are frequently singularised, meaning that current approaches to water development remain fragmented; one approach might seek to improve young girls' access to education (Bartlett, 2003; Fontana & Elson, 2014; Subbaraman et al., 2015), while another to improve health (Dasgupta & Dasgupta, 2004; Kumpel & Nelson, 2016) or livelihood security (Biggs et al., 2015; Hall, van Koppen, & van Houweling, 2014; Joy et al., 2014; Nicol, 2000). Such approaches can, and often do, result in important benefits for people. Alone, however, they limit their capacity to maximise the wellbeing benefits that people can gain from water development initiatives. Intuitively we know that wellbeing is complex, since it is possible to be healthy and yet experience the opposite of wellbeing because we might be unemployed or in physical danger. This thesis argues that development practice should reflect this understanding.

Focusing on single dimensions of wellbeing is ultimately inadequate because it does not ask whether particular forms of access to water services actually foster the *ability* of people to benefit from these in the ways that they need to flourish (as shown in Publication 1). Ultimately, it is inadequate because it stems from a lack of accounting in the water development sector for the lived experiences of those that live with water insecurity daily and experience the myriad effects of that insecurity across every dimension of their lives, whether it be health, access to social services such as healthcare and education, or livelihoods, among others. The current story being told about water services through development instruments such as the Sustainable Development Goals only gives us a partial picture of their relationship with the complex and dynamic components of human wellbeing. This incomplete picture means that the potentially transformative impacts of efforts to improve access to water services in low-income settings remain mostly unrealised.

The Capability Approach (CA) (Sen, 1999, 2013) argues against such singular approaches to development and contends that development should be approached as a means to secure complex and dynamic wellbeing outcomes (*achieved outcomes*), *process freedoms* that people rely on to safeguard their wellbeing, and *opportunity freedoms* that people can draw on to pursue the pathways that give value and meaning to their life. However, while there are clear theoretical definitions of these three dimensions in the CA literature, Chiappero-Martinetti, Edgell, Hollywood, & McQuaid (2015, p. 116) point out that,

> "…the complex, multidimensional and context-dependent nature of this approach, the lack of specificity as to how these dimensions should be selected and assessed, the absence of a rigorous formalisation, a definite metric, and a specific algorithm or index for measuring, ranking and comparing interpersonal conditions can limit the practical application of this approach."

Nevertheless, advances in translating the CA for practice have taken place in fields such as education and information technology (Chiappero-Martinetti et al., 2015; Fukuda-Parr, 2003; Yang & Day, 2015), among others. Studies such as those by Biggeri, Libanora, Mariani, & Menchini (2006) and Burchardt & Vizard (2011) empirically derived lists of capabilities through bottom-up participative methodologies, while Anand (2011) points out that qualitative methodologies such as focus groups, participatory methods and interviews are useful to gain insight into empowerment and agency, opportunity freedoms and valued wellbeing outcomes. While fields such as education and information technology have benefited from these research approaches, the same cannot be said for the water sector, leaving the question of what a CA to water service development might look like unanswered. This research has sought to envision an answer to this question by operationalising the component concepts of the CA through cognate but further theoretically and practically articulated frameworks and concepts from diverse strands of scholarship (particularly the Fundamental Human Needs framework in Chapter 4 and the Indicators of Integration framework in Chapter 6) and empirically investigating the role of water development in capability expansion through qualitative research methodologies (in Publications 2, 3 and 4). The task, at this point, is to articulate the overall vision of what the work presented in the empirical component of this thesis points to, a vision of a capability approach to water service development in urban informal settlements (Figure 4). This is the task that achieves the aim of this thesis.
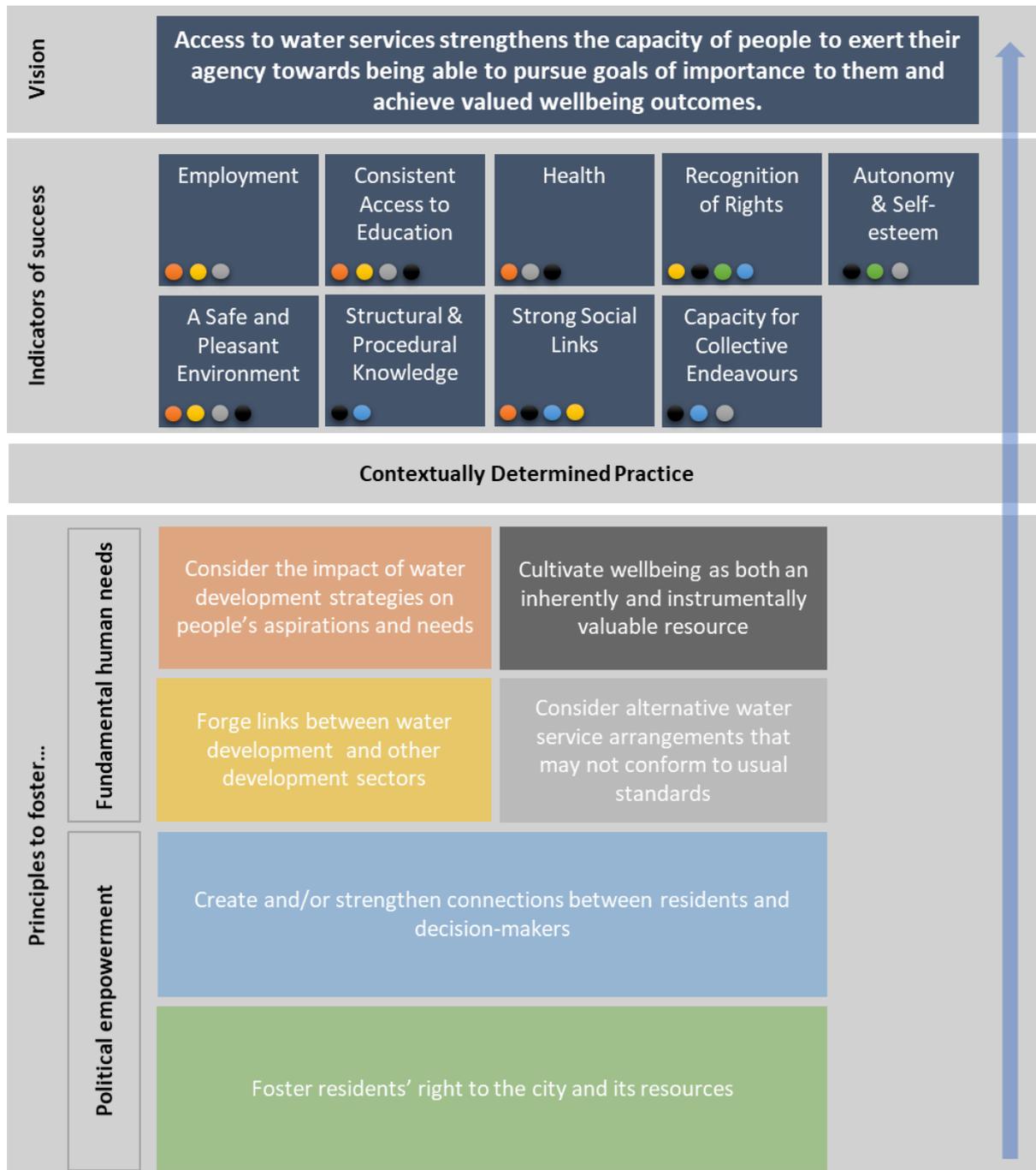
Figure 4: A Vision of a Capability Approach to Water Service Development

The four-part approach outlined in Figure 4 represents the synthesis of the findings of the empirical components of this thesis. The foundation of this approach comprises a set of six principles intended to inform both the design and the evaluation of such an approach to water development. These principles are intended to foster 1) political empowerment, and; 2) fundamental human needs, both of which this thesis has shown to be essential to expanding capabilities through water development. Chapter 5, for example, illustrates that fostering political empowerment as an explicit strategy by which to overcome the structural barriers hindering residents

of UISs' access to water services. Water development should be partly driven by this principle because residents of UISs and development workers on the ground primarily experience water service deficiencies as the result of political disempowerment, rather than technical or managerial issues. Therefore, a CA approach to water service development in UISs goes beyond the traditional quest to build pipes and toilets to simultaneously seek to **a) secure people's right to the city and its services** both through potentially adversarial means such as legal challenges and campaigns, but also by **b) creating and/or strengthening the connections between residents and decision-makers**. This is particularly important for populations such as residents of UISs, whose rights to basic services are actively denied by governing forces in Indian cities or who are often treated as little more than vote banks by politicians.

The remaining four principles of a capability approach to water development are intended to ensure that actions foster fundamental human needs. One of these principles is that water development activities should be **c) planned and evaluated according to their impact on people's aspirations as well as their basic needs**. This is because people not only aspire to be healthy, but also safe, cared for and able to care for others, to express their identity, to participate in the life of their communities, to be able to enjoy idle time, to create, understand and be free. People's access to water services can either hinder or facilitate their ability to meet such needs. For example, having toilets and water pipes in schools is not adequate to facilitate young girls' ability to gain an education and fulfil their need for understanding and participation. The fulfilment of these needs requires the water supply to be constant and reliable. To cultivate aspirations such as that for understanding and participation through water service development is to cultivate people's ability to work towards wellbeing in its complexity and dynamism. Doing so is of both **d) inherent value by strengthening people's sense of self-worth and strengthens the social and psychological resources that people draw on to withstand life's shocks**. Therefore, fostering these domains of wellbeing is an opportunity to make individuals and their communities more resilient. This goal is ambitious and requires **e) stronger links between the water sector and other development sectors** such as livelihoods, social justice, and education, as well as the **f) consideration of water service arrangements that may not conform to global (and predominantly Western) standards**, such as communal toilet blocks.

The second part of the approach comprises what I term 'Contextually Determined Water Development Practice'. This part is intentionally kept unspecified, since specific development strategies and interventions should be developed based on the local context. In part, the strategies adopted in any context should depend on thorough preliminary mapping of the social, economic, political and spatial features of a target area. This was a

key component of the successful efforts at transformative water development in Venezuelan cities discussed in Publication 1 (McMillan et al., 2014; Spronk, 2016). For example, fostering residents' right to the city and its resources will depend in great part on what those rights are at the time of project inception and what the political structure of the context looks like. The same can be said for the principle to forge links between water development and other development sectors. Activities resulting from the application of this principle might depend on where the greatest need may be in a local area (for example, in improving access to education or workforce participation among women). Ultimately, all such decisions should be made with the meaningful inclusion of all sectors of the local community and governing authorities through community-based participatory methodologies such as the ones that have been successfully deployed in public health interventions in low-income settings and have frequently led to the identification of needs and aspirations previously unknown to professionals (Holkup, Tripp-Reimer, Salois, & Weinert, 2004; Israel et al., 2006; Israel, Schulz, Parker, & Becker, 1998; Mansuri & Rao, 2004). Although articulating detailed methods to apply such approaches to the water development sector is beyond the scope of this project, this could be an area of further research and practical experimentation so that experimentation with such methods and their refinement could take place.

The third part of the framework outlines nine indicators by which to measure the expansion of capabilities resulting from water development activities. These indicators are the result of the empirical work in Chapters 4 and 6. It is important to note, however, that the nine needs found in the Fundamental Human Needs framework (Max-Neef, 1992; Max-Neef et al., 1991) and the nine Indicators of Integration (Ager & Strang, 2004, 2008) do overlap in some instances. Therefore, it was necessary to consider both their integration into this framework and their synthesis in cases where they did overlap. For example, the fundamental human need for Subsistence includes concern for Employment and Health. This research found that people's access to water services are most strongly linked with these aspects of subsistence. Therefore, the goal of strengthening people's capacity to meet their fundamental human need for subsistence is represented by the indicators of Employment and Health in this framework. In a similar vein, people's access to water services was found to be strongly linked to people's needs for Autonomy & Self-esteem, both of which are related to the fundamental human need for Freedom. Therefore, it is the former that represent the latter in this framework. The links between the principles and the indicators are represented in the framework by the coloured dots. So, for example, the principle that water development should consider its impact on people's aspirations and needs is identified as potentially contributing to the articulation of water development strategies resulting in positive employment outcomes and the achievement of consistent access to education. For example, the right to the city contributes to political

empowerment, which in turn contributes to recognition of people's right to the city. Furthermore, while some indicators are worded in the same way as the indicators of integration discussed in Chapter 6, these are conceptualised to include fundamental human needs discussed in Chapter 4. For example, the indicator of 'A Safe and Pleasant Environment' contributes to meeting the fundamental human needs for idleness/leisure, protection, freedom and participation.

How could such indicators be effectively measured? There are various Capability Approach-based measurement instruments in use globally that may be adapted to achieve this aim. Among these are the Human Development Index (HDI) (Giannetti et al., 2015), Happy Planet Index (HPI) (Abdallah et al., 2009) and Social Progress Index (SPI) (The Social Progress Imperative, 2017). Such instruments have the potential to capture the range of benefits outlined in Figure 4. The SPI, for example, captures dimensions ranging from access to education, tolerance and inclusion, personal freedom and choice, personal rights, environmental quality, health and wellness and personal safety, among others. Such dimensions correlate closely with the dimensions of a CA approach to water service development in UISs (Figure 4). Existing methodologies to measure such indicators could be the basis for operationalising its monitoring and evaluation. It is important to note that these indices are currently primarily applied at the regional or national scale. Work is therefore required to develop similar instruments to measure individual development initiatives. While it is beyond the scope of this thesis to propose means to achieve this, this could be a focus for future research.

In terms of progression, the arrow on the right-hand side of Figure 4 is intended to illustrate how the six basic principles guiding the approach are intended to contribute to the articulation of development practices and strategies that are determined by local context to contribute to the achievement of the nine indicators of success. Most importantly, these indicators may be used to assess progress towards realising forms of access to water services that strengthen people's capabilities for wellbeing. In Figure 4 this is represented by the vision of the capability approach to water service development: "Access to water services strengthens the capacity of people to exert their agency towards being able to pursue goals of importance to them and achieve valued wellbeing outcomes". This vision includes each of the three constituent components of the CA: 1) process freedoms ("strengthens the capacity of people to exert their agency"); 2) opportunity freedoms ("being able to pursue goals of importance to them"), and; 3) achieved outcomes ("and achieve valued wellbeing outcomes"), an expansion of which represents an expansion of wellbeing. It is important to emphasise that realising this vision requires a shift in practice as much as it requires a shift in thinking. To this end, the approach in Figure 4 can guide the critical discussions among communities and community-based organisations, NGOs, governments

and international development agencies about how particular infrastructures, services and access arrangements might impact wellbeing holistically. Ultimately, the vision represented at the top of Figure 4 beckons residents, development practitioners and decision-makers to remember that access to water services can contribute or hinder the achievement of wellbeing as a whole.

Ultimately, this research shows that it is possible, as Publication 1 argues, to envision ways that access can be measured according to the *ability* of people to benefit from water services, while the framework presented in Figure 4 indicates a conceptual and practical approach that may assist in realising this vision. These three domains are broad and can be interpreted according to local context. For example, what political empowerment may look like in an Indian context would be different from what it might look like in a Chinese context. The specific insights regarding these dimensions derived from this Indian case study are specific to this context. Therefore, it is important to acknowledge that a more varied set of case study locations may derive different insights about what these domains of a CA approach to water service development might look like. Nevertheless, an effort has been made to articulate a set of empirically-derived strategies that are not excessively prescriptive. For example, fostering residents' right to the city does not necessarily require adherence to strictly democratic principles, but could also involve efforts to have this right enshrined in legislation. It is also important to note that further work would be required to fully operationalise the findings presented in this thesis. Chiappero-Martinetti et al. (2015) point out that a key debate relating to the operationalisation of the CA is whether capabilities can be measured. Several scholars have addressed this question by measuring capability expansion through the use of quantitative methodologies such as large-scale surveys and cross-sectional data (e.g. Chiappero-Martinetti, 2000; Klasen, 2000; Roche, 2008). It is important to consider such questions when seeking to apply the findings presented in this thesis. Nevertheless, the empirical insights here presented do provide clear goals and strategies across the three domains of a CA approach to water service development in UISs.

It is my hope that articulating this vision of water development can shape the scholarly discourse on what the role of water service development should be in other development sectors such as education, livelihoods and political empowerment, as well as illustrating the importance of integrating other development sectors in the water sector. Both theoretically and practically, the insights offered here underscore that the water related components of development instruments such as SDG 6 can be made to accommodate the transformative potential of water development by measuring access by the capacity of people to access water services in ways that will contribute to meeting their fundamental human needs, become politically empowered and be

integrated into the life of their cities and communities. It is my hope that these findings will serve as an invitation for water development scholars and practitioners to look far beyond the obvious health impacts of water insecurity and into the complex connections between people's access to water services and their quest for belonging, wellbeing, and security.

CHAPTER 8: REVIEW & IMPLICATIONS

This chapter reflects on the achievement of the individual research objectives, the scholarly and practical implications of this research and identifies a future research agenda to build on its findings. This research has sought to deepen empirical understanding of the relationship between water services in urban informal settlements and the expansion of residents' capabilities. This has been achieved through:

i.   Establishing and clarifying the synergies between the literatures on the Capability Approach and water development and institutional frameworks guiding the practice of water development in low-income settings. Bringing these diverse bodies of scholarly and practice literatures into conversation established the "landscape of opportunity" (Ackerly & True, 2010, p. 75) for inquiry into this topic. The review established that water services are linked with a range of capabilities required for people to flourish. It also established that the severe deficiencies in water services in informal settlements, when coupled with the frequently antagonistic view of informal settlements by governments, has historically led to initiatives that, while improving access to services, ultimately curtail the capabilities and aspirations of residents. New approaches are therefore required to improve access to services in ways that foster, rather than hinder, informal settlers' capabilities to realise their aspirations for more secure, prosperous and meaningful lives.

ii. The opportunity to study water service deficient informal settlements through a single embedded case study in the Indian cities of Faridabad, Delhi and Mumbai. The sites chosen for inclusion in this case study are marked by similar deficiencies in water services; however, social actors within these sites have sought to address these deficiencies through diverse strategies. This resulted in an excellent opportunity to understand the links between water services and capabilities for wellbeing, the obstacles experienced by social actors in securing services capable of fostering these capabilities, the strategies adopted to overcome these, and the outcomes of these strategies in terms of capability expansion.

8.1 Realising the Research Objectives

The research aim of this project was met by addressing four research objectives. In this section, I outline the process by which each objective was achieved, including a summary of the key research findings.

Objective 1

To assess the way that dominant water development frameworks engage with issues of justice and wellbeing.

This objective was achieved through the review of the literature published in Publication 1 in Chapter 2. Based on the review of the literature on justice, development theory and institutional frameworks guiding water development efforts, it is possible to see that efforts to improve water services are characterised by a) the singularisation of water service deficiencies as public health issues, and b) the pursuit of improvements in access to water services, where access is interpreted as the *right,* rather than the *ability*, to benefit from water services.

Publication 1 highlights multiple implications of this characterisation. First, the framing of water service deficiencies as implicated primarily with public health masks the instrumental role of these services in hindering or enabling key capabilities required to meet individual and collective needs necessary to secure wellbeing. The human right to water was recognised by the UN General Assembly (2010) in the last decade. However, the recognition of this right extends only to drinking water and sanitation and is justified with reference only to rates of morbidity and mortality. Such singularisation leads to development initiatives that may improve access to quality water for drinking purposes and sanitation, such as through rehabilitation/redevelopment initiatives. However, it may also lead to initiatives that hinder capabilities linked with water services for productive and domestic use, neither of which are yet widely considered in water development practice (Crow & Swallow, 2017).

Second, the current interpretation of access in the water sector hinders consideration of the benefits realised by improvements in water services and infrastructure. And yet, there is plentiful evidence that indicates that water services not only impact people's health, but also their access to key opportunities for betterment and their escape from poverty (Crow & Swallow, 2017; Goff & Crow, 2014; Jepson et al., 2017; Mehta, 2014). Many initiatives are not planned or evaluated according to the actual benefits that they provide to their intended beneficiaries. Publication 1 makes an original contribution to knowledge by illustrating how, according to the current metrics in the SDGs, secure access is claimed simply by the presence of water infrastructure such as pipes, bore wells and latrines, regardless of whether the configuration, reliability, accessibility and affordability of these services impacts the capacity of individuals to derive benefit from these. A household or individual may have the *right* to benefit from a water pipe because it is present in their home or community. However, they may not have the *ability,* or have a limited ability, to benefit from the water pipe because it only has water running through it twice a week or because the pressure is insufficient for them to meet their daily needs. Publication 1 therefore argues for a reinterpretation of access as the *ability* to benefit from water services. This

reinterpretation beckons development thinkers and practitioners to consider water services as the means, rather than the ends of water development initiatives. What matters most, according to this reinterpretation, is how water services can hinder or enable key capabilities that individuals require to flourish (Mehta, 2014).

Objective 2

To characterise the relationship between water services and people's needs and aspirations (wellbeing) in urban informal settlements.

The experiences of residents of informal settlements and development workers engaged with in Publication 2 (Chapter 4) highlight that water services are implicated with a range of fundamental human needs comprising wellbeing beyond health. The relationship between water service arrangements and wellbeing is increasingly recognised in water development literature and forms an essential component of the currently dominant water development paradigm, Integrated Water Resources Management (IWRM). However, precisely what is meant by wellbeing within this context remains vague (Biswas, 2008). This question has been the focus of scholarship by researchers such as Mehta (2014), Goff & Crow (2014), Subbaraman et al. (2015) Jepson et al. (2017) and Crow & Swallow (2017). However, much of this scholarship explores single components of this relationship, such as that between water services and descent/escape from poverty (e.g. Crow & Swallow, 2017) and water services and adverse life impacts (e.g. Subbaraman et al., 2015).

Publication 2 extends these findings by investigating the relationship between water service arrangements in urban informal settlements and each of the nine fundamental human needs outlined in Max-Neef's (1992). According to Max-Neef (1992), human beings have a set of constant needs across all cultures and periods, a claim that is supported by psychological research (Tay & Diener, 2011). These needs are grounded in the condition of being human (they are ontological), are few, finite, and classifiable (Max-Neef et al., 1991). Max-Neef (1992) identifies nine needs, which are defined on the basis of four categories: 1) being (personal and collective attributes); 2) having (institutions, norms, mechanisms and tools such as laws); 3) doing (personal or collective actions), and; 4) interacting (refers to locations and contexts as times and spaces), resulting in a matrix consisting of 36 cells. In acknowledging these four categories, Max-Neef's (1992) understanding of human needs concords with that found in the Capability Approach, which views wellbeing not only in terms of *achieved functionings* (e.g. being safe, healthy, politically active, employed), but also in terms of *opportunity freedoms* (opportunities to pursue valued goals of intrinsic value to oneself), and *process freedoms,* "freedom of action and decisions" (Sen, 1999, p. 17). Furthermore, unlike Maslow's (1943) well-known hierarchy of needs, which

views the satisfaction of basic, physiological needs such as water, air, food, and shelter as the prerequisite for the pursuit of higher needs such as social belonging and self-actualisation, Max-Neef et al. (1991) frame human needs as an interrelated and interactive system, and the satisfaction of these needs in terms of "wealths", whereas their lack represents "poverties." This understanding moves beyond a strictly economic formulation of wealth and poverty, and facilitates the evaluation of the impacts of infrastructures, services, and forms of access to these on the overall life satisfaction of individuals across multiple dimensions important to physical, social and psychological wellbeing.

This component of the research uncovered relationships between water service arrangements in the case study locations and each of the nine fundamental human needs outlined by Max-Neef (1992). The complex and dynamic relationships between water service arrangements and human wellbeing presented in Publication 2 stand in contrast with the idea of wellbeing that dominates water development thinking, which is typically synonymous with subsistence. The Global Water Partnership (2013, p. 3), for example, asserts the need for IWRM in urban areas because many city dwellers "lack safe drinking water and fall ill with waterborne diseases." There is no factual error in this statement. However, Publication 2 underscores that singularising water as a health issue masks the relationship between water services and the other needs to be met by water service arrangement.

In achieving Objective 2, Publication 2 strengthens the argument for the adoption of a broader conception of wellbeing in water development scholarship and practice than that currently dominant. This publication shows that water services and the arrangements mediating access to them are not only necessary to ensure people's survival, but also play an instrumental role in facilitating the achievement of needs such as affection, protection, understanding, creation, leisure/idleness, identity, participation and freedom. Meeting this objective underscores the potentially transformative potential of water development practice in underserved settings if it is driven by a broader understanding of how water service arrangements are linked with human wellbeing than is currently the case.

Objective 3

To examine the process freedoms by which residents and development workers seek to secure water services capable of meeting people's needs and aspirations in urban informal settlements.

The case study enabled the identification of obstacles experienced by residents and development workers to securing water services capable of meeting residents' needs and aspirations. The findings presented in Publication 3 (Chapter 5) highlight that participants identified two primary obstacles to securing water services: 1) the lack of recognition of informal settlers' rights to the city, and 2) lack of meaningful engagement between informal settlers and the political establishment. The first obstacle identified is grounded in the common experiences across case study locations that governments engage antagonistically with informal settlements and their residents. The right of informal settlers to belong in the city is negated through the denial of basic water services based on the argument that informal settlements are unauthorised. In Mumbai, this negation takes the shape of the local government's requirement that residents provide proof of continuous residence in a location prior to the year 2000 to qualify for water service provision. For most residents, who lack documentation relating to residence, this is a requirement that simply cannot be met. Similar policies are in place in both Delhi and Faridabad. This situation leaves most residents to negotiate directly with officials, engineers, plumbers and the local water mafias to secure access to services. This often requires upfront payment for securing services that may be removed any day by government clearance operations.

The findings presented in Publication 3 underscore that for the urban poor, the right to the city "is not merely a right of access to what already exists, but a right to change it after our heart's desire" (Harvey, 2003, p. 939). Informal settlers represent a challenge to governments' vision for planned, aesthetically pleasing cities. This vision drives much government action towards informal settlers, but has never been achieved (Roy, 2009c). Research participants adopted numerous strategies to assert informal settlers' right to the city. In Delhi and Faridabad, efforts mostly consisted of political and rights awareness campaigns run by local NGOs. According to residents and development workers, these campaigns led many residents that took part to become better informed about political and bureaucratic processes by which they could air their grievances and assert their rights. In some instances, this knowledge and the confidence that it provided led residents to approach politicians and bureaucrats directly to seek regularisation and improvements in water services. The result of these interactions was mixed, but any improvement in the services available can be considered a success. In Mumbai, the research participants engaged in more adversarial strategies to secure recognition of informal settlers' right to the city. Strategies included peaceful protests and campaigns, although these rarely led to any improvement in services. Feeling like they had exhausted these avenues, participants engaged in Public Interest Litigation (PIL) in the Bombay High Court to seek legal recognition of informal settlers' right to basic services. After three years, the local NGO that brought the case to court won the case, although the municipal

government is yet to implement it. Nevertheless, this recognition of the equal rights of informal settlers to water services can be considered a considerable victory in the quest for recognition of their right to the city.

The second obstacle consistently identified across the case study locations was the lack of meaningful engagement between informal settlers and the political establishment. This was often expressed in relation to the promises of regularisation and the provision of water services made by political candidates at election time, which rarely came to fruition. Both development workers and residents decried this practice of using informal settlements as vote banks (Benjamin, 2008; Breeding, 2011). Residents and development workers in each of the case study locations sought to overcome this obstacle to secure better water services. In Delhi, one local development worker interceded personally on behalf of residents with a local minister responsible for the delivery of water tankers to informal settlements. This strategy led to an improvement in the frequency of water tanker deliveries. However, such strategies only bring short-term relief, and may be reversed without notice. Furthermore, they create a reliance on development workers to secure improvements directly. When, and if, the local NGO shifts its attention to another area, the loss of such support may lead to the reversal of the improvement. The recognition of the importance of facilitating engagement between residents and the political establishment in the quest to secure better services led one NGO in Faridabad to institute a monthly interface meeting between residents, NGO staff, bureaucrats, and local politicians. At the time of data collection, this meeting had not borne any concrete outcomes, in great part due to the lack of commitment to it shown by politicians and the transient nature of many bureaucratic posts in India, which mean that bureaucratic representation was inconsistent.

The findings presented in Chapter 5 challenge the perspective that water service issues and their solutions are "politically neutral, technical and/or managerial issues which can be 'objectively' solved according to technical knowledge, 'rational water use' and 'good governance'" (Boelens et al., 2016, p. 2). In fact, these findings underscore the political nature of water service deficiencies in informal settlements in India. The implication of these findings is that efforts to secure long-term access to water services in informal settlements requires that attention be paid to securing residents' right to the city. Although adversarial approaches such as the PIL brought forward by the local NGO in Mumbai were successful in gaining recognition of residents' right to water services, this avenue is difficult for development actors dependent on government support to continue their activities. Nevertheless, fostering the knowledge, skills and confidence that residents require to bring forth such challenges could be a strategy for development organisations. Nurturing these capacities among informal settlers' may also improve the quality of their engagement with the political establishment.

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Objective 4

To devise principles and strategies that may inform water service development approaches capable of fostering the needs and aspirations of urban informal settlers.

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Each of the three empirical publications presented in this thesis contribute to the realisation of this research objective. Publication 2 outlines a clear, ontological and holistic conception of wellbeing found in Max-Neef's (1992) Fundamental Human Needs (FHN) framework. The result is a set of three recommendations to guide water development towards the expansion of individual and collective capabilities for wellbeing: 1) that development discourse and practice recognise that water services are about people's aspirations as much as they are about their survival; 2) that wellbeing is both an inherently and instrumentally valuable resource; 3) that water services should be better linked to other development sectors, and; 4) that the impact of water development on wellbeing cannot just be measured by the presence of pipes and toilets in the home, but should rather be evaluated according to whichever arrangements contribute to an expansion in individual and collective capabilities for wellbeing.

Publication 3 explores the political dimensions of water insecurity in the case study locations and finds that both professional and residential perspectives indicate that water insecurity is caused not primarily by technical or governance issues, but rather from the experience of political marginalisation of residents of UISs. This aspect of the research found residents and development professionals engaged in an ongoing struggle for recognition of their right to the belong to the city and to secure meaningful engagement between residents and decision-makers. In other words, residents want to be recognised as true citizens belonging to the city. The findings presented in this publication lead to a call for the politics of water development to come to the fore of how interventions in the sector are planned and evaluated; water development interventions need to explicitly seek to foster the rights of residents of UISs and adopt at-times adversarial approaches that can challenge the active marginalisation of residents by the state.

Publication 4 synthesises the insights from studies on the integration of migrants and refugees with the findings of this project's case study to articulate an approach to water service development in UISs aimed at fostering the successful integration of residents. For residents, integration is a key concern for their wellbeing. The domains of integration originally articulated by Ager & Strang (2004, 2008) enables the identification of the role of water services within the case locations in either hindering or facilitating integration. The result of this work is the articulation of a set of guiding questions to steer water development towards the explicit consideration of

potential impacts of proposed or existing water service arrangements on a key aspect of wellbeing. Lastly, Chapter 7 reflects on this thesis as a whole and illustrates the logic behind the research design and the significance of the findings presented in the empirical papers.

8.2 Implications

This research contributes to scholarly debates in the fields of urban and water service development. The key scholarly contributions of this thesis, detailed in Section 8.2.1, are that it:

1. Challenges globally dominant approaches to water service development;

2. Extends the current understanding of the relationship between water services and individual and collective wellbeing in urban informal settlements and beyond;

3. Contributes to addressing the challenge of operationalising the Capability Approach for practice;

4. Challenges the characterisation of urban informal settlements as defined by their deficiencies, and;

5. Addresses a dearth of direct narratives regarding informal settlers' experiences of water service arrangements.

While the focus of this study is conceptual, its findings also have several practical implications. Three broad practical recommendations are discussed in detail in Chapter 7. Therefore, section 8.2.2 offers a broader reflection on the practical implications of these recommendations.

8.2.1 Scholarly Implications

 1.   Challenges globally dominant approaches to water service development.

The SDGs only came into force in 2015. As such, there is currently a dearth of critical literature engaging with the way the goals, targets and indicators are formulated. The limited literature that does do this at the high level, such as Le Blanc (2015) and the International Council for Science and International Social Science Council (ICSU & ISSC, 2015), primarily points out that there are many more potential internal links between individual indicators, targets and goals within the SDGs than is formally recognised in the framework. Scholarly engagement with the water components of the SDGs have been limited to explorations of the potential of these components to facilitate engagement with the water-energy-food nexus (e.g. Biggs et al., 2015; Rasul, 2016;

Yumkella & Yillia, 2015). These are important contributions to refining the SDGs and exploring their potential to facilitate transformative development. However, existing literature does not critically engage with the interpretations and assumptions underlying the formulation of individual SDGs. This thesis, particularly through Publication 1, contributes to addressing this gap by showing how the goal of securing access to drinking water and sanitation found in SDG 6 is currently interpreted as securing the *right,* rather than the *ability,* to benefit from water services. Through Publication 1, this thesis makes an original contribution to knowledge by providing the first critical engagement with the interpretation of the goal of securing access as it is pursued as part of global development strategies and offering an alternative interpretation. This is an important contribution towards further refining global water development efforts so that these can foster the broadest range of benefits possible to those living with water insecurity.

2. <u>Extends the current understanding of the relationship between water services and individual and collective wellbeing in urban informal settlements and beyond.</u>

Numerous scholars, such as Mehta (2014), Goff & Crow (2014), Jepson et al. (2017) and Crow & Swallow (2017) have contributed strong arguments for the need to reframe water development as an endeavour aimed at equitably fostering the wellbeing of people and communities. However, Biswas (2008) pointed out a decade ago that what constitutes wellbeing in the water sector is vaguely articulated, a claim that remains largely true. There have been rare efforts to overcome this vagueness by clarifying the relationship between water services and wellbeing. Parikh et al. (2012), for example, investigate the relationship between basic infrastructure in urban informal settlements in India and the ability to people to pursue higher-order aspirations beyond subsistence. Their study, however, assumes that water services only fulfil lower-order aspirations for subsistence, therefore precluding consideration of the broader impact of water service arrangements on multiple aspirations and dimensions of wellbeing. de Haan et al. (2014) also engage with questions of wellbeing by furnishing a novel understanding of societal needs as drivers and benefits of transitions towards water sensitivity. While the theoretical insights derived from this study are invaluable, they are formulated with consideration of a high-income context (Australia), are not derived from direct empirical investigation, and relate only to the societal, rather than communal or individual scale.

This thesis, while following from the work of the aforementioned scholars, makes a unique contribution to the scholarship on water services and wellbeing by characterising the relationship between water services and wellbeing in urban informal settlements, engages with both individual and collective aspects of human

needs/wellbeing, and illustrates the relationship between water service arrangements and the entire matrix of fundamental human needs presented by Max-Neef's (1992) in the context of urban informal settlements. Furthermore, by characterising the relationship between water services and multiple dimensions of wellbeing, this thesis underscores the transformative potential of water service development in these settings, with potential practical implications discussed in Section 8.2.2.

3. Contributes to addressing the challenge of operationalising the Capability Approach for practice.

This thesis also contributes to the broader task of operationalising the Capability Approach to development practice, which is recognised as an ongoing challenge in development scholarship (Chiappero-Martinetti et al., 2015; Fukuda-Parr, 2003). Recent efforts at operationalisation can be found in sectors including public health (Lorgelly, Lawson, Fenwick, & Briggs, 2010), education outcomes (Chiappero-Martinetti et al., 2015), and information and communication technologies (Kleine, 2010). While the utility of the Capability Approach in the water sector has increasingly been shown by scholars such as Mehta (2014), Goff & Crow (2014), Jepson et al. (2017) and Crow & Swallow (2017), this is the first study to empirically study the relationship between water services and the understanding of wellbeing found in the Capability Approach (composed of achieved functionings, opportunity freedoms and process freedoms) through engagement with the direct narratives of residents in informal settlements and development workers engaged with water development efforts on the ground, and to consider practical means to foster the expansion of capabilities through water service development.

4. Challenges the characterisation of urban informal settlements as defined by their deficiencies.

Most development initiatives in informal settlements begin from the perspective that these environments are primarily characterised by their deficiencies. This approach has led to development initiatives – such as rehabilitation/redevelopment and upgrading – that while improving access to basic services can ultimately displace residents and dislocate them from the social and economic support networks that they rely on to access opportunities (Lees et al., 2016; Weinstein & Ren, 2009). There is an increasingly vocal strand of scholarship, with roots as far back as Janice Perman's (1976) decade-long ethnography of the *favelas* in Rio de Janeiro, that underscores that characterising informal settlements by their deficiencies alone ignores their aspirational character (e.g. AlSayyad, 2004; Johnston, 2014; Lombard, 2014; McFarlane, 2012; Varley, 2013; Watson, 2013,

2016). What such scholars consistently find is that regardless of their aspirations, dynamism and inventiveness, informal settlers are rarely provided with the opportunities to fulfil their aspirations.

This thesis finds that the same is true in the informal settlements investigated in this study. Through Publications 2 and 3, this study contributes direct, narrative insights into the dynamism, creativity and resilience of urban informal settlers in their quest to secure water services capable of fulfilling both their basic needs and their broader aspirations. Publication 3 examines the barriers that residents face to realising a secure existence and the strategies adopted to overcome these and their outcomes and finds that residents are driven by making a space for themselves in their adopted city to realise their aspirations. The effort to secure water services is a key means by which this space is staked out. Such findings lead this study to argue for a reframing of the key question that water development practitioners should be asking themselves when engaging with urban informal settlements. Currently, the question is: how can we address these water deficiencies? Instead, this thesis argues that the question should be: how can we foster forms of access to water services that foster the ability of residents to meet their basic needs and work towards realising their broader aspirations? The former question focuses on the deficiencies, whereas the second focuses on the opportunities. The argument offered in this thesis, and backed up by the empirical work within it, is that it is by focusing on the opportunities that the transformative potential of water development practice is revealed.

5. <u>Addresses a dearth of direct narratives regarding informal settlers' experiences of water service arrangements.</u>

This study provides the scholarly and development practice communities with a set of uniquely rich direct narratives of development workers and residents of informal settlements reflecting on their experiences of water services in relation to capabilities to flourish, the obstacles that residents and development actors experience to securing water services, and the strategies adopted to overcome them and their outcomes. The presentation of these narratives, particularly in Publications 2 and 3, represents a rare contribution to water development and urban informality scholarship. Bapat & Agarwal (2003) presented a set of narratives of men and women from informal settlements in Pune and Mumbai, India talking about their needs for water and sanitation. However, the paper only engages with water requirements, rather than the way that water arrangements are linked with fundamental human needs. And yet, it is understanding people's experiences surrounding diverse forms of access to water services that Mehta (2014) argues is necessary to be able to understand the impacts of water services on wellbeing. In gleaning people's experiences and reflections surrounding forms of access to water

services, this thesis provides narratives that enable researchers and practitioners to "better understand people's hopes, desires, aspirations, motivations and decisions" (Robeyns, 2005, p. 104) as they relate to water services.

8.2.2 Practical Implications

An underlying ambition of this research project was to inform the water development sector on how to seek improvements in water services in ways that not only provide the most basic benefits, but also foster the capabilities of individuals to realise more secure, prosperous and meaningful lives. Chapter 7 discusses three practical recommendations stemming from the empirical insights resulting from this research that indicate pathways by which water development can enhance the expansion of people's capabilities for wellbeing through water development: 1) to more meaningfully involve target individuals and communities in the planning, executing and monitoring of water development initiatives; 2) to plan water development initiatives to be more coherent with the goals of other development sectors, and; 3) to evaluate the success of water development initiatives according to metrics that capture the expansion of capabilities for wellbeing. The manifestation of these three practical recommendations will vary on the local context, but the general framework offered in Figure 4 in Chapter 7 presents goals that may be used to articulate practical planning, monitoring and evaluation strategies. Overall, the implication of these recommendations is that water development practitioners should shift their thinking on the role of water services in the lives of those living in low-income settings and adjust their practices to better reflect local experiences.

8.3 Future Research Agenda

Many of the specific insights – such as the relationship between water service arrangements and wellbeing – are relevant to the case study locations. Central, state and local governments in India have typically adopted an antagonistic stance towards informal settlements, leading to the denial of basic services such as water supply and sanitation. However, it is important to undertake similar research in settings that present examples of more constructive engagement between informal settlers and government, such as those found in diverse Latin American countries ranging from Brazil, Colombia and Mexico (Beardsley & Werthmann, 2008). This type of comparative research may furnish important insights into the capacity of diverse urban water service development policy regimes and social and technical interventions to drive the expansion in the capabilities of

informal settlers. Such research would also contribute to validating and/or refining the conclusions derived from this study by exploring their applicability to different settings.

The aim of this study is to articulate an approach to water service development in urban informal settlements that fosters equity and wellbeing in response to the needs and aspirations of residents. Although numerous insights into ways to achieve this have resulted from this study, further research is required to operationalise these insights for practice. While this study has contributed to this task, it is beyond its scope to undertake this task in depth. For example, one of the key findings presented in Publication 3 is that a key obstacle to securing water services in informal settlements is the lack of recognition of informal settlers' right to the city. How can this finding be operationalised for practice? Though this project's case study found that the most successful strategy in securing this right was litigation, this strategy is rarely feasible for development actors that depend on the support of governments to conduct their work. Further research should explore ways for water service development initiatives to foster informal settlers' right to the city while also maintaining the support of government.

Further research is also required to adapt assessment tools that seek to capture the expansion of wellbeing, such as the Human Development Index (HDI), Social Progress Index (SPI) and Happy Planet Index (HPI) for use within the water sector. While this task was beyond the scope of this study, the development of metrics capable of capturing the relationship between improvements in water services in previously underserved areas and the expansion of wellbeing as presented by frameworks such as that offered by Max-Neef (1992) used in this study would be essential to operationalising this study's findings for practice.

8.4 Concluding Remarks

This study set out to articulate an approach to water service development in urban informal settlements that fosters equity and wellbeing in response to the needs and aspirations of residents. This need is framed by the current vagueness of how the values of equity and wellbeing are conceptualised in water development scholarship. This vagueness has serious practical implications. Broadly speaking, it is difficult to aim for equitable water development that fosters wellbeing if what this may look like is unclear. Giving shape to this vision requires an understanding of how the people and communities living with water insecurity daily experience such insecurity as a challenge to their capacity to achieve equity and wellbeing. The research presented in this project addresses this gap by investigating how the values of equity and wellbeing, and their

absence, manifest in the relationship between urban informal settlers and the water service arrangements that they have access to.

While water services are essential for the survival of people, as currently emphasised in water development practice, this study highlights that water services are also instrumental to the achievement of the many other dimensions that constitute human wellbeing. These dimensions of wellbeing have intrinsic worth. However, they are also resources that enable individuals and communities to tackle the challenges that they face. In urban informal settlements, the fulfilling of human needs for protection, solidarity, determination, critical thinking and autonomy, among others, serve as resources that enable people to challenge injustices, to cooperate to manage water services to the benefit of the entire community, and to assert their place in the city. The ability of water service arrangements to foster, or hinder, such resources highlights the transformative potential of water development in urban informal settlements. However, it also illustrates the inadequacy of the current framing of water service issues as apolitical challenges requiring a mixture of technical and governance fixes.

To address this inadequacy, this study argues that the aim of water development in urban informal settlements shift from the singular goal of securing public health benefits towards the goal of securing the integration of informal settlers into the city, a process that Doug Saunders (2012) terms 'arrival.' Such a goal includes the concern for public health that has traditionally dominated in the sector but balances it with recognition that water service arrangements in urban informal settlements are also implicated with a host of other capabilities that facilitate the ability of residents to stake a place for themselves in the world's ever-growing cities. Water development cannot solve all the challenges faced by the new residents of these cities, but it can nevertheless do more to contribute to the ability of residents to tackle such challenges than is possible from a singular focus on health. Articulating the strategic details of such an approach should be a priority in urban water development scholarship. Nevertheless, the vision of a CA approach to water service development in UISs articulated in Chapter 7 highlights that it is possible to imagine and work towards such an approach.

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Appendix A: Ethics Forms

A1. Ethics Approval Form

Please note that the title of the project and the Chief Investigator changed from Professor Jacqui True to Dr Briony Rogers shortly after the granting of ethics approval.

MONASH University
Monash University Human Research Ethics Committee (MUHREC)
Research Office

Human Ethics Certificate of Approval

This is to certify that the project below was considered by the Monash University Human Research Ethics Committee. The Committee was satisfied that the proposal meets the requirements of the *National Statement on Ethical Conduct in Human Research* and has granted approval.

|	
Project Number:	CF15/4720 - 2015002028
Project Title:	Just urban water development: Fostering the capabilities of the marginalised in India and Bangladesh
Chief Investigator:	Prof Jacqui True
Approved:	**From:** 21 December 2015 **To:** 21 December 2020

Terms of approval - *Failure to comply with the terms below is in breach of your approval and the Australian Code for the Responsible Conduct of Research.*

1. The Chief investigator is responsible for ensuring that permission letters are obtained, <u>if relevant</u>, before any data collection can occur at the specified organisation.
2. Approval is only valid whilst you hold a position at Monash University.
3. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval and to ensure the project is conducted as approved by MUHREC.
4. You should notify MUHREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
5. The Explanatory Statement must be on Monash University letterhead and the Monash University complaints clause must include your project number.
6. **Amendments to the approved project (including changes in personnel):** Require the submission of a Request for Amendment form to MUHREC and must not begin without written approval from MUHREC. Substantial variations may require a new application.
7. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
8. **Annual reports:** Continued approval of this project is dependent on the submission of an Annual Report. This is determined by the date of your letter of approval.
9. **Final report:** A Final Report should be provided at the conclusion of the project. MUHREC should be notified if the project is discontinued before the expected date of completion.
10. **Monitoring:** Projects may be subject to an audit or any other form of monitoring by MUHREC at any time.
11. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.
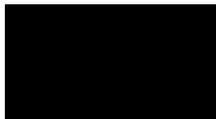
Professor Nip Thomson
Chair, MUHREC

cc: Dr Briony Rogers, Mr Francesco Gimelli
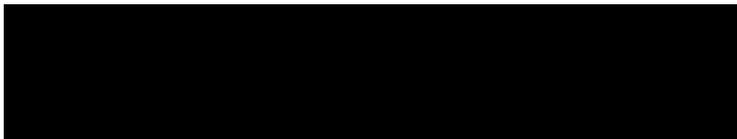
A2. Research Explanatory Statement

PARTICIPANT EXPLANATORY STATEMENT

Project Title: *Operationalising a capability approach to water service development in urban informal settlements*

Project Number: CF15/4720 - 2015002028

Chief Investigator	**Co-Investigator**
Doctor Briony C Rogers	**Doctor Joannette J Bos**
School of Social Sciences	Monash Sustainability Institute
██████████████	███████ ██████
███████████████████	████████████████████

Doctoral Student Researcher

Francesco M Gimelli

School of Social Sciences

████████████████

██████████████████████

Dear Participant,

You are invited to take part in this study. Please read this Explanatory Statement in full before deciding whether or not to participate in this research. If you would like further information regarding any aspect of this project, you are encouraged to contact me via the phone number or email address listed above.

What does the research involve?

The aim of this study is to understand how urban water development programs can provide the broadest benefits to their intended beneficiaries, as well as improve equitable access to appropriate water services and infrastructure. As part of this research you are invited to take part in an individual interview.

Why were you chosen for this research?

You have been chosen for this research because of your experience with an urban water development initiative. Your experience with this initiative represents invaluable data necessary to achieving the aim and objectives of this project.

Source of funding

This research is funded through the Australian Government's Department of Education and Training Research Training Programme (RTP) and an Endeavour Postgraduate Scholarship.

Consenting to participate in the project and withdrawing from the research

(i) Consenting to take part in this research process involves signing and returning the attached consent form.

(ii) As a participant you have the right to withdraw from the research process at any stage of data collection. Should you choose to withdraw, any data collected from you will be permanently destroyed along with your original consent form.

(iii) However, once data has been collected and published withdrawal will no longer be possible.

Possible benefits and risks to participants

Participation in this research is of potential benefit to both participants and society. Participants are able to share their insights and experiences, which will then be used to produce a tool to strengthen the programs that they are involved in. The potential benefits to society are multiple, including programs that provide water infrastructure and services in a more context-sensitive manner and which facilitate a more empowering and transformative use of water services.

No topic in the interviews is anticipated to be of a distressing nature to participants. The topics for discussion focus not on individual practice but are intended to provide insight into the broader principles and strategies of the program. The only expected inconvenience for participants is the time involved in taking part in the interviews. If, for any reason unforeseen by the researcher, a participant is uncomfortable with a line of questioning the participant is able to withdraw from the research at any moment.

Confidentiality

A number of steps are taken to ensure the confidentiality of the data collected throughout the research process. Interviews are audio recorded, and participants are asked to refrain from naming individuals, including

themselves. In publishing the data, individuals will be referred to by either pseudonyms or participant codes, with specific information about position and roles in the organisation that could be used to identify individuals omitted.

Storage of data

Data in the context of this research includes interview transcripts and audio recordings. Recordings will be stored in a password-protected storage device, while transcripts will be stored in a locked cabinet when printed, or in a password-protected storage device when in digital format. The audio recording may be provided to professional translators for transcription, who will be instructed to destroy the original audio files and remove any identifiable information such as names from the transcripts.

Results

Results will be published via peer-reviewed journals, as conference papers, and as a thesis. Each publication will be made available to participants directly from the researcher, and through community information events where the researcher will present his findings directly to the community and invite constructive feedback.

Complaints

Should you have any concerns or complaints about the conduct of the project, you are welcome to contact Pranjal Deekshit, Associate Professor at the Tata Institute of Social Sciences:

Pranjal Deekshit

Centre for Water Regulation, Policy and Governance

Tata Institute of Social Sciences

███████████████████████

█████████████ █████████████████ █████████████

Thank you,

████████████████

Francesco Gimelli

A3. Sample Participant Consent Form

<div align="center">

CONSENT FORM – INTERVIEW

</div>

Project Title: *Operationalising a capability approach to water service development in urban informal settlements*

Chief Investigator: Annette Bos

Student Researcher: Francesco Gimelli

I have read the Participant Explanatory Statement or someone has read it to me in a language that I understand.

I understand the purposes, procedures and risks of the research described in the project.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to the participant taking part in this research project as described and understand that I am free to withdraw them at any time during the project.

I consent to the following:	Yes	No
Taking part in an individual interview	☐	☐
Being video recorded during the interview, which will be later transcribed by a third party	☐	☐
To give permission for anonymous quotes from my transcript to be reported in publications of the research findings	☐	☐
To be invited to make myself available for a further interview or focus group discussion if required	☐	☐
The data that I provide during this research may be used by the research team in future research projects	☐	☐

Name of Participant

Participant Signature _____   Date _____

If participant is not able to provide written consent:

The participant has been properly informed about the details of the research and the nature of their consent, and has provided consent to take part in the research.	☐	☐

Name of Witness _____

Witness Signature _____   Date _____

Appendix B: Guiding Interview Questions

B1. Resident Interviews

Interview topic	Relevant guiding questions
Getting to know the participant	Can you tell me a little bit about yourself, e.g. what your role within the organisation is, your background, and how long you've been involved with water development issues?
Understanding individual and collective water service arrangements	I'll ask you about a range of issues related to water. Could you tell me what the situation in your home and community is relating to: 1. water for drinking? 2. use around the house? 3. toilets?

	4. flooding?
	5. pollution?
	6. anything else related to water that you think is important for me to know?
	How do you and those around you access water for drinking, for the home, for anything else you might need, and sanitation?
	In your experience, which aspects of the way you access these services is adequate to meet your needs?
	- Have these services become adequate because of specific improvements?
	In your experience, which aspects of the way you access these services is inadequate to meet your needs?
	- Have these services always been inadequate?
	- What improvements would make these services adequate to meet your needs?
Understanding the impact of water service arrangements on wellbeing	Referring to adequate services resulting from improvements:
	- How have these improvements facilitated your ability to meet your needs in comparison to before?
	Referring to services identified as inadequate:
	- What are some of the impacts of these inadequacies on your life?

	Referring to improved services:
	- How have improvements in these services changed your life?
Understanding the obstacles to securing water services	In your experience and opinion, what are the reasons why you and your community don't have the kinds of water services that you need to meet your needs? Further questioning regarding reasons identified by participant, e.g.: - [How] has your community engaged with this challenge? - What strategies, if any, have been effective in addressing these challenges? - What have been the outcomes of these strategies? - [How] have these strategies directly or indirectly improved water services in your community and/or household?

B2. Development Worker Interview

Interview topic	Relevant guiding questions
Getting to know the participant	Can you tell me a little bit about yourself, e.g. how long you've lived here, what you do with yourself, what a standard day looks like for you?
Understanding water development issues in communities	In your opinion and experience, what are the key water issues in the communities that you work in?
Understanding the impacts of water service deficiencies in communities	How, if in any way, do these deficiencies limit the opportunities that individuals and communities have to meet their needs?
Understanding the causes of water development issues in communities	In your opinion, what are the leading causes for the current deficiencies in water services in the communities you work in?
Understanding strategies to overcome identified challenges	What strategies has your organisation adopted to address these challenges? What have been the outcomes of these strategies? Do you think these strategies have been effective? Is there anything that you think needs to be done that is not currently done to address these challenges?
Understanding impacts of water service improvements in communities	What have been some of the impacts of the improvements that your organisation has instituted on the wellbeing of residents? Do you think these improvements could be enhanced further? If so, how?

Appendix C: Sample Interview Transcripts

Please note that all identifying details have been removed in consideration of participant confidentiality.

C1. Sample Resident Interview

	Timespan	Content	Speaker
1	0:00.0 - 0:22.9	So, thanks again for taking the time to talk to me. First of all I want to ask if you have any questions for me before we get started?	Interviewer
2	0:22.9 - 0:41.1	I'd like to thank you for coming from so far away to talk to us about the way our lives are and pay attention to our world. Not many people do that.	Interviewee
3	0:41.1 - 1:29.3	I'm very happy to be here. Very grateful to be here. So hopefully this will be interesting for you. So, if you could just tell me a little bit about yourself, approximately how long you've been here, we could just start with that for now.	Interviewer
4	1:29.3 - 1:42.3	I am KL. I have been 16-17 years since I have been living here. Both of my children have been living here. And my husband works at a courier company. I used to be a tutor for house to house for children. There were only 10-15 houses at the time. There was no water at the time. We used to bring water from far away. From that time, we didn't even have a permanent house. Now we have a fixed home and things are quite different.	Interviewee
5	2:19.5 - 2:39.3	So you mentioned before that you're quite heavily involved in education. So, could you tell me what your role around education in the community is?	Interviewer
6	2:39.3 - 4:32.9	I am from Orisha. So, when we came here, I had done my graduation. I got married in my last year of my undergraduate degree, so I couldn't give the exam. After getting married I have come here. So, I am much more interested in education than anything else, so that's why I thought I would work in that. Even for free I would teach 5-6 kids, get them together at my house, without taking any money whatsoever. So even in situations where the financial situation is very dire, even in those situations I didn't take any money because I wanted to teach as many kids as possible. So, I worked in a company for a while. I left that job after 2-5 years, and it was always my dream to be able to come back here and teach students. I have done the Anganwadi course, and that has helped me. And I have done a sewing diploma from Kolkata. I have done my graduation in Hindi, specifically in Hindi literature.	Interviewee
7	4:32.9 - 4:38.3	Excellent. Wow. Quite an interesting background.	Interviewer

8	4:38.3 - 5:09.9	I only had one wish: how to develop this space that I now call home. And that's all I've been working towards. You essentially have to pick up the kids from each house to make sure they come every day. So, I essentially make sure that the EWS quote in all the private schools in the area, that we utilise these heavily, so that all the children in our neighbourhood can get into good schools. People are every resistant to allowing kids from our territory there, and I make sure that it happens. I fight to make it happen. Kids don't have documents, I make sure they have the right documents. Each year 40-50 kids get into schools, and we make sure that it happens despite their lack of documentation. I help them cut through bureaucracy.	Interviewee
9	6:13.1 - 6:24.2	So, you've obviously been involved with development issues of a number of sorts, for a long time. Since you've been here.	Interviewer
10	6:24.2 - 6:46.6	I do microcredit with 15 women here. I set up a microcredit union with 15 of the women here. We have collected 2.5 lacs in 5 years. And whoever has need.	Interviewee
11	6:46.6 - 7:03.1	So, I want to start asking about water issues specifically.	Interviewer
12	7:31.4 - 8:05.4	So, it's a very difficult situation with regards to water. We have to go far, far away to find water, carry it back on our heads. Some people used to let us take water, some people didn't let us take water. So, there was a well behind where the masjid is, and that well sort of got spoilt, got polluted. So, it couldn't be used any more.	Interviewee
13	8:05.4 - 8:10.1	And how did that well get spoiled? Do you know the reason why that happened?	Interviewer
14	8:10.1 - 10:45.3	No one came to fix it. Essentially there was a bore well and it started throwing up mud instead of water. And they just left it closed. So, a year after we arrived here there was relatively easy to find water. And after that year ended, when that bore well dried up and we didn't have access to anything else, we had to travel very far away. And it got quite difficult. So two kids had an accident while trying to get water. And one of them lost one of their feet, and the other one died. So we wrote to our local politicians, with an application saying that we would like better [water], and they responded that 'Once there are laws that allow me to help you, we'll help you. Right now our hands are tied.' I did not know the NGO at the time. I worked at another NGO for 2-4 months, so I knew NGOs existed. And then I worked with another sort of charity, and they were giving me 1000 rupees in salary. So there was no solution for the water. So there were lots of families that were leaving at the time because of the lack of water, so then then person who was the leader of the community then, so he got everyone together and said 'We are going to get some tankers to come to the area. We have to figure out how to do this.' And then we used to have one tanker come every three days, and how much water is that really? Some people got water and some didn't. So now we started getting tankers daily, which made	Interviewee

		water easy. Slowly it started improving our water situation. So then, we had a line, it so happened to explode at one point. And then it started...essentially water had started coming to the surface because the pipe had burst. We were very surprised! We thought it was some sort of miracle that water was spontaneously coming out of the ground. So we dug it, a bunch of women got together and dug it up, so we saw the water coming out. Essentially, we dammed it, and we started taking water from that spillage. Otherwise it was just going into the ground. So we had to take it one bowl at a time, scoop it out. And we used to divide it according to how many people are in each house. This is in 2006, now we are in 2016. Then we opened the node with the wrench, and then the water started coming in far greater force than what was leaking. It made a huge noise, because this is the main line. you could hear the noise from far away that the water was about to arrive, and that was the water that we used.	
15	13:19.6 - 13:30.5	And so this water...people took that water, what was it used for? For drinking, for things around the house?	Interviewer
16	13:30.5 - 19:24.5	For bathing and washing things. And then we boiled it to use it for drinking. There was no alternative to find water. And the tankers would come some days, and not other days. So this was a more reliable source at the end of the day. There was so little water that people basically didn't bathe. Now with the bursting of this pipe and the opening of the node and so on. At roughly the same time we found the NGO, so first we told them what our problems with water were. And that we have to gather this water. And people were fighting about water distribution as well. So it was not a pleasant experience. We met X, there was a collective meeting with everyone. All the ladies got together, the [community] leader was also there. Essentially X said, 'How tenable is it for you to collect this spilled water with your utensils? Let's build a tank', that the NGO paid for. Some 50 rupees, 10 rupees were taken from members here as well, so that we water isn't muddy and we can collect the water without having to worry about being there all the time. After that we covered it with the tarpaulins and kept it covered for some days. So we made a women's collective, 16-17 of us, which is called the Nari Nirvalas. We put everyone's photos in it, it's fully official. So we get together and we'd all go to X and talk to her about our problems, and we take advice from them about how to use the water most efficiently. So that we can get the water while sitting at home. She suggested that we go to our local MLA, that we go to the municipal corporator, and the minister for water at the time. So we went to all these people, and after talking to all these people we got permission from the DJB for using what was essentially runoff water from a burst pipe for our own uses. Once we got the permission, this was when Sheila Dixit was chief minister, we had another meeting. So now we need money so that we can pipe water to everyone's home. First we need a more robust system of covering the tank so nothing falls into it. So we built a solid system that can be locked and everything. We took 100 rupees from each house, from each family. We built five lines, and we brought it to the main locations in every neighbourhood. So once that line came into a	Interviewee

		commonly accessible space for each subsection of the neighbourhood life became significantly simpler. Then we got 500 rupees from each house, for them to have direct access straight to their house. Once we got those main pipes everything started getting connected to their houses.	
17	19:24.5 - 19:47.6	I wanted to ask, I guess, how did people's lives become more simple? Obviously it was easier to get water. But what did that make possible for people to do because they were wasting so much time or so on…?	Interviewer
18	19:47.6 - 20:06.9	Earlier there were fights about water. There were women who were harassed. There was one girl who was abducted. And these things just didn't happen any more. They were no longer a part of our lives.	Interviewee
19	20:06.9 - 20:11.8	She was abducted while she was going to get water?	Interviewer
20	20:11.8 - 21:47.6	She had gone to get water, and another one who was attacked while she was going to the toilet. We had to carry it on our heads and bring it. That's something we no longer have to do. It's clear water, water that we don't have to do anything, or too much to. The tests tell us that we don't have to. The water is tested here as well. And we no longer need to purify it, put as much effort into making it potable. What can be a bigger difference than roam kilometres and still not finding water, but sitting at home and finding it anyway? So now there are currently 1500 people living here. So, 10-15 other colonies come here to get water, because we are the most reliable. We are drinking and we are allowing other people to drink as well. Can one imagine a bigger difference than that? X showed us the way.	Interviewee
21	21:47.6 - 22:45.1	So what do you think have been the things that have enabled you to make such a big improvement as a community, and as individuals? You've mentioned a number of things. The ability to get together and approach NGOs, the ability to just take the water when an opportunity showed itself. What are the things that have happened over the years to make this improvement possible?	Interviewer
22	22:45.1 - 23:14.7	We need that solidarity, that sense of oneness. People are afraid when we are 15 of us. Everyone is afraid of women these days! So we essentially collectivise and make ourselves more intimidating in certain spaces, and we are less likely to be pushed over.	Interviewee
23	23:14.7 - 23:26.2	So you think that the ability to collectivise, to get together, has given you much more confidence and strength?	Interviewer
24	23:26.2 - 24:25.9	Collectively it allows us greater deal of flexibility in dealing with problems as well, because the cost of problems are borne across groups of people, so that when pipes burst, or when a motor needs to be replaced, or electricity costs are higher, in those situations we can fix those much more quickly than we could if one person was in charge of them. Simply because everyone is now	Interviewee

		contributing. And everyone understand, there is a culture of contributing. And everyone understands that's just what needs to happen to make things better. So whatever money we save from our monthly maintenance we put towards building a temple.	
25	24:25.9 - 25:10.3	Ok. So you've obviously organised yourselves collectively quite successfully. I wanted to ask about something that you mentioned before, that in the past you approached politicians with your problems, but they were unresponsive. So has this ability to collectivise enabled you to get more positive or more constructive responses from politicians?	Interviewer
26	25:10.3 - 26:51.0	So getting permission for us to use the water was the biggest success that we got from the government. So, there was actually quite a lot of fairly serious opposition at times to the permission granted to us, in fact there was casteist opposition as well to access being granted to this community. And our collectivisation is what essentially allowed us to stand in the way of what would otherwise have been a defeat. What would have otherwise allowed the government to bow to the other side. And our collectivisation, our togetherness, is what convinced the government to stick with us. So, the DJB has come at times to try and fix it, but there is something with the pipelines. Every time they come ti fix it in one place, it bursts in another place. As such, there has been no improvement. Essentially it's given by the government as a lost cause, and simultaneously a lost cause that is understood to benefit this community. But it still requires significant fight on behalf of [our community'. The water that is otherwise going lost is now being utilised.	Interviewee
27	26:51.0 - 27:17.1	So, there have been many improvements. You've obviously been very much driven by the community. What do you think are the barriers that remain towards the community being completely water secure?	Interviewer
28	27:17.1 - 29:00.1	We want a bore well of our own. Because we recognise that one of the barriers that remain, I asked X specifically about the idea of how to get something more permanent. And the primary problem that still remains is that we consider the water that we have access to right now as being sort of transient. Possibly not being something that we have in the future. It is an unreliable source. So we would like something reliable like a bore well in the future. The day that we don't get the water from this source, what will we do then? Where will we go, what will we do? There are no alternatives, then. We need to have a bore well for that. It's been many years that I have been trying to get people to think about this, but it's hard for people to consider a future calamity. This is currently people taking it for granted. But we think that to be water secure we need to have a source that we can depend on in a more thorough manner than we can depend on this one.	Interviewee
29	29:00.1 - 29:22.4	And so what do you think needs to happen to get that water source for the future? It could be something from the government, from NGOs, but also in terms of community perceptions.	Interviewer

30	29:22.4 - 30:13.3	We won't be able to go and directly speak to the minister. But these are the people that we need the help of. So we need to find the people who gave us the information, and who gave us initial practice. We need to use the same path that we used last time. Essentially approach power step by step. Write a letter, get the signature of everyone in the area, and make sure that we identify the space in which the letter will make most impact. And make sure that we go there, and get listened to, and take the matter higher and higher up by stages.	Interviewee
31	30:13.3 - 30:37.2	So do you feel like yourself and other people, or anyone else in the community, is as aware as you could be about what those pathways are? Those pathways of power that impact those issues?	Interviewer
32	30:37.2 - 32:24.5	There are 15 women who know. All the members of the committee that I am a part of know. Everyone else comes to meetings and talks about 'These are my problems. Can we please get that fixed.' Only for big meetings. They're not especially aware. It happens once or twice in a month. Outside of that they are not especially aware, but the 15 women who are in my committee, we are very well aware of how bureaucracy functions. And as well as the planning of it, knowing who to pester when, and what the timeline for pestering is, knowing who to needle at what point in time, that is something we are quite comfortable with. That's information that we have, and we have used it before. And we will continue to utilise that information in the future. In 2011 there was a similar sort of interview that I had, that came into the Hindustan Times and people wanted to talk about how water solutions were...so basically someone took photographs of us while we were studying and teaching, and I had no idea that it would be in the newspaper the next day.	Interviewee
33	32:24.5 - 32:31.3	I didn't realise I was talking to a celebrity! Sorry! [Laughter] So obviously this knowledge, as well as the ability to collectivise, is something that is very useful and important?	Interviewer
34	32:45.5 - 33:57.4	I ensure that anyone who even drops a little bit of water does not hear the end of it from me! Otherwise the work is impossible without that level of understanding and organisation. We keep written records of everything. We never go alone. At least 5-10 people go together. So, the bore well, two bore wells have also been passed, so from next month there are going to be two bore wells. We have gotten permission from them and they are going to be built next month apparently.	Interviewee
35	33:57.4 - 34:26.2	So, a lot of success I can see. And that's really great to see and to hear about. Is there anything else that you think is important for me to know that maybe I haven't asked about?	Interviewer
36	34:26.2 - 35:10.3	So, we plant trees, and we plant short plants and shrubs, essentially to manage water better as well. None of this was here before. Without water, they cannot	Interviewee

		grow without water. But we need them to better manage our water as well. So we now compost as well. And we sell it for 20 rupees a kilo. It's another way for us to earn money to a certain extent. And we have created an open space for meetings to be held as well, and all of this has been a function of the fact that we don't have to worry about water to quite the same extent. These are essentially luxuries that we can incorporate into our lives. So, when we first got direct water to our house, I planted a small papaya tree, and I got 7kg of papaya from it recently. Without water that was unthinkable! And now we have fairly big trees, and all of these are a product of the fact that 15 years ago we started getting water more easily. This is something that makes me very proud.	
37	36:10.5 - 36:22.2	That's great. I really appreciate you sharing your vast experience with me.	Interviewer
38	36:22.2 - 37:11.5	I am glad you have come from so far away. I should be the one thanking you. I always tell other people, other communities that are facing these problems, this is what we have done, you should try to do the same. I was working for water harvesting in Chattarpur for 7 months. So every house I went there and explained. So I explained extensively in each house how it is important for them to utilise rain water, and to talk about our solutions as well. Wherever I go I never leave anyone alone! So if I see someone wasting water I am never going to let them hear the end of it!	Interviewee

C2. Sample Development Worker Interview

	Timespan	Content	Speaker
1	0:00.0 - 0:23.9	Let's get started. Perhaps, I know who you are, so I won't ask you the formal questions telling me about yourself and so on. But could you tell me from your perspective how, what role do you see water playing in the daily lives of the individuals you work with?	Interviewer
2	0:23.9 - 1:26.0	I am BS. Team leader of this project. This project I nearly completed four years. In my experience I see, the water is one of the greatest issues of the people. Without water there is no life, actually. I have seen both the ups and downs in the lives of the people, in their livelihoods, political situation. But one of the things, the water, is essential for humans. Many time the people are coming and asking me, one main things, that is about the water actually. More than their livelihood things, more than other necessary demands. Everyone is asking water, water, water. So, everywhere, you go to the community and water is one of their main things. So, there's need for water actually. Without water there is no life.	
3	1:26.0 - 1:30.8	So water is something that comes up all the time? More important than livelihood issues?	Interviewer
4	1:30.8 - 1:32.7	It's the life, actually.	Interviewee
5	1:32.7 - 1:50.0	That's absolutely essential, and you think the community recognises this as well. So could you tell me a little bit about what they key water initiatives that X has here in Faridabad?	Interviewer
6	1:50.0 - 2:13.4	Just, here water and sanitation initiatives, they started before three years, three and a half years before. When I came immediately I started this project. Here I complete nearly four years, actually. When I came here we focused on the sustainable development, mainly, the wellbeing of the children like the centring on child protection, and inform the people on certain entitlements. These are programs we are doing. I went here and there in the community, just I saw a lot of the sanitation issues, and the water issues in the community. See, the people are used to everyday far away for taking the water. If I go to the schools also, we cannot see the children. The main reason is the children cannot get the water. These are the very bad challenges, to go inside the schools, here and there you can see the toilets are unclean, they are in unhygienic conditions, but there is no supply water. There we also see the water issues. We go to the community during the summer season, many people are fallen sick the with diarrhoea and cholers, actually the doctors tell 'your water is contaminated', the issue is because you are drinking the unsafe water. This really touched me a lot. Finally	Interviewee

		I discuss this with our WASH director, he has given a very good suggestion. He asked me to do some demand initiative activities. What he asked me, before starting any program you have to start the demand in this sector, you have to create the demand in the community. Otherwise if you start anything, if you start any program, the people will not follow, the people will not maintain actually.	
7	3:44.1 - 3:49.6	So awareness is the most important point to start?	Interviewer
8	3:49.6 - 4:27.8	Through the skills, the drama, we form some youth group in the community, we train them up, we spoke to the people how to sensitise the community with various water and sanitation issues. The children are going here and there, training the people, spoke to the people on various issues. People also came to the 'aah, my children are sick because of this issues.' Before they don't know about why they are sick. Through the drama, the skit plays, the children they are teaching them. The children are falling sick because the water is contaminated.	Interviewee
9	4:27.8 - 4:31.3	So you're using accessible means for people...	Interviewer
10	4:31.3 - 4:51.1	Drama, script, we teach the people, we sensitise the community. Then the people themselves they will get to know 'these are the main issues.' They don't know that what their are used to the open defecation system, they have the toilet some people, they are not using the toilet. They will go for open defecation.	Interviewee
11	4:51.1 - 4:52.3	Because they were not aware of the consequences?	Interviewer
12	4:52.3 - 5:37.8	People are migrate from the other parts of the country. UP, and Bihar, there they are not using the toilet. Just if you came here, they have the toilet in the house but they are not using. They think if you use the toilet inside the house, it will spoil the environment of the whole house. This is the thinking of the people. So what we taught them, we sensitise the communities. So finally people came to know 'yes, we need to use the safe drinking water. we need to use the toilet.' Some small, small drama, inside the children's club we teach the children. 'See, if you're not using the toilet, what are the limitations, what are the direct effects that will be inside the community.'	Interviewee
13	5:37.8 - 5:40.5	So what are the consequences of not using the toilet?	Interviewer
14	5:40.5 - 5:50.6	The children are used to going to open areas for defecation, the girl children are also being harassed from the menfolk.	Interviewee
15	5:50.6 - 6:54.9	They eve-tease sometimes. So we finally came to, we had a discussion with the community, that finally the community addresses, we form a WASH Committee inside the community. We train the WASH Committee on the	Interviewee

		various issues, what are, how to test the water, how the water is contaminated, what is the purpose of toilet, why do we need to use toilet, what is the purpose of hand washing. Teaching the community on various hygienic behaviour program actually, hand wash, we train 15-20 people in each community we train, they themselves enter each and every community, and sustain each community. The fact that people are suddenly coming to us asking 'sir, we need to test the water.' The people they saw that the water is contaminated. So we hire some people from the Gurgaon area, they come and tested the water. Finally we concluded the water is contaminated.	
16	5:50.6 - 5:50.7	So problems of eve-teasing and so on?	Interviewer
17	6:54.9 - 7:01.9	And this is water from which source? Was this from tankers? Bore wells, or...?	Interviewer
18	7:01.9 - 7:04.5	Actually, the thing is there is two mode of water supply. One is from bore wells. Second one is the supply water from the tanks, the municipal corporation water. Both the water supplies were contaminated. The source they are getting through the bore, that is more contaminated than the supply water. Because the supply water is not linked to supply water to the whole communities, because the community roads they are very small, the drainage is coming. The lorries cannot cross the drainage. So the people have the bore facilities, they are getting direct personal water sources from the drainage water. So the water is getting contaminated. The main reason no, we see the community children, most of the children we see over the three years, most children have some skin problem, many children die as a result, have mental issues, some skin issues.	Interviewee
19	8:03.3 - 8:10.4	So there are problems of poisoning...heavy metals from, there's a lot of industry around here.	Interviewer
20	8:10.4 - 10:43.2	A lot of industry also contaminated the water, actually, through the drainage systems. It is contaminated. Because they are sharing the same drains, same as the regular water, we are not getting this water suitable for drinking. Is one of the big issues, actually. So we came to know that there is a need for water systems around the community. Finally we tested the water, we discussed with our colleagues also what we are doing, we provide them low cost water filter to the community people. Big number of people: 20,000 - 30,000 people. If we provide some tank water filter system, costing nearly 6000 rupees, you know, we cannot provide for all the people actually. So we teach the children, we teach the community on how to use the low cost water filter, what is the low cost water filter. We provide a bucket, and alum and chlorine, they need to mix it all in for 5-10 minutes, they have to count like that 1-50 [mixing the water], they have to put in one place for more than 6 hours. Most people are used to leave it overnight, and in morning actually fit for the drinking. The morning they fill the bottles, and that is good for the drinking also. They are continuing actually. Cost is only 50 rupees per month, annually it come to 600 rupees. Poor people is also able to continue. It's a sustainable program actually. After trailing this	Interviewee

		low cost water filter we tested the water also, there was a big difference, huge difference. Before and after. Before testing, after testing, huge difference. After six months we did a focus group discussion with the community also. We call the same group of people, those affected by many diseases: cholera, all the diseases. We call all the people in the place, we ran the FGDs, what we come to know is that there is a lot of success stories, the people in one of the communities, one of the ladies said that 70 persons were affected by tuberculosis, regularly children used to go for diarrhoea, after taking medicine also used to go. They are not aware about the water being contaminated.	
21	10:43.2 - 10:49.5	So even medicine didn't fix it because of course, even if the water is contaminated...	Interviewer
22	10:49.5 - 12:16.0	They are using the same water. So that is not stop actually. We teach the community children, we taught community people how to use the low cost water filter, finally we came to know it's a very successful story. They were sharing their stories: 'The past three months I am feeling good.' One time also they don't go to hospital for diarrhoea cases. One thing also many small children, they are effected the children below five years, was malnutrition. Why malnourish? The reason for the malnourish is because the people not taking the nutritional food. The Anganwadi department teach the community people and the family mothers, pre-natal and post-natal mothers various nutritional practice and behaviour, but after practice the children the weight is also not increased. They give nutritional food but the weight is not increase. Finally they came to know that the are drinking the unsafe water. The water is contaminated. That is why the weight is not increased. After the mother follow this process of this low cost water filtration system, they used to give the water to the children. After drinking the water the children weight is increased, the child was 11kg, now the child weight is 13kg. So the weight is increased.	Interviewee
23	12:16.0 - 12:20.7	So there is a real quantitative improvement as well...	Interviewer
24	12:20.7 - 16:16.0	Just very successful. Actually also recently people related in the FGDs, that the various people that done the X also, the X came to know also that nearly 40% unsafe water the people are drinking, reduced from 80%. People are drinking the safe water now. The other issue, is really big issue. People are only able to get the usage water, here the people that are able to get the safe water is increased now, because of the various programs. One more thing, at the start of the program, we go to the school. The school is also one of the big issues. Toilet there is, but no supply water. The girl can sit on the beautiful toilet, but no supply water, because the municipal corporation used to give supply water only for half a day, 2-3 they stop the water. They are not able to get the water for the supply also. You cannot go inside, get inside also. The children used to go to their houses for the toilet, break time 11-1 o'clock is the break time, again they go back to the house for the toilet, they will not come back again. So there is a drop in the attendance register also. One more thing, the children that have the	Interviewee

menstrual period, the community girl children need for water. So menstrual period is not come, the girl children not come to school. We discuss with the school teacher and principals, they are sharing these issues. Yeah, we though, ok, we done the water and sanitation study inside the school campus, we came to know that nearly 2500 children they are studying, only they have the two toilets, through toilet it is the supply water, pipe connection is not given actually. They have to bring water from the some buckets. It's about 500 metres, then they have to go back there. It's a very big challenge for the children actually. We discuss with the municipal corporation, we discuss with the teacher also, we got the permission for the tube. First we did the soil testing, how much filtering we need to do for the drinking water, 2, 3, 4 tests we done there the survey. Finally the technician said 'here you will get the water, after nearly 500 feet.' We dug the 500 feet and we get the water. What we done we get the pipe connection, covering nearly 2-3 kilometres inside the school. All the area get the pipe connection inside each and every toilet. Before only two toilet was there, we provide an additional three toilets. Now all the five connections for both the boys and girls and the staff, including the disability toilets also we provided the ramps, ramps also provided the disabled children by ramps they go to the toilet. The pipe and everything we brought it down at the height level, they can use the pipe water, they can clean all the private parts. They can clean everything actually. That is the system we provided. And the toilet also what we done, based on the size we provided the toilet facility for the children, the flush facilities, all the technical configuration everything we provided for the children. One more thing we given the supply water also, what we done is form the WASH Committee inside the school also, teach the children each and every day the children will do the monitoring also: the toilet are cleaning or not, the pipe connection is proper working or not, if the pipe connection is not working immediately they will put to the WASH Committee inside the school.

25	16:16.0 - 16:25.5	So there is a system in place to make sure that the infrastructure continues to work, rathe than 'we'll provided it to you, great, great, great' and then as soon as it breaks...	Interviewer
26	16:25.5 - 16:49.3	One more thing. There are expenditure is also very much low actually, the government is provide only 2000 rupees per annum. Is not sufficient for the maintenance. The cleaning lady also, they are cleaning the toilet, they are making 2000 rupees per month. The system they providing: the community and the children, and the school teachers they are contributing for the maintenance.	Interviewee
27	16:49.3 - 16:56.4	So there's a common pool that contributes to a fund to make sure that the toilets are maintained.	Interviewer
28	16:56.4 - 17:04.5	If the problem is come in the pipeline, immediately they will call some pipe repair.	Interviewee

29	17:04.5 - 17:13.0	So it really is quite well organised in order to make sure that the infrastructure is not only provided, but that it is maintained over the long term.	Interviewer
30	17:13.0 - 20:05.5	One more thing I want to share. The problem is the supply water, but the supply water is unsafe water. The source has the water disease. Not suitable for the drinking. And our feasibility study we also come to know the children they are suffering a lot seasonal diseases, because of the the contaminated water diseases. Then what we done is we discuss with the experts, and we planning to provide one 2000 litre per hour reverse osmosis water filtration system, that is suitable for 2500 children. It's a three tank system. Each and every children they used to buy the water from outside, or they bring the water from the houses. The water is very happy to drink that water actually. They are doing the maintenance, the cleaning. Recently, the children were sharing that they were drinking very bad water, that the water is not very tasty. The staff also continue to drink this water, teachers, and we have some separate water for the teachers also, some 10-15 litres mineral water. Now they are also drinking the same water. Attendance is also increase to three times actually. You have also done interview with this particular teacher also, and she said there is a massive growth in the attendance. Year ago attendance was just 1200 children, now it's 2600 children. It's huge. It's massive. Some of the private school children are also coming and joining this school also, because all the facilities are there, compared to the private school. They are not providing the safe drinking water. The children are used to drink the water from the houses, and we provide the very good water, the toilet facilities, child friendly space for the children to play. What is a package approach we have inside the communities and schools, it's more to do with the children, to give them bright futures.	Interviewee
31	20:05.5 - 20:38.8	Thank you. That's quite a good overview of the initiatives. So, my next question is: what do you think are the benefits of these kinds of initiatives? And think in the broadest way possible, because I mean, obviously, an improvement is one, and you've talked about school attendance improving, for example. Do you think there are other benefits, not just for the children, but also for their parents, the community in general. What are the benefits of these kinds of initiatives?	Interviewer
32	20:38.8 - 20:41.1	Only water, or other than the water?	Interviewee
33	20:41.1 - 21:03.0	Yeah, just water in this case. But any of the initiatives that you've mentioned. You know, the water initiatives that you've mentioned, yes, they're about water, but they're also mixed in with other things. The awareness programs are not just about water, but we can talk about the awareness programs because they target water as well, for example.	Interviewer
34	21:03.0 - 21:29.7	One more thing I just want to share about that. X cannot be able to provide all the things, because the government have a lot of resources. One thing, main	Interviewee

		ideas, main plan is to bring sustainability inside the community. You can bring some tangible benefits but not bring any sustainability, so if we provide fish, no, tomorrow they will eat, tomorrow...who will give the fish?	
35	21:29.7 - 21:34.8	Give a man a fish, he will eat for one day. Teach a man to fish, he'll eat for a life.	Interviewer
36	21:34.8 - 23:18.1	Need to teach the people how to catch...to bring really the sustainability inside the community. That is our main area, our main focus. Regarding the WASH, the areas we are working are unauthorised slums. Unauthorised slums are very neglected places, only the poor people used to stay there. It's the second biggest slum compared to Mumbai. Second is Faridabad district. Second largest slum in all of India. One more thing, every day the people are increasing fast, there is a lot of migration from other parts of the country like UP, Bihar and Rajasthan. Rest of the parts of the city the cost of living is very much, so the people used to once to live in the unauthorised slums. The cost will come down, but the issue is that the water and sanitation are the very big issues in the community. The people are there, but they will not be able to get the supply inside the communities. It's a very big challenge. The corrupt also we have the challenges issues they are there. The government investment is very poor in unauthorised communities. Just they are using the people as a vote bank, the voting bank. Election times they are making lots of promises: 'we will authorise the slum', 'we will use some wonderful water filtration system', ' we will give the tube facilities for the supply of water.' The election is passed over, they will not go and see the community people also.	Interviewee
37	23:18.1 - 23:20.3	So once the election is done, that's it.	Interviewer
38	23:20.3 - 23:56.6	The poor people are voiceless actually. They are manipulated by the politicians. So what we thought that we need to bring the changes in the political systems. We cannot bring the changes, but we can bring the changes with empowering people. So what we have done, we have lots of youth groups inside the community. We have one training module is there: Citizen Voice in Action. What is the basis for CVA element is there, is that people are very sensitive without the community. Especially on water and sanitation issues.	Interviewee
39	23:56.6 - 24:03.1	Oh, so CVA is a primarily WASH-based program.	Interviewer
40	24:03.1 - 25:15.3	It's a package of modules. It's a three days program, devoted daily program leading to a group of elders, leaders inside the communities. So how much water is needed for one person? Yesterday the boy also shared with you, how much litre of water is needed. You were also amazed he know, for drinking how much litre. We teach the youth on the water and sanitation issues, CVA. These and each and every woman, how much time is needed for bringing the water, how much time is needed. Used to bring the water for 15-20 minutes, how much water is needed, how are the UN standards we teach the community. After we teach the people they are really 'woah, really the political	Interviewee

40		people are really manipulating us. They are not providing us. We are staying here for more 15-20 years, they are not providing anything. We have 30,000 population, only 3-4 tubes is there. There is no supply water.'	
41	25:15.3 - 25:27.5	So you think through these programs that you've kind of created, you've helped to foster a consciousness in people of their own, of what's wrong with the system...	Interviewer
42	25:27.5 - 28:32.7	Basically rights of the people. What are the rights. This is citizenship. You are a citizen of this country, the government cannot neglect that you are staying in an unauthorised slum. They have to provide all the facilities. You are a citizen of India, so these are all the rights, and rules, and regulations. Everything we have teach. Finally the people have realised what is the...we teach people the various protocol. You cannot go to the MLA directly, you have to follow protocol. First level the people they realise they are not getting supply water, so they have to go another part of the places. To fill their containers they have to stand in the queue, take some water and come. The morning if they do like this many people the miss the job also. Many children also they cannot go to the school. It's a very big issue in the communities actually. What we teach the community, when you enter approach the person that is the elected representative of the community, what he say is that the government has no financial allotment for this program. The people are not stop again, again they take the initiative, they go to the second level, they went and met with the municipal corporation official. What he say is the same, the place you are staying now is unauthorised slum, these are the projects only for the authorised slum. You have to go to another community. If you have the problem, you need to move to another community and we will provide all the facilities. 'If you are asking us to move from this place, our whole livelihood is there. Our children are standing there.' They are shifting and giving to the community very far away, nearly 50kms from us. Their whole livelihood will suffer, their education will suffer. They are struggling, 'these are the places we are working, our children will suffer, people will suffer.' They are not accepting. Finally, nearly 150 self-help group women, they went and approach with the Minister, the Central Minister. Central Minister is gone outside, his PA also came and met with the people, he counselled the people, he said 'he will go and do all the program for the community.' They say 'no, no, we need to meet the Minister.' Finally the Minister also, the morning they came, even at 6 o'clock the many minsters came there, finally they were chatting all the issues. 'We want a promise, and then we will go.' Finally, the Secretary called the guild of the ministers also, so the Minister he was asking all the fundings and things, and calling the municipal corporation, the commissioner, director, they have a meeting with the community people and we give the facilities for your people.	Interviewee
43	28:32.7 - 28:36.3	So the women in the self-help group were able to exert pressure on the politicians to make sure that something was done.	Interviewer

44	28:42.1 - 28:50.3	Before they were, now they are, immediately someone will give them the priority. Is really providing the supply water to all the people.	Interviewee
45	28:50.3 - 29:13.2	So you're talking about, really in a sense, political participation as being, would you say that it's the most important benefit to come out of these initiatives? Do you think it's the most transformative benefit? The one that has the biggest impact on lots of different things. Do you think that political participation?	Interviewer
46	29:13.2 - 30:12.1	Political participation is very much necessary. Without political participation you cannot bring sustainability inside the community. Because they are the lawmakers, because they are a lot of powerful people. Immediately they can change anything. They will give all the facilities to the people, actually. Only they are not providing because the people are the village people, uneducated, the voiceless people, they want to cheat the people. This awareness went even to the whole community, just in all the communities, 5 community nearly 15-20 bore wells come because of this CVA program. People are aware about that, how they are also trying to get one Prime Minister program, 'Swachch Bharat Abhiyan', the government is bringing 7000 rupees per the toilet, individual toilet. They are also starting taking these from the government actually, if the funding comes each and every house will get the toilet.	Interviewee
47	30:12.1 - 30:18.3	So the community is aware of that initiative from Swachch Bharat and they know how to take advantage of it.	Interviewer
48	30:18.3 - 30:43.4	One more thing just I want to share. Supply water is provided, but supply water is contaminated. Because we are not providing the water filter system for all the people, it's 230,000 population, nearly a crore, nearly 30% of people of the whole community, nearly 80,000 people, just 30% of the population. The rest of the other 70% is left without. What we teach the people, same thing, hand washing, use the toilet, but we teach the people, and that the water is contaminated. What the people is doing now, because a lot of industry is there, many people got the job in the industry. Used to get the regular income, they know that they need to drink the safe water. Water they started drinking, they are buying mineral water, tanks, to fill the water bottles for 20 rupees, then they drink the water. They know that. Here they are drinking directly the supply water. Or they are not drinking the supply water directly. They are buying the water. The supply they only using for the bathing and toilet.	Interviewee
49	31:38.7 - 31:58.1	So it's an improvement, although it's not a perfect situation. It's an improvement because before people were not aware that it's dirty water. Now they're aware that it's dirty water. They have an income because there are jobs, and so they're able to at least buy safe water for drinking. Am I understanding correctly?	Interviewer

50	31:58.1 - 32:10.4	Yes. The only thing is that the government responsible authority to give the supply water. Safe drinking water for the community. They should not buy it. But the government role is there, but it is missing.	Interviewee
51	32:10.4 - 32:32.4	So, you talked about the benefits of improving...one key benefit is really improving people's ability to know their rights, and to assert them as well. So, do you think this is the biggest barrier to water development in slum areas? Do you think that is the biggest barrier?	Interviewer
52	32:32.4 - 32:32.5	Yeah.	Interviewee
53	32:33.8 - 32:53.1	So, how can X and its urban water development initiatives continue to improve this? How, what is the vision or the strategy about how to improve people's political participation, in order to improve people's access to water, sanitation and hygiene?	Interviewer
54	32:53.1 - 33:00.3	Each and every three month we are planning to do the interface meeting with the community people and the politicians and the bureaucrats. We started now.	Interviewee
55	33:00.3 - 33:07.4	So, community, politicians and bureaucrats? And facilitating an interface between them.	Interviewer
56	33:07.4 - 33:34.7	Three months started doing on the WASH and child protection. Three issues we are linking. WASH and child protection issues. Each and every, once every three month we have a meeting with the government actually. If any issues is there, bureaucrats will be there, politicians will also be there, community persons will also be there. Then they will discuss the issues and get the solutions directly. That are the initiative started, it's get a very good result also.	Interviewee
57	33:34.7 - 33:38.4	So it's already started? When did that initiative start?	Interviewer
58	33:38.4 - 33:39.9	Just one year ago. For the last one year we started.	Interviewee
59	33:39.9 - 33:41.6	So you've had four meetings?	Interviewer
60	33:41.6 - 33:55.7	Three meetings. And one is coming meeting. One thing is some of the meetings the politicians their attendance is very poor. Bureaucrats are there, but the politicians is missing. But mainly 60% success rate is there.	Interviewee
61	33:55.7 - 34:00.1	100% is hard to imagine, right?!	Interviewer
62	34:00.1 - 35:51.4	Hard getting a guarantee for all the promises. But the bureaucrats are very different from the politicians. They are the lawmakers, they have to give the funds. The bureaucrats are different. This month they will be here, next month they will get the transfer to another place actually. That's a biggest challenge.	Interviewee

		We started the initiative and we are getting the very good result, I hope and trust in future we will get the very good result actually. One meeting the politicians come, the next meeting the person responsible for the department is there. I hope we get a very good result, actually. One more thing I also, we are also, increase the people to taking part in the political, democratic process also, actually. Just now listening to the people also, to stand in the elections as the municipal ward members. They really will give the very good facilities for the particular community. If they become the decision-maker, they give a lot of facilities for the people. We are also teaching the community how to maintain the community. You should select such a person who will give support, give some facilities for the community. When it is election time, a lot of bribery system. People are getting 200 rupees from the politicians, should not be giving the vote like this. Should transform the political system also, take part in the political election also. A lot of changes is coming, I hope. To bring some changes into the community.	
63	35:51.4 - 35:58.7	Well, these kinds of changes are always long-term, aren't they? They're cumulative. They build up.	Interviewer
64	35:58.7 - 37:13.8	My mode, my task is to give some 100% of our community children should get the safe drinking water. Each and every household should have the individual toilet. Each and every community their environment should be safe, clean. That's my ambition. People also started actually, the people are not knowing it's polluted. The children's club, we have nearly 180 children's clubs. Each and every children's club we have, teaching the children hand washing also, that and the planting, small, small plants they can plant inside the community. We give the responsibility to each and every children also. Small saplings, plants, they are planting inside the communities actually. Each and every children, actually, we have 150 childrens. Each and every day they give water. If you teach, you have a very good plant, you have a very good rain water. Our pollution will not get really pollution. We will get very good oxygen.	Interviewee
65	37:13.8 - 37:19.4	So there's education about the roles that plants play in the environment, curing water?	Interviewer
66	37:19.4 - 37:57.7	The plant is a source of water. Without plant we never get rain, we never get water actually. This the children we teach. You get very good, safe drinking water. Planting in the schools also. The summer seasons the schools were struggling to get the water in the bore wells. We teach them: 'If you're not getting water in the bore well. You should not be wasting water in the rainy season. If you have the proper harvesting system, then you will also get the very good water in the tube also.'	Interviewee
67	37:57.7 - 38:07.3	So you are teaching in a sense the importance of conservation during the months of abundance, so they can safeguard the supply in the months when water is scarce.	Interviewer

68	38:07.3 - 38:20.1	The school we have done, but in the community it is a very big challenge planning to do the water harvesting system. Because there is a lack of space, you know? They will not be able to do. The house is very small, 8 to 10 feet the houses are.	Interviewee
69	38:20.1 - 39:03.9	So where to put the storage system? That's excellent. I guess one question that I do have is, considering the current barriers in people accessing water, sanitation, and having hygienic behaviour, for example. Let's say that all of these issues were overcome, what do you think people would be able to do, or how do you think people could live their lives better than what they do now? Why is it important to provide people with water, sanitation, and hygiene, really? That's another way of framing the question.	Interviewer
70	39:03.9 - 42:44.7	First, the water is very fundamental principle of the livelihood. Without water there is no life. But living life it is made for water. If I get the thirsty I need water actually. Without water I cannot live. So living purpose there is a need for water. Second, hygiene. Promoting the hygienic, there is also a need for water. Here the people they are suffering from many skin diseases, because they are not getting supply water regularly. They are not cleaning their body properly each and every day, and they are not brushing daily. Our package, our program also, this is the community sanitation behaviour program, we provide each community with toothbrush, paste, soap, and five litre of purified water. Each and every community for nearly, each and every children's club we have provided actually. All the children they drink very good, safe water. Second the brush, the paste we also provided. Everyday two times they will brush their teeth regularly. Soap box we also provided. Before eating, and after going and come from the toilet facilities for bathing they use the soap. These changes we teach, the community. After the real changes they started doing this program. Before they are not drinking the safe water, now they are not drinking directly the supply water. Drinking the very good, safe water. One more thing I just want to share, no? If I want to go to the school regularly, I need to get the regular supply water on time. The menfolk were not able to go to the job properly, on time properly. But most of the time they spend on drinking water. Supply water is very far away. They need to travel 15-20 minutes, they have to stand in the queue. Their whole livelihood is collapsed. The children, they have to get the water for the point, they take 15-20 minutes, they have to eat, they have to go to the school. Again 30 minutes is passed again. The children is not going to the school regularly. And then what happen, the supply water is not cleaning properly because the children are not hygienic, so they are not safe. The children are likely to suffer from a lot of sickness. Stop the sickness also is expensive like, cholera, malaria like type diseases. A lot of mosquitos issues are there. Stop all the things there is a need for safety with water for the safe community. Safe drink water also similar, supply water also similar. For the improvement of the livelihood systems, each and everything the water is connected actually. The water is not a standalone issue, disconnected to each	Interviewee

		and every thing. It's connected to education, connected to the livelihood, connected to the three factors. Sometimes we think the water is a standalone activity, not connected. But it is connected to each and every thing. If I get the water, I will go to the school regularly. If I get the water on time, I will go to my job regularly. If in my family children are getting very safe water, the supply water they are getting, then my own family will have a very good living conditions. It is connected with the three aspects: health, education, and livelihood.	
71	42:44.7 - 43:13.9	So, those are the things that you say water impacts. If I was to ask you the other way around: what things impact the lack or urban water development, so what impacts the other way around. What are the causes, we've talked about politics being a strong one. Do you think there are other causes for why the water situation is the way that it is? And what do you think are the main ones? Apart from politics, because we've talked about that one quite a bit.	Interviewer
72	43:19.4 - 43:38.2	The main one is naturally the, especially in the Nehru Colony, land area is stony area. The government has done lots of feasibility studies, the soil is one of the major issues. The land is a stony area.	Interviewee
73	43:38.2 - 43:40.6	So the composition of the soil...	Interviewer
74	43:40.6 - 43:45.9	The composition of the soil is not good. 600-700 feet also they are not getting water, that is one of the biggest issues.	Interviewee
75	43:45.9 - 43:49.4	So bore wells are not an option?	Interviewer
76	43:50.6 - 44:13.7	Not an option. The water tanker system is coming regularly. They are saving for improvement in the water tanker system, now they are making payment regularly, they are making for 10-15 litre tanks they are paying 5 rupees. But if the government is delivering, do the delivery free of cost, definitely it will improve the system. One more major reason, one is the water is storage, second is water is contaminated also. Supply water they are getting is contaminated, they are not cleaning the water. Some people they are drinking the water directly actually. There is a lot of damages to this, one of the big issues also. Then the political system, there is the corruption in the bureaucrats also, that's also leading to the bureaucrat problem. Sometimes the funding is come, but they are not spending the funding on the community people. Lack of awareness also. The funding is come, but the people are not aware that the funding has come for the community actually. Each and every five years the government has giving a lot of facilities to the community people, but still some people are not aware of that. They don't know how to approach, how to get the facilities from the government.	Interviewee
77	45:22.6 - 45:29.8	So there's a lack of awareness of what the channels are to approach with the problems?	Interviewer

78	45:29.8 - 46:15.6	60% they are aware, 40% they are not aware. Need to improve the systems at the community level. Need to improve more on this. They are working on this actually. Again, our five year program we plan a lot of programs, initiatives how to improve, make awareness at the community level, sensitise the community. Improve the water systems at the different levels, at the community level. Just on the other part, what is it, what X has done, giving the water filter system of the community, what's the plan? The children, the people they will give each of the people a recharge coupon, recharge card to the people. They will have to recharge it, they have to get the water, have to buy the water at the filter system. That we are planning to do with the community.	Interviewee
79	46:15.6 - 46:28.8	Ok, so a system. So how would that work? Do you know? I don't know at what stage of planning you are now. How would that work? So, individuals or households have a card? How would that work?	Interviewer
80	46:28.8 - 46:54.1	Individual card we provide. The group will do the maintenance. They will get all the facts and awareness about the water filter system, it's like they have to swipe card. They have to swipe the card they get the sufficient water, they have to make the payment for the card. They are some getting money, the SHG will do the maintenance.	Interviewee
81	46:54.1 - 47:06.5	So it's basically a system of accountability. It's about making sure that people take responsibility by providing something towards the maintenance of these systems? Interesting. That's quite innovative.	Interviewer
82	47:06.5 - 47:35.5	Going and getting the mineral water only at that time, you are paying 15-20 rupees. Now for 15-20 litres they only need to pay 5 rupees. And get the very good, safe drinking water. The process they want to have actually. Already this is done in other parts of the country. Here they want to do also. In a couple of years, 6 or 9 months it will take. The funders have to come, that our second ambition is there, that the government is not providing.	Interviewee
83	47:35.5 - 47:37.5	Have to find the funds from elsewhere...	Interviewer
84	47:37.5 - 48:17.8	We will find the system the community should get the safe drinking water. People are also more doing work actually, under present work. People are very employed actually. They are also asking: 'we need system like this.' We are also 3-4 month before, they are exposed when they went to other communities, they saw how they successfully the plan is functioning, how the SHG is going the maintenance actually. Maintenance is the big issue, the maintenance cost. See, the people are making the payment, the SHG will get the money, from that money they will do the maintenance also. So the program will work, it's not a problem actually.	Interviewee

85	48:17.8 - 48:28.1	So it's been successful in other areas. Ok. That's great! Before we wrap us, is there anything else that you think is important for me to know that I haven't asked a question about?	Interviewer
86	48:28.1 - 48:48.1	Only thing is, a lot of need are there, but the government has a shortage of funds. One side we are struggling with the government with the facilities for the poorest of the poor in the community. Also need is there, but we cannot meet. Each and every day is important. If we miss one day also the people will die. The water is life, actually.	Interviewee
87	48:48.1 - 48:50.4	So sometimes have to make the best out of...	Interviewer
88	48:50.4 - 49:08.1	If we get some additional funds from other sources like corporate, then we can able to fund a lot of studies, and can support more of our people inside the community.	Interviewee

Appendix D: Thematic Coding Schemes

D1. Publication 2 Coding Scheme

Max-Neef's (1992) Matrix of Fundamental Human Needs

Code Name	Description
Affection	
Being	Self-esteem, solidarity, respect, tolerance, generosity, receptiveness, passion, determination, sensuality, sense of humour
Doing	Make love, caress, express emotions, share, take care of, cultivate, appreciate
Having	Friendships, partners, family, partnerships, relationships with nature
Interacting	Privacy, intimacy, home, spaces of togetherness
Creation	
Being	Passion, determination, intuition, imagination, boldness, rationality, autonomy, inventiveness, curiosity
Doing	Work, invent, build, design, compose, interpret
Having	Abilities, skills, methods, work
Interacting	Productive and feedback settings, workshops, cultural groups, audiences, spaces for expression, temporal freedom
Freedom	
Being	Autonomy, self-esteem, determination, passion, assertiveness, open-mindedness, boldness, rebelliousness, tolerance
Doing	Dissent, choose, be different from, run risks, develop awareness, disobey, meditate
Having	Equal rights
Interacting	Temporal spatial plasticity (anywhere)
Identity	
Being	Sense of belonging, consistency, differentiation, self-esteem, assertiveness
Doing	Commit oneself, integrate oneself, confront, decide on, get to know oneself, recognise oneself, actualise oneself, grow
Having	Symbols, language, religions, habits, customs, reference groups, roles, groups, sexuality, values, norms, historic memory, works

Code Name	Description
Interacting	Social rhythms, everyday settings, settings which one belongs to, maturation stage
Idleness	
Being	Curiosity, receptiveness, imagination, recklessness, sense of humour, lack of worry, tranquillity, sensuality
Doing	Day-dream, brood, dream recall old times, give way to fantasies, remember, relax, have fun, play
Having	Games, spectacles, clubs, parties, peace of mind
Interacting	Privacy, intimacy, spaces of closeness, free time, surroundings, landscapes
Participation	
Being	Receptiveness, dedication, sense of humour
Doing	Become affiliated, cooperate, propose, share, dissent, obey, interact, agree on, express opinions
Having	Rights, responsibilities, duties, privileges, work
Interacting	Settings of participative interaction, parties, associations, churches, communities, neighbourhoods, family
Protection	
Being	Adaptability, receptiveness, solidarity, willingness, determination, dedication, respect, passion, sense of humour
Doing	Co-operate, prevent, plan, take care of, cure, help
Having	Insurance systems, savings, social security, health systems, rights, family, work
Interacting	Living space, social environment, dwelling
Subsistence	
Being	Physical health, mental health, equilibrium, sense of humour, adaptability
Doing	Feed, procreate, rest, work
Having	Food, shelter, work
Interacting	Living environment, social setting
Understanding	
Being	Critical conscience, receptiveness, curiosity, astonishment, discipline, intuition, rationality

Code Name	Description
Doing	Investigate, study, educate, experiment, analyse, meditate, interpret
Having	Literature, teachers, method, educational and communication policies
Interacting	Settings of formative interaction, schools, universities, academic groups, communities, family

Water Service Factors

Code Name	Description
Access	Relates to distance from water sources, time spent collecting water, and ease of access arrangements
Equity	Perceptions of equitable access to water services relative to other individuals and/or households and other city residents
Price or Affordability	Relates to ability to pay for water for domestic, productive and drinking purposes, and impacts of spending on water on purchasing other necessities
Quality	Subjective perceptions of the appearance, smell, taste, or perceived microbiological status of water
Quantity	Relating to adequate or inadequate amount of water
Reliability	Relates to reliability of access to water for domestic, drinking and productive uses

D2. Publication 3 Coding Scheme

Code Name	Description
Right to the city	
Being considered unauthorised	Relates to instances where participants identified non-notified (unauthorised) status as the principal cause for water service deficiencies
Lack of awareness of rights by residents	Relates to the practice of using informal settlements as vote banks, which participants identify as symptomatic of the broken promises by politicians
Technical problems	
Lack of government funding	Relates to lack of government funding for improvement works in informal settlements
Lack of pressure	Relates to perceived lack of water pressure due to illegal tapping, inadequate pump infrastructure, sewerage connection etc.
Inadequate infrastructure	Relates to perceived inadequacy in existing infrastructure arrangements
Maintenance	Relates to inadequate maintenance of water services
Corruption	
Water mafias	Relates to private vendors who charge exorbitant amounts of money for access to water services
Government corruption	Relates to perceived or experienced corruption of government officials resulting in denial of water services (e.g. inability to pay bribes)
Community corruption	Relates to perceived or experienced corruption within the community, such as in relation to community leaders, leading to inadequate water services
Lack of meaningful engagement between residents and political establishment	
Vote banks	Relates to the practice of using informal settlements as vote banks, which participants identify as symptomatic of the broken promises by politicians
Inaccessibility	Relates to perceived lack of accessibility of decision-makers

D3. Publication 4 Coding Scheme

Code Name	Description
Foundations	
Rights & Citizenship	The extent to which individuals "are provided with the basis for full and equal engagement within society" (Ager & Strang, 2008, pp. 176–177). In the original context of refugee integration in the UK, Ager & Strang (2008, p. 177) identify measures such as "'mean length of asylum application procedure for successful claimants', 'utilization of legal and welfare benefits advice', 'reported sense of equity in access to services and entitlements' and 'rates of application for citizenship by refugees.'"
Facilitators	
Safety & Stability	Relates to personal safety and the stability of communities. Stability was described in relation to the ability of residents to remain in the locality and experience continuity with their neighbours.
Language & Cultural Knowledge	Within the context of refugee studies, refers to the capacity to communicate in the local language. Also relates to knowledge of "national and local procedures, customs and facilities…" (Ager & Strang, 2008, p. 183).
Social Connection	
Social Links	The "connection between individuals and structures of the state, such as government services" (Ager & Strang, 2008, p. 181). Includes consideration of accessibility of such services.
Social Bonds	Bonds with family and 'like-ethnic' groups that can contribute to individuals feeling 'settled.'
Social Bridges	In the refugee integration literature this refers to the bridge between refugees and their host communities understood through the lens of social harmony and refugee participation in society.
Markers & Means	
Employment	Adequate employment. Linked with a range of benefits, including the development of language skills, promoting self-esteem, self-reliance and economic independence, enabling planning for the future and the opportunity to build networks with longer-term residents.
Housing	Appropriate housing defined according to indicators of physical dimensions, quality and facilities within the home and financial security of either tenancy or ownership.
Education	Access to educational facilities and services. Linked with providing skills and capacities that support employment and the capacity to be "constructive and active members of society" (Ager & Strang, 2008, p. 172).
Health	Reliable access to health services. Good health consistently viewed as a key resource for active engagement in society.