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Re-Conceptualising Gender and Urban Water Inequality
Applying a Critical Feminist Approach to Water Inequality in Dhaka

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Abstract. Commonly, urban water inequality has been conceptualised in scholarship and policy as a fixed issue; little attention has been given to dynamic changes over time, space, identity, and relations. Influenced by traditional feminist critiques of development and of who suffers the responsibilities of water management, the consequence has been a focus on women. However, gender mainstreaming approaches aiming to empower women are often critiqued for (re)producing static narratives, and overlooking the multiple experiences and processes of (re)production of inequality. This paper places itself within this debate, aiming to enhance analytical approaches to studying urban water inequality and challenge pervasive simplified, homogenised accounts of urban water inequality. Through critical application of recent conceptual shifts in feminist theorising, it brings together Feminist Political Ecology and Intersectionality literatures to formulate a framework for analysis of urban water inequality. This explores the role and importance of relational subjectivities, power dynamics, hydrosocial relations, and dynamic relations across and within micro and macro scales. The paper focuses on how these dynamics manifest in Dhaka's informal settlements. Bangladesh shows the complex and multi-layered nature of both how water inequality is (re)produced, and how people negotiate it in their everyday lives. The insights, particularly findings of informal-formal fluidity, are then reflected upon in relation to the framework and future research agendas.

Content

List of acronyms

BB - Bangladesh Bureau of Statistics
CBO - Community-Based Organisation
DCC - Dhaka City Corporation
DfID - Department for International Development (UK)
DSK - Dushtha Shasthya Kendra
DWASA - Dhaka Water and Sewerage Authority
FPE - Feminist Political Ecology
GAD - Gender and Development
JMP - Joint Monitoring Programme (WHO/UNICEF)
NGO - Non-Governmental Organisation
PE - Political Ecology
Tk - Taka (Currency of Bangladesh)
UN - United Nations
UNICEF - United Nations International Children's Emergency Fund
WHO - World Health Organisation
WID - Women in Development

1. Introduction

In 2015, 844 million people around the world still lacked adequate access to water (WHO/UNICEF 2017). Despite decades of international commitments and substantive investments, and the new recognition of the Human Right to Water in 2010, contemporary challenges are making it difficult to address this global challenge. Particularly, the rapid pace of urbanisation has mounted pressure on already inadequate urban water infrastructure and services; especially in the Global South. With more than half of the global population now living in towns and cities (UN-Water 2017), and much urban growth happening in city peripheries and informal settlements, 27% of urban dwellers in the developing world lack piped water access at home (UN-Water 2010). Instead, many rely on informal or community provision, making water deprivation, poor water quality, and intra-urban inequality the norm in many urban contexts. Alongside the increasing focus on cities in broader development agendas[1], concern about water inequality, previously conceptualised in rural localities, is therefore starting to include analysis of urban dynamics.

Within scholarship and policy on water poverty, it is now commonly thought that women are the most vulnerable due to their socio-economic conditions and responsibilities for domestic water provision and management (Buechler & Hanson 2015). Supported by the Dublin Principles, which state the importance of the role of women and participatory approaches in water management (UN 1992), this has particularly come to influence and guide knowledge and action on overcoming water inequality globally (Harris et al. 2016). As a result, there is a new appreciation of the importance of everyday gendered water access and control in city contexts (Truelove 2011), and a body of theoretical work on gender-water relations has developed to explore this, particularly (although not exclusively) in the Global South (O'Reilly et al. 2009). This literature particularly focuses on how gender inequality shapes, and is shaped by, unequal access to water.

Nonetheless, there is still a poor awareness of who suffers from water inequality in cities (Hofmann 2017). By building on critiques of gender approaches (Arora-Jonsson 2014; Sundberg 2017), this paper further challenges the lack of understanding of who suffers from, and what produces, urban water inequality. It adopts feminist approaches of analysis which centre on an interrogation of multi-scalar power relations (Truelove 2011), and uses insights from more recent critical feminist theories to challenge limited and homogenous understandings of gender identities and

relations common to urban water analysis. Feminist political ecology is integrated with intersectional analysis of multiple social identities and relations to propose an analytical framework which disaggregates an often-homogenised urban water poor (Hofmann 2017). As a result, the power and hydrosocial relations which contribute to, and condition the (re)production of, urban water inequality are examined across and within multiple scales.

Applications of such theoretical critiques in relation to water and inequality have been limited (Hofmann 2017). This is especially the case in urban Bangladesh, where many studies of urban water poverty either look at macro-level patterns of urban poverty, or micro-level data to explore the spatial and economic characteristics of the urban poor (Hossain 2005). Despite new national policies beginning to recognise the challenge in urban areas (Policy Support Unit 2014), there is still a limited understanding of specific experiences, and how multiple scales interlink relationally to (re)produce multiple forms of inequality. Official statistics provide a very positive picture of access in urban Bangladesh, with the latest JMP report stating 98% have at least basic[2] access in urban areas (WHO/UNICEF 2017). However, based on her research in urban Asia, Truelove (2011) critiques such statistics and urban policies for centring on distributional inequality at the city-wide scale; failing to explore multiple manifestations of inequality. In Dhaka, identity, tenure insecurity, power relations, and poverty intersect to increase vulnerability to water inequality in informal settlements (WaterAid 2001). Therefore, this paper appreciates inequality as complex and context specific, and hence adopts an open-ended, multi-dimensional understanding of its causes, and how it is experienced (Truelove 2011; Harris et al. 2016; Hofmann 2017). Through a review of the literature and subsequent analysis of the case study of Dhaka, the following research hypothesis is explored:

The way in which urban water inequality is often conceptualised is simplistic and limiting. It commonly centres around homogenous social categories and distributional inequalities leading to a neglect of experiences of, and processes of (re)production of, water inequalities.

Instead, can the analysis of hydrosocial relations and the micro and macro dynamics that shape and constrain water inequalities shed light on the multiple experiences of urban water inequality, with implications for urban water policy and practice?

1.1 Structure, Methodology, and Limitations

This paper is structured into four chapters. The first chapter briefly sets out the key conceptual ideas, research hypothesis, methodology, and limitations. Chapter two explores the prominent feminist theories for analysing gender and urban water inequality, particularly Feminist Political Ecology and Intersectionality, to propose an integrated framework for analysis. Based on desk-based research and secondary data, chapter three then applies the framework for multi-scalar analysis of urban water inequality in informal settlements in Dhaka, Bangladesh. A case study approach is adopted to explore in detail the perspectives and issues raised by the framework. The intricate detail of these intersections, especially at the community scale, is drawn from journal articles, project reports and evaluations, and policy documents. Finally, the last chapter discusses the key findings in a theoretical context; reflecting on how insights from Dhaka could strengthen the framework. The concluding points offer some potential implications for future research agendas.

Whilst analysing urban water inequality using the theoretical framework allows for sophisticated analysis of water inequality across multiple scales in Dhaka, there are several limitations. The lack of primary data makes it difficult to reach the levels of detail required by the analytical lens and for fully testing the research hypothesis. In this case, desk-based research limited the level of insight into relational dynamics due to the lack of secondary data on urban intra-household and individual conditions and relations. As May (2015) argues, and Hofmann (2017; Allen & Hofmann 2017) is able to explore through primary data collection, some dynamics associated with water poverty and inequality are hidden, and require reading between conventional lines of analysis to bring to the fore. I rely on the secondary reading of power-laden and dynamic hydrosocial relations, especially for the community scale, which can be subjective or differentially interpreted depending on the researchers' own subjectivity and positionality. Without primary research, it is difficult to know whether this is just a methodological limitation, or whether the analytical framework also overlooks such hidden dynamics.

NOTES TO CHAPTER 1

1. For example, the 2016 New Urban Agenda (UN-Habitat III) and the inclusion of a Sustainable Cities and Communities goal (no. 11) in the SDGs.

2. See Hofmann (2017) for a critical discussion on the JMP's definition of 'improved' access in urban areas.

2. Urban Water Inequality: Feminist Theories and New Sites of Analysis

This chapter navigates feminist literature to begin to disaggregate who suffers from water inequality in cities and how it is (re)produced. By looking deeper into common assumptions of gendered water inequality, it brings together recent theoretical advances in feminist theory and feminist geography to suggest a more complex reality beyond fixed categories and pre-given social inequalities.

Prominent gendered theories of development are firstly explored to lay the foundation of feminist critique. This is followed by an exploration of recent advances in feminist theorising of gender inequality and, as a result, the contributions, limitations, and future analytical potential of both feminist political ecology and intersectionality scholarship. The literature is brought together in this way specifically to evidence the limitations of a 'woman' or 'gender' focus common to traditional feminist critiques and urban water interventions. The chapter culminates in the proposition of a new analytical framework suitable for investigation into the multiple identities and social relations tied to urban water inequality.

2.1 Tracing the Contribution of Feminist Critiques

Over recent decades there has been a shift in how gender inequality in development is understood in feminist critique. Through the influence of Gender and Development (GAD) approaches[1] in the late 1970s, critical interrogation of the multiple systems of power which structure society and gender inequality brought uneven gender-development relations to the fore. Borne out of critiques of 'Women in Development' (WID) (the first attempt to specifically integrate women into the development agenda), GAD emerged in global development policy and discourse with a new focus on the socially constructed differences between men and women, and saw gender roles and relations as embedded relations of power (Momsen 2010). Applying this to water highlighted the gendered inequalities in access to, distribution of, and control over water resources; often overlooked by previously gender-neutral, or apolitical approaches (Andrijasevic & Khalili 2013; Harris et al. 2016). This brought greater attention to the various ways in which different social groups, particularly women, relate to natural resources at multiple scales – from household to global (Arora-Jonsson 2014). Thus exposing gendered divisions of water responsibilities, and unequal control of and ac-

cess to water sources in everyday water practices (Sultana 2009a). This resulted in the increasing uptake, in academic research and development practice, of gender-orientated approaches which place women at the centre of analysis. Women became the target of policy interventions around inadequate and unequal urban water access.

However, such approaches have since been critiqued. As Sultana (2009a, p.430) claims,

> *"there is little focus on the role that broader societal and ecological factors play in the ways that gender is implicated in water management – and the ways by which gendered waterscapes are produced, reproduced and challenged."*

This highlighted the lack of specific attention to spatial and ecological factors, such as hydrology, geographical location, and water quality, and called for increased attention to the influence of social-spatial-ecological interactions on water inequality (O'Reilly et al. 2009).

This has been attended to conceptually by insights from feminist geography, which sees gender as interrelated with the co-production of social *and* spatial processes at multiple scales. Gender-nature geographical research theorises gender inequality as both constructing, and constructed through, material resource struggles (Nightingale 2006; Harris et al. 2016), bringing new theoretical insight to analysis of gendered water resources. This is applied critically by Feminist Political Ecology, drawing on both Political Ecology's (PE) investigation of the power relations bound to the uneven distribution of, access to, and control over resources (Peet & Watts 2004; Robbins 2012), and feminist geographers' research into gendered experiences of the environment. In Rocheleau et al.'s (1996a) seminal book *Feminist Political Ecologies* (inspired by feminist movements and activism on environmental quality) they bridge academia, policy, and activism to connect theory and praxis through a feminist epistemology (Sundberg 2017). Sitting in between positivist and critical paradigms, the Feminist Political Ecology (FPE) framework sees gender as "a critical variable in shaping resource access and control" (Rocheleau et al. 1996b, p.4).

Contributing "a feminist perspective combined with analysis of ecological, economic, and political power relations" (Rocheleau et al. 1996b, p.287), FPE's investigation rethought water inequality through Rocheleau et al.'s (1996b)

three key sites of analysis (below). An expanded, deeper, and broader conceptualisation of water inequality and gender-water relations emerged:

1. *Gendered Knowledge*: women's multiple roles mean women develop knowledge and abilities to deal with complex systems of households, communities, and water management and access.

2. *Gendered Rights and Responsibilities*: gendered power divisions in access and control over water, and in protecting/changing/restoring/preserving water sources. Land and housing tenure as gendered and influencing service provision. Rights and responsibilities as gendered spatially: men's vs. women's water access/control is often divided between public and private space.

3. *Gendered Politics and Grassroots Activism*: Politics and activism can (re)define identity, gender, and the nature of environmental problems. Activism is commonly focused around poor water management, water scarcity and water conflicts or injustices more broadly.

FPE seeks to understand how these dynamics come together in relation to scale, particularly the interconnections between local experiences and processes, and regional, national, international, global processes (Rocheleau et al. 1996b). Through multi-scalar investigation of access to and use of water, uneven participation in water governance, and multiple lived experiences of water, gendered inequalities across the city, community, and household levels are brought to the fore (Sultana 2009b; 2011; Truelove 2011; Buechler & Hanson 2015).

Although traditionally focused on rural water inequalities, Truelove (2011) brought FPE analysis into urban contexts to expand conceptualisations of urban water inequality and poverty. Her work began to challenge the norms and assumptions of how urban water was understood and theorised. She argued that, often, governments' and international aid agencies' explorations of urban water inequality focuses on city-scale distributional inequality (Hofmann 2017), rather than everyday gendered water practices and how they can (re)produce social norms and disparities in access.

Drawing on the notion of nature-society interdependence in geography, this supported conceptualisations of water-society relations in PE (Boelens et al. 2016). Founded on Swyngedouw's (2004) concept of *the hydrosocial*, the inter-relations between society (particularly socio-economic structures and cultural-political institutions), nature, territory, and governance in the context of water emerged as a prominent site of analysis (Boelens et al. 2016). Like FPE, hydrosocial analysis connects the local to broader political, economic, cultural and ecological scales. However, it brings a more dynamic understanding, where hydrosocial processes exist-

ing at a specific scale are understood as deeply embedded in other hydrosocial processes operating at broader, often overlapping, scales[2] (Boelens et al. 2016).

Feminist authors, including Sultana (2009a, p.355), have used this insight to explore how "power relations and social realities are re-configured through hydrosocial assemblages" in relation to gender-water inequality. She argues that contextual hydrosocial processes, local knowledge systems, social practices, and naturalising discourses define inclusion/exclusion boundaries, developments in water access, and the social distribution of urban services. Within this, FPE brings to light how hydrosocial changes have unequal costs and benefits for different actors, and how hydrosocial relations can enhance or challenge water inequality (Boelens et al. 2016).

Conceptual Shifts in Feminist Theory

Alongside theoretical advances in understanding water inequality, there have also been dramatic shifts in feminist approaches to theorising gender (Elmhirst 2011. c.f Butler 1990), particularly around how a person or subject is conceptualised. Butler's (1990, p.3) argument that "it becomes impossible to separate out "gender" from the political and cultural intersections in which it is inevitably produced and maintained", sees gender as fluid and (re)produced, rather than a fixed social structure. New ideas of 'subjectivity' have emerged, where subjects are seen as socially and discursively constructed and contextually constituted, and identities as embedded in multiple relations of power (Nightingale 2006; Sultana 2009b; 2011; Mollett & Faria 2013). This draws on feminist post-structural theory and anti-essentialist critique of a single and naturalised category of 'women' (Arora-Jonsson 2014; Sundberg 2017).

These critiques have recently been applied to FPE analysis, particularly around the practical applications of gender-water theory, where 'gender' is commonly synonymised with 'women'. The use of gender in this way often means that the resulting 'gender mainstreaming' in urban water interventions is targeted at specific social groups of 'women' or the 'poor', centring on the notion that all women suffer equally, and can therefore be empowered equally through 'gendered' interventions to achieve water equality[3] (Allen & Hofmann 2017). Although there are assertions in development that women aren't a homogenous group[4], Symington (2004, p.3) argues that common narratives like "poor women are more impacted" are pervasive, and reinforce homogeneity of the urban water poor (Hofmann 2017). Such an apolitical investigation overlooks the diversity of contexts, experiences, needs, and capabilities tied to urban water inequality, rendering differing experiences invisible (Allen & Hofmann 2017) and, in several instances, exacerbating gender and social injustices (Leach, 2007, cited in Elmhirst 2011). As Nightingale (2006; Buechler

& Hanson 2015) argues, a gender-fixed FPE is therefore inadequate for understanding how (water) inequality is maintained over time and space.

A recent special edition of *Feminist Review* (Andrijasevic & Khalili 2013) argued there is a need to 're-think feminist political ecology', as post-structural and anti-essentialist framings of gender destabilise assumptions of who should be the subject of feminist-orientated research (Elmhirst 2011). This led Sundberg (2017, p.7) to question, "*if women are no longer the organizing purpose of feminism and gender is no longer its central analytical category, then what is the point of FPE?*"…

In response, two possible theoretical additions are emerging from the literature. Firstly, if post-structural insights are reconceptualising gender, then we also need to reconceptualise the gender-environment nexus (Nightingale 2006). Secondly, the rise of a new generation of feminist political ecologists who account more comprehensively for complex systems of power (Sundberg 2017).

Along with others (Sultana 2009b; 2011; Mollet & Fraria 2013), Nightingale (2006) argues that a (re)conceptualisation of gender as *a process* allows for a stronger analysis of complex gender-environment relations. Sultana (2009b) builds on this through her critique of feminist subjectivity for lacking attention to hydrosocial influences. She enriches FPE, not only to see a complex, processual gender as spatially constituted, but to include heterogeneous understandings of the physical environment - in terms of the ways people relate to ecology, and how differences in waterscapes impact on daily negotiations of identity. A key contribution to this (and particularly to the enquiry of this paper) has been the work of Truelove (2011), who takes FPE's interrogation of the everyday and gendered power at multiple scales, to explore how individual subjectivity connects with wider processes (the city and the state) in Delhi. She sheds light on multiple urban water inequalities, and finds that increased quantities of water may not actually improve water justice or equitable distribution within marginalised communities. Truelove's analysis brought new understandings of everyday water practices and micro-politics as produced by, and productive of, gender and other hydrosocial power relations. This has been especially important for international water policy and politics, which often overlooks place specificity and daily lived practices.

New waves of feminist thinking and theoretical developments in feminist geographies are also pushing FPE to expand conceptually through a re-politicised, "more complex and messier notion of 'gender'" (Mollet & Fraria 2013, p.116). Mollet and Fraria (2013) argue this through theorising race, however Elmhirst (2011) also states there needs to be an emphasis on the constitution of gender through multiple kinds of social difference and axes of power. In relation to feminist analysis of water, this is important as "too much of a focus on 'women' hides other significant factors

(e.g., class and age) and social relations – both at household and community scales – in which water users are embedded" (O'Reilly et al. 2009, p.382). Instead, O'Reilly et al's (2009) paper highlights the need for another analytical layer in gender-water theory which focuses on disaggregating the water poor. Many (Symington 2004; Yuval-Davis 2006; Elmhirst 2011; Buechler & Hanson 2015; Braun 2015; Hofmann 2017; Allen & Hofmann 2017) are calling for new dialogue across disciplines, and a turn to broader developments in feminist theory, particularly intersectionality, in order to properly theorise how social factors affect access to and control over water.

Therefore, together, these two recent theoretical additions suggest a future feminist analysis of water inequality through an "open-ended *feminist* political ecology" (Elmhirst 2011, p.131, emphasis in original) attending to subjectivity, space, hydrosocial processes, and power.

2.2 Intersectionality

'Intersectionality' theory was coined by critical race theorist Kimberle Crenshaw (1989; 1991) in the late 1980s in response to liberal critiques of identity politics and failure to transcend difference (Nash 2008). She argued from a Black Feminist standpoint that the single-axis analysis of identity common to feminism undermined feminist critique, and instead worked to pluralise feminism by challenging the common tendency to separate out race, gender, class, age, sexuality (Yuval-Davis 2006; Valentine 2007; Hofmann 2017). Her subsequent promotion of complex subjectivity, and interlocking categories of experience, brought new critiques of identity as constituted by multiple axes of power. This acknowledges that people live multiple, layered identities as members of multiple communities - where gender is just one social relation amongst others (Symington 2004; Allen & Hofmann 2017).

Moving away from dichotomous conceptualisations of power, a critical feminist inquiry into webs of power and 'multiply marginalised subjects' is fostered (Nash 2008, p.3; Sundberg 2017) – including those normally excluded from traditional feminist critique. It goes beyond anti-essentialism and feminist conceptualisations of subjectivity; acknowledging difference within social categories, but also exploring the multiple ways in which differences and inequalities can be expressed to construct individuals and communities (Crenshaw 1991; May 2015). For inequality, rather than seeing a combining of identities as additively increasing oppression, intersectional notions of subjectivity are interested in how social relations work together to *produce* distinct experiences. This brings a new appreciation of how people can *simultaneously* experience unique combinations of oppression *and* privilege through their multiple identities, whilst also taking into account the historical, social, political con-

texts which (re)produce identity and inequality through hegemonic, structural, and interpersonal playing fields (Symington 2004; Yuval-Davis 2006; May 2015).

Now commonly adopted and privileged in feminist scholarship (Braun 2015), Crenshaw's work has received significant appraisal. McCall (2005, p.1771) argues it is "the most important theoretical contribution that women's studies […] has made so far", with many agreeing on the significant influence intersectionality has had in critical theory, research and beyond (Symington 2004; Davis 2008; May 2015). However, as the conceptual sites for investigation have expanded, a number of critiques and limitations have also emerged. Although I do not attend to them all here[5], two critiques are particularly important for application of intersectional analysis to environment and development (Yuval-Davis 2006; Nash 2008).

New Relational Approaches and Theoretical Expansion

There is concern that an intersectional analysis which overemphasises multiple categories can replicate the processes of essentialisation it critiques, by assuming intersections between multiple identities are fixed and always experienced in the same way (Nash 2008; Hofmann 2017). As Hofmann (2017) argues, the coming together of multiple identities is fluid, contingent, and can be made or unmade in different contexts. Yet, intersectionality often doesn't attend to the contested nature of boundaries between categories and how they are conditional (Yuval-Davis 2006). Therefore, Hofmann (2017) calls for analysis through relational approaches which consider dynamism and spatial and temporal processes (Yuval-Davis 2006; Valentine 2007). To achieve this in practice, Nash (2008) suggests an 'inter-categorical complexity' approach, where existing categories are provisionally adopted to document relations of inequality. Based on observations of existing inequalities in constituted social groups, categories can be used strategically to display different experiences *between* and *within* categories (May 2015). In the context of urban water, this approach is extremely important. Although people may share similar identities or socio-structural positions, their trajectories of water poverty can be very different (Hofmann 2017). Indeed, it is the complex web of relations and interconnected issues, including poverty, gender, and land and housing tenure, that define their trajectory. Therefore, relational aspects need to be explored to shed new light on processes and experiences of inequality (Allen & Hofmann 2017).

There is also a distinct lack of theorisation of how intersectional identities relate to space (Valentine 2007). If a relational approach is adopted to see how different social identities interconnect in different ways with different effects each time, what is it that determines how identity is foregrounded in a particular moment? (Nash 2008). Yuval-Davis (2006) argues that intersectionality's

analysis of power and social, political, and economic dynamics can account for this to a certain extent. But, without attention to space and the hydrosocial, intersectional approaches are inadequate for fully understanding how subjectivity is produced.

Less focus on categories or identities, and more on relations between them and how they are contingent on the particularities of place, requires a broadening of intersectionality's theoretical and conceptual influences. This can occur "through collaborative efforts across and within disciplines, sectors, and national contexts" (Cho et al. 2013, p.807). At the same time, Mollet and Fraria (2013) suggest FPE should reflect on its theorisation of gender and bring analyses of the social constitution of difference to the environment. I therefore see opportunity to build on both FPE and intersectionality to create a stronger analytical lens for investigation of water inequality through theoretical integration. As Truelove (2011) states, overlapping frameworks can result in deepening of both literatures and enhance conceptualisation and analysis of urban water inequality.

2.3 An FPE-Intersectionality Approach to Urban Water Inequality

Sites of Integration

Intersectionality has received little attention in geography, especially feminist geography until very recently (Valentine 2007), but there are clearly multiple sites for integration:

Firstly, "the concept of intersectionality […] offers feminist geography a theoretical framework in which to develop geographical thinking about the relationship between multiple categories" (Valentine 2007, p.18), working to re-politicise gender and pay more attention to power to deepen exploration of lived complexities of water inequality beyond gender and 'women' (Braun 2015).

Secondly, where intersectional approaches capture the complexities of individual and group identities, the environment goes largely unconsidered. So FPE, with its focus on the hydrosocial, can enhance intersectionality by appreciating the significance of space in processes of subject formation (Valentine 2007). Similarly, FPE's attention to structural factors is extremely important as it sheds light on the role of power, hydrosocial relations, and the socio-political in producing urban water inequality. This prevents overemphasis on an individual's abilities to produce their own water inequalities, which can be consequence of intersectional analysis.

Lastly, application of intersectionality in the Global South has been embraced to some degree, especially by feminists, but has been limited in relation to socio-ecological

inequality and urban water (Hofmann 2017). By combining intersectionality with FPE methodologies, intersectional analysis can be applied in new settings and with new subjects of analysis.

Several authors are starting to analyse water inequality using this analytical entry point to explicitly explore how a subject's (multiple) identity(ies) is constituted in and through hydrosocial relations (Sundberg 2017). Exploring these has helped to ensure my analytical approach builds on, and learns from, some of the key foundational work already in this field. For example, through notions of embodied subjectivities, Sultana's (2009b; 2011) work on arsenic contamination of water tubewells in rural Bangladesh brings analysis of class to highlight how members of a household *within* a socio-economic group can have differentiated water access. She also finds new influencing dynamics on relations to water, particularly the differences between women as members of landowning families and women as tenants. Braun (2015) combines FPE and an intersectionality framework to understand social-ecological inequalities in relation to large dams. Other work includes Mollet and Fraria (2013), who explore male gendered identities from a critical race background, and Elmhirst's (2011) use of queer theory to explore the role of heterosexual marriages in resource access.

Of particular importance is Hofmann's (2017; see also Allen & Hofmann 2017) work which responds to the need for more disaggregated understandings of *urban* water poverty, and sheds light on multiple axes of inequality using a relational approach in Dar es Salaam. Her findings challenge simplified narratives and definitions of urban water poverty and show how people travel in and out of water poverty along a dynamic, rather than linear, trajectory. This has brought important contributions of understanding why and how some can move out of water poverty whilst others cannot, adding a nuanced, disaggregated understanding of different trajectories and how they change over time. In addition, Truelove's (2011, p.149) urban application of FPE highlighted differences in access between urban middle class and economically disadvantaged women, with those disadvantaged facing "abuse, violence, and a re-enforcement of exclusive spatial boundaries" around water sources 'intended' for middle classes.

Analytical Framework

The intricate and complex factors contributing to production and maintenance of urban water inequality requires analysis which draws on an integration between feminist political ecology and intersectional inquiry. Urban water inequality is contingent on particular places. It changes over time and space, is multi-layered, and is influenced by multiple social relations. Therefore, there is a need to analyse urban water inequality using a framework which can account for all the influencing factors. These include

hydrosocial relations, time, context, and power relations, from the individual to the structural level (Hofmann 2017). Building on the analysis and critique in this chapter, an integrated approach brings together *feminist* political ecology and relational intersectionality to simultaneously shed light on *power dynamics* through *relational approaches* at *multiple scales*, with these three sites forming the basis for dynamic, open-ended interrogation of the processes embedded in urban water inequality.

Power:

Critically interrogating power will shed light on the multiple axes of power that constitute subject-water interactions, and that produce multiple subjectivities of suffering and inequality. Alongside this, dynamics and experiences of water inequality are understood as intricately related to, and produced by, context-specific power relations which emerge through socio-political conditions across multiple scales.

Relational approach:

Examining power through relational approaches explores how intersectional and power relations shape access to water, moving away from categorical identities, particularly gender. It explores the power dynamics between the social and individual, and how water inequality is dynamic and can change over time and space (Hofmann 2017). Particularly, for understanding how differentiated access to water is produced by and productive of social relations, examination of hydrosocial processes through a relational approach brings an interrogation of *hydrosocial relations.* This advances understanding of "interrelated local, regional, national and international processes of water governance and the issues of equity and justice in water control" (Boelens et al. 2016, p.1), and explores the complex relationality of urban water-society interactions.

Multi-scalar analysis:

To fully understand the "interplay between everyday hydrosocial relations and external structural conditions" (Hofmann 2017, p.105), the intersection of power and the hydrosocial needs to occur across and within scales, vis-à-vis relational and structural dynamics (Saatcioglu & Corus 2014). At the macro level, interrogation is of the structures, norms, and institutions that maintain inequality, and the implications of this across scales in relation to water inequality and differential access. The micro level explores how macro vulnerabilities are overcome, contested, and re-produced through micro processes. These include individual, household, and community social relations and networks (Saatcioglu & Corus 2014). Looking across and intertwining the micro and macro sees how urban water inequality is dependent on the dynamic interplay of micro-level relations and macro-level structures, which can have both constraining and enabling consequences (Hofmann 2017).

Taking these together, a framework emerges that critically explores the hydrosocial relations in particular places, at multiple scales, which help to (re)produce and challenge everyday water inequality in cities. It also considers how water struggles and inequalities are produced by, and are the sites of, the (re)production of social differences (Elmhirst 2011; Braun 2015). This hopes to contribute to the

> *"immense potential offered by exciting new intersections between Feminist Geographies (and feminist theory generally) and developments in the wider field of Political Ecology that enrich, animate and illuminate new political ecologies in research and practice"* (Elmhirst 2011, p.130).

The next section applies this analytical framework to the case study of urban water inequality in informal settlements in Dhaka, Bangladesh guided by the following questions:

1. How is inequality and differentiated access to water influenced by hydrosocial relations?
   a. How do power relations determine and contribute to the production and maintenance of water inequality in urban Dhaka?
   b. What role does the interplay between social relations and material inequalities play in urban water inequalities?

2. How does the relationship between the micro and the macro shape and constrain water inequalities?

NOTES TO CHAPTER 2

1. For a comprehensive review see Momsen (2010).
2. Scales themselves are not natural or fixed. Rather, power laden, produced, and contested by societal, environmental, and structural norms (Brown & Purcell 2005).
3. Momsen (2010) applies the same critique to GAD approaches.

4. Not all development practice is the same. There are examples of projects which focus on difference and don't fall into this critique.
5. For a comprehensive review of the history, applications, critiques, and future research agendas of intersectionality see May (2015).

3. Investigating Water Inequality: The Case of Dhaka's Slum Communities

This chapter uses Dhaka as a case study to explore urban water inequality using the developed framework. Starting with a brief introduction to the case, and the current situation of urban poverty and water inequality in the city, the chapter then structures its analysis on the four prominent issues intricately related to inequality which emerged during research, namely pro-poor approaches, land and housing tenure, gender, and formal-informal relations. This structure has been chosen to aid a relational and cross-scalar analytical approach. The lens of a specific issue enables stronger interrogation of relational aspects across scales, and sheds light on how the micro and macro come together to play a role in the (re)production of water inequality. Following analysis, the chapter concludes with a summary of the key findings.

Due to the limited availability of very detailed, micro-scale data on individual settlements, and the myriad of factors contributing to water inequality across Dhaka, the 'case study' in this chapter consists of multiple informal settlements across the city. Although I have included a specific settlement example in Uttar Badda to evidence how issues and relations come together within one location, the majority analysis in this chapter draws on experience from a range of locations and living experiences (see Table 3.1). Nonetheless, due to its importance in the city, I will mostly refer to informal settlements where the Dushtha Shasthya Kendra (DSK) model for water provision has been in operation. Starting out as a pilot scheme in the Mohammadpur area of Dhaka[1] in 1996, the model is one of utility bulk supply, with subsequent distribution in the settlement organised and managed by the community (Hanchett et al. 2003).

3.1 Urban Poverty and Water Inequality in Dhaka

The city of Dhaka is in the south of the district of Dhaka, in the centre of Bangladesh (see Figure 3.1). It is the largest city in the country, with a population of 8.9 million

Figure 3.2. Maps of Dhaka city with key locations (Mohammadpur, Mirpur, Demra, and Badda) highlighted. Source: © OpenStreetMap contributors (modified by the author)

Figure 3.1. Location Map of Dhaka in Bangladesh. Source: CIA: The World Factbook (2017) (modified by the author)
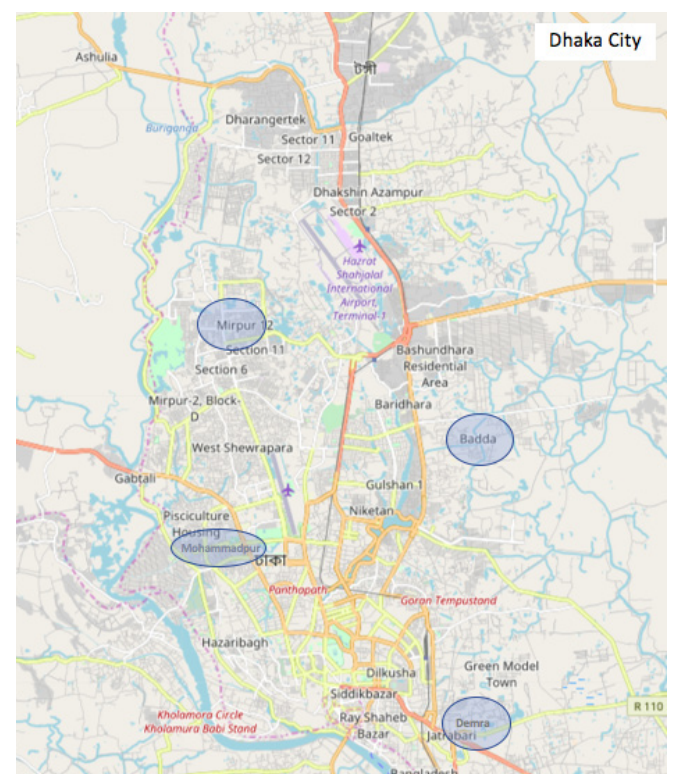
people in 2011 (BBS 2013). A rising urban population has created severe pressure on existing infrastructure and services, with much urban growth in Dhaka occurring in informal settlements or *'bosti'* (the local term for informal settlements) (Hackenbroch & Hossain 2012). They are mostly concentrated in the peripheral areas of Mirpur, Mohammadpur, and Demra (Hossain 2008) (see Figure 3.2). In 2014, there were 3,394 informal settlements in Dhaka[2], with an average population density of 220,246 persons per km2 (seven times higher than the city average) (Hossain 2012b). *Bosti* house over a third of Dhaka's population and are characterised by cheap housing structures, illegal land occupations, insufficient and unsafe water and sanitation, and very low socio-economic status of dwellers (BBS 2015).

There is a growing gap between demand and the capacity of the public water utility, 'Dhaka Water and Sewerage Authority' (DWASA) (see Figure 3.3 for a map of key actors), due to rapid population growth (Khan & Siddique 2000; Hossain 2011). Many new settlements also don't comply with statutory requirements for access to urban utilities (including water, electricity, sewerage) due to lack of tenure legality, resulting in an absence of DWASA services at the expanding periphery (Hackenbroch & Hossain 2012). In addition, land and housing tenure insecurity and fear of eviction discourage dwellers from investing themselves in water supply improvement (Akbar et al. 2007), resulting in poor service, inadequacy, and irregularity in water supply for many residents (Hossain 2012b).

As Dhaka is in the Ganges-Brahmaputra-Meghna river delta its hydrology is characterised by these three major rivers, with good quality underground aquifers providing 87% of the water for DWASA and the city (DWASA 2015). However, recent over-abstraction is causing new hydrological challenges of groundwater-level decline, subsequent rises in abstraction and treatment costs, limited water availability in the dry season, and widespread failure of tubewells (Khan & Siddique 2000). Heavy rainfall

in monsoon seasons provides an abundance of surface water, but poor wastewater drainage leads to diarrhoeal and other diseases from contaminated streams, rivers and shallow tubewells. As a result, everyday access challenges are increasingly being exacerbated.

Many of the urban poor in *bosti* are forced to use alternative sources of water as shown in Table 3.1 – commonly privately owned shallow tubewells, informal water vending (Akbar et al. 2007), and projects initiated by local and international NGOs. Supported by WaterAid Bangladesh, DSK community-managed water points in *bosti* have become a means for dwellers to access the formal water supply system (Akbar et al. 2007; DSK 2016). These are based on the principles of demand-driven service provision, commu-

Figure 3.3. The key actors involved in water provision in Dhaka. Source: Author.
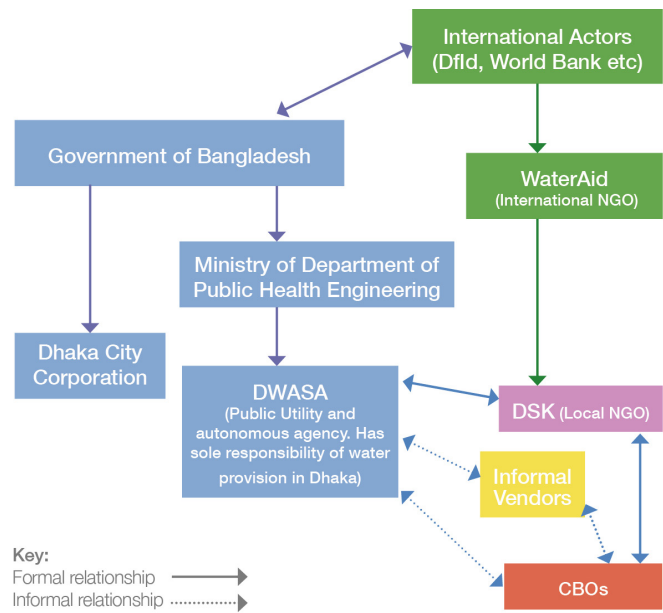
Table 3.1. The main settlements discussed in this paper, their location, involvement with DSK, and the water supply options available to dwellers. Sources: Hanchett et al. 2003; Azharul Haq 2006; Hossain 2011; Hossain 2012a. Source: Author.

Settlement	Location	DSK initiative present?	Common modes of (domestic) water supply
Boshoti	Inner city	Yes	Boreholes, nearby lake, hand operated tube wells, informal extension of DWASA lines, informal water vending
Mohammadpur Slums (including Ahura and Bashbari)	Periphery	Yes	Deep tubewells, informal water vending
Uttar Badda	Periphery	No	Hand operated tubewells, DWASA water pump, informal extension of DWASA lines

nity willingness to pay, full cost recovery of the service, and participation. Involvement of women in the design, operation and maintenance of the water points is key (Hanchett et al. 2003; Akbar et al. 2007). In 2007 there were around 115 community-managed water points benefitting around 70,000 informal dwellers in the city (Akbar et al. 2007), making it a key contribution to tackling water provision inequality in Dhaka (Hanchett et al. 2003).

3.2 Disaggregating Water Inequality

Applying the framework and critically investigating the analytical questions in Dhaka required exploration of context-specific, differentiated power relations, and their enabling/disabling relations with broader power structures in the city and country (Hackenbroch & Hossain 2012). This shed light on several factors intertwined with the experiences and processes of (re)production of water inequality. Focusing on pro-poor approaches, land and housing tenure, gender, and formal-informal relations evidences the importance of analysis at the local level and the need to disaggregate water inequality norms and narratives. Although split up for analysis, these four issues are inherently intertwined, and come together with other factors beyond the scope of this paper (such as sanitation), in multiple different ways across time and space.

The national and international water policy context has had a strong influence in defining how these issues, particularly the first three, are seen and understood. Despite an estimated 5.1% of total government expenditure going to water-related infrastructure and programmes in Bangla-

desh between 2007-2011 (UN-Water 2013), development in the sector is mostly financed by donor assistance. In 2011, basic drinking water supply and sanitation received the highest percentage of Overseas Development Assistance disbursements (UN-Water 2013), giving international actors significant influence in national water policy developments. The history of the policy landscape is shown in Figure 3.4, which maps all major policy changes from the international, national, and Dhaka levels onto a timeline. The contributing ideologies to each policy are shown, and the relations between policies evidencing cross-scalar influences are explored in the subsequent analysis.

Cost-Recovery: A 'Pro-Poor' approach?

The *National Policy for Safe Water Supply and Sanitation 1998* was a key foundation for water policy in Bangladesh. Underpinned by the need for more equitable development (Barrett 2011), as well as global water privatisation trends promoting a reduction in state responsibility of water provision for the poor, "the involvement of other partners, such as non-governmental organizations" (Local Government Division 1998, p.2) is strongly encouraged in the policy. The legacy of this has been to push cost-recovery as a structural condition in all projects to ensure external investment (Hanchett et al. 2003). Coupled with an ideological shift to demand-driven approaches, this resulted in the national adoption of community-demand and willingness to pay concepts for water systems for the urban poor (Akbar et al. 2007). Several targeted national strategies have since emerged to reinforce this, particularly the Pro-Poor Strategy in 2005. Heavily supported by a WaterAid-DfID programme, which used cost-recovery

Figure 3.4. The key policy changes in the last 20 years across international, national, and city scales. Source: Author.
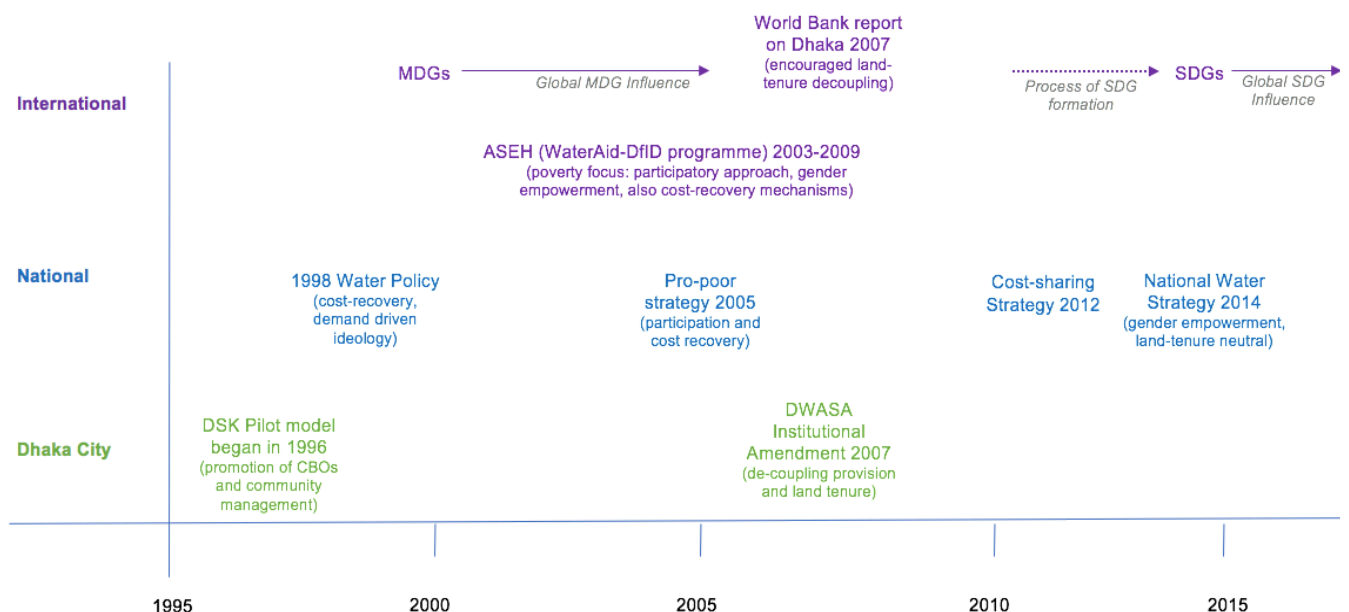
as a method of 'whole community' engagement (Barrett 2011, WaterAid Bangladesh 2011), a combination of cost-recovery *and* inclusive participation has dominated the 'pro-poor' discourse over the last two decades.

However, there have been issues in bringing these principles together. Particularly, cost-recovery approaches are resulting in the homogenisation of urban poor communities. A World Bank evaluation (2007) found that the 'pro-poor' strategy had no specific provision for the urban poor, and failed to reach the lowest level of local government initiatives due to the absence of institutional frameworks to support the urban poor (WaterAid 2011). Historically, national research into water inequality in Bangladesh has had a rural focus, resulting in a lack of understanding of the heterogeneity of urban water poverty (Banks et al. 2011, cited in Hossain 2012a).

Indeed, despite 'pro-poor' intentions, cost-recovery measures negatively impact the poorest, as not all can afford the programme user charge which exists to recover costs. Hanchett et al. (2003) use the example of a five-member household in Ahura slum to illustrate this, with a woman working as a maid, husband as a beggar, and 3 children. After paying Tk 400[3] per month in rent, Tk 60 per month for water point membership, and Tk2 daily for water, sometimes the family cannot afford to feed their children. The compromise between food and water means on some days they don't have the spare money for the daily water charge, and instead the woman must go to the swamp to bathe, putting herself at risk from polluted water and water-borne diseases. The requirement to pay to ensure cost-recovery can exclude the very poor who don't have enough money up front, which results in under-utilisation of water points and reduced capacity to pay back loans (Hanchett et al. 2003). Irregular sources of income for poor dwellers also makes it more difficult to manage regular payments, meaning there may also be issues with payment modality (Hanchett et al. 2003).

There has been a shift towards institutional recognition of the diversity of causes and experiences of water inequality in urban settlements, with the creation of a cost-*sharing* strategy in 2012 to try and recognise the mixture of incomes and ability to pay within a settlement. However, these structural changes get further complicated when operationalised at the community level. There is clearly a difference between how the strategy is framed as 'pro-poor', and how it is implemented. Access through social relations dictate, and can reinforce, local inequalities. For those who struggle as a result of structural cost-recovery barriers, it is good relations with water point caretakers or community-based organisations (CBOs) which can overcome this and give the poorest free access, even if the most they might get is a couple of pots of water for drinking and cooking (Hanchett et al. 2003). Water access can occur in exchange for cleaning the water point or other physical work, resulting in new hydrosocial relations of sharing conditioned on physical labour (Akbar et al. 2007). However, this might exclude those who cannot work, such as the elderly and disabled.

Land and Housing Tenure

Mounting pressure on service provision and infrastructure, coupled with the structural inability of *bosti* dwellers to access the formal water supply system due to their insecure tenure, pushed the decoupling of land tenure and official DWASA supply in *bosti* through the 2007 DWASA Institutional Amendment (Akbar et al. 2007; Hossain 2012a). Strongly advocated for by DSK, and international recommendations by the World Bank (2007), the change aimed to overcome city-level institutional barriers to water provision, and encourage local investment. This tackled city-wide distributional inequality and challenged perceptions of the urban poor as unviable customers (Kumar 2001; WaterAid 2001; Mason 2009; Barrett 2011; Scott 2013).

With the emergence of the *National Strategy for Water Supply and Sanitation 2014*, the issue of land and housing tenure, and the complexity of urbanisation, were explicitly recognised at the national level (sub-strategy 11). Driven by new political commitments to achieve 100% coverage of water supply, both nationally and through international pressures during the formation of the 2015 SDGs, the national delinking of "service provisions from land tensureship" to "expand supply and increase efficiency" (Policy Support Unit 2014, p.22) in cities has become a globally known and deployed example of a successful pro-poor strategy.

However, when looking deeper into the policy and beyond distributional improvements, contradictions arise. Particularly at the community scale, the landscape of water provision, distribution, and access is far more complex. For example, a local committee in the Boshoti settlement got DWASA approval for water connection under the new amendment (Hossain 2012a). However, the formal water connection was given to the committee who were already monopolising the (informal) provision of water to residents, resulting in little change in power relations at the community level, or experience for dwellers as they still purchase water from the same actors. As Hossain (2012a, p.219) found,

> *"the modified institutional provision that offers a legal means of accessing DWASA water thus fails to influence the local level informal arrangement for water supply or provide improved access for the inhabitants"* as *"water-related expenditure has not been reduced nor has the amount of daily water available to a household been increased."*

Structural changes to decouple land tenure and provision also created conflict within and between the community. In Boshoti, high-income residents in a neighbouring

settlement used their power and connections to upper-level government officials to obstruct DWASA's attempts at improving service provision due to fears of legalising unofficial housing (Hossain 2012a). DWASA was instead forced to install a deep-water tubewell on government land, which was then rejected by local informal vendors exercising their own social relations and political connections due to concerns about competition. In an example elsewhere in Dhaka, public water points installed through the DSK intervention resulted in lost businesses and livelihoods for some informal water vendors (Akbar et al. 2007). In Boshoti, this was only settled when DWASA agreed to legalise informal water lines and allow existing vendors to continue with their business. Therefore, despite the new provision amendment, a myriad of 'official' connections emerge, where DWASA-community social relations are more powerful in shaping and guiding experiences of water inequality, and support the continuation of informal water markets, which mirror, and sometimes undermine, formal provision mandates.

Despite decoupling provision from legal land tenure security, individual housing tenure is still extremely important in determining who suffers from water inequality. As Scott (2013, p.1) argues, "the people in most need of improved water and sanitation are often tenants", who often rely upon landlords or shared common facilities for access to basic services. Although there aren't many examples from Dhaka in the literature, the analytical framework shed light on the often overlooked perspective of the tenants. Similar research in rural Bangladesh shows that agreements between landlords and vendors often condition the re-selling of water to their tenants (at higher prices than the landlord paid), where the right to water, price, and quality for tenants can vary due to physical location, relations between tenant and landlord, and the socio-political position of the landlord in the community (Sultana 2009b). Supplies to landlords who are local political leaders or live-in landlords tend to be of better quality, potentially allowing their tenants the opportunity to also get better quality water (Hackenbroch & Hossain 2012). However, this usually requires good landlord-tenant relationships, and can be overshadowed by landlords' relations with vendors. In his research in a *bosti* in Dhaka, Hossain (2012a) finds that despite tenants being eligible for tenure-neutral DWASA connection, realising the right to formal water supply always occurs through the landlord. Cemented landlord-vendor relations can stop tenants from involving another actor in water supply, which can perpetuate their water inequality and be difficult to challenge.　Due to the in-

Box 3.1. Uttar Badda settlement where the integration of hydrosocial relations across scales (re)produces and challenges water inequality (based on Hossain 2011, p.278). Source: Author.

Uttar Badda is a small settlement on the periphery of the city. Prior to the mid-1990s, the only water source for domestic water was hand operated tube wells. When DWASA pipes came only half the settlement had connection, and any new building construction was limited to this area. But this meant land price rose dramatically, forcing new migrants to consider the lower-priced, un-serviced peripheral land. Local landowners sold their land or rented it out to migrants, resulting haphazard development and a rise in absentee landlords who live outside the area and have little incentive to lobby for better service provision. Despite this, a water pump was installed in the eastern part of the settlement by DWASA in 2009 to extend the network, but the location was dictated by political/personal interests, not planning considerations. The pump was installed on community donated the land (decided by powerful landowners) regardless of the feasibility of the site.

Dwellers then violated article 52 of DWASA regulations and installed electric motor pumps between the DWASA water line and in-house reservoirs. This was tolerated by DWASA and resulted in differentiated access to water between houses according to spatial and economic considerations - poorer houses farther from the pump only got water when the demand of nearby houses was met. As a result, farther houses were forced to establish 2 permanent connections through 2 separate water lines, where the 2nd is unapproved yet installed by DWASA field staff in return for money. Houses can shift supply from one line to the other to get continuous connection, but this results in contamination and leakages, especially in the rainy season.

Contamination continued for 4 years without official attention. Despite particularly affecting tenants who had no option to rely on the poorer quality water, no community level action was taken until the water quality hampered religious practices. The Mosque Management Committee, made up of influential residents met with an MP, taking with them signatures from households and bottles of contaminated water for material proof of poor quality. Usually only landlords would have been involved, but the committee decided to invite tenants to increase the number signatures. The power of the MP alongside the outcome of a relationship between one inhabitant and a television reporter, resulted in intervention by DWASA officials.

ability to secure legal security from the state, maintaining relationships with landlords for temporary housing security has become extremely important. Although there are examples of tenant-CBO relations enabling free water access (Hanchett et al. 2003), vulnerable residents are still left highly dependent on landlords and influential community actors (Hossain 2012b).

During their research, Hackenbroch and Hossain (2012) also found that the cycle of inequality is entrenched for those renters who cannot afford their landlords' high water prices, as they are then forced to rely on cheaper or free, less safe water from polluted wells and lakes, with implications for personal health and future landlord relations. Free access can occur through DWASA public standpipes (Hanchett et al. 2003), but these are usually located on the periphery of slums characterised by long waits in queues, creating another layer of inequality through spatial dynamics (Sultana 2009b; 2011). Distance influences whether people join the DSK water projects or use free DWASA standpipes, and instead may subvert them and rely on other, often illegal, lower quality, and more expensive, means of accessing water (Sultana 2009a). Location of water points is determined by a mix of physical geology and hydrology, and landowner power, as wealthy landowners often donate land for water supply (Sultana 2009a), as was the case in Uttar Badda (see Box 3.1). This has implications for quality, as land suitable for deep tubewells means cleaner water is more likely to be available. Although DWASA's water supply conforms to international standards, water quality also deteriorates as water moves through the network. Longer distances increase the likelihood of contamination for already spatially marginal populations (Azharul Haq 2006; Hossain 2011).

Kumar (2001) also notes the vulnerability of landlords themselves, complicating one-way and static narratives of tenant-landlord inequalities. In *bosti* "a large proportion of landlords are as poor or even poorer than their tenants" (Kumar 2001, p.2), which produces its own set of challenges. Landlords may not be able to afford the costs of improved provision, therefore when better services are achieved, they are forced to increase rent. This can push the poorest and most vulnerable tenants into cheaper accommodation with inferior water access, or put a strain on household expenses and income without increasing tenure security for the tenant or the landlord (WaterAid 2001; Scott 2013; Hofmann 2017).

Beyond Women: Intersectional Subjectivities

Ensuring equity for vulnerable people in water provision is at the centre of the 2014 strategy, and comes under a gender mainstreaming element (sub-strategy 8). The push to achieve equality mostly through women has been strongly influenced by the drive for the empowerment of women in WaterAid Bangladesh's projects, as well as international policy and academic focus on gendered water inequality.

Hossain (2012a) also contends that community-level empowerment of women is particularly encouraged due to international-national relations. NGO activity in Bangladesh is restricted by the National NGO Affairs Bureau, which discourages NGOs from engaging in political empowerment, promoting participation in urban governance, or challenging wider prevailing power systems (Hossain 2012a). Instead, empowering women through development has become a key focus. This has commonly resulted (especially in the DSK programme) in the creation of women-run CBOs, with 80% female members in urban water point CBOs in Bangladesh in 2009 (Barrett 2011).

Legally, this is now supported by the national recognition of gender equality in the Constitution of Bangladesh, with special provisions for women explicitly promoted (BBS 2009). This permeates all scales, with seats for women reserved in the ward commissioner positions in Dhaka (Hackenbroch & Hossain 2012), and female CBOs used as a tool for empowerment and to overcome access and social inequality.

However, disaggregated analysis at the community level in Dhaka through a feminist-intersectional lens shows that looking at 'women' alone is insufficient. A disconnect between how gendered interventions are conceptualised to empower women, and how they manifest on the ground is evident. CBOs are formed with eight women from a settlement, and determine water prices, cleaning and maintenance, revenue collection, payment of bills, and loan repayment to DSK (Akbar et al. 2007). They therefore hold a significant amount of decision-making and operational power for water access in the community. However, the formation of water committees occurs between NGO field-level staff and only a few powerful residents, often landlords and community leaders, meaning they are dominated by existing networks of social relations and power hierarchies within the community. As Hackenbroch and Hossain (2012, p.413) find, "it is primarily the female room owners or the wives of the room owners who participate in the NGO activities and hold the committee positions", often meaning the poor *and* the poorest women in the settlement have little involvement in, or empowerment through, community decision-making (Hanchett et al. 2003).

This has consequences for who can access the water point, as frontline staff-CBO relations establish the location of the water point and subsequent list of households to include in the project (WaterAid Bangladesh 2007). Thus, pre-existing personal networks, geographical location, and households run by influential female actors dictate access to safe water (Sultana, 2009a), and can further entrench community divides. According to a dweller in Bashbari, "the CBO members collect water first and often pay less than the others" (cited in Akbar et al. 2007, p.28). Thus, the concept of 'community' ownership of water points only becomes available to those with certain positions of power and social relations.

Greater involvement of women in the decision-making, implementation, and evaluation of water management projects is encouraged nationally in Bangladesh to increase equity. But, there is clearly evidence of exacerbation of inequality and difference in Dhaka, and the institutionalisation of intra-community and intra-category hydrosocial inequality (Sultana 2009a). This is characteristic of Rigon's (2014; see also Hackenbroch & Hossain 2012) description of 'elite capture' of participation, where internationally-funded urban development programmes aiming to empower through community governance, actually institutionalise pre-existing power imbalances between landlords and tenants (Rigon 2014), and in this case between women.

In addition to complications at the community level, progressive national gendered water policies are also challenged at the intra-household level. Sultana's (2009b) investigation into such dynamics in rural Bangladesh suggest the importance of this scale in influencing water inequality, as she finds that intra-household patriarchal traditions and subjectivities determine who has the responsibility of collecting water, and from where. Cultural traditions enforced by male members of the household can prevent young unmarried women from collecting water in overtly public places such as bazaars, even if they are the safest water source (Sultana 2009b). Also, within wealthier households, hired female labour collect water, whilst powerful women in the households participate in decision making. Therefore, at this level, "intersections of class, marital status, and age" become extremely important in dictating hydrosocial responsibility and ability to overcome inequality (Sultana 2009a, p.431).

Formal-Informal Relations

Intersecting relations across scales are important for determining unequal access to water, but the case of Dhaka particularly shows the importance of formal-informal fluidity in these relations. In his paper Hossain (2011) critiques DWASA for following ad hoc approaches to meet intermediate needs; often through a myriad of informal and formal relations between DWASA and communities (See Box 3.1). Bribes for land and water point permission are a common occurrence (Hossain 2012b). The operation of illegal water lines in communities can secure good unofficial relationships between community leaders and DWASA field staff, which helped to get an authorised water connection from DWASA in a *bosti* in 2005 (Hossain 2012b). Despite DWASA having no mandate to supply water to the area, informal relations became a key prerequisite for formal access, as the application was instead supported by the local ward commissioner and field-level DWASA staff who lobbied upper levels in DWASA in return for money from the community committee (Hossain 2012b). Even formal access through the 'official' DSK model relies on good

personal relations between key individuals in WaterAid Bangladesh, DSK, DWASA and some members of the DCC (Akbar et al. 2007), which can privilege access for communities where DSK has a strong presence.

Within the community, "informal negotiations have [also] become regular practice and an everyday urban phenomenon used to gain access to urban amenities and services in Dhaka" (Hackenbroch and Hossain 2012, p.398), with informal networks and socio-political relationships having exclusionary/inclusionary outcomes; guaranteeing privileged access for some. For example, ability of the very poor to access water is often conditional on their relations with other more influential members of the community; commonly wealthier households who may have their own pump or privileged access to a water source (Crow & Sultana 2002). Such actors are often local leaders, who may illegally tap water from DWASA, engage in water vending, or facilitate vending activities (Hackenbroch & Hossain 2012). Adopting a position in the community as a water vendor, opens a network of relations with socially well-connected homeowners and members of local associations, giving vendors power in the community to determine prices, who gets access, and even informally negotiate with, and make payments to, DWASA officials to secure their vending activities (Hossain 2012a). For the poor with social connections to such vendors, this not only ensures access, but can overcome issues of inequality in the regularity and quantity of water supply if DWASA-vendor and vendor-buyer relationships are maintained and strengthened over time.

However, for each of these hydrosocial relations there are social conditions that ensure water security for some households and water deprivation for others. Poor households who lack good intra-community relations may have their status of water inequality entrenched, as they not only struggle from lack of water, but are unable to purchase water from powerful vendors. At the same time, being a member of influential formal community institutions, such as mosques, can help to overcome inequality whether you're a vendor or a tenant, due to the powerful mandate to stop water inequality hampering religious practices (Hossain 2011) (See Box 3.1).

3.3 Summary

Through exploration of four key issues related to water inequality in Dhaka, analysis has shown the importance of relational and multi-scalar examination, particularly bringing to light the community scale. This has evidenced how policies aimed at providing services to the urban poor and reducing inequality for the most vulnerable in *bosti* don't have universal impacts. Rather, the outcomes of enabling structural conditions are simultaneously enabling and disabling at the community

scale depending on individual identity and relations, community dynamics, and micro responses to structural change (Sultana 2009a). Despite extensive research and the thorough analysis in this chapter, the availability of literature has meant analysis has only scratched the surface of intra-household dynamics in the urban context. Sultana's (2009b; 2009a) work on gendered relations at this scale has suggested individual and intra-household dynamics could have significant influences on urban water inequality. Therefore, research at this level in the urban context will further substantiate analysis.

One key finding uncovered by the analytical framework is that relations and negotiations between actors are essential for accessing urban water services, where a "highly formalised informal system" of social negotiation (Hossain 2012a, p.219) and constantly shifting hydroso-

cial relations, regulate water inequalities (Hackenbroch & Hossain 2012). Such hydrosocial relations speak to Simone's (2004) people as infrastructure concept for Global South cities, based on informal social networks in Johannesburg. Experience in Dhaka shows the importance of socio-economic networks and tenure status in creating social infrastructure to cope with everyday urban life. However, particularly evidenced is the fluidity between 'formal' and 'informal'. This occurs within the formal sector, between formal and informal provision, and within the community, and is central to the (re) production and contestation of water inequality. Such relations are further complicated by community power structures, employment activities, geographic location, water source options, as well as landlord-tenant and landlord-vendor relations (Crow & Sultana 2002; Hossain 2012a).

NOTES TO CHAPTER 3

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1. The pilot has subsequently been scaled up across the city and into Chittagong (See Figure 3.1 for location).
2. Measured by adding the number of informal settlements in

Dhaka North and South City Corporation's (previously combined as the Dhaka City Corporation 'DCC' pre-2011).
3. Exchange rate: Tk 107.3 to £1 (31st July 2017).

4. Conclusions and Implications

Utilising the theoretical insights of an analytical framework which is attentive to everyday power and hydrosocial relations, and relations across scales, has demonstrated that conceptualisations of urban water inequality can, and must be, deepened. Disaggregated analysis of urban water inequality through an FPE-intersectional lens, which incorporates multiple experiences of inequality and begins to challenge homogenous narratives of who suffers inequality, has offered a far more nuanced account of the diversity of causes and processes of (re)production of water inequality experienced over time and throughout the whole community and city. By looking at urban water inequality in Dhaka, this work has shown that water inequality manifests as a result of the interplay between micro-level hydrosocial power relations and networks, and macro institutional and policy structures.

Similar to Hofmann's (2017; Allen & Hofmann 2017) and Trulove's (2011) findings, the analysis reflects that everyday urban water inequality is formed through complex, multi-layered dynamics. Through the lens of the pro-poor approaches, land and housing tenure, gender, and formal-informal relations, the three elements of the framework (power, hydrosocial relations, and multi-scalar analysis) have been brought together to shed light on hidden inequalities across and within each issue. As I endeavoured to answer my analytical research questions, specific interrogation into hydrosocial (power) relations showed how socio-spatial relations of inequality are decided and entrenched by multiple axes of power at the community level. In particular, water inequality and the ability to overcome it (whether through DWASA, the DSK project, informal methods of provision, or free water supplies), is shaped and constrained by poverty, land and housing tenure, and socio-political position in the community.

However, it was the relational approach across scales which particularly brought new attention to how these power relations are dynamic. This offered a disaggregated understanding, and even counter-narratives, of international and national macro-political approaches to urban water. As a result, the experiences of many who suffer from water inequality in cities has been highlighted, and the (re)production of common simplified conclusions of distributional and gender inequality prevented. Indeed, the framework demonstrates the need to attend to contradictions between conceptualising and imple-

menting water policy across scales, as relations between communities and individuals, and the fluidity of formal-informal boundaries, complicate and even contest structural approaches to reducing water inequality.

4.1 Implications for the Framework and Future Research

My critical application of a FPE-intersectional framework has contributed to the stronger integration of feminist critiques and water in scholarship (Rocheleau et al. 1996b), and allowed for deeper investigation into the dynamics of inequality potentially hidden or overlooked by a traditional feminist approach to gender. However, the case study has also illuminated possibilities for further expansion in the framework and analysis. The evidence from Dhaka shed light on informal-formal intricacies, and their fluid nature in relation to urban water inequalities in access, control, and decision-making power. When looking at relations between the city and community scale, it was clear that the 'formal' has informal means of access which are an essential pre-requisite to realising the right to formal water provision. This dynamic relationship across formal-informal divides wasn't explored in the production of the analytical framework, however relational analysis brought this to light as a key way in which people navigate water inequality in their everyday lives. Due to the prominence of formal-informal relations in accessing water around the world, particularly in city peripheries (Allen et al. 2006), it would be useful to add informal-formal dynamics as a fourth site of analytical investigation in the framework. This would result in a more nuanced exploration of the processes associated with urban water inequality, but also contribute to the wider critique in critical geography of formal-informal dichotomies when understanding urban dynamics (Roy 2005; Varley 2013).

Bringing analysis of the community scale and shedding light on micro-relations within gendered categories and between tenants and landlords, highlights the need for further research at the intra-household and individual scale in the urban context. Primary research into landlord-tenant relations in Dhaka is needed to shed light on the power relations tied to inequality which this paper has alluded to, but hasn't been able explore in detail.

At the moment the framework gives little indication of how to move forward with the information it uncovers, and which issues or disabling structures and relations should be addressed first to overcome inequality (Nash 2008). Shedding light on differing experiences of inequality and empowerment in Dhaka has evidenced the importance of challenging taken for granted urban water policy and practice, particularly around those that appear to be 'pro-poor'. However future research in this field could benefit from investigation into how these findings can be translated into policy which is truly inclusive of all experiences, and which can be scalable and translatable across contexts.

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