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Linking Water Services and Human Well-Being Through the Fundamental Human Needs Framework: The Case of India

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ABSTRACT: Although the focus of water development in urban informal settlements has traditionally been on improving public health, development scholarship increasingly emphasises the relationship between water services and multiple dimensions of human well-being. Nevertheless, how well-being is defined in the literature remains unclear, leaving questions about what dimensions of it are to be fostered through water service development. In this paper, we argue that prominent interpretations of well-being 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 we show to present a clear, holistic and dynamic understanding of well-being. Through a case study of water service arrangements across six informal settlements in the Indian cities of Faridabad, Delhi and Mumbai, we illustrate how using the FHN framework uncovers potential pathways by which water service development can satisfy a broad range of fundamental human needs. Applying the FHN framework to these settings leads us to argue that: 1) water services should be linked to people's aspirations as well as to their basic physical needs; 2) cultivating well-being has both intrinsic and instrumental benefits that enable individuals to become more resilient; 3) water services should be better linked with other development sectors; and 4) non-traditional water service arrangements should be re-evaluated according to their capacity to contribute to people's well-being.

KEYWORDS: Urban informal settlements, water services, well-being, fundamental human needs, India

INTRODUCTION

Residents of low-income settings such as urban informal settlements (UISs), otherwise known as slums, are burdened with deficiencies in water services such as water supply and sanitation. In India, where this study takes place, 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 by constructing them 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). 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 well-being 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. In 2010, for example, the right to safe drinking water and sanitation was enshrined by the UN General Assembly (2010), which framed its necessity 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 well-being beyond health (Mehta, 2014).

In fact, all the Sustainable Development Goals, including SDG 6 – "to ensure availability and sustainable management of water and sanitation for all" (United Nations, 2015) – are considered necessary contributors to SDG 3 – to "ensure healthy lives and promote well-being for all at all ages" (Hall et al., 2016). However, the United Nations (2019) frames SDG 3 in relation to child health, maternal health, HIV/AIDS, malaria and other diseases. It is therefore fair to assume that 'health and well-being' within the SDGs relates either primarily or exclusively to physical health and well-being. Loevinsohn et al. (2015) argue that such a "knowledge silo" is caused by a disconnect between health and other disciplinary and practice communities, and that this limits the evaluation of the broader range of impacts of water development initiatives.

Recently, a body of scholarship has sought to broaden the understanding of well-being in water development by employing the Capability Approach (CA) (Sen, 1999, 2013; Robeyns, 2005; Nussbaum, 2011) to human development, a normative framework which asserts that social policies and institutions should foster people's capability to function (Robeyns, 2005). 'Function' here 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: 351). CA-informed 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: 10).

Prominent examples among water development literature include Gandy's (2004) acknowledgment that, historically, the development of water services had an emancipatory impact on theretofore oppressed people such as the working classes in the industrial cities of Europe in the 19th Century. New forms of access such as reticulated water supplies and sewerage systems both improved people's health and freed up their time and energy to seek out new opportunities in work, education, etc. Another prominent example is Mehta's (2014: 67) work, which 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. 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 and 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 well-being, particularly in relation to people's livelihoods. More recently, Jepson et al. (2017: 3) have extended Mehta's call to reconsider water scarcity in terms of capabilities for well-being 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 well-being in their full breadth and scope". These scholars strengthen the call to approach water service challenges as challenges to well-being.

The water development literature influenced by the CA, however, is generally ambiguous on what constitutes well-being and how water service arrangements are linked to it. Mehta and Punja (2006)

represent a rare exception in this case by presenting a model of aspects of water and well-being that includes dimensions such as culture and identity, security, decision-making, social relations, autonomy and control, and freedom to choose. Mehta and Punja (2006), however, are focused on the displacement of tribal peoples as part of a water development project in Gujarat, rather than on everyday forms of access to water services. Furthermore, they do not clarify how they derived the dimensions of well-being identified in their model.

Other challenges to articulating an operational capability approach to water are methodological. Chiappero-Martinetti et al. (2015: 116), for example, highlight that although the CA "plays a central role in the current debate on individual and societal well-being", "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". While we do not delve into these methodological issues in depth in this paper, we contend that one strategy for overcoming them will be the adoption of a clearly defined, holistic and dynamic understanding of well-being. Although several frameworks (discussed in next Section) are candidates for this task, we argue that the Chilean economist Manfred Max-Neef's (1992) Fundamental Human Needs (FHN) framework represents a particularly strong candidate, and through our case study we illustrate why this is so.

MASLOW, ALDERFER AND MAX-NEEF: THREE UNDERSTANDINGS OF HUMAN NEEDS

Several social psychological conceptualisations of human needs have informed research into the relationship between services and well-being. Psychological research widely accepts that human beings have a set of constant needs across all cultures and periods (Tay and Diener, 2011), and that these needs are grounded in the condition of being human (they are ontological), and are few, finite, and classifiable (Max-Neef et al., 1991). Two prominent frameworks put forward to represent such needs are Maslow's (1943) hierarchy of needs (HoN) – famously represented as a five-tier pyramid representing physiological needs, needs for safety, love and esteem, and needs for self-actualisation – and Alderfer's (1969, 1972) refinement of the original five-tier typology into three needs, for existence, relatedness and growth (ERG).

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. The first example is Parikh et al.'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: 478) found that access to drinking water, sanitation, waste management, rain water 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". According to this conclusion, water services serve to fulfil a narrow and basic set of physical needs. De Haan et al. (2014: 125) use the ERG framework to frame an understanding of the role of water services in the fulfilment of human needs. They conclude 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". The conclusions of both studies assert the hierarchical nature of human needs. However, while the above studies – in accord with the HoN and the ERG frameworks – equate services with needs, Max-Neef (1992: 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". This distinction represents the view that services such as drinking water supply, electricity for critical infrastructure, or emergency health care services are not needs per se, but rather are satisfiers of needs. After all, it is possible to imagine how fundamental human needs can be satisfied

without electricity, even though having it might make the satisfaction of these needs more complete or likely. For these reasons, in our case study, we distinguish between needs as broadly interpreted, and satisfiers of needs.

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 failing to acknowledge their dynamic and overlapping nature.

Pelenc (2014: 6) highlights that the FHN framework complements the CA, since "in both approaches functionings or satisfiers are considered the basic brick" of human well-being. However, as we previously highlighted, the CA literature can be vague on what constitutes well-being and what its dimensions are. Conversely, the FHN framework provides a clearly defined, holistic and dynamic understanding of well-being. 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). The result is a matrix of 36 cells. This formulation of needs and satisfiers as a matrix addresses Neher's (1991) critique by proposing dimensions of well-being with considerable overlap. This matrix approach has informed scholarship ranging from Bryce et al.'s (2016) work to operationalise a cultural ecosystem services (CES) framework (defining potential cultural benefits stemming from 151 marine sites in the UK), through to a project in the Catalonian city of Lleida, which mapped the hurdles to actualising human needs presented by perceived patterns of unsustainable consumption (Guillen-Royo, 2010). These studies, among others, show that the FHN framework has been successfully used to link environmental conditions with the achievement of human well-being. In this paper, we use the FHN framework to investigate the nature of such a link between residents of UISs and their access to water services.

Table 1. Fundamental human needs matrix (Max-Neef et al., 1991).

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	Friendships, partners, family, partnerships, relationships with nature	Make love, caress, express emotions, share, take care of, cultivate, appreciate	Privacy, intimacy, home, spaces of togetherness

	humour			
Understanding	Critical conscience, receptiveness, curiosity, astonishment, discipline, intuition, rationality	Literature, teachers, methods, 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, co-operate, 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 humour, lack of worry, tranquillity, sensuality	Games, spectacles, clubs, parties, peace of mind	Daydream, brood, dream, recall old times, give way to fantasies, remember, relax, have fun, play	Privacy, intimacy, spaces of closeness, free time, surroundings, landscapes
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 stages
Freedom	Autonomy, self-esteem, passion, determination, assertiveness, open-mindedness, boldness, rebelliousness, tolerance	Equal rights	Dissent, choose, be different from, run risks, develop awareness, disobey, meditate	Temporal/spatial plasticity (anywhere)

It is important to note that while we view the FHN framework as providing a more holistic and dynamic – and therefore, in our view, more accurate – understanding of well-being than the HoN and ERG frameworks, we do not claim that it is complete. For example, the FHN framework does not offer a structured approach to identifying the reasons why people cannot meet their needs. In part, this may be due to the local and often unique circumstances that lead to well-being deprivation in the first place. However, in undertaking our case study we have come to feel that there is also a diagnostic purpose served in applying the FHN framework to understanding how water service access shapes individuals' capacity to achieve valued well-being outcomes, in that understanding how such access enables or hinders their achievement allows us to infer the causes for this achievement or non-achievement.

METHODOLOGY

Case study approach

We undertook a single embedded qualitative case study (Yin, 2009) of the experiences of residents surrounding water service arrangements across six water-insecure urban informal settlements (two in each city) in the Indian cities of Faridabad, Delhi and Mumbai. Our aim was to understand how water service arrangements in UIs are experienced by residents as hindering or satisfying their ability to meet their needs. 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 collected and relay here is representative of the aspirations of all urban informal settlers. 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 particular points in time. Stake (1995: 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" (ibid: 6) of perspectives and experiences.

Location and participant sampling strategy

In each city, we selected participants from informal settlements marked by long-term and ongoing water insecurity. The settlements selected for this case study were non-notified (unauthorised), meaning that they were officially denied access to basic services such as water supply, sanitation, electricity and waste management by governing authorities, although small clusters of households within these settlements have become notified because of electoral promises over the years. In such cases, notification occasionally has led to the provision of piped water that was 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 rural Maharashtra. The majority of households in the settlements depended for most of their basic water needs on unreliable deliveries by water tankers either from local government or private providers, and on community-installed standpipes. According to local non-governmental organisations (NGOs) and residents, water from every source 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 their premises, with most people having to resort to open defecation. All settlements, however, apart from one in Mumbai, did have 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 our investigation of how improvements in water service delivery impacted people's ability to meet their needs. Ongoing initiatives by NGOs range 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 Policy, Regulation, 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 following from initial contact. Although interviews included six community leaders, the rest of the interviews were undertaken with housewives, students, day labourers, small-business people, unemployed individuals, and domestic workers. The inclusion of this variety of people 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 by Yin (2009) and Stake (1995) for balance and variety in case study research.

Data collection, analysis and reporting

Collection, analysis and reporting of data was guided by the Consolidated Criteria for Reporting Qualitative Research (COREQ) 32-item checklist (Tong et al., 2007). Written informed consent was gained from participants for all interviews after they read and discussed 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. Over a period of eight months, from March to October 2016, the first author undertook 29 semi-structured, in-depth individual interviews averaging one hour in duration, as well as numerous field visits, observations and informal individual and group discussions with residents. Individual interviews were undertaken in the homes of participants wherever possible, or in communal spaces offering privacy. Interviews were conducted in English in instances where residents could express themselves in that 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) FHN framework. Doing so ensured that participants were not being prompted to discuss the particular satisfiers and needs found in the framework.

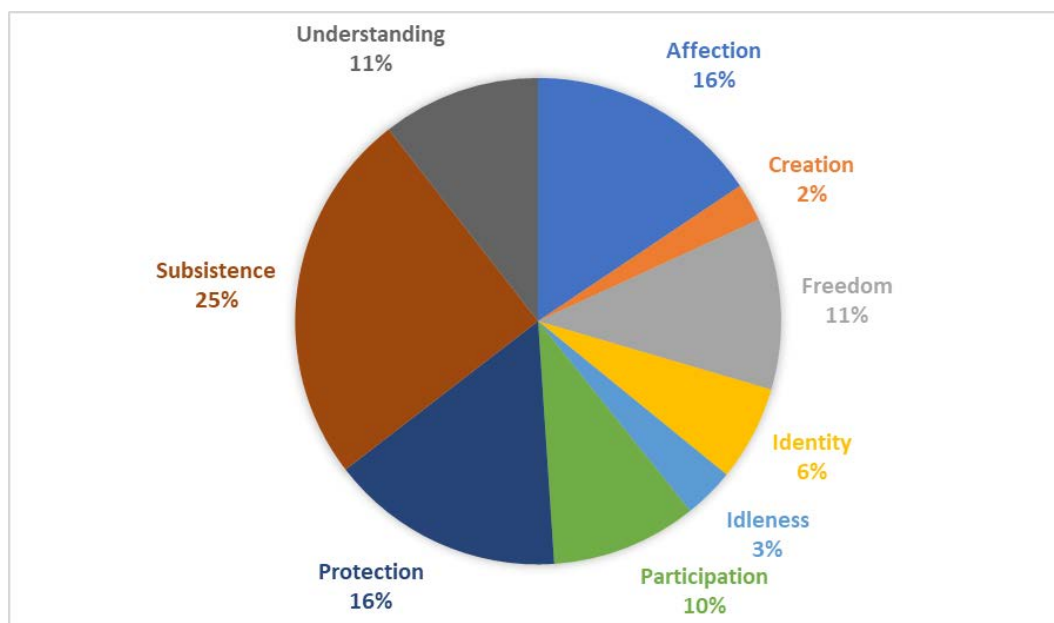
Interviews were audio recorded and transcribed using the NVivo qualitative data analysis software, followed by a process of theoretical coding based on the FHN framework. It is important to note that the references coded refer to *satisfiers*, rather than the overarching categories of *needs*; references to individual satisfiers allowed for an assessment of the role of water service arrangements in facilitating the satisfaction of needs. It is also important to note that we coded references to both physical infrastructure (e.g. bore wells, pipes, water tanks, drains, etc) and social infrastructure (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 et al.'s (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 insight into 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 methods study investigating multidimensional household water poverty. In that study, the authors identify the importance to quality of life impacts of

water service delivery factors including ease of access, equity, price or affordability, quality and quantity. These factors are interrelated, leading to individual responses frequently being coded in relation to multiple factors, which is reflected in our findings below.

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 below in order of frequency, along with illustrative quotes. It is important to note that many, if not most, of the illustrative quotes presented in the following sections could also fit into 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 1. Percentage of total coded references to fundamental human needs.



Subsistence

The most frequently cited impact of water service arrangements on well-being was found to be that on satisfiers of the need for subsistence. This insight 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 and Nelson, 2016). However, health impacts were only one satisfier of the need for subsistence identified by participants.

Among participants, one commonly identified hindrance to meeting the need for subsistence was the effect of unreliable or difficult-to-access water connections on people's capacity to secure steady employment. As one community leader (Interviewee 1) from Delhi pointed out:

[p]eople 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.

Individuals frequently cited the increased opportunity for holding 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 of Delhi and Mumbai, respectively:

There is water standing in front of all our houses. You can't go out. You can't move much (Interviewee 2).

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 (Interviewee 3).

Protection

Impacts of water service arrangements on satisfiers of the need for protection and affection were cited second most frequently. These included both self-directed satisfiers (e.g. autonomy and self-esteem) and other-directed satisfiers (e.g. taking care of, preventing, curing). 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. As stated by a housewife (Interviewee 2) 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 impact on their capacity to save money of having to rely on expensive private water supplies. This hindrance 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 (Interviewee 4) in Mumbai pointed out that:

[t]he 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.

Spending such a high percentage of the household's daily income on water can have serious implications for 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 et al. (2010) found that such payments are a leading cause of impoverishment in India. The erosion of the financial margins of poor households due to the exorbitant costs of necessities such as drinking water can therefore further diminish their capacity to access services such as healthcare.

Affection

The need for affection – which includes having qualities such as self-esteem, solidarity, respect, passion and determination – 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 the denial of basic water services to their reliance on open defecation, while access to communal toilets or the less-common in-home latrines satisfied their need for affection by providing privacy and self-esteem. When talking about the local communal toilet block, one young woman from Faridabad (Interviewee 5) reflected that:

[b]efore, 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 their community's social – rather than physical – infrastructure with an increased ability to satisfy their need for affection. For example, participants from Mumbai often reflected on the enhanced self-esteem resulting from their water rights activism. One long-term resident and activist (Interviewee 6) reflected that:

[f]irst, 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 for improved access with both public agencies (e.g. local government) and private actors (e.g. plumbers and water vendors), resulting in concrete improvements in water services for many households. A similar situation was found 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 provided microcredit loans from the pooled donations of the women and provided a network of support that members could draw on as a safety net in times of need, as asserted by one member (Interviewee 7):

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 was also a key platform through which residents launched campaigns to secure access to water services. One member recounted how a group of 150 women forced their way into 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 to install piped water 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 reliability and ease of water access as one of the main satisfiers of this need. For example, one parent from Delhi (Interviewee 8) reflected on the situation 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 – in addition to time efficiency – was the frequency and severity of illness resulting from water quality. As one mother and one resident social worker from Mumbai (Interviewee 9), respectively, explained:

[b]ecause 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, a sense of empowerment was expressed by members of the SHG, and also by participants in a Youth Parliament in Faridabad which was 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. Members of both these groups felt that in their quest to challenge perceived inequities in their access to water services they learned to navigate complex bureaucratic systems. 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 on 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 (Interviewee 10) reflected:

[a]fter 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 a considerable overlap with the need for affection (especially 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, one resident from Mumbai (Interviewee 11) reflected thus 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.

This kind of participation can have concrete impacts on the reliability and ease of access of water services available to residents. One young woman in Faridabad (Interviewee 12), for example, 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 who 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 people's need for interaction and cooperation. Participants often bemoaned the conflicts that arise at points of water collection, saying

that they create an unsafe atmosphere and animosity between residents which leads to a decreased sense of community. As one woman from Delhi (Interviewee 13) 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 they existed, collaborative community-based water management services were praised by residents as being satisfiers of their need for participation, along with their need 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 settlement. Having found a substantial amount of groundwater, the community collectively funded the installation of water pumps and articulated a water-sharing programme by which households would be allotted a set, monitored amount of water. One long-term resident (Interviewee 14) 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 and 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 discussed, 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 that their freedom was restricted by the harassment that they frequently experienced at water collection points and when openly defecating, as discussed earlier. However, with their ability to assert their equal rights this need was satisfied as well.

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, and as recounted by a young man from a settlement in Faridabad (Interviewee 15):

[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 in which 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 (Interviewee 14):

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/leisure was most frequently impacted by the unreliability of the water supply. 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" (Interviewee 16). However, residents also cited the opportunities for beautification of their landscapes that were created by a secure and reliable water supply. In Delhi, one woman (Interviewee 17) recounted how:

when we first got direct water to our house, I planted a small papaya tree, and I got 7 kg 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 an adequate water supply as well as free time, can also be framed as a satisfier of subsistence needs by providing a nutritional and/or economic resource. It could also be viewed as a satisfier of 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 assertive in pursuing their life goals, as explained by one young man in Faridabad (Interviewee 15):

The water situation affected our studies and our daily life routines (...) [I]t affected whatever we are going to do in a particular direction, in a particular manner (...) Continuously affected 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 (...).

IMPLICATIONS OF OUR CASE STUDY FOR WATER DEVELOPMENT PRACTICE

The preceding analysis has shown that water service arrangements can hinder or contribute to the satisfaction of the whole range of fundamental human needs. In this section we discuss four general insights stemming from our research, and their implications for how water service development in UISS is approached.

Water services are about people's aspirations too

First, our case study underscores that water services are not merely linked to individuals' ability to survive, but also to their broader aspirations to flourish. This conclusion is in line with the understanding presented by prominent urban planning theorists such as Roy (2005, 2009a, 2009b), Varley (2013) and AlSayyad (2004), who suggest that urban informality should be understood not 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: 478) study, we find that participants seek water services that can facilitate the satisfaction of their need for affection, protection, understanding, freedom, identity, and creation, alongside their most basic physiological needs.

Our case study underscores the point that residents experience 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 et al., 2008). And yet, it is not unreasonable to claim that much water development can be characterised as seeking to overcome despair rather than foster hope. This is the view reflected in

the still-common assertion that improvements in access to water services are required primarily because people are falling ill (see, for example, Global Water Partnership, 2013). Such assertions 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 satisfaction of the whole range of fundamental human needs. According to Goff and Crow (2014: 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 well-being.

Well-being 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, well-being scholars Dodge et al. (2012: 230) point out that the strengthening of psychological, social and physical resources (wealths) is what enables individuals and communities to achieve a sense of stable well-being, 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 of 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 well-being in all its complexity and dynamism. This shift may better address the multiple needs of residents of UISs by revealing how particular configurations of water services can enrich or impoverish their lives. Designing water development interventions that can provide multiple well-being benefits to people may also strengthen their capacity to secure further improvements to services through their own agency. For example, our case study reveals that water service arrangements can either foster or hinder (among other things) self-esteem, solidarity, critical thinking, dissent, and the capacity to challenge authority and participate in settings of formative participative interaction. 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 that drive 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 and Swallow, 2017). In SDG 6, the main reason for pursuing water development remains to avoid morbidity and mortality, rather than to develop the capacity of people to pursue good lives (Gimelli et al., 2018).

SDG 6 does include the target of "support[ing] and strengthen[ing] the participation of local communities in improving water and sanitation management" (UNDP, 2019). This target could guide the development of more inclusive processes for water service delivery that are explicitly geared towards articulating initiatives and designs which reflect the needs of residents of low-income communities such as UISs. To this end, local governments and utilities need to help build democratic water governance arrangements that create spaces for residents' participation, which in turn requires that governments and utilities start viewing residents of UISs as citizens with rights and capabilities. It is important that governments become accountable for the implementation of such arrangements. Although it is beyond the scope of this paper to explore mechanisms to realise such accountability, this should become an area of focus for further research.

Water services should be better linked to other development sectors

Regardless, there is scope within instruments such as the SDGs to facilitate the consideration of the complexities in the water sector that are highlighted in our case study. The SDGs are formulated as 17 individual goals with constituent targets and indicators that function as an interconnected network (Sachs, 2012; Le Blanc, 2015). While the current formulation of SDG 6 privileges the public health dimensions of water, clearer linkages between SDG 6 (and its constituent targets and indicators) and those from, for example, SDG 4 (quality education), SDG 8 (decent work and economic growth), and SDG 10 (reduced inequalities) should be more explicitly drawn. Doing so may motivate development initiatives in the water sector to more explicitly consider links with other development sectors and vice versa, thus helping to operationalise a well-being-focused approach to water service development (called for by Goff and Crow (2014); Mehta (2014); Jepson et al. (2017); and Crow and Swallow (2017)) by bringing the multiple potential well-being benefits of water service development to the fore of practitioners' and policymakers' 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 existing instruments such as the Human Development Index (Kubiszewski et al., 2013; Giannetti et al., 2015), the Social Progress Index (The Social Progress Imperative, 2017) and the Happy Planet Index (Abdallah et al., 2009). Such research should explore whether instruments like these can capture dimensions of well-being found in the FHN framework and, if not, what indicators might be able to do so.

The impact of water development on well-being 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 infrastructure that satisfies a range of needs but is not considered to fulfil international standards of access (Dombroski, 2015), such as communal toilet blocks (as referred above) and community-driven water supply arrangements not approved by the state. Our case study also presents examples of social infrastructure 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 infrastructure represents forms of access that satisfy a range of fundamental human needs for our participants. This approach is problematic in UISs, which are often defined by their distinction from the formal, state-sanctioned city. In this context, it is often 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, Melbourne or higher-income areas of Delhi and Mumbai. This is not to say that the state is completely absent in these circumstances or that its absence is ideal in UISs. Broader state and non-state stakeholders such as NGOs and community-based organisations (CBOs) have important enabling, monitoring, evaluation and maintenance roles to play in the development of infrastructure and services in UISs such that they can secure residents' fundamental human needs (Patel and The SPARC Team, 2015).

AlSayyad (2004) goes so far as to assert 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. The water development sector should become more open to configurations of water services that may not fit within such understandings of urbanity while nevertheless satisfying fundamental

human needs. Our case study shows that fundamental human needs can be met, even if only partially, by water service arrangements that are tailored to a particular community.

CONCLUDING REMARKS

There is an emerging consensus in development discourse that water services are strongly linked to human well-being. Precisely what constitutes 'well-being', however, remains largely unclear. In this paper, we have shown that replacing this ambiguous notion of well-being with the clear, holistic and dynamic understanding of well-being found in the FHN framework can help to highlight the truly transformative potential of water service development for the lives of residents of UISs and perhaps for others living with water service challenges. That is not to say that the FHN framework is a silver bullet for the ambiguity that has characterised the water sector's use of the concept of 'well-being'; while we argue that the FHN framework presents a more holistic approach to well-being than that offered by the HoN or ERG frameworks, further research could be focused on articulating a conception of well-being that is more fit for the purpose of enabling transformative development practice than that found in the FHN framework.

It is also important to acknowledge that while the FHN framework discusses needs, it does not have anything to say about rights. The human right to water has become an important frame within which to discuss and seek to address shortcomings in people's access to water services (Linton, 2012; Miroso and Harris, 2012; Rodina, 2016). While it is beyond the scope of this paper to delve deeply into the potential dialogue between discourses of 'needs' and 'rights', it is important that this connection and the potential complementarity between these concepts become a focus of critical discussion.

Ultimately, the FHN framework helps to shed light on the way access to water services shapes residents' ability to satisfy needs for affection, protection, participation, understanding, leisure, freedom, identity and creation, as much as it affects their very 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 also be geared towards their articulation, testing and evaluation.

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REFERENCES

- Abdallah, S.; Thompson, S.; Michaelson, J.; Marks, N. and Steuer, N. 2009. The [Un]Happy Planet Index 2.0: Why good lives don't have to cost the Earth. London, http://roar.uel.ac.uk/604/#collapse_1338 (accessed 12 November 2017)
- Alderfer, C.P. 1969. An empirical test of a new theory of human needs. *Organizational Behavior and Human Performance* 4: 142-175.
- Alderfer, C.P. 1972. *Existence, relatedness, and growth: Human needs in organizational settings*. New York: Free Press.
- AlSayyad, N. 2004. Urban informality as a "new" way of life. In Roy, A. and AlSayyad, N. (Eds), *Urban informality: Transnational perspectives from the Middle East, Latin America, and South Asia*, pp. 7-30. Lanham: Lexington Books.

- Berman, P.; Ahuja, R. and Bhandari, L. 2010. The impoverishing effect of healthcare payments in india: New methodology and findings. *Economic and Political Weekly* XLV(16): 65-71.
- Bhan, G. 2009. "This is no longer the city I once knew". Evictions, the urban poor and the right to the city in millennial Delhi. *Environment and Urbanization* 21(1): 127-142.
- Le Blanc, D. 2015. Towards Integration at last? The sustainable development goals as a network of targets. *Sustainable Development* 187(April): 176-187.
- Bryce, R.; Irvine, K.N.; Church, A.; Fish, R.; Ranger, S. and Kenter, J.O. 2016. Subjective well-being indicators for large-scale assessment of cultural ecosystem services. *Ecosystem Services* 21: 258-269.
- Chiappero-Martinetti, E.; Egdell, V.; Hollywood, E. and McQuaid, R. 2015. Operationalisation of the capability approach. In Otto, H.-U.; Atzmüller, R.; Berthet, T.; Bifulco, L.; Bonvin, J.-M.; Chiappero-Martinetti, E.; Egdell, V.; Halleröd, B.; Christl Kjeldsen, C.; Kwiek, M.; Schröer, R.; Vero, J. and Zieleńska, M. (Eds), *Facing trajectories from school to work*, pp. 115-139. Cham: Springer.
- Crow, B.; Swallow, B. and Asamba, I. 2012. Community organized household water increases not only rural incomes, but also men's work. *World Development* 40(3): 528-541.
- Crow, B. and Swallow, B.M. 2017. Water and poverty: Pathways of escape and descent. In *The Oxford Handbook of Water Politics and Policy*, pp. 1-32. Oxford: Oxford University Press.
- Dodge, R.; Daly, A.P.; Huyton, J. and Sanders, L.D. 2012. The challenge of defining wellbeing. *International Journal of Wellbeing* 2: 222-235.
- Dombroski, K. 2015. Multiplying possibilities: A postdevelopment approach to hygiene and sanitation in Northwest China. *Asia Pacific Viewpoint* 56(3): 321-334.
- Ercumen, A.; Arnold, B.F.; Kumpel, E.; Burt, Z.; Ray, I.; Nelson, K. and Colford, J.M. 2015. Upgrading a piped water supply from intermittent to continuous delivery and association with waterborne illness: A matched cohort study in urban India. *PLoS Medicine* 12(10): 1-24.
- Gandy, M. 2004. Water, modernity and emancipatory urbanism. In Lees, L. (Ed), *The emancipatory city*, pp. 178-191. London: SAGE.
- Giannetti, B.F.; Agostinho, F.; Almeida, C.M.V.B. and Huisinigh, D. 2015. A review of limitations of GDP and alternative indices to monitor human wellbeing and to manage eco-system functionality. *Journal of Cleaner Production* 87: 11-25.
- Gimelli, F.M.; Bos, J.J. and Rogers, B.C. 2018. Fostering equity and wellbeing through water: A reinterpretation of the goal of securing access. *World Development* 104: 1-9.
- Global Water Partnership. 2013. Policy Brief | Integrated Urban Water Management (IUWM): Toward Diversification and Sustainability. 16.
- Goff, M. and Crow, B. 2014. What is water equity? The unfortunate consequences of a global focus on 'drinking water'. *Water International* 39(2): 159-171.
- Government of India. 2011. Primary census abstract for slum. www.censusindia.gov.in/2011-Documents/Slum-26-09-13.pdf (accessed 7 July 2015)
- Guillen-Royo, M. 2010. Realising the "wellbeing dividend": An exploratory study using the Human Scale Development approach. *Ecological Economics* 70(2): 384-393.
- de Haan, F.J.; Ferguson, B.C.; Adamowicz, R.C.; Johnstone, P.; Brown, R.R. and Wong, T.H.F. 2014. The needs of society: A new understanding of transitions, sustainability and liveability. *Technological Forecasting & Social Change* 85: 121-132.
- Hall, N.; Richards, R.; Barrington, D.; Ross, H.; Head, B.; Jagals, P.; Dean, A.; Hussey, K.; Abal, E.; Ali, S.; Bouilly, L. and Willis, J. 2016. Achieving the UN Sustainable Development Goals for water and beyond. September. Brisbane.
- Jepson, W.; Budds, J.; Eichelberger, L.; Harris, L.; Norman, E.; O'Reilly, K.; Pearson, A.; Shah, S.; Shinn, J.; Staddon, C.; Stoler, J.; Wutich, A. and Young, S. 2017. Advancing human capabilities for water security: A relational approach. *Water Security* 1: 46-52.
- Kubiszewski, I.; Costanza, R.; Franco, C.; Lawn, P.; Talberth, J.; Jackson, T. and Aylmer, C. 2013. Beyond GDP: Measuring and achieving global genuine progress. *Ecological Economics* 93: 57-68.

- Kumpel, E. and Nelson, K.L. 2016. Intermittent water supply: Prevalence, practice, and microbial water quality. *Environmental Science and Technology* 50(2): 542-553.
- Linton, J. 2012. The human right to what? Water, rights, humans, and the relation of things. In Sultana, F. and Loftus, A. (Eds), *The right to water: politics, governance, and social struggles*, pp. 45-60. London; New York: Earthscan.
- Loevinsohn, M.; Mehta, L.; Cuming, K.; Nicol, A.; Cumming, O. and Ensink, J.H.J. 2015. The cost of a knowledge silo: A systematic re-review of water, sanitation and hygiene interventions. *Health Policy and Planning* 30(5): 660-674.
- Maslow, A.H. 1943. A theory of human motivation. *Psychological Review* 50(4): 370-396.
- Max-Neef, M.A. 1992. Development and human needs. In Ekins, P. and Max-Neef, M.A. (Eds), *Real-life economics: understanding wealth creation*, pp. 197-214. London: Routledge.
- Max-Neef, M.A.; Elizalde, A. and Hopenhayn, M. 1991. *Human scale development: Conception, application and further reflections*. New York: Apex Press.
- Mehta, L. 2014. Water and human development. *World Development* 59: 59-69.
- Mehta, L. and Punja, P. 2006. Water and well-being: Explaining the gap in understandings of water. In *Waterscapes: The cultural politics of a natural resource*, pp. 188-210. New Delhi: Permanent Black.
- Miroso, O. and Harris, L.M. 2012. Human right to water: Contemporary challenges and contours of a global debate. *Antipode* 44(3): 932-949.
- Neher, A. 1991. Maslow's theory of motivation: A critique. *Journal of Humanistic Psychology* 31(3): 89-112.
- Nussbaum, M. 2011. *Creating capabilities: The human development approach*. Cambridge, MA: Harvard University Press.
- Owusu, G.; Agyei-Mensah, S. and Lund, R. 2008. Slums of hope and slums of despair: Mobility and livelihoods in Nima, Accra. *Norsk Geografisk Tidsskrift – Norwegian Journal of Geography* 62(3): 180-190.
- Parikh, P.; Chaturvedi, S. and George, G. 2012. Empowering change: The effects of energy provision on individual aspirations in slum communities. *Energy Policy* 50: 477-485.
- Patel, S. and The SPARC Team. 2015. The 20-year sanitation partnership of Mumbai and the Indian Alliance. *Environment & Urbanization* 27(1): 55-72.
- Pelenc, J. 2014. Combining the capability approach and Max-Neef's needs approach for a better assessment of multi dimensional well-being and inequalities: A case study perspective with vulnerable teenagers of the region of Paris (France). In *Human Development and Capability Approach International Conference*, https://mpr.ub.uni-muenchen.de/66277/1/MPPA_paper_66276.pdf (accessed 18 April 2018)
- Robeyns, I. 2003. Is Nancy Fraser's critique of theories of distributive justice justified? *Constellations: An International Journal of Critical & Democratic Theory* 10(4): 538-553.
- Robeyns, I. 2005. The capability approach: A theoretical survey. *Journal of Human Development* 6(1): 93-117.
- Robeyns, I. 2006. The capability approach in practice. *The Journal of Political Philosophy* 14(3): 351-376.
- Rodina, L. 2016. Human right to water in Khayelitsha, South Africa – Lessons from a "lived experiences" perspective. *Geoforum* 72: 58-66.
- Roy, A. 2005. Urban informality: Toward an epistemology of planning. *Journal of the American Planning Association* 71(2): 147-158.
- Roy, A. 2009a. Strangely familiar: Planning and the worlds of insurgence and informality. *Planning Theory* 8(1): 7-11.
- Roy, A. 2009b. Why India cannot plan its cities: Informality, insurgence and the idiom of urbanization. *Planning Theory* 8(1): 76-87.
- Sachs, J.D. 2012. From millennium development goals to sustainable development goals. *Lancet* 379(9832): 2206-11.
- Sen, A. 1999. *Development as freedom*. Oxford: Oxford University Press.
- Sen, A. 2013. Development as capability expansion. In DeFilippis, J. and Saegert, S. (Eds), *The community development reader*, pp. 319-327. New York: Routledge.

- Sethi, A. 2015. At the mercy of the water mafia. *Foreign Policy* 1-12, <https://foreignpolicy.com/2015/07/17/at-the-mercy-of-the-water-mafia-india-delhi-tanker-gang-scarcity/>
- Stake, R. 1995. *The art of case study research*. Thousand Oaks, CA: SAGE.
- Subbaraman, R.; Nolan, L.; Sawant, K.; Shitole, S.; Shitole, T.; Nanarkar, M.; Patil-Deshmukh, A. and Bloom, D.E. 2015. Multidimensional measurement of household water poverty in a Mumbai slum: Looking beyond water quality. *PLoS ONE* 10(7): 1-19.
- Tay, L. and Diener, E. 2011. Needs and subjective well-being around the world. *Journal of Personality and Social Psychology* 101(2): 354-365.
- The Social Progress Imperative. 2017. 2017 Social Progress Index. www.socialprogressindex.com/ (accessed 22 November 2017)
- Tong, A.; Sainsbury, P. and Craig, J. 2007. Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus group. *International Journal of Qualitative in Health Care* 19(6): 349-357.
- UN-Habitat. 2013. *State of the world's cities 2012/2013: Prosperity of cities*. The state of the world's cities. New York: Routledge.
- UN-Habitat. 2016. Habitat III Issue Papers: 22 – Informal Settlements. In *Habitat III*, <http://unhabitat.org/wp-content/uploads/2015/04/Habitat-III-Issue-Paper-22-Informal-Settlements.pdf>
- UN General Assembly. 2010. Resolution 64/292: The human right to water and sanitation. www.un.org/es/comun/docs/?symbol=A/RES/64/292&lang=Ewater
- UNDP. 2019. Goal 6 targets. www.undp.org/content/undp/en/home/sustainable-development-goals/goal-6-clean-water-and-sanitation/targets.html (accessed 8 February 2019)
- United Nations. 2015. Sustainable Development Goals. www.un.org/sustainabledevelopment/sustainable-development-goals/ (accessed 29 March 2016)
- United Nations. 2019. Goal 3: Ensure healthy lives and promote well-being for all at all ages. www.un.org/sustainabledevelopment/health/ (accessed 24 January 2019)
- Varley, A. 2013. Postcolonialising informality? *Environment and Planning D: Society and Space* 31(1): 4-22.
- Yin, R.K. 2009. *Case Study Research*. 4th ed. New York: SAGE.

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