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Bodies as urban infrastructure: Gender, intimate infrastructures and slow infrastructural violence

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ABSTRACT

Drawing from deep longitudinal and ethnographic work, this article interrogates a set of key relationships between bodies, gender and infrastructure in the context of understanding cities such as Bharatpur and Dhangadhi in Nepal as well as Delhi, India. This article seeks to make two contributions. First, utilizing feminist political geography approaches, we examine bodies as infrastructure, referring to how the social and material work of the body helps to build, develop and maintain cities through gendered infrastructures in the everyday. We show conceptualizing bodies as infrastructure reveals important and intimate dimensions of the everyday politics and social and material forms that enable critical resources to flow and integral networks be built in cities. Second, we demonstrate from our comparative case studies the ways that gendered “slow infrastructural violence” accrues through patterns of infrastructural invisibility. Particular bodies act as urban infrastructure in everyday and unremarkable ways, shaping the uneven social and political consequences of embodied infrastructural configurations. We specifically examine slow violence and informal financial infrastructure in Bharatpur and the provisioning of health in Dhangadhi followed by the exploration of slow violence and fragmented water in Delhi. This article thus raises a simultaneous call for theoretical engagement with the socio-materiality of infrastructure and the body, an increased regard for the multiplicity of urban infrastructures, and an interrogation of gender and infrastructural politics in cities where more people will be living in the future and where politics and infrastructure are being actively created.

Declaration of interest

None.

1. Introduction

Critical urban scholars and geographers focusing on southern urbanism have created an impressive and growing literature on infrastructure. From the necessity to consider comparison between the north and the south (McFarlane & Robinson, 2012; Ranganathan & Balazs, 2015) and heterogeneous infrastructural configurations within cities themselves (Lawhon et al., 2018; McFarlane et al., 2017), to understandings of infrastructure as hybrid (Larkin, 2013), incremental (Silver, 2014), visible/invisible (Star, 1999; Amin, 2014), lived (Graham & McFarlane, 2014), and peopled (Simone, 2004). This body of work has not only “importantly expanded meanings and understandings of infrastructure” (Lawhon et al., 2018, p. 722) that acknowledge both the

social and material dimensions of infrastructure, it has also opened up multi-disciplinary approaches that go beyond understanding infrastructure as being primarily rooted in non-living material systems and structures, but rather highlighted the simultaneous social, cultural and peopled dimensions of infrastructural networks that make infrastructure “living” (Berlant, 2016). In Berlant’s (2016: 393) words, “infrastructure is not identical to system or structure, as we currently see them, because infrastructure is defined by the movement or patterning of social form. It is the living mediation of what organizes life: the lifeworld of structure”. Such understandings have led to a growing number of new studies that consider how infrastructures are forged, maintained, and eroded through changing relations that pattern social and material form – and in the case of the urban, structure the ways that life is made and unmade in cities (Elyachar, 2010; Lancione & McFarlane, 2016; Millington, 2018; Ruszczyk, 2017; Simone, 2004). The everyday making (and unmaking) of infrastructures is thus inclusive of – and just as much about – the social, peopled, and financial infrastructures that enable life to take

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place, as it is about more conventional associations of infrastructures comprising roads, pipes, and sewer networks.

This article builds on geographic and interdisciplinary approaches to urban infrastructure that highlight their social, material, and “living” components and forms. While acknowledging the tremendous and varied scholarship in urban studies on the multiplicity of infrastructure, there continues to be a need to further interrogate how living social and material infrastructures shape, maintain, and enable urban life, politics, and distinctly unequal lived experiences of the city. As scholars such as Simone (2004) demonstrate that “people are infrastructure” through flows of information and networks of collaboration in cities like Johannesburg, and Elyachar (2010) demonstrates the social infrastructure she calls “phatic labor” that women use to bolster financial networks and resilience in cities like Cairo, we build on this body of work in several distinct ways. Specifically, this article pushes the concept of infrastructure further into the sphere and scale of the body, drawing on feminist theory and feminist political geography more specifically to do so. By exploring the body as infrastructure in three highly differing cities of South Asia, we argue that there is a consistency of this phenomenon. The embodied and gendered dimensions of infrastructure constitute integral forms of living infrastructure that enable critical networks in the city to function, while profoundly shaping urban life and the politics of inclusion and exclusion. Yet, gendered and embodied dimensions of infrastructure have been rather lightly interrogated in the literature thus far. In demonstrating the ways that gendered bodies act as critical urban infrastructure, we follow Star’s (1999: 379) assertion that studying the unstudied with regards to infrastructure offers an enriched understanding of cities that brings infrastructural visibility through “a social justice agenda by valorizing previously neglected people and things.”

In interrogating the relationships between bodies, gender and infrastructure, and specifically the making of cities such as Bharatpur and Dhangadhi in Nepal and Delhi, India, this article seeks to make two primary contributions. First, we show how conceptualizing bodies as infrastructure reveals important dimensions of the social and material processes that enable critical resources to flow and integral networks to be built in cities. We explore this in relation to intimate infrastructures, referring to how the social and material work of the body helps to build, develop and maintain cities through gendered infrastructures in the everyday. Second, we show from our comparative case studies the ways that gendered “slow infrastructural violence” accrues through patterns of infrastructural invisibility. Particular bodies act as urban infrastructure in everyday and unremarkable ways, and attention to embodied infrastructural configurations reveals important social and political dimensions of the consequences of infrastructure on everyday urban life. This article thus raises a simultaneous call for theoretical engagement with the socio-materiality of infrastructure and the body, an increased regard for the multiplicity of urban infrastructures, and an interrogation of gender and infrastructural politics in the city.

1.1. Experiencing cities

Empirically, this article draws from long-term ethnographic research in two tier-two cities in Nepal, Bharatpur and Dhangadhi, as well as the mega-city and capital of India, Delhi. Our ethnographic work is not intended to provide an exhaustive qualitative analysis of bodies as infrastructure in each field site, but rather demonstrate some of the key processes, mechanisms, and practices by which bodies act as urban infrastructure in the cities and sites of our long-time research. Specifically, Ruszczyk draws from research in second-tier cities of Nepal from November 2014–April 2019 through four fieldwork trips to Bharatpur in which 120 people were interviewed, the majority of whom were women. Several focus group discussions with community groups (especially mothers’ groups) took place and some of the interviewees were repeatedly visited. Aims of the fieldwork included analyzing how urban governance was evolving and changing in an academically under-researched yet rapidly urbanizing second-tier city. One trip to

Dhangadhi in November 2017 took place in order to compare how second-tier cities were developing and the role of women’s bodies as infrastructure was specifically investigated. Over 20 interviews took place with community groups, government officials, health officials and non-governmental organizations in Dhangadhi. Truelove draws on ethnographic research on planned and informal settlements of Delhi, India during 2011–2012, as well as follow-up fieldwork in 2016 and 2017, including interviews and/or focus groups with more than 60 residents. This research was primarily aimed at tracking the differing gendered infrastructures by which water is accessed “beyond the network” in both formal and informal settlements.

By considering how bodies act as both social and material infrastructure in a set of cities that have distinct features and are of varying sizes, we hope to demonstrate how intimate infrastructures, their visibility and invisibility, and their consequent “slow violence” are forged, maintained and navigated in highly situated ways. Further, by drawing from data sets across differing cities, we consider the differing types of intersectional caste, class and gender politics that both produce everyday infrastructures, as well as their uneven social and political consequences in the cities of study. The article proceeds as follows. First, we draw from feminist political geography and other gendered approaches to infrastructure to conceptualize bodies as infrastructure. We then propose the frame of slow infrastructural violence for understanding the consequences of bodies as infrastructure, which brings attention to mundane and slowly accruing forms of violence that accompany gendered infrastructural practices in cities that are rapidly transforming or developing. The article then turns to an elaboration of empirical qualitative evidence of how the body as infrastructure, and slow infrastructural violence, manifests itself in two urbanizing cities of Nepal and in Delhi. We conclude by arguing for further theoretical engagement with the socio-materiality of infrastructure and the body, an openness to the multiplicity of urban infrastructures, and an interrogation of gender and infrastructural politics in cities where more people will be living in the future and where politics and infrastructure are being actively created. These cities warrant exploration.

1.2. Bodies as infrastructure

This article puts forward the conceptualization of bodies as infrastructure. We specifically show how the body acts as both a material and social form of infrastructure not only in megacities like Delhi, but as importantly, in urbanizing spaces such as Bharatpur and Dhangadhi, Nepal that warrant critical analysis. Cities such as Delhi, Bharatpur and Dhangadhi are important to reflect upon because it is in such places that urban dwellers of the world reside (UCLG, 2020). These cities represent the lived experience of cities throughout the world. Although megacities and regional urbanizing cities may have many differences (including population size, geographic size, levels of inward and outward migration, density, and financial resources under the management of local authorities) (Ruszczyk et al., 2021), there are similarities in the way infrastructure is evolving, the role of gendered bodies as socio-material infrastructure and the power involved in these evolving dynamics. This is an important contribution to political geography.

Conceptualizing the body as infrastructure firstly seeks to build on, and extend, a growing scholarship that examines infrastructure across scales (global, regional, urban, intra-urban) and spheres (social, cultural, political, economic, material, and ecological). As infrastructure is a collective term that has been reworked through recent social science studies that give attention to both its human and non-human agencies and associations, infrastructures consist of a plurality of integrated parts that are understood to support some higher order project taking place (Carse, 2017). Rather than what constitutes an infrastructure being pre-determined and intuitive, Larkin (2013) argues that the act of defining something as an infrastructure is a categorizing moment that brings particular aspects of an infrastructure into view, while potentially obviating others. For Harvey et al. (2017: 7), while “anything can be

called into being as an infrastructure” what is important to consider is that once something is defined as infrastructure, there are implications related to sites of governance. As infrastructure can be found on multiple scales in the city, we understand that defining an infrastructure is a political act that focuses attention on certain aspects of infrastructure while ignoring others. It is precisely because bodies are not conventionally understood to comprise infrastructure – that their roles in mundane tasks such as hauling water, providing social networks of support in neighborhoods, and even aiding in financial networks of exchange do not surface in policy, planning, and mainstream narratives of how resources and networks function to build cities – that the role of the body in critical urban networks is often made invisible and overlooked.

Secondly, in our case studies of bodies as infrastructure across South Asian cities, we also build on feminist political geographers’ long-standing work on the intimate and the body. This scholarship has “long centered the body as subject and object of analysis through which to understand how power acts spatially in the world to control” (Mountz, 2018, p. 759). Feminist political geography expands the realm of the political to untangle and attempt to understand the relationships between space, power and politics (Staehele et al., 2004; Fluri, 2009; Fluri & Piedaloue, 2017; Hyndman, 2019). Through these relationships, the intimate sphere of life, which includes bodies and the body, becomes key. In the words of Mountz, the body “becomes analytical tool, scale, site, ...that is subjected to other processes” (Mountz, 2018, p. 761). Thus, feminist geographic thought has reformulated the body as an active site by which wider processes become collapsed and experienced in the everyday, and by which differing forms of political engagement occur (Fluri & Piedaloue, 2017; Pain & Staehele, 2014). We thus understand the intimate not to be disconnected from the structural, but as feminist political geographers and others have shown, to constitute a sphere of life and everyday practice by which wider political, economic, and social relations are experienced and lived. For example, Pain and Staehele (2014) suggest that intimacy consists of both proximate and distant spatial relations that span interpersonal, institutional and national realms. This also includes a consideration of how emotion, affect, and embodiment are tied to a range of differing spatial relations.

This work is particularly useful in embodying infrastructure studies through our framing of how bodies become a critical urban infrastructure. Considering bodies as an important and intimate dimension of infrastructure provides insight into the multi-scalar spatial relations that are connected to the body’s infrastructural practices (Pain & Staehele, 2014). Whether the work of women’s bodies that maintain waste infrastructure in Dakar (Fredericks, 2018), to gendered social labor that bolsters financial networks in Cairo (Elyachar, 2010), to networks of care by which water is secured by women for the benefit of other household members in Delhi (Truelove, 2019a) – all are connected to wider political, economic, ecological and social relations. As the Collective (2019: 21) state, bringing feminist perspectives on the body into understandings of urban infrastructure.

“opens up avenues for exploring how bodies – in their racialized, classed, gendered, aged forms – constitute infrastructural systems. Such an approach challenges the prefigurative and performative role of people in/as infrastructure by revealing the ways embodied labour is embedded in large infrastructures, knowledge practices, urban lives.”

Ultimately, we show how the infrastructures maintained through the body’s social, affective and material practices disclose important dimensions of how infrastructures are made in the everyday, how networks across the city work, and how the city (and patterns of belonging, exclusion and violence) are unevenly experienced. Bringing an intimate perspective to analyzing infrastructure is critical to uncovering important and unpredictable dimensions of infrastructure in daily life. As Wilson (2016) notes, “Tracing circuits of pipes and cables embeds intimate relations in unpredictable junctures of material and symbolic power.”

Thus, thinking about infrastructures in urban Nepal and India

through this lens opens up analytical space to consider the politics at hand in the mundane practices of the body as it engages in infrastructural labor, care, and social work and is connected to wider social, political, and economic processes at the neighborhood, city, and regional scales. We show how intimate and embodied activities of daily life, from forming social networks in neighborhoods to enacting gendered household labor of hauling and distributing water, form key infrastructures by which urban dwellers access and circulate resources and knowledge, while also disclosing how neighborhoods and cities are unequally experienced at the bodily scale. This analysis thus contributes an urban and infrastructural focus to “feminists’ ongoing interrogations of the everyday, the intimate, and the mundane as vital spaces from which to theorize in/equality and to map the workings of power” (Piedaloue, 2019: 4, see also Nelson & Seager, 2005 as well as deLeeuw, 2016).

Finally, in understanding the body as infrastructure, we draw from the nuanced work of anthropologist Julia Elyachar (2010) who expands on the gendered social and financial infrastructure of Cairo. She delves into how women who live lives apart from the male world provide essential social and financial infrastructure. This in turn, allows their communities and male family members to be successful. Elyachar utilizes the concept of “phatic labor” to make visible social infrastructure. She argues that women create key social infrastructures through maintaining relationships and extended contacts that can be mobilised not only in a time of need but to achieve long term familial goals (i.e. marriage for children, establishing businesses). The gendered infrastructures of women’s social networks, viewed as a form of “essential infrastructure” (ibid, 456), allow the city to function. While the social labor of such networks may not create conditions for women or their families to thrive, women’s bodies buttress against the city crumbling or collapsing, and actively create conditions for male family members to be more successful and resilient in Cairo. Although Berlant (2016: 393), following Edwards (2003), proposes that “failure of an infrastructure is ordinary in poor countries and countries at war”, our research draws on Elyachar and others to argue a different position. If we broaden the understanding of infrastructure to the social and material practices of bodies, then people as infrastructure (Simone, 2004) do more than prevent the city from failure. They can actually help the city to develop, enable critical resources to reach households, and often support particular household members to have economic resilience and life opportunities in cities, albeit often reifying particular types of gender/class/race inequities in the process.

Fredericks’ (2018) work demonstrates how such intersectional gender inequities become reified as gendered and classed bodies labor unequally in waste infrastructural networks in Dakar, Senegal. She provides essential signposting for this article by paying particular attention to overly burdened female bodies that comprise the materiality of rubbish collection in the city. Fredericks utilizes a materialist reading of infrastructure through which the definition of infrastructure is expanded to recalibrate how we think through material and social aspects of labor and working bodies. Here, the infrastructures of waste in the city become devolved onto the gendered, laboring body, which is further marked as disposable within wider urban and gender politics.

1.3. Slow infrastructural violence

The second main conceptual contribution we seek to make in this article relates to what we call “slow infrastructural violence,” which we argue often accompanies, and is a consequence of, bodies as urban

infrastructure. In particular, we show in separate case studies in urban Nepal and India the *intersectional*¹ gendered dimensions of everyday infrastructural violence that emerge as bodies act as urban infrastructure. While a great deal of historical writing about women in the city has been concerned with safety and security (see Bondi & Rose, 2003), and literature on urban violence has tended to focus on geopolitical warfare and spectacular violence (Graham & Mcfarlane, 2015; Gregory, 2011), we use the framing of slow infrastructural violence to bring attention to mundane and slowly accruing forms of violence that accompany gendered infrastructural practices in the everyday city. Here we bring together literature that conceptualizes slow violence (Nixon, 2011), infrastructural violence (Rodgers & O'Neill, 2012), and feminist approaches to violence (Datta & Ahmed, 2020; Pain & Staeheli, 2014) in order to theorize the ways slow infrastructural violence results from embodied infrastructural practices.

Slow violence has been utilized as a conceptual device in the environmental and domestic spheres of life. In reference to the environment, Nixon's (2011: 2) foundational work defines slow violence as:

“a violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all”.

This concept can gain further nuance in relation to cities when tied to scholarly conceptualizations of “infrastructural violence” (Rodgers & O'Neill, 2012, p. 403), which understand infrastructural violence to be both active and passive and recognize first and foremost that “the workings of infrastructure can be substantially deleterious.” While not taking an explicitly gendered lens, Rodgers and O'Neill (2012: 404) assert that, as infrastructures rework relations between people and things in daily life, these relationalities are often “to the detriment of marginalized actors,” but can receive little visibility since their deleterious effects often accrue slowly over time, rather than simply through spectacular events. Thus, while infrastructures can be the material embodiment of structural violence, revealing how networks of water, waste, and energy operate through political economic structures that exclude working class urbanites from equitable access, for example, infrastructures can also be what Rodgers and O'Neill (2012) call “the instrumental medium” of a violence more akin to Nixon's conceptualization that takes place slowly over time. Here, understanding the violence of infrastructure means investigating how “the material organization and form of a landscape not only reflect but also reinforce social orders, thereby becoming a contributing factor to reoccurring forms of harm” (Rodgers & O'Neill, 2012, p. 303). As bodies provide often invisible forms of infrastructure in daily practice, we bring a gendered and embodied lens to understanding the workings of “slow infrastructural violence”: a violence of gendered (and intersectional) social orders that organizes urban landscapes, helps distribute and circulate resources, and that often leads to recurring forms of harm for particular gendered/classed/casted/racialized bodies in the city. Here, we also respond to feminist political geographers that advocate for further scholarship on the ways that slow violence “has clear though [until now] largely unexplored relevance for urban studies” (Pain, 2019, p. 387).

We thus see the gradual accretion of slow infrastructural violence over time as part of infrastructural invisibility. Because bodies acting as infrastructures tend to be invisible, slow violence is a quality of this invisibility. In other words, we show that slow violence accretes over time as an unrecognized and unseen aspect of everyday intimate infrastructures: the waiting for water that prevents women from other

income opportunities or the physically taxing processes of hauling cumbersome buckets to provide water for drinking, washing and cooking in Delhi, and the social labor and networks of care that provide resilience in urbanizing Nepal but yield unequal effects for men and women. As indicated by Elyachar (2010), this type of infrastructure does not leave easily visible traces on the ground for researchers to follow nor data for algorithms for engineers to reproduce. Its invisibility is part of its power to keep things the same. While not widely recognized or perceived, public visibility of these infrastructures and their violences occasionally happens at moments of rupture. For example, in the case study on Delhi, we will show how rupture occurs when Muslim men take over the typically feminized labor of finding water, with the result of disrupting patriarchal discourses and norms. As such practices stand out as against the norm, they thus reveal a visibility of relations that have otherwise remained normalized and status quo and present new openings for reworking and denaturalizing gendered infrastructural labor.

Finally, while few studies have taken a gendered lens to infrastructural violence (see Truelove & O'Reilly, 2020 and Datta & Ahmed, 2020 for exceptions), our article draws from Datta and Ahmed's (2020) recent writing on gendered and intimate violence in relation to urban infrastructures. In studying violence against women in Thiruvananthapuram, Kerala, Datta and Ahmed importantly demonstrate that an *absence* of infrastructures such as water, toilets and public transport constitute a form of gendered and intimate violence. These scholars show how intimate infrastructures in the everyday, and particularly their absence or malfunction, not only spatializes structural violence, but critically reveals an “intimate and corporeal experience of this violence from the city to the household” (Datta & Ahmed, 2020, p. 68). While our work draws from Datta and Ahmed's approach to intimate infrastructures and focuses on the slow violence of the everyday, we diverge from this research in looking at the making of infrastructures (rather than their absence) through our conceptualization of bodies as infrastructure. We show how gendered bodies acting as urban infrastructure constitute a slow violence that reinforces patterns of harm that are experienced by the body as simultaneously affective, structural, intimate, and ongoing. This includes the hidden violences of gendered social orders that shape unequal infrastructural practices in the first place. Or additionally, the long-term, chronic physical and emotional tolls associated with finding and transporting resources like water, as well as lost life and income opportunities that can result for time devoted to the everyday labor surrounding infrastructure. In the following sections we show how the body works as an intimate (and thus often invisible) infrastructure of city life that circulates and enable resources to reach city dwellers, revealing the actually-existing infrastructures by which fragments are pieced together and made into social and material systems that keep resources circulating. Thus, conceptualizing bodies as infrastructure helps to reveal important patterns of invisibility related to how infrastructures are made in the everyday, how the city works, and how the city is unevenly, and often violently, experienced.

1.4. The body as infrastructure in Nepal's cities

Bharatpur is located in the south-central part of Nepal, bordering India. From 2014 to 2018, its population increased from 150,000 to 270,000 and the geographic area doubled. It is visually transforming from rural agricultural land to settled neighbourhoods throughout the city. Many of its male residents are international migrants in Malaysia or in other more affluent countries. Dhangadhi is located in the far-west of Nepal and shares a border crossing with India. It has a population of 170,000 and it is the provincial hub for government. Many of Dhangadhi's residents work in India for very low wages compared to migrants working in Malaysia.

By looking at increasingly urbanizing Nepal we can see intimate social infrastructure in cities via a gendered lens. In some cities of Nepal, such as Bharatpur, it is the social infrastructure of mothers' groups which allows members to transmit meaning and economic value

¹ We utilize intersectional understandings of gender in this article, drawing on Crenshaw's (1989) foundational work on intersectionality, which accounts for the ways that other social identities such as race, class, caste, ability, sexuality, and religion intersects with and modifies gender identities and experiences.

through an exchange, while in other cities such as Dhangadhi, it is not through a group but rather an individual body that provides infrastructure. In Simone's discussion of infrastructure (2004: 419) he suggests:

"Such infrastructure remains largely invisible unless we reconceptualize the notion of belonging in terms other than those of a logic of group or territorial representation. People as infrastructure indicates residents' needs to generate concrete acts and contexts of social collaboration inscribed with *multiple identities* rather than in overseeing and enforcing modulated transactions among discrete population groups".

It is this weaving of diverse people with multiple identities as urban infrastructure that is useful as an analogy to Bharatpur, Nepal. People's maneuvering in mothers' groups, for example, is represented as geographical bound to the neighborhood because this is the form of urban infrastructure that is being made visible from this city. Through action in informal collectives, people are able to function as infrastructure in the manner Simone describes. Women organize themselves into mothers' groups with 60–100 members, on a neighborhood scale. The groups are between one and ten years old. The women interviewed explained that they established groups because they worried about basic infrastructural issues that were not being addressed by the local authorities. Often times, these mothers' groups are organized by caste, level of income and extended family networks, meanwhile excluding tenants as members. These intersections come to matter in the politics of infrastructure as bodies because there is always a hierarchy and a differentiation being made through different markers.

The mothers' groups provide a range of services: social support to each other as well as to vulnerable individuals in the neighborhood (who are not members), access to a group savings and credit scheme and they participate in government initiated 'environmental cleanliness campaigns' (the women clean and tidy the streets) in their neighborhood. In Bharatpur ward 4, the mothers' group members, led by Rita Devi, explain the range of activities during a focus group discussion in 2015:

"This mothers' group helps the poor women in the group when they have problems such as the death of a family member. We also work for health and sanitation in the community. We also manage problems in some households. We help children in poor families with stationery [for school]. We also provide food to old age people. We also do savings [scheme] and the people in need can use the money on a rotation basis".

With the help of a female community leader, I (Ruszczyk) held a focus group discussion with the Little Flower Mothers' group two hours after the Gorkha earthquake of April 2015 started. To my surprise, the members of the group stayed with me, while the ground beneath us shook and told me about their lives and their group. They explained that they wanted me to tell others about their efforts for the city that are unacknowledged by the government, indicating how visible work in local areas is rendered invisible at the city scale and within wider patriarchal social orderings. The women were proud of their activities and wanted respect from city-dwellers and political actors embedded in patriarchal structures. The members of the Little Flower Mothers' group overwhelmingly included high caste Brahmin women whose families owned land. The women were housewives, teachers or had other paid employment. During the focus group discussion, they explained that the purpose of the mothers' group is to provide essential support to the community that is lacking, whether it be infrastructures that bolster financial security or the cleaning of streets. As a personal benefit, through participation in the Little Flower Mothers' group, they can interact with other women. Otherwise they are physically restricted to their houses if they are not employed. These societal norms manage the mobility and actions of high caste Brahmin women.

During November 2017, in the city of Dhangadhi, women express pride in their infrastructural labor as volunteer municipal health and community liaison officers. While unpaid and voluntary, their responsibilities include guiding women through safe pregnancies, providing early childhood care, health and family planning and

immunization services. Often times the volunteer health officers treat cases of lower respiratory tract infections. The women work irregular and long hours, but they do not receive a salary and are not valued sufficiently to be paid by the local authority, as these infrastructures of care become naturalized as unpaid gendered labor of women. However, women's work as health infrastructure for the city provides the essential link between vulnerable populations in rural, semi urban, and urban communities and the formal health system (Public Services International, 2018, p. 11). But they (and their husbands whom I also interviewed) are angry that it is not only their labor that is unpaid: they must also pay for their own public transportation. The municipality trains the health workers and relies on their essential labor but is unwilling to compensate them or to reimburse for expenses. Instead the municipality saves municipal funds for other more visible infrastructure projects such as the provision of roads or street lighting. These social and material practices in cities that are rapidly growing show the politics of this bodily work at the intimate scale (both through groups and an individual basis) and how political dimensions of the city are played out in gendered bodies. The ways that bodies are utilized as everyday socio-technical infrastructure to serve the city is often invisible but continues with the acknowledgement and support of the patriarchal society and government structures.

1.5. *The body as infrastructure in Delhi*

Across Delhi's diverse neighborhoods, the everyday lives and routines of women are often shaped by both social and material practices to access household water. Due to patriarchal discourses and gender norms that relegate household water management to women's domestic labor, responsibility for water procurement across class groups predominately falls onto the bodies of female household members. It is through women's bodies, specifically women's gendered social and material practices, that an intimate infrastructure is made that actively subsidizes, and enables, water from (and beyond) the network to reach city-dwellers. This all-too-invisible infrastructure is absent in dominant narratives of how water is circulated in India's capital. Yet the stress, strain, sacrifices and physical and emotional care that makes water flow reveals a critical and overlooked dimension of both how the urban metabolism of the city's waterworks come to function, and how the politics and infra-making (Lancione & McFarlane, 2016) of the city itself is unevenly experienced.

While Delhi provides an average of two to four hours per day of centralized piped water to planned neighborhoods, excluding centralized water connections altogether from unplanned areas, the public water supply is often unreliable due to unequal allotments to differing districts, interruptions, lack of pressure, and leakages, each of which require social and material practices and negotiations of predominately middle-class women to overcome and circumvent. As women are primarily responsible for procuring and managing household water, it is common for middle-class women living in planned areas of the city to approach local Resident Welfare Associations (RWAs) to try to rectify water inadequacies to their homes. In addition, a water board (Delhi Jal Board) office might be visited to issue a complaint of sporadic water timings or faulty pipes, or neighbors might need to be persuaded to stop letting water overflow in their own household water storage tanks through (often illegal) pumps, preventing those down the line from filling their own. Women often compensate for insufficient water through the gendered time and labor of calling a private water tanker, buying bottled water, or negotiating and managing water sharing with a neighbor who has an illegal tubewell (personal communication, 2017).

Even if piped water arrives in adequate quantity to the planned city, it must be actively managed in real-time: pumps must be turned on when water is flowing and rooftop storage tanks must be filled to keep water so it can last the duration of the day or for days at a time for the household. Sometimes reverse osmosis machines are installed and utilized to filter the water so it will be potable. Women's social and material labor

provides the “bridge” between these infrastructural fragments (McFarlane, 2018) to enable and manage the city’s water supply, often so that men and children in Delhi’s households have safer and accessible water. However, waiting for, finding, and timing water’s arrival must be negotiated in tandem with (or at the expense of) women’s other plans and opportunities. Furthermore, as women pump water, often with illegal motors, to store as much as possible in overhead tanks during the hours it is running, the rush for water is often fraught with conflict amongst women neighbors who cooperate with each other at other times of day. For example, as one middle-class woman (who works in the water sector herself) summarized about her own neighborhood’s gendered water labor and conflicts:

“The same women who used to go together to drop their children to school in the morning would be fighting in the afternoon for that maybe 200 L of extra [piped] water [to store in overhead tankers]” (BBC, 2012).²

As shown elsewhere (Truelove, 2019b), the water security of women household members is often curtailed through the risks, time, hazards and sacrifices made to patch together fragmented infrastructural networks. Using their bodies as infrastructure enables not only their household members, but the city itself, to achieve higher levels of water security.

Thus, the politics of this bodily work, though highly normalized and thus invisible and taken for granted, is absolutely crucial to water politics at the city-scale. This is a politics of how “actually-existing” infrastructures, often invisible as they are relegated to the intimate sphere of everyday life, are pieced together and made into socio-technical systems that service the city. Zerah (1998, 2000) referred to this water labor as “compensation practices,” estimating in the year 2000 that their worth totalled around Rs. 3 billion each year which was about twice the municipality’s expenditure on its water supply during the same period of time. Here, the city’s public network is able to render invisible many of its disruptions, gaps, and inadequacies through the embodied gendered labor that works on a daily basis to fill those gaps and ensure water is secured for households. Conversely, the gendered laboring bodies that pump, store, distribute, and negotiate neighborhood water distribution do not come to count or be seen in dominant understandings of the infrastructure by which water reaches city dwellers in the everyday. This not only represents a devaluing of labor that subsidizes the city’s low costs and charges associated with distributing household water, but demonstrates how the politics of water infrastructure at the city scale is ever-reliant and intimately connected to the gender politics of water at the household and bodily scale.

1.6. *Between empowerment and slow violence: informal financial infrastructure*

Informal community groups in Nepal often develop an urban financial infrastructural function through group savings schemes. Some groups such as the male-led neighborhood groups collect 100 or 200 NPR from each member (equivalent of \$1 - \$2 in April 2015) per month and annually they redistribute some of the funds to each participant (retaining 1000 NPR from each person in the financial scheme). The group members view the financial schemes as a fundamental part of the neighborhood group service provision. This new form of urban organization is rupturing historically unequal and destructive lending practices impacting the most vulnerable in the community. This informal, intimate infrastructure has somewhat relieved economic pressure on the very poor in Bharatpur and is changing social dynamics on multiple scales (individual and community level) for men. These new changing urban practices are mitigating slow violence of poverty and deprivation

² Truelove interviewed this woman as part of the research on multiple occasions during 2012. The quotation comes from an interview of the same woman in a BBC news report from 2012.

for men but, importantly, not for women irrespective of intersectional markers including ethnicity, caste and class. The rigid patriarchal society is not motivated to better the situation of women.

The financial infrastructure of savings and credit schemes are also viewed as essential by all of the mothers’ groups interviewed. The Little Flower Mothers’ group in ward 4 explains that all members contribute 200 NPR monthly. Any woman can access the funds (if necessary) - up to 30,000 NPR with minimal interest. The most common uses for the money include medical treatment, private school tuition fees and materials and less frequently, for the construction of a house. The savings schemes provide women with economic empowerment, a financial safety net, and the psychological empowerment of “having a voice” in their community. Every member of a mothers’ group mentions personal empowerment through finances. In Bharatpur, the women’s saving and credit schemes do not provide income-generating loans; rather the group approach enables women to ensure household subsistence and survival, and at times, planning for the future. Through the management of funds, the women have control and power to support themselves and other women in a time of need without asking for approval from husbands. Through the provision of informal financial infrastructure in the form of the group saving and credit schemes, both the neighborhood groups and mothers’ groups are addressing their perceived most important everyday risk in the city - economic security. The schemes are a safety net if a family faces extreme difficulty in their livelihoods strategy, if health deteriorates, in case of death or other everyday crises.

Tensions arise in cities when mothers’ groups become too visible in terms of their labored infrastructure provision within rigid social orderings or when their requests for changes in neighbourhoods and cities become too loud for men to bear. Tensions also arise when mothers’ groups become too powerful in terms of the amount of money they have under management. On a local level, there are tensions between mothers’ groups who control their own financial schemes and other financial groups. The Little Flower Mothers’ group explains that the local financial cooperative is not pleased with the power afforded to the Little Flower Mothers’ group by managing their own funds. The financial cooperative has high expenses related to managing their funds while the mothers’ group has minimal expenses due to free labor within the mothers’ group. The financial cooperative wants “this mothers’ group to be dissolved” and the money deposited directly into the financial cooperative instead to gain political power over the group’s assets, according to the president of the mothers’ group. On a municipal aggregated basis, the financial value of mothers’ groups financial schemes in circulation could be in the range of \$100,000 – \$350,000.³ Given the amount of money under informal management, it is not a surprise there is envy towards mothers’ groups.

Slow violence and exploitation of gendered invisible infrastructure takes place in audacious yet common place ways. In another part of ward 4, the new male neighborhood group president earnestly explained that his management team would not “take” the mothers’ group funds and distribute to the neighborhood group’s members as grants (unlike his predecessor who had no qualms about stealing from the local mothers’ group). When I asked the mothers’ group about this theft, they responded with despair and anger towards the neighborhood group. Women felt humiliated and powerless. They were not allowed to control their own money and, simultaneously, they unwillingly continued to implement the dictates of the neighborhood group. The women continued to clean the streets and complete other tasks the neighborhood group (and local authority) “asked” of them, they did not have a choice. The threat that the neighborhood group could steal their money without any repercussions was always there. The slow violence placed upon women and their bodies, and even their hopes and aspirations for a

³ The municipality does not know how many mothers’ group exist in their city. This estimate of the value of financial schemes is based on Ruszczyk’s knowledge from conducting research in this city for several years.

future of their imagining, was rendered invisible to those not in the local area. There was no way for the women's groups to stake a larger claim. They were isolated in their neighbourhoods and did not know how to connect with other women's groups in the city. In this situation, the women were mindful of the patriarchal societal limitations in place that constrict their options for maneuvering. Several mothers' groups highlighted limitations of the mothers' group due to social constraints imposed by men (for example, wives need permission from husbands to join mothers' groups) and the government (who is not interested in engaging with urban concerns as articulated by women). The informal financial infrastructure can be considered empowerment and also slow violence that is affective with elements of shame, helplessness and anger, while also being intimate, elusive and ongoing. There are promises and perils of financial infrastructure.

In the case of Dhangadhi, the local authority was keen to utilize women as core municipal (but unpaid) staff who provided essential health services to the city's residents. Furthermore, they expected the women and their families to subsidize expenses such as travel and materials needed to give to poor health clients. Nixon argues that the impacts of slow violence are "pervasive but elusive" (2011: p.3). This type of violence "quietly accumulate[s] and defer[s] their damage over time" (Davies, 2019, p. 2) leaving women devastated and angry yet simultaneously proud of their contribution to their communities and cities.

1.7. Slow violence and fragmented water in unplanned Delhi

In the unplanned *bastis* (small informal settlements) of Delhi such as Rampur Camp,⁴ slow violence constitutes a particular quality and outcome of the invisible and intimate infrastructures that make water flow. Slow infrastructural violence appears in the social orderings by which particular bodies experience chronic and accruing harms from a systematic exclusion from the public water network, the social reproduction and care that structure gendered water practices, the hazards of finding, negotiating and transporting water, and lost income, life opportunities, and even potentially life years due to the experience of mitigating a contaminated, insufficient, and irregular water supply.

Specifically, residents of Delhi's *bastis* are excluded from accessing centralized, in-house water connections from the public utility. The social and material labor of piecing together fragmented infrastructures beyond the network - including attempts to track, coax and store water from inadequate and unreliable local tube wells and erratic and insufficient tanker deliveries - relies on specific bodies. While patriarchal discourses position women across class groups as household water managers, intersections of class, caste, and religion work to compound infrastructural violence over time for particular urbanites. Firstly, working-class groups in Delhi face significantly more severe water problems and inadequacies as compared to middle and upper classes since the working class by-and-large lack centralized water connections due to the "illegality" of their housing, while often having less money and resources to circumvent water problems (Truelove, 2019a; Zerah, 2000; CAG, 2013). Their reliance on partial and fragmented infrastructures like tankers, tube wells, and privately purchased water often falls below baseline water levels of what the WHO (2003) deems necessary for meeting even basic needs (CAG, 2013; WHO, 2003). Apart from the substantial struggles to find water in the wake of supply inadequacies, shortages of potable water in and of themselves are associated with dehydration, an inability to cook food if there is not sufficient water for cooking, and reliance on non-potable sources that lead to illness through contamination. Secondly, for non-dominant caste groups and Muslims among the working class, previous studies indicate that systems of ethno-religious discrimination can further erode access to, and control over, water infrastructures in Delhi's neighborhoods (see Truelove, 2019a, 2016). These groups might be excluded altogether

from local NGO development initiatives, (Truelove, 2016) the last to receive access (at the highest price) when tube wells do service an area, and face other structural constraints (such as having no other family members in the city, or working as construction laborers) that further confine how they will problem-solve inadequate water flows during daylight hours. In Rampur Camp, it is the bodies of non-dominant caste and working class women, as well as Muslim working class men (who live without female family members), who bear the brunt of the slow violence of procuring and managing water beyond the piped network. This includes the labor, time and social networking required to negotiate access and piece together fragmented networks. This might entail sharing water with a neighbor, negotiating with politicians for closer access to tanker deliveries, or the everyday practices of waiting for, hauling, and managing water and its various uses, storage, and circulation for household members. Women in particular reported back and shoulder injuries, lost time and income-generating opportunities, exposure to increased harassment from men, and ongoing stress. Piecing infrastructural networks together forms a politics of care and social reproduction that levels compounded, yet often all too invisible, tolls on the city-dwellers who undertake this work.

Thinking through these intimate infrastructures thus opens up analytical space to consider the politics at hand in the mundane practices of the body as it engages in infrastructural labor, care, and the everyday maintenance of water flows that are connected to wider social, political, and economic processes at the neighborhood, city, and regional scales. Despite Delhi boasting more than 200 lppd of water in the city, largely drawn from regional areas and dams, specific social groups face intersectional inequalities that produce unequal burdens of both water procurement and insecurity. The slow violence of bodies working as a replacement for absent or defunct infrastructure is shaped by intersecting gender, class, caste, and ethno-religious power relations. As particular (gendered, classed and cased) bodies are unevenly tasked with supplementing and compensating for infrastructural inadequacies, other urban residents experience the benefits of increased water access and security that results.

For example, while dominant-caste women in Rampur Camp had stronger ties to the local leader and local water vendors, and could often use these social connections to press for increasing allotments of tube well water, non-dominant caste women had to find alternate and more laborious water solutions. This includes negotiating water access from places of work, for example, when tube well water in the settlement was not sufficient or had been disproportionately distributed to dominant caste groups. Women reported that "borrowing" water from their employers in the form of a few buckets a day when other water sources were scarce diminished their negotiating power and even work incomes, sometimes leading to not receiving their full wages. On the flip side, Muslim women and men in Rampur Camp experienced ethno-religious discrimination at the neighborhood and city scale that curtailed their access to local water sources. For example, a local NGO-initiative had not extended tubewell water pipes to their side of the settlement to the degree granted to Hindu residents, which Muslim residents attributed to patterns of long-term discrimination they encountered in Delhi. As a whole, infrastructures for Muslim residents were visibly lagging behind in the settlement, including drainage, concrete lanes, and electricity, placing higher burdens on these residents to problem-solve the basics of water access, a marked difference from that of their Hindu neighbors comparatively (Truelove, 2016). The Muslim community's exclusion from equitable tube well water caused residents to resort to alternate water sources, including buying small packets of water or walking to another settlement with a tubewell, in which the neighboring community was more willing to partly share the water. These situated material and structural forms of infrastructural deprivation show how slow violence accretes over time through both the limits of infrastructural access, and the body's work to compensate for absent, fragile and defunct networks.

For local, predominately Dalit women in Rampur Camp, time given

⁴ Rampur Camp is a pseudonym used to protect confidentiality.

to water also plays a key role in the nature and toll of slow infrastructural violence. Some women give up jobs, life opportunities and even take girl children out of school just to devote the time needed to find and secure critical water sources. This includes waiting for unpredictable state tanker deliveries to come on any given day, and filling and transporting as much water as possible in the few minutes water is available after a tanker's arrival. Others face harassment, and even violence, when they seek out water sources outside their own communities, such as using water from another neighborhood's tube well, buying temporary stores of water packets or sachets, or visiting local government (Delhi Jal Board) offices to speak with engineers and even politicians about improving water deliveries (through more regular tankers). Most women interviewed expressed, for example, that it was not safe to walk the streets to neighboring areas to seek out water (and sanitation), and thus women often tried to coordinate so they could go in groups. Such experiences compound the emotional stress experienced due to a lack of water with the risks of facing harassment from men on the streets, and even within shops and offices, as women seek out alternate water sources.

While the robbing of life hours (and accompanied physical and mental strain) that are given to managing water – that for some accrues into years that could be devoted to other life purposes and opportunities – remains a source of unrecognized, invisible and slow infrastructural violence, moments of rupture do occasionally occur. Such ruptures help disclose both the highly gendered and intersectional dimensions of this slow violence, and bring attention to its deleterious embodied effects. In 2012 in Rampur Camp, Truelove observed Muslim men from Bihar living on their own, having left wives and families behind in rural areas to tend land. Due to the absence of women from many households on this side of the neighborhood, the gendered labor of finding water (as well as other household tasks such as cooking) becomes suddenly reversed. As Muslim men took on the gendered labor of finding water due to their wives' absence, these men's water practices disrupt patriarchal norms and gain visibility as their male bodies stand out against the gender norm. For example, on any given evening Muslim men could be seen carrying heavy containers of water on their shoulders, accessed from the neighboring settlement's tubewell (Truelove, 2019b). While Star (1999) indicates that infrastructures often become visible at the moment of breakdown, here the breakdown of infrastructure that brings visibility is the sudden rupturing of embodied and patriarchal reproductive labor, a breakdown in social structures that reverses the norm of the female body working as an infrastructure of household water provisioning. As Muslim men take on the typically feminized labor to procure and transport water after 12-h long shifts working on construction sites, they resort to a variety of strategies to gain even the most minimal amounts of water. It was common to hear expressions amongst this group that problem-solving water was the most stressful element of living in Delhi, and that it had become so dire they often did not have sufficient water to cook food, and instead had to use money to buy food from informal vendors, which further eroded away their earnings to send back home to their families in rural Bihar (Truelove, 2016, 2019b).

2. Conclusion

This paper approaches intimate everyday infrastructures in urban Nepal and India through the lens of gendered bodies as infrastructure. As such, one of the primary goals of the paper is to open up analytical space to consider the everyday politics and practices that shape, and become (re)produced, as bodies engage in infrastructural labor, care, knowledge networks and social work. These are the often unseen yet critical infrastructures and embodied practices that help neighborhoods and cities to function, and also reflect social relations and hierarchies, slow violence and unequal patterns of urban inclusion and exclusion. In our comparative case studies of Bharatpur, Dhangadhi and Delhi, we show how gendered bodies as infrastructure are connected to wider social, political, and economic processes at the neighborhood, city and regional

scale, demonstrating how the politics of the city is intimately connected to the gendered politics of the body, and vice versa. As such, we contribute to new work in feminist geography utilizing a gendered and intersectional approach to understand the bodily scale and sphere of urban infrastructures, and its associated gendered forms of slow violence in cities.

Firstly, our respective case studies utilize a gendered intersectional approach to show how wider politics and governmental structures at the city and regional scale become unevenly experienced intimately at the bodily scale. Drawing on feminist political geography work on the body, we demonstrate the ways such wider politics profoundly shape how infrastructures are made in the everyday, and whose gendered/casted/classed/racialized bodies disproportionately (and often invisibly) engage in circulating critical resources, materials, and knowledge in their communities. As such, we hope to contribute to De Leeuw's (2016, 16) call for "a deeper engagement with the political geographies formed in everyday intimacies". This analysis seeks to bring visibility to gendered infrastructural practices and networks that often go understudied and are rarely acknowledged in policy, planning and research. It also allows us to think comparatively about how gender operates in tandem with other key identities (caste/class/race/ethno-religious identities) in relation to unequal embodied experiences of urban infrastructure. Notably, giving analytical attention to intersectionality at each field site reveals important differences in the ways diverse social groups in urban Nepal and India unevenly experience "infra-making" (Lancione & McFarlane, 2016) in the everyday through wider gender, caste and class politics. While gendered invisible infrastructural labor, patterns of care, and social relations all shaped how infrastructures are built in each city of study, such networks are heavily inflected by caste, class and ethno-religious politics in urbanizing South Asia.

For residents in Bharatpur, for example, middle-class Brahmin women (and home owners) experienced particular caste and class based politics that provided complex openings and closures with regard to the social labor to build financial networks of support in mother's groups. Many Brahmin middle-class women reported a lowering of perceived risks in the city and that a sense of economic security was achieved through the mother's groups provision of informal financial infrastructure at the local and household scale. However, patriarchal governmental structures at the neighborhood and municipal government scale worked to curtail some women's power over this savings and credit infrastructure, with the tacit condoning of such practices by local male authorities, community leaders, and even husbands. Such findings speak to the necessity for urban scholars across locations to take seriously the ways differing patterns of intersectionality are tied to the everyday politics and uneven experiences of infrastructure.

In Delhi, social, political, and economic processes at the neighborhood, city and regional scale shaped differing gendered infrastructures and embodied water practices at the intra-household scale. While governmental structures at the city and regional level have put in place laws that widely exclude the urban poor (specifically those living in unplanned areas of the city) from centralized water connections, our research demonstrates that the provision of public water even in planned areas of the city (that are assumed to receive adequate per capita water deliveries) nonetheless relies upon the gendered labor and time of women's bodies in order to circulate. The unacknowledged and unremunerated gendered labor of storing, managing, and distributing household water amongst middle class women creates tensions between neighbors, interrupts and even hijacks women's routines, and curtails other life and income-earning opportunities. For residents of unplanned areas in the city such as Rampur Camp, the quest to piece together water infrastructures beyond the network disproportionately falls onto the bodies and daily practices of non-dominant caste women and Muslim men of lower socio-economic groups. For the few Brahmin women living in the area, and many Hindu men, accessing water was not identified within research interviews as a major problem in their own daily routines, precisely because it was either handled by other household

members, or provisioned at relatively more secure levels through dominant caste relations and connections in the settlement. Here, we see not only how intersectional gender/class/caste/ethno-religious politics come to matter in shaping the everyday life of infrastructure, but also how particular neighborhoods and household members benefit from the circulation of resources that are provisioned through the ongoing labor, care, and social networks of others.

Lastly, and related, our research shows that the invisibility of these everyday intimate practices of particular bodies to provision infrastructure is deeply connected to what we term “slow infrastructural violence.” Here we contribute to feminist geographical work that gives attention to the gendered and urban dimensions of “confronting the often invisible, systematically maintained, and normalized ‘slow violence’ experienced by disposed and marginalized peoples” (Piedalue, 2019, p. 2). Slow violence accretes over time as an unrecognized yet critical dimension of the embodied experience of infrastructural networks in the city. We show how it manifests through unequal gendered social hierarchies and relations coupled with forms of long-term and disproportionate forms of harm associated with practices such as waiting for and hauling water on a daily basis in Delhi, or providing unrecognized and unremunerated forms of care and maintenance that the municipality is failing to provide in Bharatpur’s streets and lanes, or not paying health workers to do essential public sector work in Dhangadhi. These simultaneous infrastructural politics and material configurations reveal important dimensions of urban inclusion and exclusion that have to be understood at the intra-household and bodily scale, profoundly shaping the uneven experience of the city for urban residents. We thus call for not only more engagement theoretically and empirically with the multiplicity of urban infrastructures that enable resources to circulate and cities to be built in the everyday, but also extending our understanding of the socio-materiality of infrastructure to include bodies in order to understand the intimate and gendered infrastructural politics of the city.

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