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– **WALK THE PIPELINE:** Urban Infrastructure Landscapes in Bengaluru's Long Twentieth Century

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Abstract

Walking reveals how urban infrastructure lends identity to the urban landscape. This article focuses on the oldest water pipeline in the city of Bengaluru, India. A series of vignettes trace the linear trajectory of the walk both in terms of the spatial orientation of the pipeline, and its trajectory through time. Through space, the pipeline connects the centre of the city with its suburbs, tracking differential and sometimes invisible patterns of urbanization that follow the city's sprawl. Through time, the pipeline connects water narratives, from nostalgic notions of precolonial management to the contemporary construction of scarcity. The use of walking as a methodological tool draws attention to the subsumed and often invisible experiences of inequity in various parts of the city. The pipeline is a maker of urban stories alongside routine practices and larger strategic projects of urban development. While the pipeline enables the provision of water, the neighbourhoods it passes through are sometimes excluded from the service it provides. Strategic projects have attempted to control water resources following different ways of imagining the city. Still, such urban imaginations coexist with a more extensive set of everyday practices that engage with the pipeline in the urban landscape.

> 'Walking has created paths, roads, trade routes; generated local and cross-continental senses of place; shaped cities, parks; generated maps, guidebooks, gear, and, further afield, a vast library of walking stories and poems, of pilgrimages, mountaineering expeditions, meanders, and summer picnics. The landscapes, urban and rural, gestate the stories, and the stories bring us back to the sites of this history.'
> Solnit (2001: 4)

Introduction

Rebecca Solnit describes walking as an amateurish activity that delivers amateur histories (Solnit, 2001). Urban histories of infrastructure emerge as the researcher experiences the socio-spatial character of urban infrastructure through walking (Anderson, 2004). Walking enables the connection with both time and space through a grounded experience of the physical environment around us (Evans and Jones, 2011). Walking through a place uncovers hidden meanings. The spatial awareness so generated makes visible the subaltern voices that remain invisible through conventional techniques of research (*ibid*.). Walking an urban landscape is a means to apprehend both the real and the imagined ways in which the city is produced and experienced by its population. Infrastructure creates a variety of urban experiences. On the one hand, its presence enables the provision of essential services and supplies that make the urban. On the other hand, infrastructures shape existing patterns of inequity, hiding the subaltern lives of those who live in their shadow. Walking infrastructure reveals what is made visible alongside what is hidden. Insights from landscape studies show that walking

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helps to create associations that reveal the sociotechnical relationships shaping the city (Wylie, 2005). If infrastructures are the invisible lattice of the city, walking is a means to make their operation visible.

Easterling (2014: 12) describes the constitution of infrastructure within a so-called 'soupy matrix' of repeatable formulas that constitute a global urban space. Such global urban space is the result of global politics in urban environments, where urban infrastructure acts as a means to reproduce both inequality (Graham and Marvin, 2001; Jaglin, 2008; Zérah, 2008) and projects of urban violence (see Nolte, 2016; Rokem, 2016). Infrastructures are linked to political projects of identity reproduction that allow the control of territories and ecologies (Swyngedouw, 2015). However, that soupy matrix also contains sets of varied experiences that shape the everyday life of infrastructures, creating diverse and contingent urban infrastructure landscapes (Castán Broto, 2019).

Water infrastructure, in particular, is at the core of cultural imaginaries that reveal how urban infrastructure develops in urban areas alongside a set of social and institutional practices. Gandy (2014) has described water infrastructures and their cultural representations as manifestations of modernity projects that over the long twentieth century have shaped both the imagined city and the vast expanse of ecological relations and transformations that constitute urban infrastructure landscapes. In another work, Gandy has referred to urban infrastructure landscapes as manifestations of 'collective memories interspersed' (Gandy, 2011: 58). Urban infrastructure landscapes are both a cultural product of urban lives and a contingent materialization of urban imaginaries. Urban infrastructure landscapes result from situated ecologies, as water and other infrastructures make manifest the ecological dependences that underlie urbanization projects (Heynen *et al*., 2006). At the core of this understanding, there is a reflection on the 'untameable' nature of the material and the emergent properties that create surprises in urban areas requiring continuous maintenance (Graham and Thrift, 2007).

Some scholars have proposed the idea of walking infrastructures as a means to reveal the sociotechnical aspects of infrastructure landscapes. For example, Barry (2013) proposed to 'follow the pipeline', in this case a gas pipeline, to reveal the complex geopolitical conflicts across its traces. In Bengaluru, India (also known as Bangalore), the 'pipeline road' follows the outline of the oldest pipeline in the city, traversing changing urban landscapes that reveal attempts at governing the ecology of the city as much as how everyday life has changed in an ever-expanding urban area. Our interest is in the mundane aspects of the pipeline's presence within this particular urban landscape.

The notion of landscape mobilized in this article emerges from an understanding of 'things' that follows Graham Harman's (2009) version of speculative realism. As infrastructure objects become part of urban landscapes, they do not become invisible (Star, 1999), rather they recede from view and become part of people's sense of being, without being articulated in knowledge narratives. Urban infrastructures such as the pipeline have become tangled through time in multiple relations (Hommels, 2005).

Harman's conceptualization of 'things' adds to established sociotechnical readings of infrastructure by pointing to the emergent, incalculable conditions of the material. The pipeline's significance cannot be reduced to the different ways in which it is implicated in human needs and experiences, because the pipeline shapes the urban fabric in unexpected ways. A pipeline is one of those ready-to-hand artefacts involved in urban maintenance (*cf*. Graham and Thrift, 2007; Castán Broto and Bulkeley, 2013). The pipeline's significance emerges by investigating not just the strategic projects that it has served, but also how it operates daily within the particular configurations of infrastructure that constitute the lattice of urban life. While we are not proposing that the pipeline has a distinct intentionality that can shape strategic projects, we do see it as a dynamic artefact that organizes resources and practices in time and space. The

pipeline 'works' to deliver water at a particular pace linking locations and resources. The pipeline also divides, opens, moves, and, overall, has a definitive influence on the processes of resource organization in the city.

Walking it is a means to examine the relationship between the pipeline's visible material aspects today and their configuration within a particular urban history. A walking narrative of the first water pipeline built in Bengaluru helps to show how this can be captured through writing. Five vignettes of that walk reconstruct specific moments of encounter and help to construct a vibrant urban history for the city. The narrative exposes urban water myths embedded in the infrastructure landscape. It reveals the pipeline both as a maker of urban stories and as an enabler of marginalization, both processes operating alongside routine practices and larger strategic projects of urban transformation.

Walking urban infrastructure landscapes

Urban infrastructure landscapes reflect both the cultures that shape the built environment and the ecological transformations that they warrant (Gandy 2011; 2014). Monstadt and Schramm's (2015) analysis of infrastructures in place, looking at examples of sanitation in Hanoi, emphasizes the material arrangements that shape access to urban infrastructure. In their analysis they describe urban infrastructure landscapes as amalgamations of heterogenous infrastructure configurations. Urban infrastructure emerges from diverse, provisional, and sometimes makeshift constructions with multiple overlapping manifestations (Lawhon *et al*., 2018). Urban infrastructure landscapes are thus characterized by their contingency, as they become tangible in specific moments or events.

Landscape research has long been associated with phenomenological perspectives that privilege the experience of the observer but simultaneously recognize the ephemeral and constructed nature of those observations (Tilley, 2016). Landscapes are the result of unfolding everyday practices in space (Ingold, 1993; 2000). In particular, urban infrastructure landscapes result from multiple, incoherent and not necessarily purposeful actions of human and non-human actors rather than from the materialization of single-purpose strategic projects. Those landscapes are not simply the result of a singular political project of capitalism (*cf.* Mitchell, 2002; 2003). Instead, urban infrastructure landscapes reveal that urban material politics are ultimately unmanageable and unpredictable (Lawhon *et al*., 2018). The ambivalence of urban infrastructure opens up multiple possibilities to interpret and navigate urban space, a meagre hope for those whose needs are excluded from dominant systems of service provision (Coutard and Guy, 2007).

Walking as a landscape methodology extends the experiencing subject and makes explicit the relational and situated character of experience. Wylie (2005: 236) demonstrates how walking reveals 'differential configurations of self and landscape emergent within the performative *milieu*'. Walking is itself a relationship, which shapes both the walker and that which is being walked. Walking has a special place in urban imaginaries as a way to resist convention and conjure up new cities. De Certeau (1984) describes every bifurcation and alternative itinerary as a revolutionary moment of urban reinvention. The urban infrastructure landscape thus becomes the manifestation of a collective, shared project, infinitesimally appropriated in situated tasks beyond individual projects of collective domination. A deliberate engagement with urban ecologies, particularly, can guide an intellectual project of urban resistance, as observed already by Debord (2012) in his theory of the *dérive*. 'Walk the pipeline' is thus a motto that invites the subject to challenge observational boundaries and experience the urban infrastructure landscape in a relational way. Walking also engages the walking subject in situated political projects that challenge anthropocentric perspectives and emphasize the potential possibilities of a fluid urban environment.

Walking is a means to imagine how the city itself can become an archive that, in practice, operates as a repository of alternative knowledges and resistance projects (see Burgum, 2020). Walking enables an engagement with the urban materialities that order the functions and actions of different urban groups. The archive may be an instrument to order territories, as much as a mechanism to generate new and unexpected histories, for which moving through the city is essential (Sheringham and Wentworth, 2016). Paraphrasing Roberts (2015), urban dwellers themselves become the curators of the giant, contingent archive that is the city. If infrastructures are the main means through which long-term urban archiving happens, reading the city as an archive is a means to apprehend how 'the messy and always incomplete articulation of the cities of the global South can be conceptually related to the politically precarious situation of urban residents in such places' (Rao, 2009: 376).

While the promises of walking are many, in practice, the experiencing subject and narrator will necessarily be conditioned by a series of pre-existing understandings of what things—the pipeline, the refill can, the solar water heater—mean or ought to mean, as they are embedded in stories and forms of cultural production. Our account of the pipeline is a historicized one, and there are linear elements in our narrative, because our walk follows a line, both temporally and spatially. Yet, walking allows for an alternative structuration of the infrastructure narrative, emerging in a series of encounters between the experiencing subject and the material landscape. We focus on developing a walking account of the oldest water pipeline in Bengaluru, India, and its insertion in processes of urban transformation over the long twentieth century. The analysis reveals the interconnection between the experience of the urban infrastructure landscape and what water means and why it matters in this urban context. The analysis shows a disconnect between the grandiosity of infrastructure development visions and the lives of subaltern communities whose settlements appear along the length of a pipeline.

Water scarcity in Bengaluru

Water security is often invoked in Bengaluru as the major challenge facing the city today. The water supply is managed by the Bangalore Water Supply and Sewerage Board (BWSSB), which was constituted in the 1960s to satisfy the demands of a rapidly growing city. The BWSSB, alongside other institutions and academics, points towards population growth as the root cause of water scarcity. Water scarcity is a familiar narrative that takes shape in the context of the insertion of Bengaluru in global economic circuits, which has led to a spectacular urban growth even by Indian standards (the city's population is expected to reach 10 million by 2021). Crisis is a constitutive feature of Bengaluru's hydrosocial regime (Goldman and Narayanan, 2019).

Scarcity preoccupations are expressed in simple arithmetic. The BWSSB supplies about 0.87 Million cubic metres (mcm) of water per day to the city from the Cauvery River about 200 kilometres away. This represents a long distance with an energy-intensive inter-basin and interstate transfer. The demand is estimated as 1.27 mcm of water per day (BWSSB, 2020). The BWSSB recognizes the role of different local systems in bridging this difference, including the use of underground water resources and a small quantity of water from the Arkavathi River, which is brought to central Bengaluru and distributed in tankers. Three major pipelines connect Bengaluru with the wider rural region and beyond—these include a masonry duct leading from the Hesaraghatta reservoir to Tarabanahalli and Soladevanahalli, a pipeline connecting Tarabanahalli to the military-governed regions of the city, and a pipeline from Soladevanahalli to the main city of Bengaluru via the Combined Jewell Filters (Figure 1). Today, though the Combined Jewell Filters are not in operation, they remain emblematic of the city's water history and development.

Water scarcity debates also involve a very active group of water experts and ecological activists, who are concerned about the dependence of at least 30% of the city's water supply on exploiting underground resources (Lele *et al*., 2013; Srinivasan

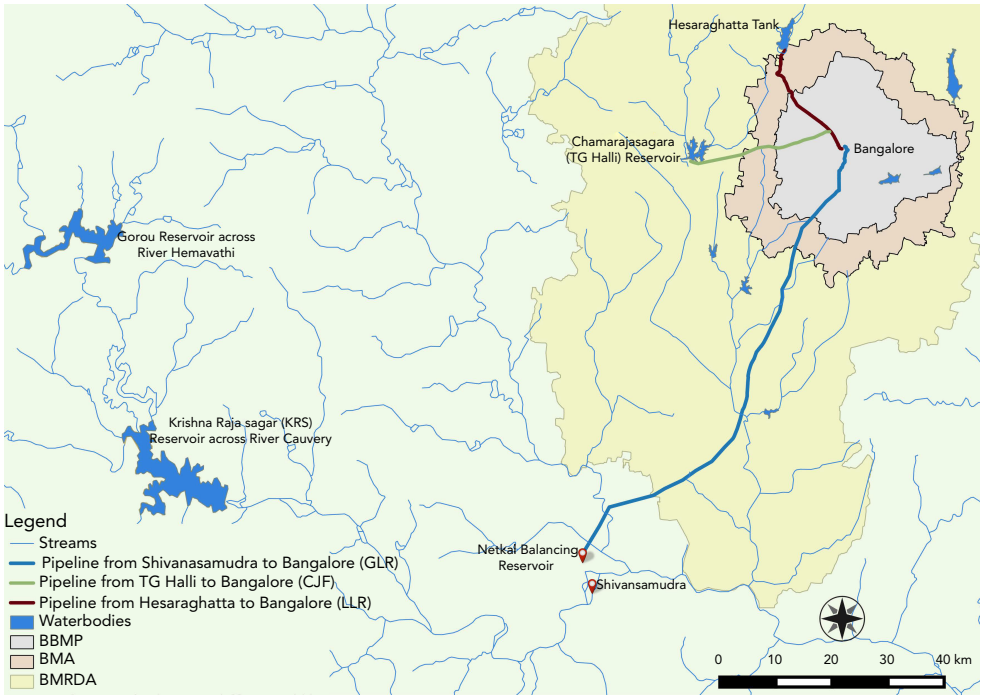

FIGURE 1 Pipeline-based water transfers across the Bengaluru region (map produced by H.S. Sudhira)

et al., 2017; Thomas *et al*., 2017). Citizens and institutional actors have turned to 'digging holes' as a means to access reliable water services. The BWSSB maintains around 6,000 bore wells for public use, and estimations suggest that there could be as many as 50,000 residential bore wells (Sawkar, 2012). Environmentalist efforts have been directed towards water conservation, especially rainwater harvesting and water recycling (Shivakumar, 2018). Yet there is an increasing sense that the future of water provision in Bengaluru is bleak, long-distance water transfers are indispensable, and ecological and environmental impacts are a necessary consequence following water extraction by bore wells, which threatens the depletion of underground resources.

There is a consensus in Bengaluru that the impact of water scarcity is borne by the low-income groups and underprivileged classes who are excluded from the long-distance transfer-oriented water network, on the one hand and do not have the means to develop bore wells, on the other (Nagendra, 2016; Unnikrishnan *et al*., 2016; 2017). The poorer classes are mostly dependent on locally maintained open wells that are, in many cases, polluted or dry (Unnikrishnan *et al*., 2017) or private water tankers that operate on a for-profit basis and are much more expensive than the heavily subsidized centralized supply system. High-income residential compounds, which may also have higher rates of consumption, can drill even deeper boreholes, but as water is extracted from the subterranean layers, wells that access more superficial layers of water dry out. Also, as the technologies required to drill deeper become expensive, poorer citizens get further excluded from access to water and are left dependent on water available to them in private markets (Ranganathan *et al*., 2009; Das, 2011). The recognition of water access inequalities, however, has not necessarily challenged existing systems of provision. This water infrastructure landscape is fragmented in terms of water resources, the means of distribution, and the institutional arrangements that govern provision.

Bengaluru's first pipeline: and account of urban water myths

Before the development of the networked piped infrastructure, the city relied on an ancient engineered system of networked tanks or reservoirs that exploited the natural elevation gradient of the city (Sudhira *et al*., 2007). Seasonally replenished, these tanks worked in association with a system of open wells (which tapped into shallow aquifers recharged by the tanks) to provide a measure of water security to the mostly agrarian population (Rice, 1897).

The Chamarajendra waterworks of 1894 changed both the water and the urban history of the city. The first modern pipeline in the city was laid, an iron tube that brought the water of the Arkavathi River to the colonial city in the High Grounds. Today, this pipeline can be traced back to the Hesaraghatta Dam, crossing the central district of Malleshwaram, the northern neighbourhoods and the sprawling suburbs across the different administrative boundaries that establish governance relationships over water (see Figure 2). Along its route, the pipeline is integrated into the urban fabric in a manner that reveals the history of urban development in the city. The following account emerges from an itinerary walked over two days that generated photographs, casual encounters and informal interviews about the insertion of the pipeline in the urban infrastructure landscape. This information was integrated with historical records available at the British Library India Office Records, the BWSSB archives, and the analysis of historical maps. The walk has been translated into a historical account of how the urban infrastructure landscape has changed through the pipeline's lifetime.

We divided our walk into five 'stations,' each representing a different urban infrastructure landscape (Figure 2). The first station is the starting point of the pipeline, the 'Low Level Reservoir' in today's central Bengaluru, from which water was originally distributed to the rest of the city. The second is in the area of Malleshwaram, the small village around the Dattatreya Temple that grew up in the early twentieth century as a

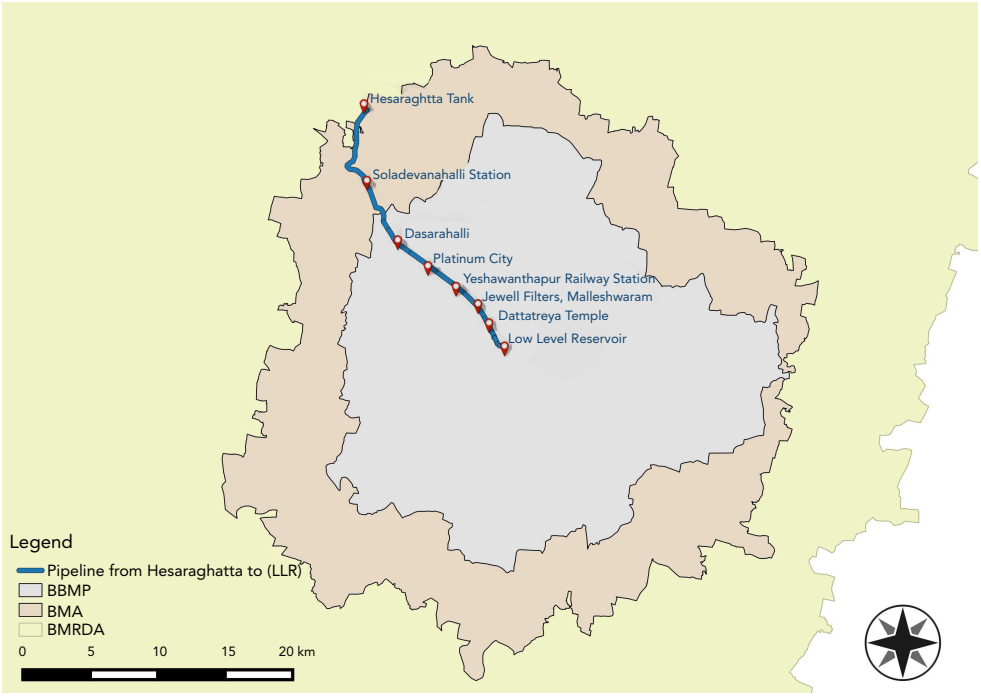

FIGURE 2 Walk itinerary and key stops (map produced by H.S. Sudhira)

central neighbourhood around the pipeline. The third is the Combined Jewell Filters at the end of Malleshwaram, which for a century channelled the supply from the Arkavathi River to the rest of the city, west of the now internationally known Indian Institute of Science. The fourth station is in the neighbourhood of Yeshawanthapur, an industrial suburb that has transitioned from an industrial to a coveted residential area with developments such as Platinum City. The fifth is the suburban neighbourhood of Dasarahalli, which is only now receiving, for the first time, some supply of water from the water board (BWSSB), and the final stop on this journey, the Hesaraghatta Dam, is praised today as green infrastructure in need of restoration. For each station, we draw a vignette that paints a particular infrastructure landscape. The walk reveals a changing landscape with heterogeneous urban infrastructure configurations. These variegated landscapes tell the water stories that have developed with the urban fabric around the pipeline and how they have affected the lives of people.

– Vignette 1: the Low Level Reservoir

In the northwestern corner of Bengaluru's racecourse, there is an area of concrete whose entrance is indicated with a sign saying 'Low Level Reservoir'. On the north side of Race Course Road, where the Low Level Reservoir stands, a walled parking lot hosts a few idling auto-rickshaw drivers, waiting for passengers in their three-wheelers. The place looks empty of anything other than cars, a disconnected place in the middle of a hyper-connected city. Behind that wall, however, there is an affluent area of the city where mansions stand next to the golf club and the luxury hotel, Taj West End, vestiges of a bygone era. The two sides of the reservoir are two diametrically opposite worlds—one inhabited by the city's transient, vulnerable occupants (such as the auto-rickshaw drivers waiting in front of us), and the other a place of aesthetic and recreational luxury that caters to a cosmopolitan elite.

The Low Level Reservoir—a groundwater tank—stands modestly in between these hidden monuments to privilege, with its soft yellow concrete surface and its ventilation towers. Water tankers are parked, waiting to be filled, at the back of the reservoir. On the side of one such tanker, the following announcement can be read: 'Drinking water—Rs 360 per load. Contact nearby BWSSB office'. A little hut at the back of the reservoir holds a chair and a table for an absent guard. On the side, a commemorative plaque pays homage to individuals who have played a role in the history of the reservoir, in this case, one 'Mr. C. Raghava Charlu', that is, Mr. C. Ranga (Runga) Charlu, CIE, the first Dewan of Mysore from 1881 to 1883. This is all the evidence in this place of the phenomenal role that the Low Level Reservoir played in the history of Bengaluru and its development as a modern city.

In the later nineteenth century, Bangalore became not just a military colony of the British Empire, but also, a place of 'civility' for refined travellers and pensioners from Europe. The establishment of the British Civil and Military Station in the city was followed by the subsequent division of jurisdiction enabled through the Act of Rendition in 1885 (Unnikrishnan *et al*., 2016). According to this Act, while overall command over the city rested with the British, the city was divided into two zones—the anglicized Cantonment and the native *Pete*. Jurisdictional authority over the native part of the city was granted to a subsidiary of the British empire—the Wodeyar rulers of Mysore. This division of the city set the stage for some of the city's developmental trajectories including, but not confined to, the city's water infrastructure. The development of the networked, piped, centralized water supply system characteristic of Bengaluru took place mainly to meet the growing demand from the Civil and Military Station (Castán Broto, 2019; Unnikrishnan *et al*., 2020).

From 1873, water was already of great concern for military officials. As the *Guide to Bangalore and Neighbourhood* (Anon, 1873: 30–31) explains, a complex system of wells and private providers supplied the Civil and Military Station. This heterogeneous system

of household wells, public wells and private sellers is still a defining characteristic of the water system of Bengaluru today. New means of water distribution were being developed, driven by campaigns around water quality. Before 1873, the colonial apparatus depended on unfiltered water from the lakes of Dharmambudhi, Sampangi, and Ulsoor. This last, which supplied the stationed army directly, was the object of a complaint related to the turbidity of the water. One Dr Nicholson, who investigated the water system in 1872, is cited as a guarantor of the quality of the water. Still, almost 50 years later, cleaning works at Ulsoor had not born any fruit and the waterworks lay in decay (Paul, 1929). The construction of the network of lagoons called Miller's Tanks, and later, the Sankey tank, were not sufficient to satisfy the needs of the city.

The city's administration then looked up to the Arkavathi River, in the north of the city, with the explicit intention of modernizing the water system. A rectangular masonry pipe followed by cast iron pipes were laid down for about 20 km from the Low Level Reservoir to the Hesaraghatta Lake in 1894 for the 'Chamarajendra Water Works'. Promoted by the Dewan, the project was originally conceived as a means to provide water to the Indian population, but the Civil and Military Station had already requested piped water from the Works in 1893 (Nagendra, 2016a).

The Low Level Reservoir, and the nearby Ground Level Reservoir, made possible the supply of water to high areas such as the High Ground which were considered uninhabitable because they did not have access to water. At the turn of the century, the British regarded the High Ground as a site for excursions and fern collection. The proximity of water after the 1894 works enabled the development of this highly affluent, partially isolated area, which is still one of the most exclusive locations in Bengaluru. The pipeline's purpose thus shifted from the one originally intended: from providing water to the city to creating new privileged spaces for the city's changing elites.

The pipeline also had a role in ordering the provision of water in a rapidly developing city. As the pipeline was constructed, regulatory provisions were made for the Municipal Commissioner, who could both assess household water needs and collect appropriate rates (Rau, 1968). The piped system stood in stark contrast with the traditional system of unfiltered water and wells that had awakened suspicions among Bengaluru's European residents, and its reserve of piped water soon became the pride of the city. This system provided water to the city until 1933 when the dam at Thippagondanahally (the Chamarajasagara Dam Scheme) was built across River Arkavathi. Although the Low Level Reservoir and the Ground Level Reservoir continued to support the water network, the Hesaraghatta pipeline became a secondary source. The new reservoirs built in 1961 in Mount Joy, Vidarasandra and High Grounds superseded the Low and Ground Level Reservoirs and changed their central role in providing water to the city.

– Vignette 2: Pipeline Road in Malleshwaram

Our route continues beyond the High Ground, following a road called the 'Upper Pipeline road'. The road crosses the neighbourhood of Malleshwaram diagonally leading northeast up to the Combined Jewell Filters in the proximity of the Indian Institute of Science. The road was given its name because it was built on top of the pipeline. Parts of it, however, have recently been renamed as Dattatreya Temple Street and, further on, 1st Cross Road, although some maps continue to show the name 'Pipeline Main Road'. Its unique layout cutting across the neighbourhood, and the occasional ruptures revealing the underlying pipeline, make the original route of the pipeline visible, with streets and buildings piling in around a continuous path, only interrupted by the occasional public square (Figure 3).

Malleshwaram has traces of an industrial past. Walking up Upper Pipeline Road, there are still some tailoring workshops, metal works, and carving workshops. Saree shops have replaced the century-old household-based industries. As the road changes

FIGURE 3 Pipeline road across Malleshwaram (photo by Vanesa Castán Broto)

its name and the avenues that cross it broaden, markets emerge. The houses reveal a neighbourhood accommodating middle to high-class families, living in colourful two- or three-storey houses. The Dattatreya Temple, a sacred religious site that some residents believe to be 700 years old, stands today near a municipal waste management station. Not far away, plastics and discoloured paper float in a canal linked to the polluted Vrishabhavathi stream. Some apartment blocks emerge, with their own water tanks on their roofs. In the most luxurious-looking houses—for example, those that have been recently painted—solar water heaters are also visible on the roofs. Several of these blocks show the presence of cohesive and active communities, as evidenced not just by their joining in collective celebrations but also by their organizing formal community-based initiatives, such as cooperative housing and credit societies. A plaque from the still-existing Sri Kodanda Rama housing society, for example, commemorates a housing extension inaugurated in 1941.

We climb up to Kadu Malleshwara, the temple where local residents are celebrating Maha Shivaratri (a key festival in honour of Lord Shiva, one of the major Hindu deities). This temple was located in the old Mallapura village, which provided the name for the neighbourhood. On the other side of the temple, there are a few huts of a kind rarely seen in Malleshwaram. They cover no more than 12 square meters and are all on one floor, without windows, and with only a small door for access. They are whitewashed. They mark a site where the rural intersects with the urban, forming a rural–urban continuum of sorts and a reminder of a previously common mode of settlement in this area (Nagendra *et al*., 2014).

Mallapura, a village of one-bedroom huts around a temple, was all that once stood here (Nagendra, 2016a) before Malleshwaram grew to be one of the central and most populated areas of Bangalore. In 1898 an outbreak of bubonic plague in central Bangalore caused the death of about 20,000 people. People saw themselves forced to vacate central areas of the city, where the plague spread, and many built

temporary shacks near Mallapura, then on the outskirts of the city. The preoccupation with overcrowding had long haunted city administrators (Anon, 1873; Paul, 1929). Easing overcrowding was the main rationale behind the conversion of the 1898 temporary settlements, Basavanagudi and Malleshwaram, into permanent extensions (Rau, 1968). With the new extensions came legal amendments to the Municipal Regulations that governed service provision, first enacted in 1871. A key amendment, Section 197, authorized Municipal Commissioners to lay down the infrastructure to provide water for domestic use to the inhabitants, with additional provisions for the recovery of water rates (Section 209). Even though Municipal Commissioners were anything but independent, they had a great deal of power in organizing urban life at the neighbourhood level. Archive records tell the story of Arcot Srinivasacharlu, one of the last of the nineteenth-century commissioners, who would regularly inspect each neighbourhood to assure that the streets had been swept and watered in accordance with his instructions.

When the pipeline was laid, the Chamarajendra Water Works were initially intended to supply central Bangalore city, and then the Civil and Military Station, which was also centrally located. As people settled in the new extensions, new demands for water challenged existing configurations. Malleshwaram was first occupied mainly by Tamils with networks extending into the government, creating an elite enclave initially, to be followed by a mixed population of industrial workers. The eastern side of the settlement soon grew into a high-class area with good services. South of the district, nearer the area which is crossed today by Upper Pipeline Road, the lower classes concentrated, sometimes in terrible conditions, moved there by their needs to access employment in the mills (such as those of the Mysore Spinning and Manufacturing Co. Ltd) and other work locations. Access to water was restricted by the conditions of these settlements.

In 1935 two academics made a census of huts and tenements in different locations of the city (Srinivasan and Moorty, 1935). The city's estimated population had grown from approximately 80,000 inhabitants in 1891 to 172,000 in 1931. The availability of a piped water supply from the nearby Sankey Tank and later on the increasingly long-distance modes of water transfer from the Hesaraghatta reservoir were a key factor supporting that growth. Srinivasan and Moorty identified both 'huts', small constructions made of mud with roofs of hay, straw or bamboo supported by wooden posts, and tenements. The huts described were similar to the few one-bedroom houses we saw during the walk in Malleshwaram, harking back to the rural roots of the region. Srinivasan and Moorty found 683 huts in Malleshwaram out of 2,442 found in the whole city. The majority of those huts were located to the west and south of the neighbourhood, giving access to varied possibilities for building livelihoods in the city south of Malleshwaram. These settlements provided labour to the mills and casual labour in other nearby industries.

Overcrowding and sanitation continued to be the principal preoccupations for the urban experts of the time, despite the proximity of the pipeline. The pipeline was an infrastructure that aimed to provide water to the masses, but it excluded the rural neighbourhoods that bordered it. Today, while the centralized water network has been made available to this neighbourhood, there are still issues relating to overcrowding and waste management—issues that remain both visible and in stark contrast to the rest of the area. Waste management responsibilities were allocated to residents, but calls to deal with problems of water scarcity and proper housing were directed towards city managers, not because of the lack of available water, but because of the gap between the availability of water and the possibility of reaching huts within the built environment (*ibid.*). Malleshwaram benefited from the waterworks, and its growth changed the social and technical relations around water. Still, it did so in a manner that was spatially differentiated in terms of class and proximity to different labour areas.

– Vignette 3: the Jewell Filters

If Malleshwaram represents urban growth between the end of the century and the pre-independence period, Yeshawanthapur, the neighbourhood north of Malleshwaram, represents the growth of the city in the post-independence period. Joining Malleshwaram and Yeshawanthapur we find the famous Indian Institute of Science to the East and the Combined Jewell Filters to the west. The Combined Jewell Filters continue to be an emblematic location to understand the distribution of water in Bengaluru, which today is done by tankers that drive it around the city (Figure 4).

The Combined Jewell Filters were a crucial part of the 1894 Chamarajendra Water Works. The cast-iron pipeline started here, connecting the Combined Jewell Filters with the Low and Ground Level Reservoirs. The water from the Hesaraghatta Dam was conducted in a rectangular masonry pipe up to a suburban village called Soladevanhalli from where the water was pumped to the Jewell Filters, where it was treated before distribution.

However, the rapid growth of suburbs like Malleshwaram in the aftermath of the bubonic plague and the prosperity of the city as an industrial and trading post soon raised concerns about how to maintain the water supply of the city with the reserves from Hesaraghatta. As the city's water demand grew in the first two decades of the twentieth century, water rationing became common (Rau, 1968). Temporary arrangements were made to supply water from existing tanks, but the city's administration was looking for a more permanent arrangement. Works to build a new tank across the Arkavathy River, downstream from Hesaraghatta in a place called Tippagondanahalli, started in 1926 and were completed in 1932. This was the Chamarajasagara Dam Scheme. The new pipeline joined the old Hesaraghatta pipeline at the Combined Jewell Filters, making this the centre of water provision in the city until the first stage of the modern 'Cauvery scheme' was completed in 1974.

FIGURE 4 Water-distribution trucks are filled at the Combined Jewell Filters (photo by Vanesa Castán Broto)

Despite their proximity to the main node for water distribution in the city, for a long time the suburbs north of Malleshwaram and the Combined Jewell Filter continued to rely on the traditional water provision system using local tanks and wells. Beyond Malleshwaram the traditional water system only started to change radically in the 1960s, when the supply of piped water was extended, many of the old tanks were sealed and key infrastructures were built around the old water network. One of the most prominent transformations in central Bengaluru occurred through the conversion of the Dharmambudhi tank into the city's central bus station. The Dharmambudhi tank was situated at the head of a network of reservoirs, which also included the city's iconic Miller's tanks. The filling up of the Dharmambudhi tank had profound effects on other reservoirs in the chain, disrupting the system of engineered water flow and, in addition, rendering the remaining tanks of the network vulnerable to decay (Unnikrishnan *et al*., 2020). Today, Miller's tanks have given way to a residential and industrial landscape, and this area remains one of the main contemporary symbols of this transformation. Yet, while this transformation was radical in the centre of the city, it was progressive in peripheral neighbourhoods such as Yeshawanthpur. One water expert, for example, recalls how this transformation is interspersed with his childhood memories:

> Yeshawanthpur was surrounded by tanks and we used to play in the marshy lands by catching crabs and flying kites. The well, dug to a depth of about 10 metres … was serving water to the 20 houses in Yeshawanthpur where we lived. My father used to draw water manually from the well with rope and a copper vessel—'*bindige*'—and walk a distance of about 100 metres to fill up the water tank in the house. As we grew up it was me and my younger brother whose duty was to draw water from the well. The nearest tap water was [when we were growing up] about 3.2 km away. My mother used to send us to bring two pots of tap water supplied from Hesaraghatta tank for boiling the … *dal* (lentils)' (Prakash, 2011: 43).

As increasing amounts of water were delivered to the city first from the Arkavathi River, and later from the Cauvery River, water seemed less available for citizens who had never worried about it. Yeshawanthpur residents had to walk farther and farther to provide themselves with water. While the archival record does not dispel the notion that waterworks were built following a modern infrastructure ideal of universal service provision (Graham and Marvin, 2001), in every case, they had the effect of distancing poorer populations from a regular supply of water. The system of tanks and wells made water ready to hand, barely a hundred metres away from each household. Yet, the development of the water network, which in theory should have brought water to the houses, instead separated those neighbourhoods further unless they met a set of conditions (location, built environment) to be networked. The network offered dreams of modernity in a not so distant future, but the immediate price to be paid (loss of control of water resources) was already high. Water provision was prioritized first to supply the Civil and Military Station of the British, and, as the city's economic importance grew, to support industrial growth in the textile industry and the mills.

These developments were also intrinsically linked to the changing mode of nature transformations, which in our pipeline became visible in the redirection of water flows. As it conducts water, the pipeline organizes space by, for example, fostering the development of elite enclaves in the High Ground or by supporting the growth of new settlements in Malleshwaram. Yet, as the realities of urban development are mismatched with the pipeline trajectory, the trajectory itself may be transformed, depending on the possibilities that the pipeline offers. In this case, reversing flows was a means of adjusting the pipeline to meet new demands.

Today the Combined Jewell Filters are a crucial location for the distribution of water in the city, even though their significance has changed as the water system has been progressively reconfigured alongside ecological water flows. While the pipeline was initially designed to bring water from Bengaluru's periphery into the city, the pipeline now serves as a means for distributing water from central Bengaluru to the rest of the city. Water is received and stored in the Low Level Reservoir, from where it is pumped to the Combined Jewell Filters. From there, water is distributed further, either to peri-urban areas connected through the old pipeline or, by means of water tankers, to areas not connected to the water network (Figure 4). Water from the Arkavathi River supplies areas not currently supplied by the water network directly. Water tankers are filled here to distribute the water around. As we will see below, this system has become the main lifeline for many water-poor residents in Bengaluru. But it has also fostered the development of specific systems of collective water governance that speak to the integration of water within the urban fabric.

– Vignette 4: urban transformations in the shadow of the Outer Ring Road

North of Yeshawanthpur, the pipeline continues north, progressively separating itself from the landmark Tumkur Road. This is a former industrial area still marked today by some remaining industries. For example, Hindustan Machine Tools (HMT) Watches, established in the city in 1961, has its main manufacturing unit in the area. A chain of automation and mechanical engineering industries was established alongside the pipeline. Some of these industries also fostered the development of nearby settlements, but for the most part, industries dominated over residential uses. That changed rapidly in the 1990s and early 2000s. The construction of the Outer Ring Road from 1996–2002 constituted an inflection point in the development of the metropolitan area of Bengaluru because it made places that previously had been thought of as being too far from the centres of activity into desirable locations. Alongside a new identity, the Outer Ring Road has supported the development of new markets for residential developments.

The Outer Ring Road intersects the pipeline just after a residential neighbourhood, Munishwara Nagar, where the pipeline road becomes a forest path. On the other side, there are signs of a rapidly changing landscape. Because the city has grown at such speed, it is not unusual to follow the pipeline into forested areas broadly ignored in urban life. These areas are not incorporated in the city's economic flows and constitute marginal spaces where alternative modes of looking at the city emerge. These are spaces where the disconnect between the urban and its peripheries is visible in the marginalization of communities living in these spaces. In our walk, for example, we encountered a young family of transitory settlers living in a tent, completely disconnected from any urban circuits, even those that engage other migrants in urban economies. These nomadic communities (once very common throughout the city) are usually found in such spaces—close to erstwhile villages and village commons such as water bodies and forests from where they derive their sustenance. Urbanization and associated changes to the city have meant that these communities, which once engaged in activities such as theatre and fortune-telling, have had to find alternative livelihoods—most commonly as knife-grinders or locksmiths. However, the transient nature of their lives and livelihoods have rendered them separate from the urban fabric of the city, much as they stay separated from the resource provided by the pipeline next to which they have set up their tents.

On the northeast side of the pipeline, after the Outer Ring Road, there is a block of apartments called Jal Vayu Heights. This is a block of 322 apartments built in the late 2000s by the Air Force Naval Housing Board. The Board, a public body, builds housing for army personnel on a not for profit basis. The building of Jal Vayu Heights in Bengaluru followed the pioneering experience of the development Jal Vayu Vihar, in the east of the city, which established a model for green gated compounds for the rest

of the city. The complex is provided with piped water by the BWSSB, and it is regulated by internal by-laws and the oversight of a residents' association.

On the other side of the pipeline we find a very different type of development. The now famous Platinum City hosts about 4,000 people in 1,000-odd flats. Platinum City is marketed as a luxury complex with a swimming pool and shopping amenities. Yet Platinum city, like the majority of large-scale private developments, hosts a range of livelihoods and heterogeneous conditions of living. A scandal emerged in 2013 when the Bangalore Development Authority, the city's principal planning authority served 17 notices of eviction to residents in Platinum City because one of the builders involved had failed to obtain a mandatory occupancy certificate. The notices were served for the 'O' complex, which had been marketed as the most affordable section of the development. Residents protested and argued that they had paid for the flats, including all services, attributing responsibility to a developer who, in their view, had not met their commitments. The flats were built, for the most part, for new residents in Bengaluru, often emigrants from outside Karnataka attracted by Bengaluru's status as 'the Silicon Valley of India' (Nair, 2005). Rarely speaking the local Kannada language, these new residents found it difficult to negotiate with developers or with the Bangalore Development Authority (BDA). The BDA, however, regarded part of the development as encroachment and eventually 'recovered' some of the land appropriated during its construction.

The contrasting examples of Jal Vayu Heights and Platinum City on either side of the pipeline illustrate the kind of developments that are taking place in Bengaluru, occupying non-residential or previously industrial areas. These complexes are often occupied by new professionals who are attracted to the opportunities of the job market. However, urban development is shaped by complex dynamics driven both by public works and the growing need for housing among all classes in the city. New developments are heterogeneous both in terms of culture and in terms of how life in them is organized. What is common to all of them is the increasing demand for water. The construction of the Outer Ring Road (which was originally intended to ease congestion in the city by preventing high haulage traffic) led instead to the sprawling of the city beyond its boundaries, as a growing sector of its population were looking for space which was not available in the city itself. Its growth around the Outer Ring Road can be linked to diminishing water reserves as the demand for water—not just for cooking the *dal* but also for swimming pools and gardening—has spiralled out of control.

It is generally thought that the growth of the city has led to the drilling of bore wells in private complexes, for growing industries, and by indiscriminate water sellers who make a business of selling water around the city (Dittrich, 2008). While there is evidence in areas around the pipeline of these practices, it is also worth remembering the city's history and how its population has traditionally used and exploited underground water resources. The majority of the city's estimated 50,000 bore wells are, however, dry. Old tenements and rural neighbourhoods that exist in the form of pockets within the larger urban fabric, and who traditionally relied on superficial wells are seeing their supplies cut as the phreatic zone goes down. The rapid acceleration in the drilling of borewells is not only associated with luxury developments but also with the growth of new layouts and developments facilitated by infrastructures such as the Outer Ring Road (Das, 2011).

Most water activists in Bengaluru face an impossible dilemma. The current system of drawing water from the Cauvery River is perceived as being excessive and costly. Simultaneously, it is thought of as insufficient. The proliferation of developments in the sprawling city means that when the BWSSB cannot provide water directly, drilling a borehole may be the only suitable alternative. But only for those who can. While boreholes are now seen as the chief evil as regards controlling and protecting water resources, this is often coupled with a romanticized view of a past system in which

a network of tanks and open wells supplied the city. Boreholes, tanks, dams, pipes, and other means of conducting water have long been part of the city's infrastructure landscape.

Water activists have facilitated the reconstruction of an image of tanks as 'natural systems' which the city has encroached upon. Missing in these discourses is an acknowledgment of the formerly agrarian landscape supported by the tanks and indeed the engineered character of these reservoirs. Following these discourses, water activists in Bengaluru emphasize water conservation and advocate reducing consumption, equipping new houses with rainwater harvesting systems and recycling water. The focus remains on technical solutions to mitigate water shortages. By contrast, local ecologies (such as those enabled by the erstwhile tank network) remain relegated to the realm of aesthetic and recreational functionalities (Unnikrishnan *et al*., 2016). There is, however, no overall questioning of the fundamental principles that perpetuate water shortages and reproduce water inequality. This perspective became visible in the last part of our walk when we reached the Hesaraghatta Reservoir.

– Vignette 5: the suburbs in the shadow of Hesaraghatta

Beyond the Outer Ring Road, extends a landscape of growing suburbs. As a variety of residencies and roads spread along the horizon, the pipeline also rises from its subterranean trajectory. The old rectangular masonry pipe becomes a yellow snake that organizes settlements around it. The pipeline also structures the path of other infrastructures, such as gas pipelines and roads. It surfaces in between fences, structuring green spaces and walking trails around it. Where the pipeline disappears, the surface is dotted with access gates for pipeline maintenance.

In the outer settlement of Dasarahalli colourful two-storey houses pile against each other following roads and markets. The ground floor often hosts a business while residents live above. Modern post-networked technologies, from rainwater harvesting to solar water heaters, have spread in this area. The old masonry pipeline survives, with the access gates that make it visible to the passer-by. Two-storey houses are interspersed with small and much poorer huts, often consisting of one single room whose residents reclaim space by spreading their clothes outside to dry. In all the houses, there are clear signs of networked infrastructure and service provision, particularly of electricity. What is less obvious, judging by the water tankers lining up at the doors, is the provision of networked water or at least its adequate availability to these populations living on the city's periphery. In a sense, what becomes highly evident here is how the pipeline bypasses certain neighbourhoods (most often the most vulnerable ones) of the city through which it passes, to provide critical infrastructural services to the rest of Bengaluru.

The visibility of the pipeline in Dasarahalli is shocking. The pipeline is fenced and framed with BWSSB signs that emphasize its historical role connecting Soladevanahalli and the Combined Jewell Filters, from where a significant amount of water is now distributed back to suburban areas such as this one (Figure 5). As explained above, the pipeline section between the Combined Jewell Filters and the High Ground has now changed the direction of its flow, as water from Hesaraghatta does not reach the city anymore. From the centre to Dasarahalli—in the part of the city where the water supply is taken for granted—there are no indications that the pipeline is there other than vanishing vernacular names and the linear structuration of the built environment alongside the pipeline. In Dasarahalli, however, the pipeline and its associated waterworks are completely visible.

The pipeline has shaped Dasarahalli over 100 years, but, for most of this time, it has not provided water to its residents. After the construction of the works, residents continued to obtain water directly from existing tanks and wells. In suburban areas of Bengaluru water supply is structured by a variety of means. In their study of bore

FIGURE 5 The pipeline is made visible as a political project of water provision in Soladevanahalli (photo by Vanesa Castán Broto)

wells in West Bengaluru, Raju *et al.* (2011) have documented some of these institutional mechanisms for the provision of water. Often, bore wells are managed by a society that collects deposits from households and charges residents directly. Societies have contractors who lay down the piped network. Societies can ration water and charge residents, but their operation is varied, and their success in getting residents to pay their dues has a strong influence on the prices they charge. Facing pressure from activists and technicians alike, however, the BWSSB is making efforts to incorporate all areas in the existing system of provision, depending on the interbasin transfer from the Cauvery River. Even peripheral areas like Dasarahalli are expected to be connected to this supply. Ultimately, the reversing of water flows will be complete if the water from the Cauvery River comes to the settlements in the shadow of the Hesaraghatta Dam, showing that the change of direction of resource flows is as important as the changing practices and technologies that are applied to dominate nature. As the city sprawls, processes of circulation and ordering of resources have to be made visible: water provision becomes an explicitly political project around which visible political statements need to be made. The pipeline reaches a crossing with the railway, an elevated position from which we can observe the proliferation of houses and new layouts around the land.

Our endpoint is the Hesaraghatta Lake, which, on a February afternoon, is half-full. The lake is integrated into local livelihoods in a myriad of ways, as it is visible in the cottages built around the lake, motorbikes parked nearby, the numerous boats drifting around and the even more numerous ones turned upside down on the banks, cows walking on the shores and the people sitting in the sun on the dam (Figure 6). The lake is now a 'protected area', whose role in ecosystem conservation is also visible. Hesaraghatta represents today a remnant of what is thought to be a more sustainable past.

Restoration of the Arkavathy River is defended as the only alternative to long-distance transfers from the Cauvery River. The Rao Committee made an inventory of

FIGURE 6 The Hesaraghatta Dam today sustains diverse livelihoods (photo by Vanesa Castán Broto)

141 lakes in 1981. The lakes have progressively disappeared following 'encroachment' by everyone, not just informal settlement dwellers and aggressive private developers, but also, by BDA-authorized urban development projects and layout extensions. Most lakes are polluted and littered. Only bigger lakes like Hesaraghatta and the emblematic tanks of the Lalbagh gardens and Ulsoor remain clean and accessible. Various experiments have been undertaken by both state-led and collective initiatives, yet these have met with limited success. For example, the establishment of the Lake Development Authority in 2002 and its subsequent privatization of four of the city's lakes to corporate entities in exchange for maintenance proved to be both socially as well as ecologically disastrous (Baindur, 2014; Unnikrishnan and Nagendra, 2015). In recent years, several community-led collectives have worked to restore and rejuvenate tanks within the city. Yet they continue to face several challenges such as negotiating heterogeneity within and across groups, vested interests, effective lobbying with bureaucracy, the size of the water bodies, and dealing with local land mafias (Nagendra, 2016b). Small successes, however, abound in these alternative solutions. For example, the case of Kaikondrahalli Lake in south Bengaluru and Jakkur Lake in the north are good examples of efforts that take into account both social justice and ecological balance in their approach to co-producing the water bodies (Nagendra and Ostrom, 2014).

For all the enthusiasm about the potential for restoring the tanks and the network, there remains a misleading argument about the idea of returning to a more natural water system, or a more natural city. Bengaluru never had enough water, and its growth was always predicated on the construction of waterworks: first, the tanks and now the large-scale transfers from the River Cauvery. The tanks, the wells, the pipelines are not remnants of a past in which there was a harmonious relationship with water. Instead, they constituted the basis for the current water system in which demand is taken for granted. Rationing is not a ghost of the past, but a present reality for many whose water supply depends on water societies or private vendors.

What emerges from our walk is a perspective that brings to light how fractious the infrastructural landscape is. Along its length and providing critical water resources to the heart of the city, the pipeline passes through neighbourhoods and communities that remain either disconnected from the infrastructural service or are reflective of how the city has grown by engulfing its villages. In doing so, the pipeline reminds us that tanks were, in the first place, the fundamental mechanisms that enabled Bengaluru's urbanization. An urban infrastructure landscape speaks not of what is unnatural, but of what is appropriated. As Nagendra (2016a: 191) argues, in Bengaluru 'we observe a wholesale re-naturing of urban nature. From being shaped by the hands of many, nature has increasingly come under the influence of a like-minded few, a reflection of the inherent inequalities that shape all cities today'. She then proceeds to praise the work of several environmental organizations (the Environmental Support Group, ESG, Hasiru Usiru, Maraa, CIVIC) as means to reclaim water landscapes through situated practices of engagement, from connecting informal settlement dwellers with green spaces to monitoring and denouncing the dumping of solid toxic waste in tanks and reservoirs.

Walk the pipeline

If walking the pipeline is a strategy to apprehend the city as it becomes an archive (according to Burgum, 2020), embedding the pipeline road in the history and context of urban development in Bengaluru constitutes an attempt to imagine what the point of view of a pipeline could be in the constitution of the hydro-social regime that made the city possible (following Goldman and Narayan, 2019). This account shows how the pipeline links city imaginaries to the material manifestation of strategic, hegemonic projects that make the city. However, the pipeline also shows how alternative imaginaries emerge from subaltern practices of living and activist projects.

Projecting a landscape perspective on the city reveals the many ways in which such strategic projects of ecological control are never entirely completed, and how they need to be reimagined, adapted, maintained. In the interstices between all those unfinished projects, the urban infrastructural landscape emerges as a heterogeneous, collective project which is manifest in the urban fabric. Following Harman (2009), things should be looked up in themselves, for the inherent surprises that bring to the city and why they matter.

Through the sequential analysis in five vignettes, the case study illustrates aspects of the social life around urban infrastructures. Infrastructures are implicated in authority-making projects, from the provision of water to urban elites to the delivery of projects of service provision as a means to build new political allegiances. Authority-making projects relate to moments in which infrastructures are made visible as a means to carry out visions of the city.

For the most part, infrastructures are imbricated in daily life through social practices. They are not invisible, but rather integrated into the urban infrastructure landscape in a manner that makes them disappear from human consciousness but not from human existence. The deeper their integration is, the higher the degree of embeddedness in daily tasks, and the bigger their significance for those who inhabit the city. Key locations become emblematic without really being present. The Combined Jewell Filters in Bengaluru, for example, still commands nostalgia as a central node where water flows have been organized through time. While inequities are consolidated through infrastructure projects, those infrastructures can also be appropriated to create new modes of being urban that enable survival.

Making infrastructures strategic again requires disrupting their assimilation in daily lives, whether this is by creating new technological approaches to water (e.g. moving from a tank to a piped network); drawing new resources (the long-distance transfer from the Cauvery River); or dramatically reversing the direction of flows (from the peri-urban area to the centre of the city and vice versa) (Unnikrishnan *et al.*, 2020).

Encroachments and violations also inform the official water discourses in Bengaluru (Sundaresan, 2011; 2019) alongside ecological concerns such as flood mitigation and local microclimate regulation (Kiran and Ramachandra, 1999). There is, however, less understanding about how these infrastructures operate in specific locations, how they are embedded in the ebb and flow of everyday life.

Water tanks emerge as an important symbol of Bengaluru, a manifestation of ideas of ecological loss that inspire action and hope. Water tanks are part and parcel of heterogeneous infrastructure configurations (Lawhon *et al*., 2018). In Bengaluru, traditional systems of wells and tanks coexisted with the networked system. The networked system is moving outwards but is not entirely eradicating the multiple and complex ways that lead to the provision and governance of water. The walk reveals that in urban infrastructure landscapes the overlap of functions keeps the city going, and functions are also tied to future possibilities, as urban citizens reimagine their city every day while they look for ways to achieve their life goals.

We know little of unsuccessful strategic attempts to change the urban fabric radically and how they were materialized or made invisible in urban infrastructure landscapes. Yet we know even less about how the daily course of life in the city may have shaped them. We need more amateur stories of urban areas. Walking through urban landscapes is a strategy to engage with the ordinary as experienced in passing, contingent moments that ultimately make the city.

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