Researching World Class Watering In Metropolitan Calcutta

Kuntala Lahiri-Dutt[1]

Senior Fellow, Resource, Environment and Development Group
Crawford School of Public Policy, College of Asia and the Pacific
Australian National University
Kuntala.lahiri-dutt@anu.edu.au

Abstract

Enormous social and economic inequalities notwithstanding, a colossal and ever-expanding middle-class has come to symbolise a new India. Because of the economic and social fluidity of this class, its members are prisoners of social and economic aspiration, negotiating and manoeuvring imagined and actual worlds, tradition and modernity. This middle-class is reinventing individual and household consumption by accessing hitherto out-of-reach resources and technologies. Water as an everyday resource has not escaped this whirlwind of change; a substantial volume of water is caught within the interstices of urban homes, where western-influenced, water-intensive forms of living are becoming the norm. New water consumption technologies now adorn most middle-class homes, indicating residents' changing values and practices regarding water. As these practices change existing meanings of water and redefine what is meant by pure and clean water fit for drinking, the new technologies required to purify water fundamentally recast their users as a new type of water consumer: the use of new technologies of water purification thereby represents new ways of being, recreating in the process middle-class subjectivity.

From Third World Peasants to Global Consumers

This paper presents a study of the practices surrounding water use in middle-class, urban households in Calcutta, India. As middle-class households in India endeavour to find new ways of being global citizens, they reinvent individual and household consumption by accessing hitherto out-of-reach resources and by consuming resources in new ways. The focus of this paper is on the ways in which resources, goods and services assume new meanings and materialities through new tools and practices of consumption. Water is unique because of its symbolic value in Indian cultures and its ongoing scarcity in urban homes. I argue that a part of the rise in consumerism has been changes in middle-class perceptions of clean and pure water, leading to changes in water use practices. These practices involve the use of tools and technology that ostensibly mirror concepts of convenience and purity. One way to illustrate this transformation is through small case studies, which can capture changes in the practices of middle-class households in metropolitan Calcutta. A close analysis of these cases reveals that a deeper relationship of mutual exploitation exists between superficial commercial sentiment and consumer idealism - a relationship that finds common ground in middle-class aspirational ideals related to social status.

An inescapable part of growing up in India in the 1970s was living with labels the western world used to describe its population; if much of the rest of the world was divided into the 'first' and the 'second', we in India were designated as citizens of the 'third' world. Academic texts and popular media originating in the first world introduced us to our third world cities before we could form our own impressions of them. We were told of the chaos of rural migrants crowding the already overburdened cities and their amenities and infrastructure struggling to keep up. Calcutta, we were told, was a city of peasants, the definition offering a simple, homogenised view of the city's inhabitants. Although the quintessential 'primate city', it was nonetheless a city of the third world, tying everyone living in Calcutta to rural origins and rural ways of life that contrasted with those of the cities of the first world. In particular, third world cities such as Calcutta were seen as lacking in those material goods, amenities and services that made life comfortable elsewhere, and hence constituted an object of study by first world experts.

At that time, India followed its own version of a centrally planned, command-and-control economy. The desire to nurture domestic industry – and the culture of economic protectionism that followed in its wake – conspired against the importation of what were regarded as 'world class' goods and services into the country. When a 'foreign-returned' person arrived home, friends and family, neighbours and visitors milled around opened cases, digging out the gifts of fragrant soap bars, talcum powder and other foreign goods that held the whiff of a world that was inaccessible to most.

But that was before India's economy opened up. During the mid-1980s under Prime Minister Rajiv Gandhi, India took up a set of economic policies – partly by choice and partly under duress – that enabled the country to join the game of catch-up with the rest of the world. Eventually, neoliberal economic measures led to abandonment in 1991 of the socialist economic model in favour of an open economy. Part of the agenda for India's planners was to set about reconstructing its cities in terms of western, consumer-driven values, filling vacant spaces and replacing dilapidated building stock with high-rise apartments and shopping malls. Changes in economic policy put India somewhat suddenly in the throes of manifold changes brought about by a sudden surge of economic growth, creating winners and losers as with rapid growth elsewhere in the world. Inequality has increased in India in the last two decades: a large proportion of its population continues to live in abysmal poverty. The changes also had social and cultural repercussions: the pervasive mindset of the prior four decades of protectionism, endemic corruption, and bureaucratic control was under challenge (Haynes *et. al.*, 2010).

During this period scholars studying Indian society began to notice that some Indians were not necessarily suffering from the abject poverty defining their class, but rather were transforming into voracious consumers. Clearly, changes in economic policy had paved the way for, among other things, "a middle-class based culture of consumption" (Fernandes, 2006, 19). The culture of consumption was slower to affect eastern India – where the metropolis of Calcutta is located – than metropolitan Delhi and western India, indicating the close attachment of consumerist culture to distinct political and regional proclivities; in eastern India the rise of the middle-classes was presided over by the pro-China Communist Party, which ruled the state of West Bengal for three decades, and in its effort to reinscribe history changed the name of the city from Calcutta to Kolkata.

While estimates of the size of the Indian middle-class vary, there is a consensus that it is large and growing (IMF, 2010; Varma 1998). In addition to being a beneficiary of the new economic model, the middle-class is also a magnet for multinational corporations wanting to conduct business in India. Shrivastava and Kothari (2012, 323) observe:

India is important to TNCs (transnational corporations) because even if only 20–25 per cent of the country can be roped into the global consumer economy, it amounts to over 280 million people, which is more than the size of the populations of the UK, France and Germany taken together and almost the size of the US.

This consumption culture is unprecedented in India's history and is beginning to attract scholarly analysis.

Practices of Material Consumption

In addition to this large middle-class there are those waiting at its margins and interstices, in smaller urban centres as well as in the metropolises, to join the amorphous group. The contemporary view is that the 'middle-class' is a fluid

category, with enormous internal diversity and contested identities that defy its attribution as a sociological category in favour of the ideological work that it performs. The defining feature of the new middle-class is material consumption – those who are in it are the voracious users, and those who are outside aspire to become so. The old middle-class of India was defined largely by its cultural outlook and political allegiances; it was the foundation stone of the Nehruvian developmentalist state, constituted in terms of the historical materialist conditions that prioritised specific concerns. As a political construction, the category has sometimes seen its dominance lead to the reproduction of inequalities in Indian society (Fernandes, 2006). Different from this group is the 'new' middle-class, the post-liberalisation aspirational group, large in sheer numbers but small in terms of its proportion within the Indian population, holding "the middle-class culture of public life" (Nandy, 1998, 4). Ray (2010, 314) defines this class as a "proper noun", in terms of its members' self-perception, cultural performances and enactments, which Ray argues reproduce an imagined middle-classness. It is marked by certain shared characteristics, which in the case of India include aspirationalism, and also the necessity of negotiating the imagined and actual worlds of East and West, of tradition and modernity (Brosius, 2010). New ways of consuming material goods underpin these characterisations and, therefore, the idea of being middle-class. The concept thus becomes:

> An identity constructed through consumption [that] is far more empowering and controllable than that which is dependent upon production…there is a clear preference for consumers to be able autonomously to employ their resources for the self-construction of their individual and social identity (Miller, 1995, 38).

If consumption underlies the ideas of being middle-class, then consumption, by default, also becomes a means for those on its margins to join that class. For the new heterogeneous middle-class' individual, familial and group mobility strategies, "consumption assumes a long-term dimension, oriented towards present and future" (Osella and Osella, 1999, 990). It is no wonder then that the middle-class in India is endeavouring to find new ways of being; hungrily consuming resources such as water and energy that were hitherto out of the reach of ordinary Indians.

Understanding the material practices of this new middle-class requires study of Indian households. Home has been sacred to the Indian way of life for a very long time, acting as the prime location of indigenous culture and cultural practices. The location of native tradition and culture within the private domain in India is considered to be the result of contact with European culture, and concomitant with colonisation. This contact created a binary division between the public and the private spheres (noted by Chatterjee, 1993), fostering the image of the archetypal Indian as a product of colonialism: someone who is tradition-bound at home while juggling modernist ideals in public life. For the first time since it came into being through British cultural contact, this binary division is beginning to blur as a rising middle-class develops and adopts new ideas and new ways of being at home. Within a short span of twenty years, a number of cultural practices have changed

fundamentally, symbolising a deeper shift in the value system and cultural ethos of the middle-class.

Increasingly social and individual practices are being studied in order to develop an understanding of consumption. Practice theory, a loosely connected body of work, considers practice to be the location of all that is 'social', allowing us to move away from the conceptual binaries of structure and agency, and placing practices at the centre of human action. Practices are seen as routines, the indivisible unit of social enquiry and the site of analysis:

[P]ractice (*Praktik*) is a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge. (Reckwitz, 2002, 249–50)

It does not follow that because practices are routinised behaviour, they do not change: crisis of routine leads to changes in practice. With increased pace of life and increased rates of innovation and obsolescence, crises of routine have become more frequent, leading to more frequent changes in practice (Reckwitz, 2002; Shove, 2009). Consumption is considered to take place as a part of carrying out a practice. Put differently, most practices involve consumption of one kind or the other (Warde, 2005). Therefore, if practice is the unit of social enquiry, examining household practices should yield insights into social processes. This is the logic that provided the foundation for a large study of "water-using practices of households" in the south and southeast of England (Pullinger *et al*., 2013). Based on this logic, one may hope to explore how changing values of water are reshaping water practices among the transforming Indian middle-class. Calcutta's particularities offer a fascinating opportunity for investigation into material practices of water in middle-class homes. These include: its location in economically stagnant eastern India; its unique history of the separation of private from public social spaces; the early development of a middle-class in the city as a result of British colonial influence; and its Communist rule and deep attachment to Marxist materialist ideology[2].

Entering the Middle-Class Household in Calcutta

Bengali intellectuals describe the Calcutta social milieu as a "microcosm of Indian society" (Roy 1986, 9), yet the city is very different from other metropolises of India, on several counts, the foremost being the Bengali culture that was inscribed over two hundred years of colonial rule (Mukherjee, 1972). The general

[2] It is well-known that Marxism in this part of India was widely adopted as a guiding philosophy by upper caste urbane, educated communities, giving it a *bhadralok* (or gentleman's) culture. How far this Marxist political history played a role in influencing the material culture of Bengalis is however beyond the scope of this paper.

lack of economic buoyancy in its hinterlands, the decay of old industries like the jute mills, and the refugee influx after the partition caused the city to burst at its seams. Munshi (1975, 11) noted that the civic services were "not very far from a total breakdown". In spite of the establishment of Calcutta Metropolitan Development Authority (CMDA) as the apex planning body for the city, Calcutta's urban growth has in general been haphazard; since the 1970s, Calcutta's sprawl of concrete extended into the south – away from the traditional 'native' North Calcutta, or the old or 'black' town (Munshi, 1975). Broadly, the original pattern of elongated growth along the levee of the Ganga has gradually changed as the wetlands in the eastern parts of the city were filled up to make way for new residential areas. As urban life flowed and shifted away from the core, "the merciless property boom extended deeper and deeper southward" (noted by Chaudhuri, 2013, 288) and eventually gulped the remaining swamplands.

During the summer months of 2012, twenty-one households in a predominantly middle-class neighbourhood of south Calcutta were surveyed and their water-related practices were observed for one full day each. These households were self-selected; the aims and objectives of the survey were initially described informally in a meeting at which participants expressed their interest to join the study. An overview of the survey was offered to interested participants either over the phone or by email, before meeting them in person. Within the household, the option to be interviewed was again open to each of the members; those members decided which one person from each household would participate in the study. The interviews were semi-structured, allowing them to veer into topics close to respondents' interests. Of those interviewed, 60 per cent were women, and the average age of the respondents was 43 years, allowing the safe inference that most were well-established in their jobs and life. An average household comprises roughly four members, two of whom are income earners providing two income sources within each household. All households have at least one part-time domestic helper, yet all complained of the difficulties of running the household. The average family income at the time of the study was 25,300 Indian rupees per month; that is, nearly 380 US dollars, although translated into US dollars this amount fails to convey its value within the community. Suffice to say, this income is sufficient to enable the households concerned in this study to access a number of the trappings of modern life. All of them have bank accounts and life and medical insurance. A considerable 72 per cent own smartphones, and go out once per week to malls for shopping, to watch a movie, or to dine.

The households covered by the study live in apartments. They are middle-class in their earnings and residences, and also in their worldviews. Over the last few years, their tastes and behaviours in consumption, ideas of cleanliness and comfort have changed fundamentally as Calcutta has transformed into a global city. Conforming to these changes, water-use practices have also altered significantly;

on an average day, 90 per cent of the households have at least three members who use water for a full-body shower.[3] Previously, women would sit on a low stool in the bathroom, but a standing shower has now become more common. As with western sensibilities, the purposes of showering are to maintain bodily hygiene, to minimise bodily odour and remove sweat, and to feel clean. Men usually shave outside of the shower area, and in over half the households brushing and combing hair also took place outside the bathroom, usually in a basin meant for washing hands before and after eating food.

One key aspect of intra-household water use is the application of electronic technology that is intended to reduce labour at home (as noted by Hand, Shove, and Southerton, 2005). All the households have, in the past decade or so, introduced a variety of appliances such as flush toilets, washing machines, water-heaters and most importantly, water purifying machines, along with more and varied kinds of taps in their homes for use in water-related chores. Electrical water filters are used by all households: 84 per cent use geysers or electric water heaters; and 72 per cent of households use washing machines. Surprisingly, dishwashers are owned by only a small eight per cent of households. Following Woolgar (1991), one might deduce that this snapshot of appliance use is influenced by the ease with which a particular appliance accommodates the social and cultural context of the respondent household. Practice innovation thus links existing cultures with new technologies. Washing machines in India have been modified to wash garments that are unique to India, such as saris (such as Samsung's washing machines provision of a 'Sari mode'), and kitchen appliances have been adapted to culturally rooted food preferences (such as the 'browning' facility in some microwave ovens meant mainly for the South Asian market). Interestingly, dishwashers are not yet designed to accommodate typically large and numerous Indian utensils, and the particular stove-top style of cooking in many Bengali households has yet to be addressed by electronic whitegoods manufacturing design. Practices are differentiated when they travel across the social spectrum (as noted by Werde 2005); the near-ubiquitous presence of the part- of full-time domestic help is also crucial in determining who uses what and when in Calcutta. The households with dishwashers have strong overseas links (merchant navy; residence in the United Kingdom), connections which perhaps have predisposed the residents to accommodate a dishwasher in the kitchen. Such exposure to different ways of consuming may well have influenced respondents' consumption patterns, based on the acquisition of conspicuous and tangible objects rather than on practicalities of their use. To explain the practices of such consumption technologies, Shove (2003, 11–12) underlines that goods and objects should not be analysed in isolation without noticing "the pre- and co-requisite systems and technologies on which they [consumer durables] depend, or the reconfiguration of ideas, actions and habits associated with their use and

[3] Although the term 'bathing' is used widely in India, it connotes showering, rather than bodily immersion, as is the case in a western context.

appropriation". Indeed, the constant endeavour of the middle-classes to find new ways of being within the microcosm of the home is exemplified by the entrance of these new technologies, which also creates new global citizens out of the Calcuttans. The routines of everyday life are "situated and inscribed in tools, devices and material objects" (Shove, 2003, 13), yet, it is necessary to go beyond the theories of consumption. One might note here that the perceived and almost universal need for domestic help in urban middle-class homes was not reduced by the presence of dishwashers or for that matter any of the other gadgets. Thus, more than the savings in domestic labour through its regular use, ownership of a dishwasher reflects the middle-class adoption of the notions of comfort conveyed by use of that appliance, and the accompanying status associated with it, even while the meanings of these technologies are site-specific. This example demonstrates why the use of water- or energy-efficient technologies in Calcutta does not directly conform to western models of consumer use.

Planning to Supply Water to Calcuttans

Water has distinctive meanings for urban households in Calcutta, a gigantic metropolitan city that began its urban journey in three villages located on the natural levee of the river Ganga. Indeed, Calcutta barely rises above the sea-level, and is "balanced upon a huge natural raft of clay, literally floating on an enormous reservoir of water stored within the sand grains underneath" (Das Gupta, 1995, 2). One would expect water to be abundant in such a context; yet, since colonial times, there were obsessive concerns over accurate planning of not just the supplies but on the purity of the water.[4] Naipaul (1990, 281) described Calcutta as:

…the British-built city of India…. In the building of Calcutta, known first as the city of palaces, and later as the second city of the British Empire, the British worked with immense confidence, not adapting the styles of Indian rulers, but setting down in India adaptations of the European classical style as emblems of a conquering civilization.

For this second most populous city in the Empire after London and a key colonial depot for the British, built with the image of London in mind, obtaining clean water supplies was paramount from the early days of Calcutta's history. Understandably, the original source of water for Calcutta was the river Ganga – once known at the mouth of the Bay of Bengal as Hooghly, now rechristened Hugli. A number of waterworks followed which lifted water from the Hooghly River for distribution to some areas of Calcutta. As the river carried large quantities of silt, and flowed through the industrial backyards of Calcutta, the quality of water soon became a problem. During the peak of summer (April–May) and during the

[4] Datta (2012) offers a detailed perspective on early planning of Calcutta to emphasise the planners' preoccupation with cleanliness as a means of achieving desirable urban forms, and on ensuring an adequate supply of water throughout the municipality.

monsoon months it was either too saline or silty. Therefore, numerous tanks and wells were built in the city to store fresh water from monsoon rains. The largest of these was 'The Great Tank' located in Dalhousie Square – now known as the Binoy-Badal-Dinesh Bag – which developed as the central business district due to its proximity to river and ocean transport: the port; the warehouses; the *ghat*s anchoring barges carrying goods from the interior; and Fort William. This tank was deepened and extended in 1809 in order that the garrison at the old Fort could maintain sufficient access to fresh water. As the city grew, an increasing volume of water was required, and between the years 1805 and 1836 more and larger tanks were excavated to enhance water supplies.[5] The turbid water was clarified using alum and fine cloth strainers, a practice that today has almost entirely fallen out of use. Some larger households stored the fresh February water in jars for use during the monsoon months. Similarly, some Europeans harvested rainwater to store in Pegu jars, while wealthier households had water carried into the home by water-bearers[6].

The Bengal Landholders' Attendance Act of 1848 (also known as the 1848 Act[7]) first overrode a private land owner to acknowledge the need for public water supply for drinking in Calcutta. Following enactment of this legislation, an expert was deputed to carry out elaborate analyses of the water sourced from the River Hooghly between December 1861 and January 1863. Largely as a result of these tests, construction of the waterworks began at Pulta in 1868. Water was drawn through cast iron pipes from Pulta to the Tala Tank, where another pumping plant delivered the water to the residential neighbourhoods, part of it being directed to another subterranean reservoir at the Wellington Square, where a further pumping station was built[8]. Together, the reservoirs at Tala and Wellington Square had the capacity of three million gallons (660 thousand litres) (Ray, 1901). By 1870, all the major residential areas of Calcutta had access to piped water, and the daily consumption was nearly 20 million litres. Subsequently, further pumping stations and overhead tanks were added to the system. Regardless of this, until the 1950s the primary source of water had remained the river.

The Kolkata Municipal Corporation (KMC) is the institution responsible for the supply of water to resident households in Calcutta. The Calcutta Municipal Act of 1951 formally established the body in 1952 that is now responsible for water

[5] Information in the two following paragraphs is sourced largely from Goode's (1916) authoritative work on Calcutta's municipal history.

[6] Also see Kolkata Metropolitan Water & Sanitation Authority ('Retrospect: Water Supply in Old Days'), available from http://www.kmwsa.gov.in/html/retros.html (accessed on 20th June 2014).

[7] A landholder, Mr Bon Behari Mondal, contested the Bengal government's right to acquire part of his land for public purposes, that is, for building a water reservoir and for higher compensation. His case was nullified by the High Court under proviso of Act II of 1948.

[8] Data from Kolkata Metropolitan Water & Sanitation Authority ('Retrospect: Water Supply in Old Days'), available from http://www.kmwsa.gov.in/html/retros.html (accessed on 20th June 2014).

supplies in this metropolis. At present the total rated capacity of water supply to the area from several pumping stations and water treatment plants now stands at about 1400 million litres per day for its 10 million-plus residents in the Municipal Corporation area, and about 79 per cent of households have access to water – defined as potable water piped into the house – on an average of 8.3 hours of uninterrupted supply per day (ADB, 2007).[9]

The rapid increase of urban sprawl in Calcutta has not been matched by an expansion of services; the geographical boundaries of the corporation area currently represent a correspondingly small proportion of Calcutta's urban extent, which largely depends on non-piped water supplies. Even within the corporation area, most urban residents depend on a mix of sources: treated surface water from the Hooghly, deep tube or bore wells, and hand pumps. Most middle-class households are dependent on either the KMC supplies or groundwater. Excessive use of groundwater has caused a significant decrease in peizometric levels, leading to ground subsidence in certain areas. Sahu *et al*. (2013) add to this that lowering of the groundwater table may be associated with the threat of arsenic contamination. Several studies show that the subsoil in a number of areas is contaminated by dangerous levels of arsenic, which leaches into the groundwater, causing chronic and life-threatening illness. Altogether, this has created a situation of crisis in Calcutta's water supply; Basu and Main (2001, 41) argue that the crisis "encompasses mutually reinforcing problems of efficiency, equity and the environment". Consequently, debates over water in Calcutta have assumed two dimensions: that of quality and availability.

These water debates in Calcutta are closely connected to overall urban decay resulting from the inability of the urban service delivery system to cope with the post-partition influx of millions of refugees from East Bengal. The consequent pressure on water supply saw not only the decline of older uses of water such as washing streets, but also the emergence of new sources of water such as hand pumps in poorer areas and deep tube wells for high-rise buildings. Since the 1980s high-rise building boom most middle-class Calcuttans rely on underground water lifted by deep tube wells. Today, very few households rely exclusively on KMC-supplied water, although in lower-income areas, public taps also perform an important role. Public knowledge of arsenic poisoning that ensues from the excessive groundwater withdrawal and the health risks from drinking untreated municipal water have driven behaviour change as ideas of water purity and potability have fundamentally changed. Consequently, almost every middle-class household has now introduced water filters to be used as the norm. In public spaces outside the home, preventive measures such as using bottled water, especially when eating in a restaurant, have become standard practice for most of the respondents,

[9] This figure is disputed by the KMC, which claims that 94 per cent of the city's households are connected to piped water and that water is supplied continuously for up to 20 hours per day.

and very few households report having suffered waterborne diseases. When they do occur, the diseases – upset stomach or diarrhoea – are routinely identified by the respondents as the result of consuming water from a public source outside the home.

Historically, domestic help in middle-class households was tasked with household chores including washing, cleaning, and fetching water. While piped water is available today and households are equipped with time-saving appliances – usually a washing machine –domestic help continues to be a regular household fixture. Consequently, most households employing domestic help continue to require the performance of water-related chores such as washing and cleaning. Household use of water in the form of washing cars and bikes are also the tasks of drivers and/or external help: these are washed with varying frequency ranging from daily to once or twice per week, with buckets of water usually sourced from a local public tap.

Although Delhi, Mumbai and Bangalore eclipse it today, until 1981 Calcutta was the largest Indian metropolis. Controversially referred to as either the "dying city" or the "city of hope", today it is choked with sewage and people; slums and shanties exist side-by-side with apartment blocks and air-conditioned shopping complexes. For a good part of the last quarter of the twentieth century, but especially since the early 1990s, the middle-class of Calcutta has been moving into small two-bedroom apartments in high-rise buildings. Typically, these apartments would roughly cover an area of between 700 and 1,200 square feet (65 – 112 square meters). This movement in many ways encapsulates a break from the past and the tradition and culture associated with that past.

Water Narratives of Calcutta

How have the practices of water use changed? To get an intimate view, it might be useful to look at how the respondents themselves viewed the transformations and narrated them. These narratives, collected as 'stories' during the qualitative interviews during the course of the research, allow us intimate access to the changing values of water. Let me narrate a water story as truthfully as I can from the taped interview of Respondent 10, a 61 year old woman who has been a housewife all her life and has lived all her life in Calcutta. For the interview she spoke in Bangla, as she is more fluent in this language. She has one son, a 36 year old software engineer in a multinational organization and a divorcee, who lives with his parents. Her husband is 69 and is now retired from his position with the central government. The respondent's 93 year old father was sitting next to her during the interview, and often interjected to correct her memories of how water was used in their household or how practices used to be carried out in public spaces. The fascinating story of water they narrated together exemplifies my point: that the attention of the middle-class has shifted gradually from access to quality, that is, from receiving adequate piped water in the home to being able to choose

better-quality water for drinking. It also offers intimate views of water practices of urban middle-class homes in the past.

According to them, until about the 1920s, most households did not have piped water supplies because only the richer, whiter parts of the city and the homes of a few aristocratic families were connected to the corporation pipeline. Indeed, as they recalled, Calcutta had a much smaller population in the 1920s than it does today, with sprawling houses inhabited by joint families. The woman respondent noted that many middle-class neighbourhoods had their own wells from which water was drawn by one of the household helpers – buckets were carried into the house by domestic servants. The old man recalled that the servants would pour the water into large *jalas* – earthenware pots – that would then be covered with muslin cloth to filter out the particulate matter. The woman respondent observed that water stored in the jalas was used for drinking; the earthen pots also kept the water cool during muggy Calcutta summers. The old man recalled that many *bhadralok* – genteel folk – required their servants to carry smaller earthen jars – *kalsis* – so that cool drinking water was at hand even when they travelled. Vendors at the railway stations sold these pots to passengers.

The old man recalled that by the mid-1930s water pipes were laid across most of the northern and central parts of the city, and in parts of the south, extending piped water to middle-class Bengali families. During the same pre-WWII period, unfiltered river water became available through street-side hydrants. Although they were intended for washing the roads, most of the poorer families depended on these hydrants for bathing and for washing utensils. At the time of independence in 1947, water pipes had been laid in all of the existing middle-class neighbourhoods, such as Ballygunge, Alipore, and Tollygunge. Since then, the underground water system has been extended across the corporation area, serving most middle-class neighbourhoods that reside within the formal urban boundary. Those on the outer fringes or the frontiers of the sprawl are not served by piped water or sewage systems at all.

In spite of the municipal water system, however, the preferred source of drinking water was still the tube wells also constructed by the corporation. Underground water was thought to be purer – described by respondents as *swachha*[10] – containing fewer disease-causing bacteria. The method of collecting drinking water was labour-intensive, but it was invariably the cheap labour of domestic workers, who used two large jars or buckets hanging from the ends of a wooden pole to carry the water into the kitchen for storage. Nonetheless, on occasion, particularly on hot summer days, some people filled a glass of drinking water straight from the tap without any filtration: knowledge of waterborne diseases at the time was not as widespread as it is today.

[10] Also, *parishkar* or *parichhanna* (in Bangla). All these terms imply various ways of describing clean, pure and clear nature of things.

The old man recalled a severe epidemic of jaundice during the summer of 1960 as the crucial factor in creating the first panic among the Bengali middle-classes concerning the quality of water being supplied by the corporation. As other waterborne diseases related to gastro-enteric ailments were identified, doctors began to advise citizens to boil the water before consumption. The respondent noted that the first water filtration devices made their appearance in middle-class households at about this time. The early contraptions comprised two ceramic or stainless-steel containers, one sitting on top of the other. The upper container incorporated a porous ceramic cylinder that filtered out impurities – only particulate matter – into the lower container, which included a tap from which drinking water could be drawn. They were relatively expensive for the time, so some households fell back on the practice of dipping alum into water in the hope of purifying it. By the 1970s and 1980s almost every middle-class household possessed one of the two-container water filters as a necessary part of everyday life.

During the 1980s the existing technology was adapted for convenience – this took the form of a porous polypropylene moulded cylinder – referred to as a filter 'candle', with the now generic product name 'Aquaguard' – attached to the kitchen tap (Muralidhararao and Rao, 2005). Another, newer technology was Zeoline, a liquid product that could be carried around in one's pocket or handbag, one drop of which would purify a glass of drinking water within a minute. Comprised of Sodium Hypochlorite, Zeoline left a slight chlorinated smell and altered the taste of the water[11]. More sophisticated filtering options began to appear only during the late 1990s, and now most middle-class homes boast at least one of these devices.

Let me now look at how other respondents' views about the quality of water have changed over recent years. Respondent 11, a Bengali male aged 57, with two incomes, lives in one of the high-rise apartment blocks. He has been renting the apartment that he lives in for the last 18 years. His apartment receives water from KMC. About 16 years ago, Respondent 11 began to feel that the water was not clean enough for drinking. He purchased a large aluminium pot to boil water in order to sterilise it, then cool it and strain it through a piece of cloth. Within a year or so, the process proved costly and time-consuming, so he purchased a water-filter, a steel jar about one metre high and fitted with ceramic filtering candles. However, the filtering process was also time and labour-intensive, so he purchased an electrically powered filter to provide the family with drinking water. He went through these changes because he felt that the "quality of water is very important for all uses", and that "life is easier" with these water filtering devices. In his view, pure water that is fit for drinking "is free from iron and sediments". Tap water

[11] This statement is verifiable. See http://www.sastasundar.com/index.php/product/details/MzU4Nw==/188 viewed on 21st June 2014.

supplied by KMC did not meet this standard as it contained sediment. In his office Respondent 11 drinks filtered water, but whenever he is in a restaurant he purchases mineral water. He feels that bottled water is superior in quality to the filtered water he uses at home.

Around the same time as Respondent 11 began to use a water filter, he also installed a flush toilet in his house. Although he recognises that a flush toilet uses more water than the old-fashioned Indian toilet (which used to be a composting pit toilet), he favours a flush toilet as it is in his view "more hygienic and scientific". He also uses an electric water heater – a geyser – for "more comfortable showers". To make life more convenient, Respondent 11 does not rely only on electrical appliances; he also engages domestic workers to take care of domestic chores including washing and cleaning.

Respondent 3 shares an apartment with her husband and two children. She is 41 years old. Her family bought the apartment three years ago when they moved back from the United Kingdom after spending considerable time in that country. In addition to other commonly found water-related electrical appliances, Respondent 3 also owns a dishwasher. She did not use a water filter in the United Kingdom, but finds it necessary to use it in Calcutta even though her apartment is supplied water from a deep tube well. The family owns a car, which is washed every day. Safety and convenience form the basis of her decisions. Use of a water filter was not regarded as an option as "once we came back to India we had to use a water purifier as our systems were not equipped for normal water". Although Respondent 3 recognises that she is "so used to a washing machine, dishwasher, etcetera, that I need them as everyday tools for a modern, comfortable life", she also feels that she requires the comfort provided by servants, which she employs to provide domestic help. Respondent 3 also uses flush toilets. She considers the traditional Indian toilet to be "inconvenient and obsolete".

Most respondents cite convenience as the reason for adopting new time-saving devices. Respondent 6 was pressed for time: "since both my husband and I work and the children go to school/college, we needed convenience…so the gadgets were purchased". But if the service of domestic help is being used in conjunction with time-saving appliances, convenience alone cannot wholly be the reason for using appliances. Sufficient evidence exists to suggest that use of electronic appliances to perform domestic chores does not lead to increased free time (see for example Schor, 1991). However, in her 2003 work, Elizabeth Shove notes that: "the valuing of convenience is itself indicative of further transformation. Any number of devices and solutions are sold in the name of convenience and sold to those who believe themselves to be harried, hurried and harassed" (Shove, 2003, 2). Therefore, one can reason that besides what is seen as clean, what is *thought of* as convenient drives the everyday consumption of an essential resource such as water.

The diversity of sources of water used by respondents' households exemplifies this assertion. Most households rely on deep-bore wells in conjunction with the KMC domestic water supply; very few rely on the municipal water supply alone. This reliance on a wider basket of sources implies the need to have choice and is is indicative of a larger trend among the middle-class in India, whereby unreliable or unsatisfactory provision of amenities and services by the state has been dealt with by arranging for private provision of services, be it security (gated communities), health (private hospitals and clinics), education (private schools), electricity (captive power via large generators) or water (private deep-bore wells). In a context in which the middle-class is wealthier, more aware, empowered, and vocal than other social, economic and political groupings, its reliance on private service provision could further affect service provision by the state.

None of the households report using untreated tap water for drinking. In most households the practice of using some kind of treating mechanism was introduced at least a decade ago. Furthermore, most households currently use electric filters, even though many started with simple boiling and straining of water and the ceramic candle filters.

Two aspects concerning safe drinking water stood out. One was that only a particular type of water is considered safe irrespective of evidence, and the second was the understanding that one kind of technology can provide safe water only as long as a better technology does not become available. In other words, what is currently considered safe may not be safe tomorrow. The water extracted from great depths through deep-bore wells is believed to pose minimal chances of contamination (Escamilla *et al*., 2011) for uses other than drinking. Similarly, most households relying on KMC water felt that the water supplied was "more or less safe", agreeing that "drinking water has become safer and more readily available", while nonetheless purchasing and regularly using water filtration devices. The same respondents also felt that a shift to filtered water was a logical choice because "waterborne diseases are rampant here in Calcutta".

Most households also reported using bottled water when consuming water outside the home, especially when in restaurants. The reason once again concerns the quality of tap water and its deleterious impact on health. Many respondents described "pure, good quality water" as bottled water. One respondent's remarks regarding what they considered pure, good quality water suggests the extent to which their decisions are influenced by consumer marketing and the values attached to commercial campaigns: "Like Pepsi's Aquafina - *clean water"* [author's emphasis]. In spite of the claims of multinational drinks retailers, there is ample evidence from India to suggest that bottled water may not be safe (CSE, 2003). An important concern arising from this circumstance is whether bottled water should be considered safe. Why do consumers overlook the circumstances by which Indian manufacturers' claims of the purity of bottled water are not vouchsafed by a competent independent authority? Such advertising is relatively unregulated by sufficient legislative control, and is motivated by corporate interests

almost to the exclusion of public health concerns. Why is there a focus on water when there are many other ailments such as respiratory diseases among young and the elderly living in large, polluted cities? Is it a matter of what a citizen can and cannot control through their consumption?

Water filters are not the only technology that has changed in middle-class households in India: the design of mechanisms for the disposal of faecal and urinary waste has also altered considerably. While the use of flush mechanisms connected to plumbing in toilets was only introduced a few decades ago, it is now commonplace among middle-class households. Respondent 4 recalled that his house "used to get tube well water from the roadside. Then the corporation started providing piped water and plumbing was done to take advantage of it".

Householders tend to prefer modern toilets to the now out-dated non-flushing Indian toilets, referring to these as "inconvenient" and "cumbersome" (Respondent 5). Respondent 8 called modern toilets "fashionable and scientific", while Respondent 20 remembered that "in the Behala house where I lived with my parents, I had to carry a bucket of water to flush. It was embarrassing when there were guests and inconvenient too". Interestingly, convenience is linked here with social status, which is often an accurate gauge of class in India. Thus, one can see how water technologies also represent an imagined a class ladder which is a primary motivator in redefining convenience. Convenience sold successfully to consumers can morph into a status concept that can then inconspicuously merge with other factors such as the need for personal space and privacy.

Until about the time of independence, the Indian sense of cleanliness and the available technology was such that in most households toilets remained external to home. The physical presence of toilets was considered polluting; in the urban context where the entire property was indoors, houses were often designed with the toilet either in one corner of the ground floor or at the furthest permissible distance from the main sleeping and cooking areas. Piped water and plumbing were the first steps in making toilets integral parts of the household. As with the rest of Indian municipalities, in Calcutta infrastructure and services constructed over decades have been vital in introducing new practices while dispensing with old ones. Yet, they have followed a model that has now created practices that municipal resources and infrastructure are hard-pressed to keep pace with. Every apartment built for the middle-class household is now equipped with at least one modern flush toilet that devours the limited supplies of water.

Fluid Practices of the Situated, Fluid Self

The emerging research on middle-class consumerism in India focuses on public spaces such as shopping malls, multiplexes and gated communities, the political construction of a social group that is a beneficiary and proponent of economic liberalisation, and on the interaction of the middle-class with the human and non-human worlds around it, including nature tourism, adventure tourism, and

bird-watching (Urfi, 2012). Scholarly studies have addressed the public spaces of consumption, in which people interact within a controlled environment and in doing so display a right to belong, a kind of citizenship mediated by the ability to consume. These spaces separate middle-class consumers from the marginalised elements of society that are excluded from participation in the new economics and governance of this community space (Voyce, 2007).

Within households too, new practices divide the present from past and class from class: "I have always seen and am familiar with piped water and flush toilets. Public tube wells are used by the poor and slum dwellers" (Respondent 1). New practices also reflect the sense of entitlement of a middle-class consumer satisfied with nothing but the best: "sure of pure water, always" (Respondent 1).

Since the 1990s, the ideas of purity, bathing and self-cleansing have become a vital component of the new culture of material consumption adopted by the middle-classes. Srinivas (2002) suggests that the story of the bathroom conveys the story of the acceptance of Western modernity and commodification in Indian households. Aided and abetted in no small measure by persuasive advertising in mass media and the design of products and services that reinforced these emerging practices, the definition of hygiene, safety, personal wellbeing, and the good life in general altered, and the practices around them changed dramatically. The reasoning of one respondent for using water filters was instructive in this regard: "it is the safest thing to do for the family; the children need protection" (Respondent 19). The words used form the backbone of every advertising campaign for water filters.

A key aspect in the changing practices of water in middle-class urban homes is the use of tools and technologies – no longer just to store and consume water but to alter its constitution through processes of purification, just as the consumer's body is purified through association with this technologically cleansed product. These new tools have imparted new values and meaning to water. Water is no longer regarded as a scarce resource. Although most respondents estimate their daily household water consumption to be between 100 and 150 litres per day, these estimates were not confirmed. While almost all respondents are aware of water shortages, none feel the need to question their own water consumption. Consumers do not consume water any longer; they consume ideals of the aspirational class: the convenience of a washing machine, the comfort of a geyser, or the safety of a water filter. Once embedded, practices engendered by a desire for comfort, cleanliness and convenience are difficult to reverse.

Technologies and tools reflect changing human behaviour as the embodiment of human desires and ambitions. As technology changes the meanings of pure and clean water, new technologies recast the subjects in a mutual relationship in which the individual and technology is co-constructed. The practice of using new technologies represents new ways of being that recreate the middle-class subject as one who embraces change in the aspiration to join the conventional global consumer model of over-consumption. New consumptions, and new ways of

consuming things like water, allow the middle-classes to become global citizens, and the radical transformation is not only expressed in behaviour in public spaces but in the intimate space of one's home.

I will end the paper with a response to the obvious question: what might be the use of investigating water practices at home? Understanding the changes at the household is at the heart of scaling down in thinking about water, and can have potentially far-reaching policy implications. Critiques of neoliberal policy reforms, or scholars of Indian water and experts on urban service provision, have so far focussed their attention on the 'big pictures': broad-brush assessments of declining per capita availability of water volume and quality in Calcutta (Engel *et al*., 2011), and of economic analyses of the willingness to pay for water (Roy, 2012). Whilst these areas of inquiry are important, greater insight into consumer behaviour has the capacity to replace notions of the 'average consumer' with closely observed knowledge of the diversity of water-use practices in domestic spaces. Such studies will help to demonstrate how water demand shifts, how different factors shape that demand, and how new practices can reorient distributed demand. Introducing such a critical lens to contemporary water studies relies upon the realisation that effective analysis of domestic water practices involves understanding the social context of water consumption in its entirety: the cultural meanings intertwined with the habitual and inconspicuous routines of everyday life.

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