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Local waterscapes and global technologies: micro-politics of desalination in Chennai

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Abstract

Aspiring 'global' cities of the South often deal simultaneously with rapid infrastructure building, resource access pressures and environmental concerns. They seek technological solutions to address these issues. My research traces the process of urbanisation and emerging political possibilities in the south Indian coastal city of Chennai. Popularly imagined to be water starved, the city has opened two seawater desalination plants for networked supply. They were welcomed as a sustainable alternative to exploiting the city's dwindling groundwater reserves. Environmentalists and fishers, however, opposed it and suggested a revival of the region's centuries' old but deteriorating system of tanks and canals. The present day city's cultural view of the sea as an accessible and dependable resource while romanticising pre-colonial ecological engineering complicates the divide between modernist technology and traditional naturalism. The paper studies desalination in Chennai at the nexus of such local micro-politics and global technological approaches to environmentalism and urbanism. This paper explores the way socio-political relations in the cityscape shape the position of technology and its contestation in the cityscape.

Keywords

Chennai, waterscape, desalination, urban, techno-political, infrastructure, environmentalism, fishing

A city built on water

Chennai's waterscape is something of a peculiarity. The city, located on the east coast of South India, is framed by two estuaries, has numerous canals crisscrossing its surface and has three rivers draining into its catchment area. Admittedly, these are not perennial sources but are mainly rainfed. Chennai's average rainfall, however, hovers around 1200 mm. When the Meteorology department declares a drought, it still receives around 700 mm of annual rainfall.[1] The city has had chronic water shortages, during which government and private service providers clamour to supply groundwater pumped from the hinterlands. Water shortage is now an annual summer event, when a bevvy of non-piped sources like trucks, cans and bottles converge at homes and public water taps, filling pots, overhead tanks and backyard slumps.

To its credit, the city's water utility Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB or Metrowater), has never used neo-Malthusian arguments to justify these scarcities. Instead, Metrowater turns to climatic and geophysical reasons like monsoon failures, soil make-up or riparian issues. Five years back, Metrowater took what it now calls the first step towards stabilising and securing Chennai's water supply. It commissioned a seawater desalination plant with the capacity to supply 100 million litres of water per day (MLD). By drawing on the sea as a natural resource close to the city, the utility aimed to make water supply both drought and weather proof. Apart from the need to secure the city's water supply from regular rainfall, desalination is regarded as a reliable and a more sustainable alternative to exploiting Chennai's over-abstracted groundwater reserves. Today there are two desalination plants, pumping 100 MLD each, and two more in the offing, with capacities of 100 and 400 MLD each. The success story of desalination in Chennai is another instance of the increasing use of reverse osmosis and membrane technologies globally. But, such a reading ignores the range of local reasons interacting with global issues that make desalination in Chennai a complex political issue. The paper emphasises a political reading of technology and sustainability to explore the micro-politics surrounding desalination plants. Apart from the presence of a long and stable coastline, Chennai's ecological conditions do not fit the pattern of arid regions that typically adopt desalination, globally. This city that has been content to let its residents simply pump water up from their backyards has plans to double its piped supply using desalination.

[1] Source: India Meteorological Division, District Wise Rainfall Data. Available at: http://hydro.imd.gov.in/hydrometweb/(S(ihwpv3jv2ljh2hft1yis1a55))/DistrictRaifall.aspx.

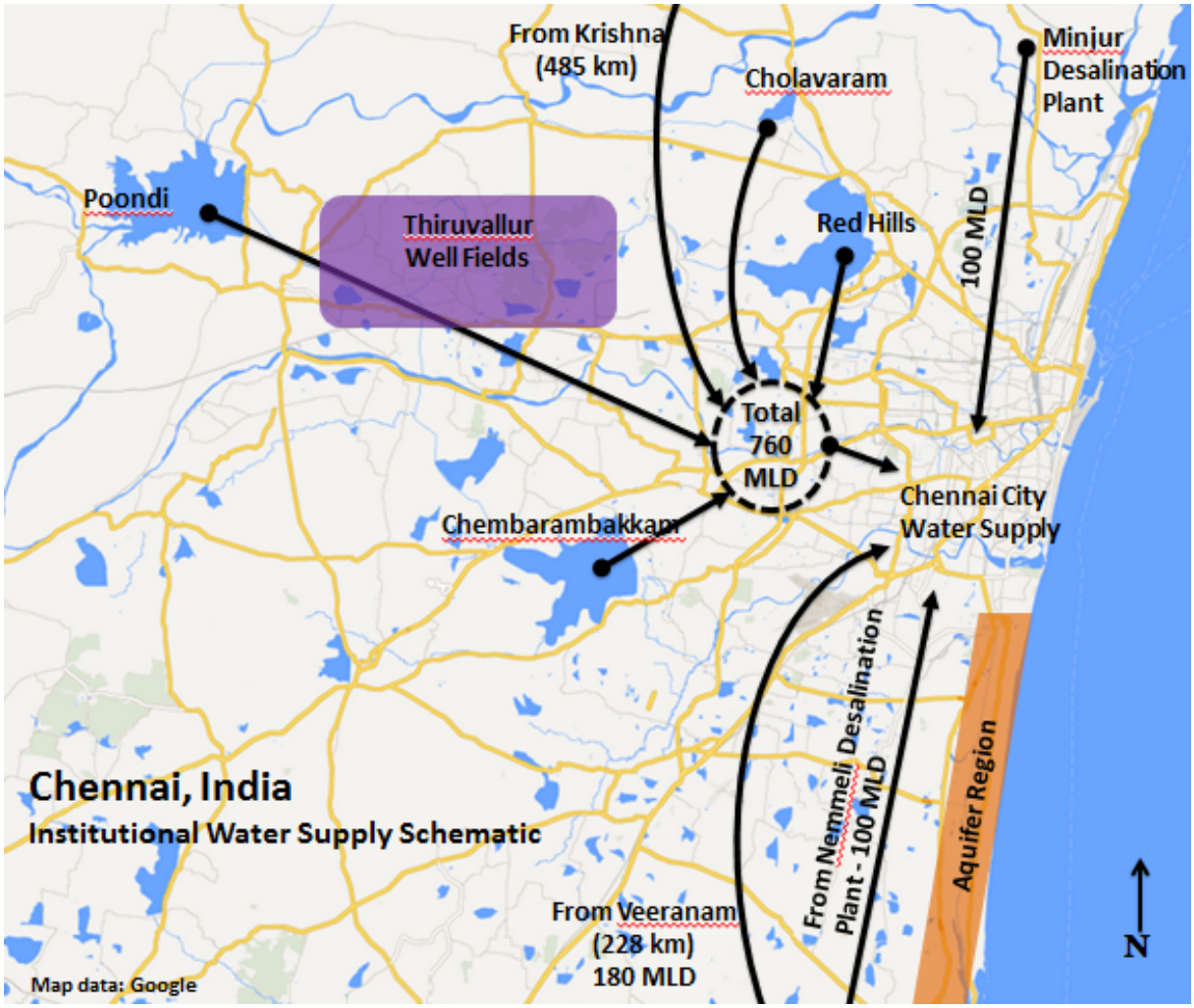

Figure 1

The global allure of desalination has indeed been its capacity to drought-proof or climate-proof cities and states (Kabat et al. 2012). The potential for techno-natural sustainability of water supply is the overarching factor, with the technology's energy efficiency occupying engineering and policy debates. It follows then that reducing the energy consumption of the reverse osmosis also makes it sustainable (Davidson 2005, Stover & Crisp 2008). But, the environmental questions and other contests over desalination in Chennai barely touch on its energy consumption, focusing instead on historical and present-day socio-material issues. This paper will explore these issues using observations from preliminary fieldwork in the city to highlight some key debates that explain the political and spatial processes forming Chennai's waterscape.

But, why is a focus on water technologies and their local politics useful or important? The scholarly focus is partly a contribution and response to the body of literature on the global technocratic order of technologies dealing with environmental change and resource access. Environmental degradation and the threat of climate change have also brought up new and efficient technologies of extraction to sustain present standards of living. Desalination is one such technology meant to address the issue of water scarcity. The political implications of the environment and technology nexus have been of much interest to social scientists. The next section explains the conceptual approach of my fieldwork.

Politics of Technology: Opening the 'Blackbox'

In recent times, technologies of water are implicated in what is called the post-political condition. For example, the use of 'smart' metres to cut off lower paying water users (Graham 1997) employs socially divisive technology and technocracy (Wynne 2002), to make climate change and resource scarcity 'legitimatory discourses'. Environmental consciousness has spawned not only intervening technologies like metres but also whole new technological systems (Kemp 1994, Smith 2003). Bakker (2005) and Goldman (2007) have called it market environmentalism or green neo-liberalism. Marxist scholar Erik Swyngedouw (2007) calls intervening technocracy to 'solve' the environmental crisis a feature of the 'post-political' condition.

According to him, 'technological solutionism' fosters the belief that current environmental issues can be solved through external interventions and there is no need to alter our behaviour, economy or administrative setup fundamentally. The universal threat of environmental catastrophe, in fact, has prompted to reorganise public services to favour the market and interests of private capital. The reorganisation means that mathematical calculations of efficiency and cost recovery determine environmental action rather than on environmental justice (Eichelberger 2012). Technology, thus, leads to a whole system of technocracy, which forecloses proper political engagement (Oosterlynck & Swyngedouw 2010). Technocratic environmental action based on a managerial strategy of consensus tends to suppress dissent (Kenis & Lievens 2014).

Additionally, the global nature of the environmental movement often results in technological solutions imposed top-down, especially in the global south (Tsing 2000). How does Chennai deal with desalination, as the global technology brought in to solve its water crisis? This

question leads to exploring the political choices that have opened about desalination. Accounts of the depoliticising effect of technology are not exactly new. Technological solutions have always incentivised business in the place of laying down environmental regulation (Kemp & Soete 1992).

But, as James McCarthy (2013) puts it, the 'post-political' condition is 'potentially analytically flat, totalizing, and inadequate'. The problem with calling technocracy not 'properly political' is that it boxes technology into a mere object that may be manipulated by capital without paying attention to social needs. It credits technology with too much precision and efficiency to be a readily usable tool in the exercise of power (Coutard & Guy 2007). Technology, far from being homogenous, exists in various forms with its own specific historical, social and cultural connections. The contestations it sparks can result in organic politics that cannot be easily categorised in existing political formations. The case with fishers along the coast of Chennai exemplifies how they organise to oppose intrusions into their lives with development projects concerning desalination, nuclear power plants or road infrastructure.

Second, McCarthy argues that it is never possible to depoliticise an issue because even as scientists, bureaucrats and policymakers work in this setup, they bring their personal politics into the job:

> …the people affected by new property relations and management regimes resisted and reconfigured the newly emergent socio-natures in their areas in a variety of ways, producing a reality more complicated than, and often at odds with, the superficially clear official policy
>
> McCarthy 2013: 21

This premise forms the basis for ethnographies of technological infrastructure that this project follows to open the 'black box' of desalination in Chennai (Latour 1999). 'Black boxing' refers to how technology remains opaque as long as it functions properly. But, Latour's reference to black boxing is not restricted to the technological artefact but includes the matrix of scientific and social factors that support its existence.

Peopling Infrastructure

Urban infrastructures are technological artefacts that are black-boxed as they are supposed to work in a seamless way and become invisible to users. Star & Ruhleder (1996: 115)

suggest opening the black box by seeing what infrastructure means to different people, rather than consider its materiality: "Analytically, infrastructure appears only as a relational property, not as a thing stripped of use." Roads for drivers can be problems for canal diggers or the pedestrian, and yet another design variable for the city planner. This approach focusing on human and technological interactions makes infrastructure a mutable and a wide-ranging idea. It also enables investigation into the work most associated with technological systems – engineering. There is, after all, no reason to define engineering as pure technical work; it may be re-imagined as a 'hybrid socio-technical profession' that bridges the barrier between society and technology (Bell et al. 2011).

Ethnographic accounts of engineering in urban infrastructures offer an insight into the micro-political impact of rigid and homogenous systems. Karen Coelho (2006) in her ethnography of water infrastructure, shows how engineers are simultaneously bureaucrats, arbitrating the flow of water to different communities by treating the pipes and valves as flexible systems, open to social and political negotiation. During field work in Chennai, I interviewed engineers in Metrowater, to delve into what desalination meant to them and how it related to the ecology of the city and the environmental and resource crises it faces.

Using human labour or work as the analytical tool also opens interesting avenues to redefine what we refer to as infrastructure or a socio-technical system. The system of tanks and canals that environmentalists propose as an alternative to desalination were built through a process of labour and social work during pre-colonial times. Mosse & Sivan (2003: 4) call it, "an engineering response to the ecological regime of the South Indian monsoon cycle." What is now a natural lake or a stream, in peninsular India, may have once been engineered.

Ashley Carse (2012) proposes to use infrastructure as a theoretical tool to explore natural environments. According to Carse, natural landscapes like rivers and forests constitute infrastructure when they have been appropriately modified and reorganised to serve human interests. Human labour "blurs the nature–technology boundary, suggesting that a neat division is illusory" (ibid: 540). This connection between nature and human labour provides an interesting perspective on the way fishers contest desalination and other conventional infrastructure projects along the sea.

We will first explore the environmental contestation involving the canal system. The contestation over coastal lands between the ostensibly traditional work of fishing and the modern technology of desalination will follow.

The history of tradition

Environmentalists in Chennai are concerned that the desalination plants divert attention away from the revival of the system of tanks and canals over which the city has been built. This water network ensured that rainwater was stored and percolated into the ground while also mitigating floods. As figure 2 shows, Chennai, which lies at the riparian end of these canal networks, is filled with lakes and other water bodies. In their absence, the city would be inevitably flooded and unable to retain water thanks to run-offs into the sea. So, there are three essential functions in this process – maintenance of water bodies that fulfils the other two functions of water storage and flood management.

Administratively speaking, though, these three functions are divided over three different public organisations. The maintenance of water bodies comes under the Tamil Nadu State Public Works Department due to their legacy as irrigation tanks. The city Municipal Corporation builds and maintains storm-water drains to manage floods, but ends up draining all the water into the sea. The water supply utility Metrowater builds and maintains reservoirs to store water that it will supply to the city. In recent times, increased awareness about rainwater harvesting has led to Public Interest Litigations (PILs) filed in courts. These question the lack of maintenance of water bodies, prompting the Corporation, the only directly elected body among the three, to take some interest in lakes and tanks. The Corporation calls it ‘ecological services’ to maintain select lakes for urban leisure and recreation. The divide between the ‘natural’ environment such as a lake and the ‘infrastructure’ of reservoir or pipe or a desalination plant persists in the engineering imagination at Metrowater.

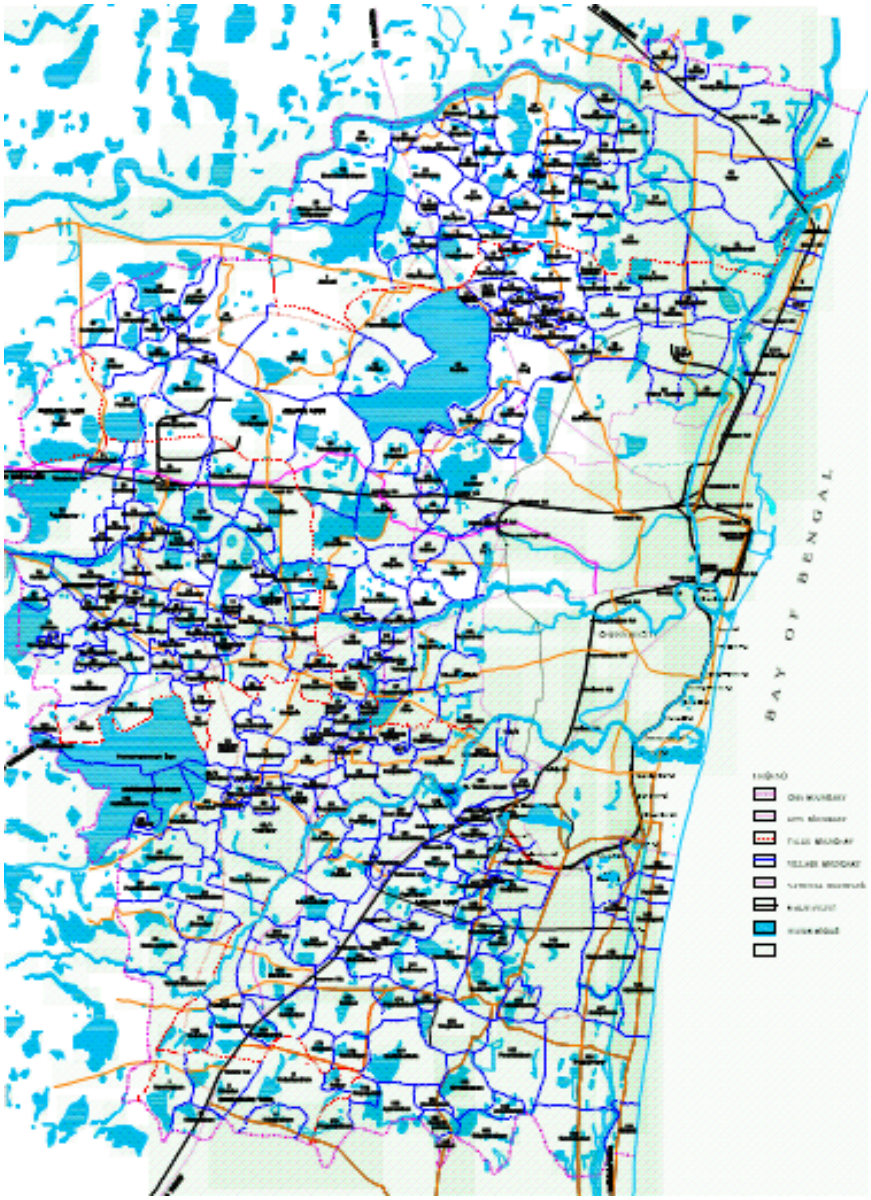

Figure 2 (Source: Chennai Metropolitan Development Authority - Map of Water Bodies).

The argument favouring canals and tanks, though, is not entirely about their utility to the city. There is an inherent environmental wisdom identified in their status as a traditional and community-managed system. Naz & Subramanian (2010) argue that pre-colonial Indian society had 'significant technical sophistication' in building irrigation systems for agriculture. Nevertheless, they think these are essentially village level community organised organic projects -- a view shared by the 'new traditionalists' of the present day environmental movement in India (Sinha et al. 1997).

This strand of environmentalism (Agarwal & Narain 1997), contends that traditional community managed systems worked on an inherent conservationist wisdom that got destroyed deliberately or ignorantly by technical and administrative changes brought by the British and post-colonial administration (Mosse & Sivan 2003, Sinha et al. 1997). The hegemony of 'Western' science, strengthened by colonialism, has also been blamed for the lower status accorded to traditional knowledge in post-colonial development (Sengupta 1985). But, the image of an unadulterated pre-colonial community devastated by colonial rule may itself be an Orientalist construction, influenced by our post-colonial politics, reason Mosse & Sivan (2003).

The tanks and canals, they argue, were not engineered as a purely rational and calculated response to an environmental cause. The calculation included social, political and cultural power relations. They were an outcome of the exercise of political power, by certain powerful groups in society, through institutions like caste, kinship and religion. Consequently, the technology of tank irrigation, in this case, is "viewed not as a fixed arrangement specified by engineering science but as what people do" (Mosse & Sivan 2003: 20). As people are social and political beings who do things for a vast number of reasons outside the techno-natural causative framework, technology, here, is identified as a feature of their social life. More importantly, technology is considered from the point of a human relationship to it and the socio-political and socio-natural relationships that it mediates.

A techno-political lens can then be applied to the traditional system of tanks and canals as well as modern infrastructure like desalination. The set of power relations that governed existing knowledge on water management in pre-colonial Tamil Nadu and sustained the canal system do not exist in present day Chennai, whose rapidly transforming urbanism generates a new set of political conditions.

Contrary to Karen Coelho's (2010) view that Metrowater formed as a bureaucratic body in 1978, took on a slow road to privatisation, the utility continues to be heavily influenced by the state government and its party politics. It also, now, invests in large-scale infrastructures like desalination using grants from the Central government or private agencies. Despite global wisdom in water management shifting from public control to privatisation, and currently community management, Chennai has traversed the path backwards. From using backyard wells and tanks to being supplied by private trucks, the city has now invested heavily in

centralised piped supply. The following section will look at the water management ethos that stem from Chennai's local and global political positioning.

Beautiful and Bigger

Chennai is part of an international network of cities connected by their aims of growth and affluence (Robinson 2004) and keen to attract global business investments. In fact, its stated goal is to become a version of Singapore, which happens to be heavily dependent on desalination for its water supply. The changing waterscape of the city is closely tied to the changes in its urban processes, and its environmental politics or the lack thereof is related to its political history and global positioning (Arabindoo 2006).

While et al. (2004) write "…it would appear that urban entrepreneurialism itself might depend on the active remaking of urban environments and ecologies." They reinforce environmental crisis as an opportunity for active green policies promoting investment through eco-friendly initiatives in public transport and river restoration projects. The latter has been prominent in Chennai lately. The Cooum River Restoration project, for example, which was later renamed the Chennai River Restoration Trust[2] incorporates any river or water body in the city.

The Cooum, Adyar and Kosasthalayar are three major rivers that run through the city but over the years, have been too polluted, silted and blocked to be of any real value to the city except as drainage. The Tamil Nadu government initially took up restoration of the Adyar river, which runs through the affluent Southern neighbourhoods, to create 'ecological services' for aesthetically appealing natural spaces. This initiative led to the high-profile Cooum restoration project that has so far not started but has received a budget allocation of Rs. 30 billion[3] and an initial grant of Rs. 6 billion last year.[4]

This is a project that has garnered interest from foreign cultural centres like the Indo-Korean Centre or the Goethe-Institut (German). These centres conduct art or performance based campaigns about the history and value of clean water bodies,[5] including a decisive action to clean the rivers in Chennai. Water technology companies from the respective countries

[2] http://www.chennairivers.gov.in/index.html.
3 http://timesofindia.indiatimes.com/city/chennai/Tamil-Nadu-budget-Govt-allocates-Rs-3834-crore-for-Cooum-restoration/articleshow/30336705.cms.
[4] http://www.thehindu.com/news/cities/chennai/cooum-gets-another-chance/article6868173.ece
[5] http://www.inkocentre.org/WaterBodies_an_Indo_Korean_Arts_Residency.html.

liaison with the City Corporation for those projects through the cultural centres. Chennai city is abuzz with local and foreign private enterprises, specialising in various aspects of water purification using membranes, chemicals and so on for industrial and recreational purposes.[6]

These initiatives are driven more by an aesthetic sensibility than any significant environmental politics. The Singara Chennai campaign initiated by the Mayor of Chennai in 1996, from his newly re-established elected position, translates to 'Beautiful Chennai'. Recent efforts to 'clean up' the city's waterways including slum clearance and riverside development along the banks spring from this foundational campaign. The campaign was possible following elections and re-establishment of a city government that was abolished in the 70s. This was followed by an expansion of the city's boundaries by designating a Corporation area and a larger Metropolitan area for planning and future expansion. The Corporation area expanded from 176 sq. km. to 426 sq. km. in 2011, with the Metropolitan area extended to 1189 sq.km.

Today public officials reason a larger city can attract investment through public expenditure allocation or from private and international agencies. At the same time, while the Singara Chennai branding contributed to a place-making and marketing strategy, it did not lead to a sustained environmental politics. Chennai, unlike neighbouring Bangalore, which sold a middle-class identity and sensibility, capitalised on its 'physical and intangible infrastructure' (Little 2010) – the ports, expressways constructed to carry goods to and from the ports, outskirts that can house factories and the technically capable human resource awaiting jobs at the hinterlands. Expansion of the city facilitated all these physical infrastructural developments.

As the urban poor displaced from river banks got relocated to the peripheries, the peripheries themselves got pushed outward (Coelho & Raman 2010). Beautification and expansion went hand in hand. At present, desalination and the planned massive expansion of water supply to the city reinforce the logic of its spatial expansion. However, desalination has to deal with the potent issue of fishers and fishing settlements along the coast.

[6] http://waterexpo.biz/.

Rights on the sand

In the UN Earth Summit of 1992, a 'rights' framework underpinned the question of sustainable access to resources. The framework focused on environmental justice (Haughton 1999), pitting environmental sustainability against the social equity in resource access as contradictory aims, especially when practices from the global North are advocated in the South (Greenough & Tsing 2003). Governments of the global South can leverage the debate to assert their autonomy or retain policies exploitative of their ecologies and people (Peluso 2003). Ramachandra Guha's (1989) landmark 'third world critique' of North American environmentalism centred on wilderness preservation identified a distinct strand of Southern environmentalism for sustaining livelihoods dependent on natural resources.

Fishing is one such livelihood that visibly conflicts with desalination and other development projects that the state has launched along the coast of Chennai. Amidst rapid urbanisation and infrastructural development, fishing settlements have persisted within and outside Chennai. Infrastructural projects along the coast like desalination, roads and ports have triggered some action from fishers, asserting their sovereignty over the sands.

The desalination plants have gone through mandatory environmental and coastal zone clearance and a procedural public consultation. At first, the proposed plants held the promise of 'development' and the possibility of employment convincing the fishers to consent to the plants. Additionally, some political manoeuvre between local administrative officers ensured that the required consent was fait accompli. Now, as the desalination plants run smoothly, the fishers raise protest precisely because the paperwork was meaningless to them.

Much of the scenic southern coast, immediately outside the city limits, as the site of the desalination plant, belongs to a private trust from the colonial period. At present, fishers in the adjacent village are pragmatic in their approach to resettlement, as the desalination plant has triggered sea erosion pushing sand and water directly into their homes. There is also the fear of reject water pumped back into the sea, with consequences for marine life and their potential catch. Besides, they think the land was never theirs, and so, they were always in danger of eviction due to development projects. But, coastal lands are not owned by fishers or by anyone else. Ownership, in fact, allows acquisition of the land, as with the private trust land where the desalination plant was set up.

To the north of this village, another fishing settlement has started asserting its right to park its boats, spread its nets and provocatively use the sand for defecation, against a beach resort. Further north, within the city, two fishing settlements mapped out their usage of the beach space, using satellite mapping technology, and presented it to the government as their unique knowledge system and sovereignty over the beach (Kumar et al. 2014). They were frustrated with different infrastructural projects proposed across their settlement that called for street protests.

The coastal sands are an infrastructure for the fishers to park their boats in, to spread and dry their nets, to unload their fish and to build their homes on the sands. It is their labour that makes this part of nature infrastructure. For the Government or a private developer, though, it is an officially unclaimed resource that can be put to productive use.

Techno-political cityscape

Paying closer attention to local environmental techniques and discourses reminds us that environmental politics "did not begin with contemporary, northern environmentalism or with the colonial era" (Dove 2003: 104). This position does not necessarily mean a conflict between Northern and Southern environmentalism or scientific and indigenous knowledge systems. As Ajantha Subramanian (2009) demonstrates in her study of subaltern politics in coastal Tamil Nadu, marginalised fishers use the discourse of global trade laws and rights to oppose technologies affecting their livelihoods. Local environmental politics may be neither overtly technocratic nor traditionalist, but as Amita Baviskar (1997: 195) puts it, the "interweaving of often contradictory political thought and action". The paper shows that the environmental movement exists outside of its global versions and sometimes influenced by it. An urban micro-politics of ecology is central to contests related to the technocracy of accessing resources. The technical and political implications of these contests shape the cityscape.

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