

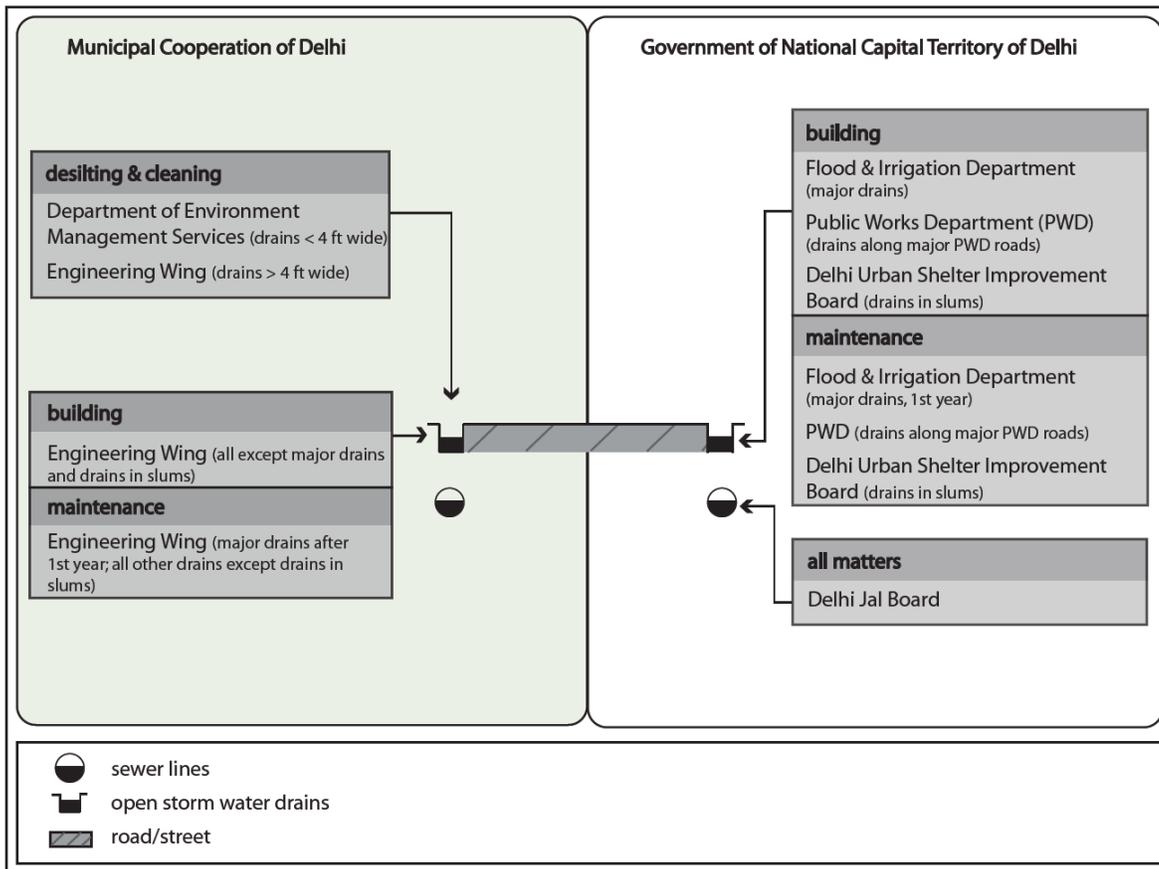
**Fragmented governance, divided cities:**

**The need for an integrated view on urban waste water: A Case Study of Delhi**

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It is a well-known fact that the Yamuna River, and especially its Delhi stretch, resembles more a “sewage channel” than actually a river. Especially outside the Monsoon season, one can hardly talk about “water quality” in the capital, as in this period of the year, the full volume of Yamuna water is diverted north of the city for

It is striking in the debate that such an integrated view that connects the politics of fresh and waste water, vulnerable populations and rivers is vastly lacking. In the official narrative, river pollution is explained almost exclusively by population growth and migration in combination with lack of funds. In Delhi’s Ministry of Urban



Development, for example, an anonymous interview partner stated: “There is one root cause for the environmental problem: No politician is willing to touch the population issues. The day politicians will start saying no more than two kids [the problem will be solved]” (interview, 27/10/2009).

Somewhere down the line, so goes the promise, there will be enough

water supply to its residents; the urban part of the “river” is then made up exclusively of drain water, i.e. sewage. Figures are highly disputed, but it is estimated that at least 1,789 million litre out of the 3,267 million litre of waste water that Delhi generates are discharged into the Yamuna every day untreated through the 19 major drains of Delhi (CPCB 2004: 2). It is therefore not surprising that the Delhi stretch is declared biologically dead, and levels of dissolved oxygen are near zero once the river enters the city (CSE 2007: 89). Also, coliform bacteria counts are several millions above the permissible levels for bathing standard (ibid.: 90; see also Gol Ministry of Environment & Forest 2009: 46).

While this is unfortunately no news, this article wants to discuss the approach taken to tackle this issue so far and argues that no sustainable and just solutions are likely to come up until an integrated view including political & social reasons behind river pollution is achieved.

money, migration will be under control, and even the last couple will have opted for the small family model – and then problems will be solved on their own. River pollution is thus isolated from its wider political context: **policy-makers seem to believe that the status of our rivers can be addressed (or redressed) without addressing the question of governance and the highly unequal living conditions in our cities.** However, to solve the pollution issue, it is high time to understand the connection between our ecology and our social and political urban landscape better.

**A first point to raise is the governance set-up.** When studying – as one example amongst many – Delhi’s urban waste water cycle, it turns out that each fragment of the mosaic is handled by a different agency. The Central Pollution Control Board monitors the water quality and pollution levels of major rivers, such as the Yamuna.

The Delhi Pollution Control Committee monitors the water quality of the Yamuna in Delhi, as well as certain drains, groundwater bodies, and ponds in the city; it also supervises Common Effluent Treatment Plants and treatment plants of hospitals among other responsibilities. Concerning waste water collection and treatment facilities, in Delhi alone no less than eight, and probably even more, government agencies at both state and municipal level are responsible for various tasks. The major agencies and their respective responsibilities are depicted in the figure on the previous page; besides, DDA builds drainage infrastructure in its colonies, and DSIIIDC is responsible for drain construction, too.

As can be seen above, the sewer system, and thus sewerage, ought to be dealt with in all matters by Delhi Jal Board. **Yet, in practice, the sewer system covers only between largely a half and two third of Delhi's population** (different data is given on this, NIUA 2005: 115, Gol Ministry of Environment & Forest & GNCTD Planning Department 2001: 43). Where sewer lines do not exist, the storm water drainage system is used for evacuation of human waste (black water) and (so-called grey) waters from kitchen sinks, clothes washing and bathrooms.

This system is inherently flawed: The open drains have a slope of 1/150–200 inch (~0.6%), as opposed to slopes that are five to ten times steeper (3–6%) in sewers, because they have been constructed exclusively for storm water drainage, as Delhi Jal Board points out. With lower slope (and thus slower flow) any solid material such as faeces and garbage is much more likely to deposit in the open drains, creating blockages and subsequent overflow.

But officially at least state actors are in denial: storm water drains are not acknowledged as integral part of Delhi's sewerage story. This shows for example in the letter of the Conservancy and Sanitation Engineering Department (predecessor of the Department of Environment Management Services) in the appendix to the Delhi Master Plan 2021: here the department holds that its responsibility consists exclusively in the "disposal of storm water drainage" (DDA 2006: A–36).

Yet, because the internal storm water drains of residential areas are used for the evacuation of municipal waste water, the absurd situation arises that the Department of Environment Management Services ends up handling large parts of Delhi's sewage without

the pertaining mandate to do so. As a result of this institutional (and mental) fragmentation, therefore, there is no state actor which is officially assigned the responsibility of sewage that does *not* flow in the sewer lines – i.e. all waste water in or from unconnected areas.

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Chasing the dream of a completely sewered capital, vast amounts of money are currently being poured into the construction of ever more sewer lines, new treatment plants, and the covering up of drains (maybe hoping that out of sight, the problem might be out of citizens' minds?). In 2011, it was expected that phase III of the Yamuna Action Plan will be approved soon. Under this phase, Rs 1,656

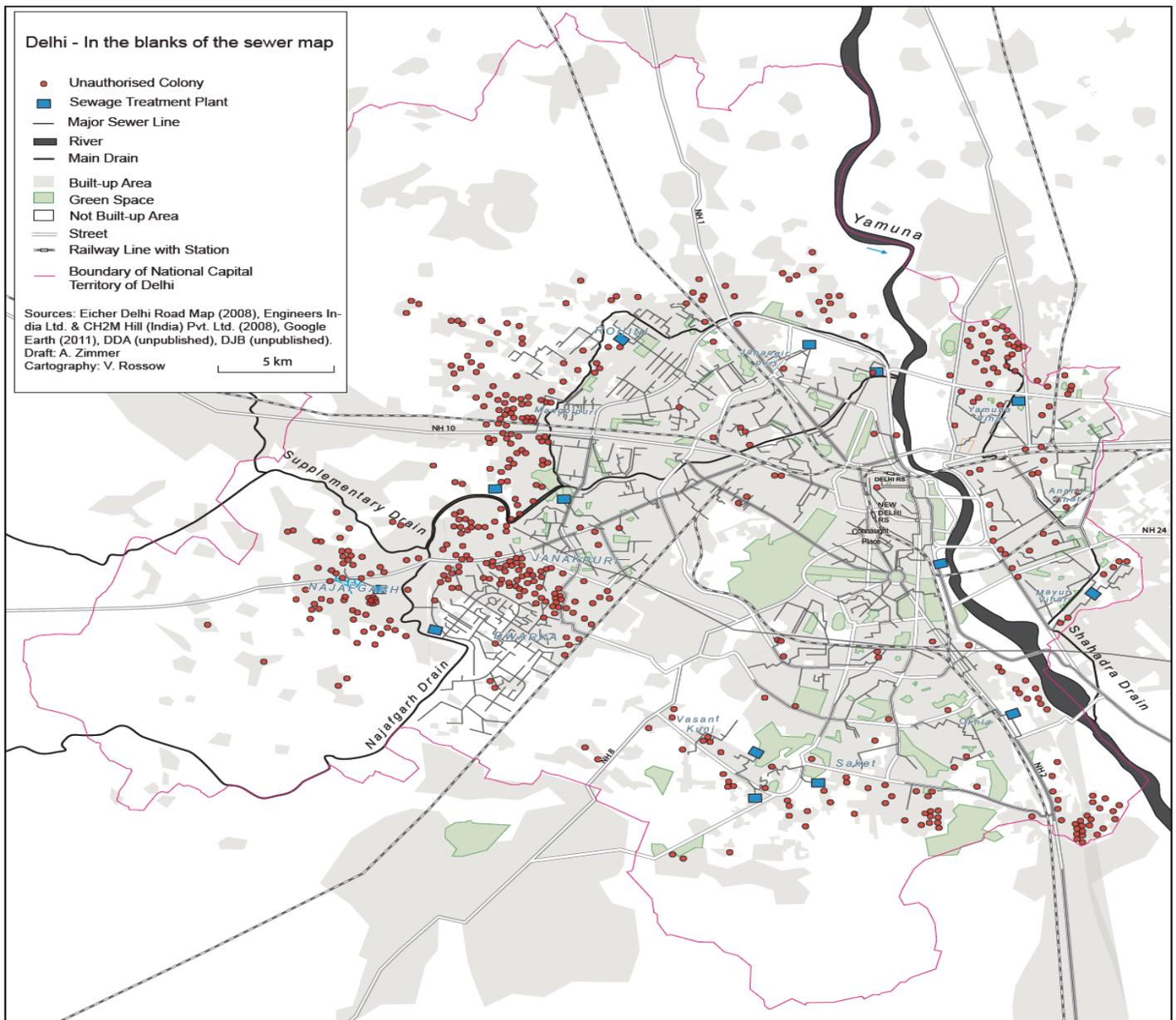
crore of Japanese loans would be spent with a focus on expanding Delhi's sewer system in order to tackle pollution (The Hindu 2011).

Moreover, the National Ganga River Basin Authority was founded in 2009 to revive river 'clean-up' initiatives. While the Government of India invests 556 million USD, the World Bank has granted financial support of 1 billion USD to this project on May 31, 2011 (making it a total amount of 8,262 crore Rupees).

Plans are (among other goals) to vastly expand the sewer systems and number of sewage treatment plants in the basin (World Bank 2011). Most recently, Delhi Jal Board announced extending the sewer network, renovating pumping stations, rehabilitating sewer mains and increasing the capacity of the several Sewage Treatment Plants at a cost of more than Rs 552.5 crore, partly financed through JNNURM (The Hindu 2012).

Yet, at the same time, DJB announces projects such as the interceptor sewer to come up. **This project shows very clearly the second main concern regarding how waste water is framed in current urban governance: the disassociation of ecological concern and social (and environmental) justice.**

The interceptor sewers are to be built along Delhi's three main drains – Najafgarh drain, Supplementary drain and Shahadra drain – and are meant to capture the sewage from areas without sewer system before it enters the main arteries that would transport it straight into the Yamuna: a classical end-of-pipe approach. At an estimated cost of Rs 2,455 crore, this is another mammoth project in the 'clean-up' mode with the objective of an "effective abatement of pollution in the River Yamuna and improve(...)[ment of] water quality" (Engineers India Ltd. & CH2M Hill (India) Pvt Ltd 2008: 1).



Yet, this project is not very likely to be successful even in terms of enhancing the quality of water in the Yamuna as it leaves out crucial factors such as the waste water quantity added to the drains due to extensive groundwater use, the malfunctioning of existing sewage treatment plants, the lack of fresh water flow in the Yamuna outside of the monsoon, and the fact that pollution levels are actually higher than assumed in the Detailed Project Report (CSE 2009: 16-19).

**More seriously still, addressing exclusively the aspect of river pollution, residents of unconnected areas are left out of the project equation, and are literally left to dwell in the sewage that overflows from their open drains:** As the sewage is to be trapped at the outlet of internal drains into the major drains, this means that in the best of cases, the ecological status of

these drains (and subsequently the Yamuna) will enhance. In the residential areas, in contrast, nothing will change: sewage will continue to flow (or stagnate) in storm water drains, exposing residents to its pollutants almost on a daily basis. Although designated by Jairam Ramesh, then Minister of Environment, as “interim measure” (The Times of India 2011), the high investments in these drains and the even higher investments that would be needed for covering the whole city with sewers makes the supposed temporary character of the project very unlikely.

Moreover, the political leverage of the populations concerned is not the best: *The map above shows how the lack of sewer connection concerns to such a very significant degree residents of unauthorised colonies.* Slums, too, fall almost exclusively in the category of

unconnected residential areas (although this would not be visible at the scale of this map as smaller slum pockets are inserted in otherwise connected colonies). It is therefore mainly the 'informal Delhi' that suffers from the current waste water governance.

In such unconnected areas, inhabitants face regular overflow of sewage onto streets, and partly into houses. The situation worsens significantly during the monsoon months when overall city drainage systems touch (or overstretch) their limits. Next to practical problems of daily life, this presents a major health hazard.

It is therefore not surprising that 7.5% of all deaths in India are attributable to deficiencies in safety of water, sanitation or hygiene (Prüss-Üstrün et al. 2008: 38). By far the highest number of these deaths is due to diarrhoea and its consequences.<sup>1</sup> Expressed in disability-adjusted life years, water, sanitation and hygiene-related diseases are even responsible for an estimated 9.4% of all years lost in the country (ibid: 39). In terms of financial costs, it is calculated that India loses 2.4 trillion Rupees or an equivalent of 6.4% of its GDP due to inadequate sanitation in urban as well as rural areas (WSP 2010).

As a consequence of more frequent exposure to waste water, public health problems are identified especially amongst the residents of urban informal settlements (UNDP 2006: 48-51). This does obviously not concern the capital alone: in a study on Chennai, slum residents for example have been found to bear catastrophic economic costs of disease burden, with up to 22% of monthly incomes lost due to direct or indirect costs of ill-health (Sakdapolrak 2010: 317). In Delhi, slum inhabitants have also recorded higher morbidity than other urbanites (Singh 2009: 207 & 212).

**Apart from health risks, residents of these areas struggle with the insult to their dignity and social wellbeing that constantly overflowing or blocked drains mean to them.** Research in an unauthorised colony and a slum cluster in Delhi revealed how inhabitants suffer from living in what they perceive to be a "fourth class" colony (interview with Naseem Begum<sup>2</sup>, 13/11/2009), or to have to live like "insects" (interview with Meena, 17/09/2009) – being ridiculed by visiting relatives from smaller towns and villages, feeling

discriminated against in comparison to residents of adjacent authorised colonies, and facing an overwhelming sense of neglect vis-à-vis government agencies and politicians that remember them only in times of elections.

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In the best of cases, complaints to the political representative or the local administration lead to short-term solutions when scavengers are sent to clear blocked drains. Yet, this strategy mostly works if people get together in a group – something especially daily wage labourers find difficult to do as time directly translates

into (meagre) incomes. And even then, complaints are no guarantee for relief, and the response often takes too long. Seeking relief from government agencies unsuccessfully, residents then spend a significant amount of time cleaning drains manually as well as money in trying to prevent overflow through other means.

But these means are difficult to agree upon amongst neighbours. Several households cover the drains parts in front of their house, but thus make cleaning more difficult. Some residents put a grid in the open drain where their plot starts, trying to prevent garbage to settle in front of their house, but thus create even more blockages for those who live 'upstream'. Others would like to hire private scavengers but find their neighbours are not ready to contribute money for this. Again other households suffer more because their houses have become very low with raising levels of concrete to repair internal lanes.

They are frequently left to clean the drains of the whole street if they want to avoid overflowing sewage to enter their ground floors, because better-off families who could rebuild their houses do not feel concerned any more. One of the consequences of insufficient public scavenging services therefore is that communities have to deal with numerous conflicts among neighbours. **Life in unconnected areas is therefore even tenser than it already is due to difficult economic situations.**

Next to time and money invested in these small scale and temporary solutions, inhabitants of unauthorised colonies – usually better educated and connected than those in slum areas – have tried to seek better service provision through court cases. But this avenue is not easily accessible: in the investigated colony, cases have for example been dropped as the petitioners were not able to attend all the court dates. Nevertheless, more scavengers have been allocated to the area – because

<sup>1</sup> India thus is positioned 104<sup>th</sup> amongst 152 WHO member states for which data are available.

<sup>2</sup> Names have been changed for sake of anonymity.

the municipal administration got scared, according to residents' impression.

The documented stories of neglect and ongoing struggle are appalling and loudly call for change. Yet, it is high time not for more crores and lakhs of rupees, or more engineering solutions – it is high time to frame river pollution differently.

An integrated appreciation on waste water, as we have seen, needs to achieve both: a comprehensive view of the urban water cycle, and a deep understanding of (and commitment to) the social and political dimension of this water cycle.

**Continuing to leave storm water drains out of the sewerage equation will lead to continuously underestimating waste water quantities, and the dimension of the problem we are trying to address. Equally, turning a blind eye to the fact that more than half of Delhi's citizens simply cannot afford living in areas which are connected to the sewer lines will not allow to clean the Yamuna, or any other river for that matter.**

It is just too likely that even after a new round of augmenting the sewer network, large areas will remain undeserved and keep relying on internal storm water drains. Instead of chasing the ever-escaping goal of a fully sewered city and spending lakhs of crores in order to do so, therefore, **policy makers would be well advised to work towards options of waste water treatment that are cheaper, localised, and less prone to technical problems.**

It should allow for incremental infrastructural improvement such as effective collection and treatment of sludge from pit latrines, and envisage using existing drains for example as spaces for biological waste water treatment. Ultimately, however, in order to handle urban waste water in an integrated manner, the need is for ways of including citizens' experiences, knowledge and concerns in the governance of river pollution and the urban water cycle.

Only if the informal and unconnected Delhi gets a voice will the urban waste water problem show in all its dimensions. Therefore, it is imperative to create forums where different actors, from inhabitants to local politicians, NGOs to administrators, can come together to assemble the elusive and fragmented story of our dying rivers.

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