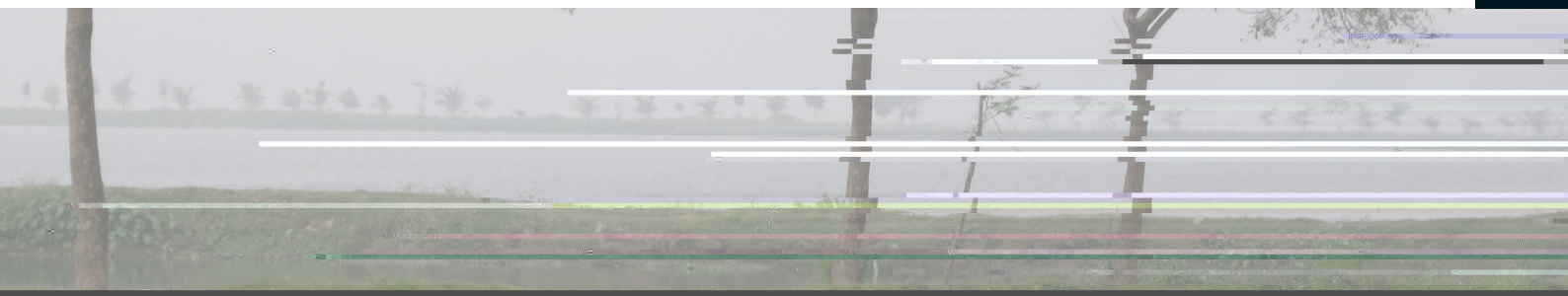

Water Justice City Profile:

Jenia Mukherjee, Institute of Development Studies Kolkata
Asish Ghosh, Centre for Environment and Development

SWEDEN

dpu
Development Planning Unit

Translocal Learning for Water Justice
http://www.bartlett.ucl.ac.uk1b/wl.ac88-j

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City Profile

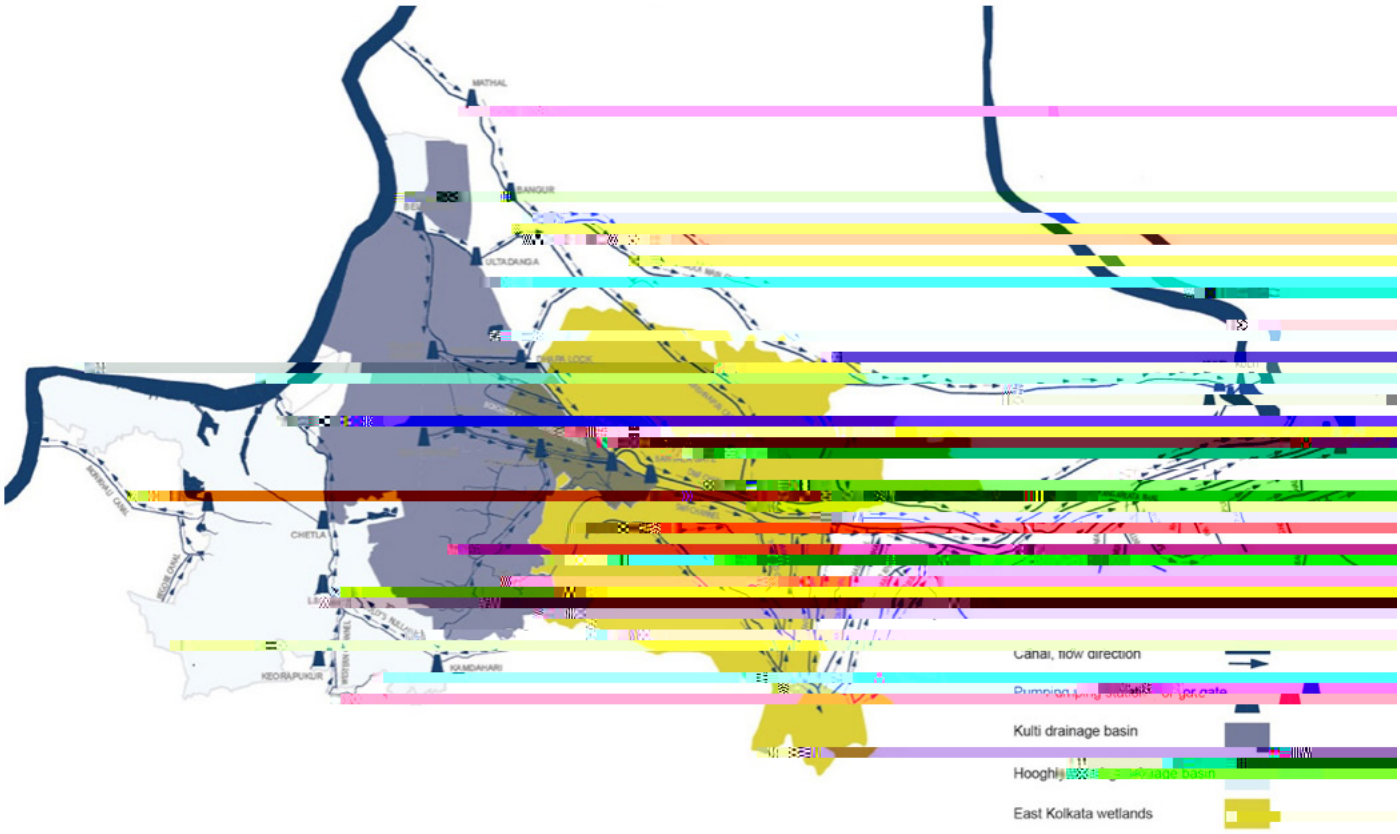
City Profle

The city of Kolkata is often described as ‘triple-blessed’: possessing a river for drinking water, another to dispose of waste, and the wetlands between to treat its sewage and produce its food. Yet despite these rich advantages,

and farmers, this has yet to reach a signifcant scale within the city. Within this context, it is important to:

- Examine drinking water supply and sanitation arrange-

Map 2: Kolkata drainage basins. Source: Herzog et al, 2008, p.60-61



Urban sprawl in the eastern part of Kolkata has seen the rapid conversion of huge hectares of the wetlands since the 1960s. In the 1990s, civil society groups along with grass-roots actors waged a battle against the state (Dembowski, 2001) and successfully sought the protection of the wetlands from further encroachment. In 2002, 12,500 ha of EKW was recognized as a Ramsar site, ensuring the conservation and sustainability of these wetlands areas. However, despite this internationally recognized protection, water bodies are still being encroached upon and converted within this area and its environs. Recently, there has been a conflict between the KMC, Kolkata Metropolitan Development Authority (KMDA), Department of Irrigation and Waterways (DoIW) and Fish Producers' Associations over the operation of gates on the sewage canals, impacting the supply of waste water being channeled into the *bheris*. A recent report published in the Times of India commented: "The flow of sewage into the fish farms or bheris has been deliberately reduced in an attempt to snuff out fishery and farming and make way for conversion of the land into real estate" (Subhro Niyogi, Feb. 6, 2015). This mirrors wider trends of urban development within the city, impinging upon hard-fought rights for the ecological protection of the wetlands. While the KMDA and other government and development agencies like the West Bengal Industrial Development Corporation, and the West Bengal Housing Infrastructure Development Corporation (HIDCO) are interested to attract private investments through urban and industrial development in this region, environmentalists, civil society groups (PUBLIC, Save the Wetlands, amongst others) and local residents are strictly against such ventures, pushing instead for the preservation of the wetlands.

1.3 Water injustice and emerging urban development trends

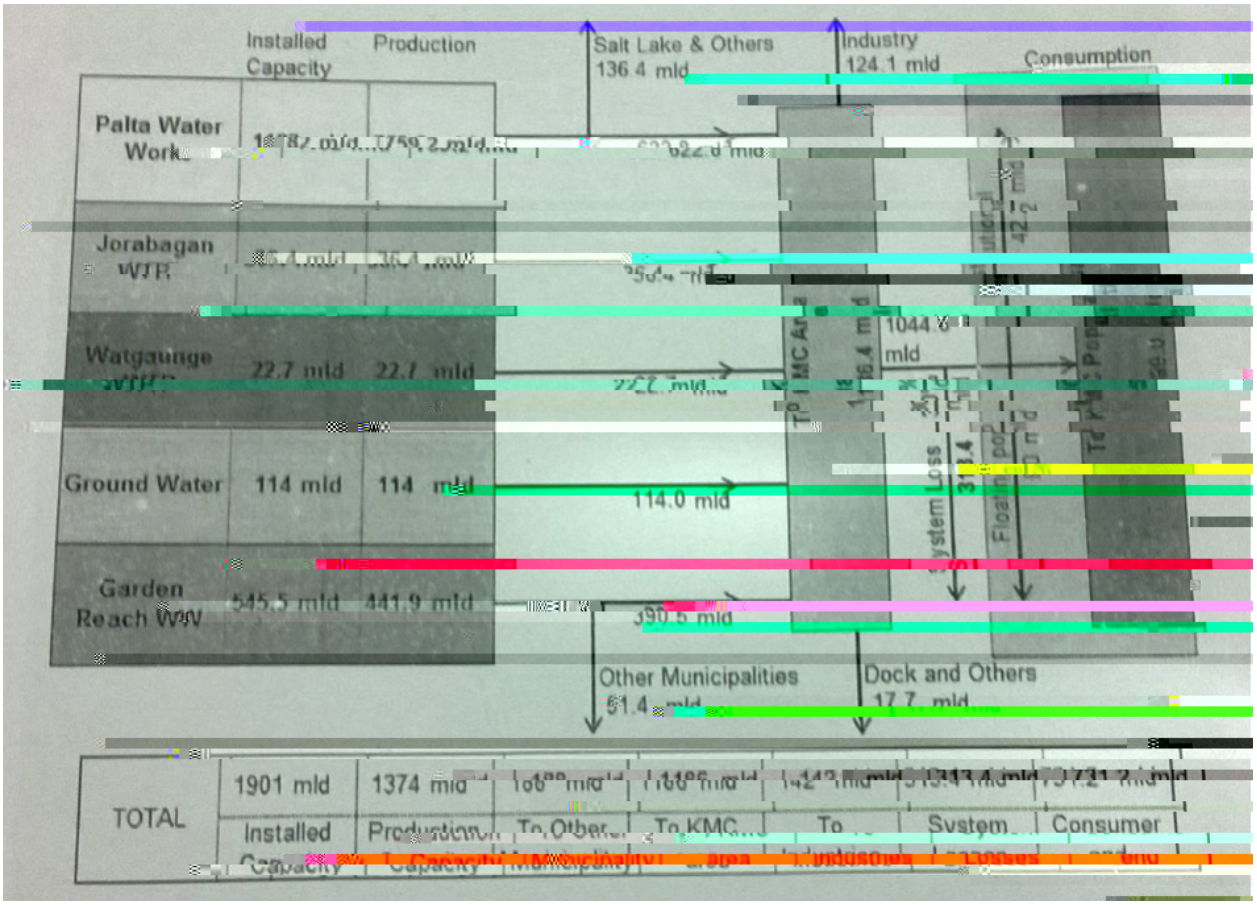
The evolution of modern water injustices experienced at the city-level in Kolkata can be traced back to colonial times. In 1868, the Palta Water Station was constructed [4], providing treated and filtered piped water supply (from the Hooghly River) to the then most affluent 2,316 houses out of the total 16,000 in the city. The remaining 'black town' lacked access to both piped water supply and sanitation facilities. In 1872, C. Fabre-Tonnerre, Health Officer for the Calcutta Municipality writes:

> *"A bustee or native village [black town] generally consists of a mass of huts constructed without any*

> *plan or arrangement, without roads, without drains, ill-ventilated and never cleaned….In these bustees are found green and slimy stagnant ponds, full of putrid vegetable and animal matter in a state of decomposition and whose bubbling surfaces exhale, under a tropical sun, noxious gases, poisoning the atmosphere and spreading around disease and death. These ponds supply the natives with water for domestic purposes and are very often the re-*

While the Palta Water Works project was laid out in stages (Table 1) to supply nearly 1,700 million litres every day, its spatial distribution has continued to disproportionately

Figure 2: Water production, distribution and losses for KMC. Source: Chakrabarti, 2013, p. 25



NOTES TO CHAPTER 1

1. The wetlands are known as the East Kolkata Wetlands, and the nomenclature owes to Dhrubajyoti Ghosh, an environmental engineer who frst discovered and documented the resource recovery features of the landscape.

2. The EKW consists of roughly 20, 000 ha of which 12,500ha is designated as the Waste Recycling Region (WRR). This is the core area which has achieved Ramsar recognition and protection since 2002.

3. The salt water marshes existed on the eastern part of the city for many years. The marshes were saline as a result of the Bidyadhari River overrunning into the low-lying marshes. The Bidyadhari River acted as the outfall channel for the disposal of stormwater and sewage for the city; when the river decayed in1928, the Kulti Outfall Scheme (further east of the region) was executed and commissioned in 1943. With this diversion in the discharge of the city, the salinity of the salt lakes dwindled from 800–1200 parts per million (ppm) to 500–600 ppm. This turned the once proftable nona bheris (saltwater fsheries) into sewage-fed fsheries. The saltwater marshes that existed 200 years back between the Hooghly and Bidyadhari Rivers gave rise to the present EKW (Gupta, 2005, p.24). When the Kulti Outfall Scheme was implemented, an adequate water-head was raised for supplying sewage to most of these fshponds, which resulted in the extension of wastewater fshponds further east and south-east for about 8,000 hectares (Ghosh, 2005, p.48).

4. And with this Kolkata became the frst city in Asia with piped water supply.

5. The population of Kolkata increased from 3.2 million in 1981 to 14 million in 2011.

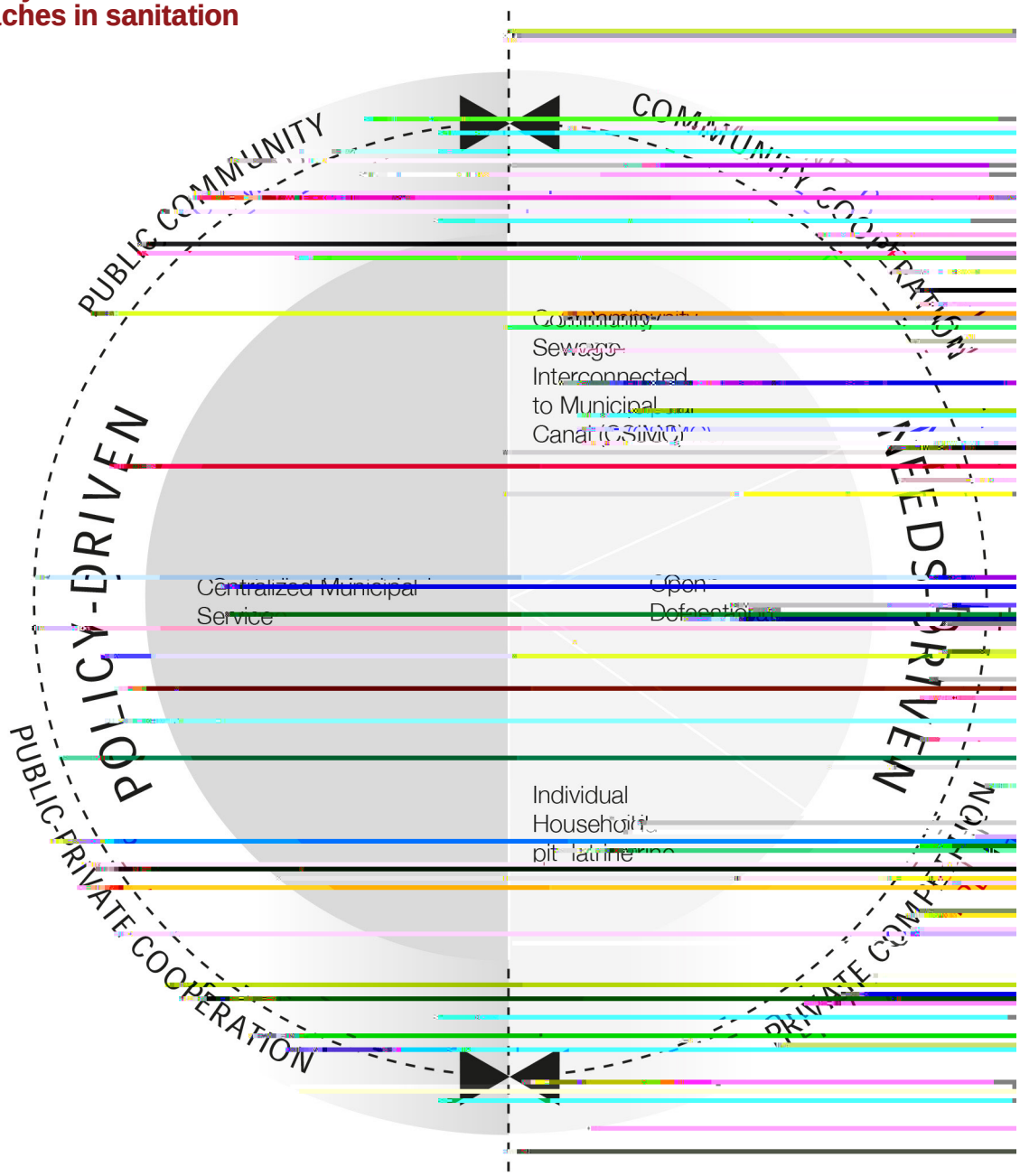
6. In 2006, the Palta treatment plant had to be shut down as

These challenges of municipal service provision are mirrored within the East Kolkata Wetlands. Within this area, the vast majority of residents lack access to fltered piped water supply. lnstead, residents rely upon a number of needs-driven and demand-driven arrangements: purchasing water from municipal tankers, private vendors, an NGO-supported community drinking project (water treatment plant) (at lower prices than vendors), or for the poorest of household, collecting from the sewage-fed ponds (*bheris*) (Table 2).

Practice	Type	Characteristics			

Practice	Type	Characteristics	Approx. Cost	Examples	Additional observations
Water vendors	Needs driven	Vendors work privately, either extracting ground water from tube wells, collecting fltered surface water from pressure release points, purchasing water from the community drinking water project, or leaking KMC pipes. They distribute it using bicycles or tricycles to neighbourhoods. HHs purchase the water and have it transferred into their own containers.	The price of water varies between Rs. 5 to Rs. 20 for a jar of 20 litres, dependent upon the distance travelled by the vendor.	Bidhannagar (ward no.17) Dhapa Bantala	With inadequate and poor municipal service coverage, this form of small-scale business is fourishing, with many poor members of peri-urban HHs becoming involved.
Community drinking water project	Needs Driven	A small water treatment plant has been set up through a joint initiative by a private company and an NGO (SAFE) to provide treated water at a very low price. This plant treats surface water and at the same time conserves water through rain water harvesting.	60 paisa/litre	Shukantanagar *bheri* (within Bidhannagar (ward no. 17)	This project is seldom used directly by peri-urban poor residents as they lack the storage capacity, and often cannot travel 5kms daily to reach the project. Instead, this facility is often used by middle-class HHs in the adjacent areas that also lack fltered piped water connection. It is also used by water vendors and distributors who collect and sell among the peri-urban poor and others at an infated price.
Small individual/ private water treatment plant	Needs Driven	Individual HHs have set up water treatment plants without permission from the municipality. These plants generally use ground water as the raw source and have the capacity to produce 500-1000 litres of treated water per hour.	Rs. 10 for a jar of 20 litres	Bidhannagar (ward no. 17)	The complex dynamics relating to these distributive mechanisms are yet to be examined.
Bheris (sewage-fed ponds)	Needs Driven	The pond water is consumed directly and used for other domestic purposes.		Bidhannagar (ward no. 17) Bantala Dhapa	The poorest of the PU HHs depend on this practice.

2.2 Policy-driven and needs-driven approaches in sanitation



Source: Elaborated on the basis of Allen et al., 2006a; 2006b

Sanitation is a broad, overarching concept that includes the provision of facilities and services for the safe disposal of human excreta, solid waste and waste water. In developed countries the majority of people are served by 'environmental sanitation', which "focuses on the entire chain of managing wastewater, looking for the optimal approaches and technologies related to collection, transport, treatment and disposal of wastewater flows" (Wetlands International, 2010, p. 29). Safe disposal of wastewater is a complex issue, and the costs of wastewater treatment and disposal depend on the different technologies used along the sanitation chain (Tilley et al, 2008).

Historically, sanitation in Kolkata has had a lower priority amongst planners (Nath, 1991). 50% of the city's population and 55% of the KMC area is covered by sewerage network measuring 1,610 km, and consisting of 1,430 km of piped sewers and 180 km of brick sewer line. The city has no sewage treatment plants (STPs) within municipal boundaries. There are three small plants located outside the municipal limits at Bangur, Garden Reach and

Bagha Jatin (Map 2), however, these have little capacity: 45 mld, 48 mld and 2 mld respectively.

In spite of the lack of major STPs, the city does have a natural waste engineering plant and recycling infrastructure, which relies upon low-cost indigenous technology and techniques. The EKW and Dhapa landfll area absorb

vary from the use of single and double pit latrines connected to septic tanks, to makeshift community sanitation systems connected to municipal canals (CSIMC), to open defecation. The exact percentage for all these

3. Overview of Co-Produced Practices in the EKW

Co-produced water and sanitation practices in the East Kolkata Wetlands must be contextualized in relation to the wider socio-political forces and legal restructuring which occurred in West Bengal. The *West Bengal Estates Acquisition Act* and *West Bengal Land Reforms Act* were implemented in 1953 and 1955 respectively, to abolish zamindari (aristocrat) ownership of land. However, these acts contained exemptions covering tea gardens, orchards and fsheries, and as such individual fsh farms in peri-urban Kolkata largely remained intact until recently. In 1995, the *Land Reforms Amendment* was passed, at which time the fsheries were covered. This led to the cooperativisation of a number of bheris, when private holdings were vested from their owners by the state and transferred to fsheries groups and cooperatives. This led to the decline of large privately owned fsheries, however a number of smaller, household-managed ponds continued to exist. At this time some of the large fsheries were also directly acquired by the government, through the State Fisheries Development Corporation.

Today, a wide range of dynamic CWM practices involving multi-level stakeholders can be identifed in the EKW impacting both water and waste arrangements. Fishermen and farmers depend on the municipal supply of waste water and solid waste for pisicultural and agricultural activities. Fish production in the *bheris* depends on a number of factors, including coordination among various stakeholders. Within the government, this includes the KMDA, KMC, DoIW, Dept. of Environment (DoE), Dept. of Fisheries (DoF) and West Bengal Pollution Control Board (WBPCB). It also includes external supporting agencies and programmes such as the Asian Development Bank-funded Kolkata Environmental Improvement Investment Programme (KEIIP). Finally, this also includes fsh producers associations and fshermen and women (Table 4).

Stakeholders	

Around 8,500 people are employed in the 264 *bheries*

4. Selected Case Studies

4.1 Bidhannagar (ward no. 17)

Ward 17 of the Bidhannagar Municipality contains 65 bheris, including two of the largest government owned *bheris*: Nalban and Goltala. Similarly, some of the largest cooperative *bheris*, such as *Baro Chaynavi Matsya Samabay Samiti* cooperative, also lie within the administrative division of the BMC. The cooperative fsheries, in particular, have played an important social and ecological function in this area of the wetlands, supporting everyday water and sanitation strategies for residents. Cooperative fsheries in this area also practice integrated aquaculture and similar activities (horticulture, cattle rearing, poultry), using municipal waste water and biodegradable solid waste.

Ward 17 lacks fltered piped water supply arrangements provided by the municipality, and residents depend alternatively upon a number of other policy and demands driven initiatives (Table 2). Individual and small-scale private water treatment plants (producing 500-1000 litres of water per day) are increasing being established in this area, particularly following the success of the community water drinking project implemented by SAFE and Waterlife. The secretary of one of the cooperative fsheries has indicated that the cooperative also has a plan for installing a private water treatment plant that would be fully managed and run by cooperative members.

Around 50% of households lack municipal sewerage coverage and rely upon makeshift private sanitary arrangements, with the sewage ultimately discharged either into the canals or the *bheris*. However, this practice is being highly discouraged by cooperative fsheries, which have Y

and document the coping strategies adopted by the local fishermen in response to these challenges.

4.3 Dhapa

Dhapa has been the dumping ground for the city's solid waste from 1865, when a one-acre piece of land was acquired on the western edge of the wetlands to dump garbage from the city. During the period of colonial rule, a company called the Salt Water Lake Reclamation Company started experimenting with sewage and garbage farming to raise paddy, vegetables and cotton. From this point, "…the dumping of garbage and farming on it began simultaneously and have remained an inseparable whole" (Hertzog et al, 2008, p. 77). However, though initially successful, in absence of technical support from government actors or other experts, this practice of garbage farming was maintained only through the efforts of indigenous farmers.

The entire Dhapa region is owned by the KMC, which

5. Conclusion

The Kolkata case strongly highlights the need for the emergence of more inclusive paradigms in urban ecological research (Mukherjee, 2015). There seem to be two major paradigms dominating the city: on the one hand, urban and the peri-urban areas are studied using a framework of domination/subordination, in which peri-urban areas function as both an output and an input—produced and required by the city (Mukherjee, forthcoming). From another perspective, rural and peri-urban areas are perceived as a liability to the growth and development of the urban core (the economic nucleus) (UN Habitat, 2012; UNECOSOC, 2014). This research seeks to challenge these prevailing paradigms, highlighting the metabolism between the city and its PUI, characterized by mutual linkages, interactions and interdependencies, rather than in contrast or contradiction.

The East Kolkata Wetlands are the largest community managed waste-water fed aquaculture system in the world. As such, there is a strong potential to explore the ways in which these co-produced waste management practices can contribute to both the ecological sustainability and empowerment of local communities, as well as scale-up across different sites. Cooperative management structures that have formed around the fsheries have already demonstrated evidence of contributing to both the social and ecological functioning of the wetlands and its residents. It is evident in this case that marginal peri-urban communities play an immense role in the sustenance of the city. However, these systems still need to be studied in more detail, interlinking the water (and waste) trajectories at work within the city with those water regimes operating within the entire basin. It is also important to identify the (local and extra-local) challenges and conditions that have hindered a deeper recognition from local authorities (such as planners and officials) of the immense potential of this system in supporting productive, ecological, and social functions in the city.

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