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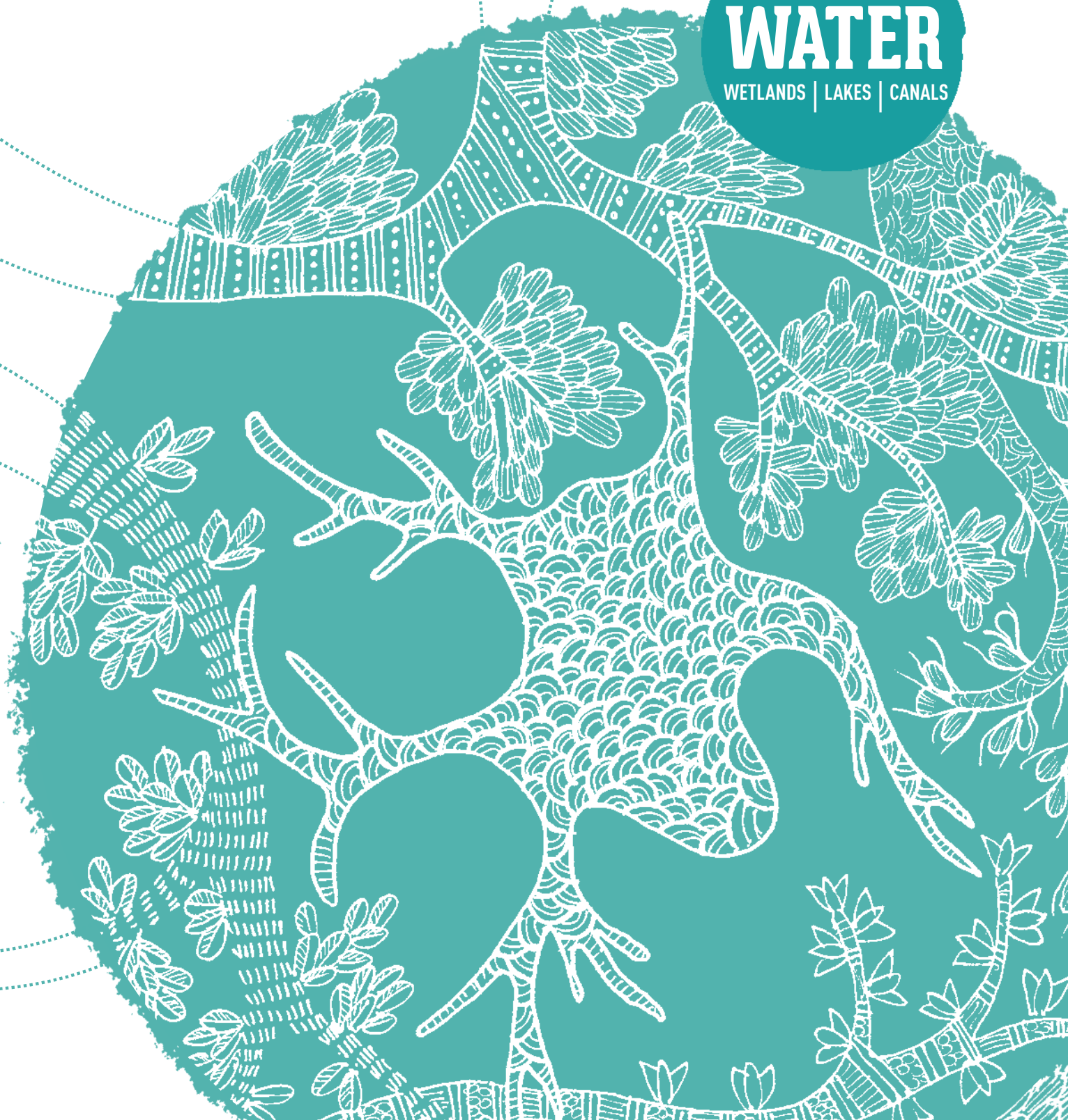
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WATER

WETLANDS | LAKES | CANALS





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LAKES OF DELHI

Across Delhi's history, one can see how its citizens have long reaped immense economic, military and environmental benefits through the successful management of the region's topographical and hydrological resources. The technological limitations of the past made certain that our ancestors developed a gradual understanding and learning of nature through incremental improvements and interventions. While the succeeding generations may have inherited the city's natural resources, they have, sadly, not inherited the knowledge of how valuable these resources are and why they need to be cared for. In the rush of fast paced development today, the natural resources of the city have been condemned to an unfortunate state of neglect and disregard.

One such valuable natural resource are the ponds, also called *johads*, which are traditional, community-owned catchments that store rainwater harvested throughout the year. The water from a *johad* is generally used for washing, bathing and drinking purposes by humans and their cattle. It also recharges the groundwater. They were an intrinsic part of a historic integrated system of water management. However, due to many complex factors, very few have survived but most of them have lost their ecological significance.



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The lake [johad] near Bakkarwala village lies outside the abadi area. With a temple near by, the water is used for rituals and is comparatively cleaner all through the year.

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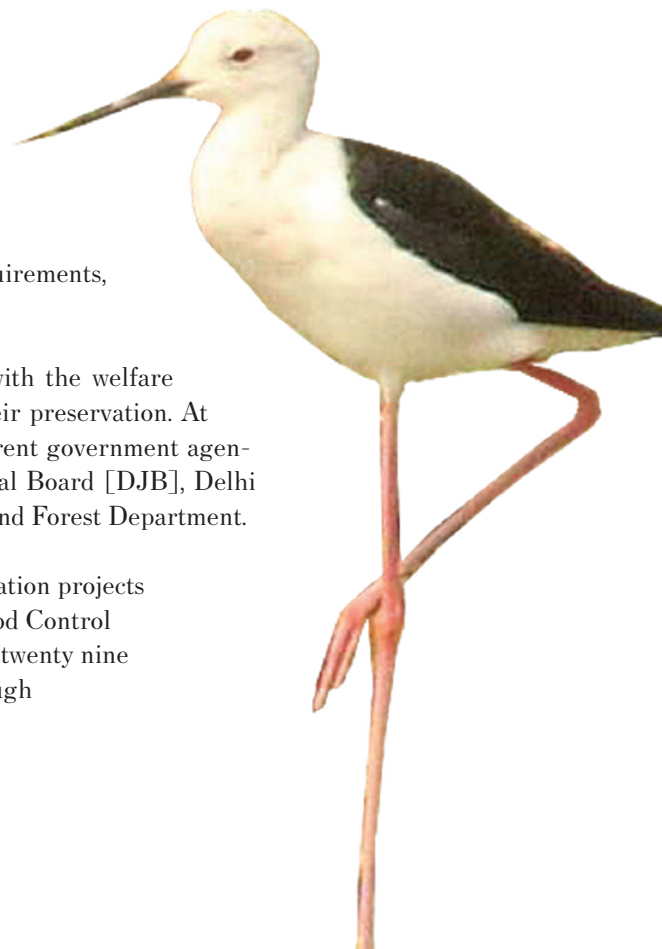
The lake of Mohammadpur Majri lies adjacent to the abadi area. It is quite large and attracts several birds. The water also is used for bathing cattle.



The *johads* that have survived are primarily located in rural realms. Many of them are in good natural state, while many are now used as dumping grounds of the waste generated by the surrounding villages. Many times, the villagers attempt to reclaim the land by filling them up. Moreover, due to the public ownership status of these *johads* which implies the existence of negligible acquisition proceedings and minimal compensation requirements, they are always vulnerable to encroachments.

Over the years, no single government agency has been entrusted with the welfare of these significant water bodies or has remained responsible for their preservation. At present, these water bodies fall under the jurisdiction of eleven different government agencies—Gram Sabha, Municipal Corporation of Delhi [MCD], Delhi Jal Board [DJB], Delhi Development Authority [DDA] Architectural Survey of India [ASI] and Forest Department.

With Delhi Government's push to revive water bodies, multiple restoration projects have been initiated by the Delhi Jal Board and the Irrigation and Flood Control Department. To assist in one such project, we undertook the survey of twenty nine water bodies located in West, North-West and South-West Delhi through





BIRD LIFE AT THE WATER BODIES
 [LEFT TO RIGHT] Red-wattled lapwings, Black-winged stilts and Greylag Geese

NEERI [National Environmental Engineering Research Institute]. Here, I would like to share part of my ongoing work of listing and documentation of some of these historic water structures [located in the north-western region of the city].

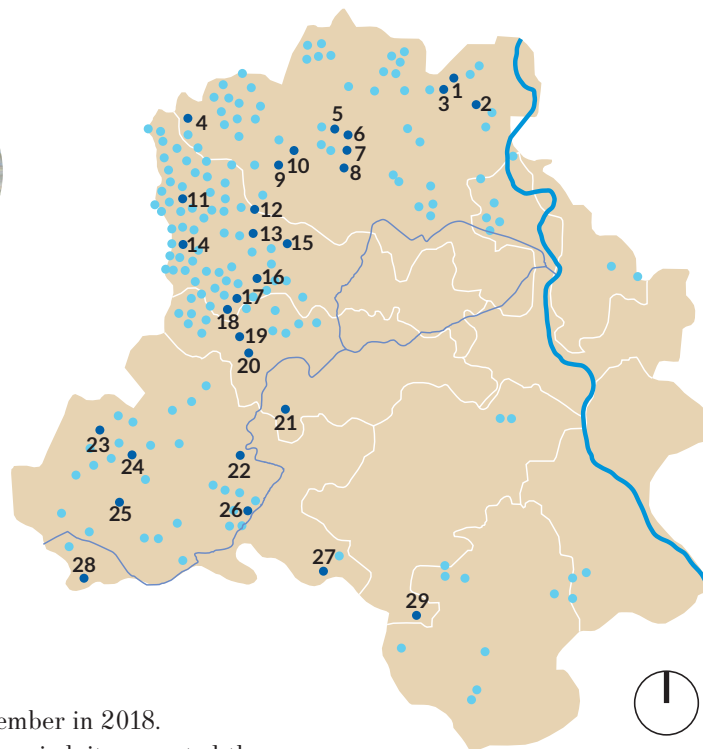
The Survey

The initial survey was conducted from September to November in 2018. Since these months immediately follow Delhi’s monsoon period, it presented the opportunity to understand the inherent role of each pond within the regional water infrastructure system—as a run off catchment saturated to its maximum water carrying capacity with storm water draining into it and a thriving biodiversity [seasonal plants and birdlife] living off and around it.

The study would generally begin in the early morning hours. A typical site study of the pond comprised a team of urbanists [in this case, our team] accompanied by a Junior Engineer and personnel from the Flood and Irrigation Department [*beldar*], who were well versed with the history of the place. Active support from village communities, elders and the local panchayat proved very helpful in the whole process.

The first part of the work involved a physical survey of each pond. This included studying and mapping the various aspects of the pond from its location, access points, abutting edges and surroundings, land use, built structures in the vicinity and the activities and circulation around it. An activity chart was then drawn up which mapped the activities that took place in and around the pond throughout the day. Since this was majorly a public task, the villagers showed a keen interest in the process and would often share stories and their recollections of the pond. The study further identified the pond’s local, regional, cultural and environmental significance, surrounding biodiversity, imminent threats which were followed by recommendations with broad conservation methods.

The second stage of the work involved transcribing the collected data into the standardized format for easy reference and comparison which included an analysis of the boundary conditions of the site, the status of the water body and its water level, the vegetation in and around it and the built structures dotting the site.



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VILLAGES OF DELHI IN WHICH SURVEYED WATER BODIES ARE LOCATED

1. Bakkarwala
2. Baprola
3. Barwala
4. Daryapur
5. Daurala
6. Garhi Bakhtawarpur
7. Ghewra-A
8. Ghewra-B
9. Ghitorni-A
10. Hamidpur
11. Hiran Kudna
12. Holambi Khurd
13. Kanganheri
14. Karala-B
15. Khera Dabar
16. Khera Khurd-A
17. Khera Khurd-B
18. Ladpur-C
19. Mohammadpur Majri
20. Mundela Kalan
21. Mungeshpur
22. Nangli Shakrawati
23. Nithari
24. Nizampur
25. Puth Khurd
26. Rasulpur
27. Salahpur
28. Sultanpur
29. Tajpur Kalan



PROJECT: GHEWRA-A WATER BODY, GHEWRA VILLAGE

↓ MAPS

Google maps of Gherwa Village showing the lake, its access and the surrounding built structures and activities

→ SITE INVESTIGATION AND DOCUMENTATION PROFORMA

The survey of the water body included various important aspects – Site area, onlets of water bodies with assumed levels, character of lake bed, lake edges, issues, status of surrounding flora and fauna, surrounding temporary and permanent structures and activities on site



SITE INVESTIGATION AND DOCUMENTATION PROFORMA		WATER BODY NAME: GHEWRA-A	
Khasra No.: 223, 223/1		Date of Site Visit: 20/09/2018	
		Time of Site Visit: 9:00 am	
		Visit conducted by: Intekhab Alam, Mriganka Saxena	
		District/ Town/Village: West Delhi/ Gherwa	
		Site Coordinates: 76° 59'50.51"E/ 28° 41'35.47"N	
		No. of water bodies in the town/village: 03	
1. Proposed Site Area (Water body and adjacent and where restoration works may be planned)		Total Site Area(sq.m): 14,985 (source: Google earth)	Area of Water Body (sq.m): 14,288 sq.m (source: Google earth)
		Area of adjoining lands for landscape development (sq.m): 697 sq.m	
2. Access			
General Description: The water body is located towards the south-west in Gherwa. Houses are built to the edge of the water body giving no or very little space to access it. There are two streets which lead to the water body and one open access to the north. There are no pathways etc: even on the periphery.			
No. of access roads/ streets to the site: 03			
Are these gated/ non gated? Non-gated			
No. of planned access points into the water body, if any, and their description: None			
3. Boundary Conditions (Boundary of proposed site)			
General Description: There is no fencing around the water body. Only recently one small stretch of boundary wall was erected to stop the water coming towards the village area.			
		Height	Material
Condition 1	1.5 m	Concrete wall and steel railing on top	Due to contact with water, the boundary wall is getting damaged at the bottom
Condition 2	3 m	Concrete wall and steel railing on top	MCD School boundary
4. Water Body			
Status: Wet		General Description: Remains wet throughout the year.	
Area (sq.m): 14,985			
Perimeter (m): 588			
Assumed Depth (m): 2.5-3.0			
Surveyed Depth (m): NA			
Assumed Volume (cum.): 37470 approx			
5. Inlets			
No. of Inlets and Inlet Structure		Details: Waste water from the village flows in the storm-water drains along the streets, finally falling into the water body. Cow dung also comes in the water body directly from the dairy farms located immediately adjacent and from those in the surrounding neighbourhood.	
Inlet 5	Open Drain Channel	Cemented storm water drain along access road	
Inlet 5	PVC Pipe	Direct drain from adjoining homes	
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Inlet 5	PVC Pipe	Direct drain from adjoining homes	
6. Water Levels Assumed			
High Flood Level (m)		0.5	
Water Level (m)		NA	
Water Table (m)		NA	
7. Water Body Bed			
Not lined			
8. Water Body Edge Condition:			
General Description: The periphery/ edge of the water body is not lined. The southern edge is defined by a concrete boundary wall of the MCD School. At one location, a concrete road has been made within the line of the water body.			
		Soft/ Hard	Material/Surface
Condition 1	Hard	Concrete road	Residents have encroached on the water body by making a concrete road at site access point.
Condition 2	Hard	Boundary wall	Boundary walls of MCD School and adjacent homes
Condition 3	Soft	Solid waste, cow dung, soil	Left over spaces around the site
9. Solid Waste			
General Description: Primarily unsegregated domestic waste and cow dung			
Number of solid waste dumping zones: 03		Description (Extent & Type)	
10. Vegetation			
Vegetation on Site			
General Description: Vilayati keekar is grown widely on site, there are few peepal and neem trees also near access roads			
Trees (Number & Type)		20-22, native type	
Shrubs- Description		Native shrubs are growing widely in some part of the pathway	
Grasses- Description		Wild grasses could also be seen on the edge of water body especially near MCD School	
Vegetation in Water Body			
General Description: Reeds and grasses are seen at certain locations			
Grasses/ Shrubs- Description			
11. Built Structures on Site (Temporary & Permanent)			
No. of Structures: 04		General Description: There are structures at the periphery of site in the form of built permanent road or temporary cow shed structure.	
Structure 1	Road	Encroached concrete road, damaged in some parts	
Structure 2	Well	Stone wall well near access no-02, the structure is said to be very old as told by villagers and needs repairs	
Structure 3	Cow Shed	Temporary cow shed made of asbestos sheet with wooden pillars for support	
Structure 4	Cow Shed	Temporary cow shed made of asbestos sheet with wooden pillars for support	
12. Activities on Site			
		General Description: Due to poor condition of the water body and lack of any access, people are not using the water body for recreational purpose. Water is used for bathing of cows.	
13. General Observations:			
		Planned access on all sides is required to ensure upkeep and maintenance of the water body. Limited opportunities exist for landscape development. However, approach roads/ streets to the water body and edge conditions can be substantially	



PROJECT: GHEWRA-A WATER BODY, GHEWRA VILLAGE

LEFT [TOP TO BOTTOM]

- ← In Ghewra village, the lake is not visible from the main access road. Unless one asks the villagers, it is difficult to locate it from outside
- ✓ The main access to the lake has been reduced to a solid waste disposal unit
- ✓ The lake carries all the waste water and storm water of abadi area
- ✓ View looking towards west from school building towards the lake

Approach to Landscape Development

During the study it was observed that on sites where the *johads* lay in proximity of a religious building such as a temple, they were relatively cleaner and well kept. These ponds became an active and integrated part of the village's cultural life with people worshipping and maintaining them as sacred entities. On the other hand, the ones that lay far off from settlements became dumping grounds, remained neglected and hence became cesspools. It was an important lesson that such ecologically fragile areas located near settlements need to be conserved for their natural significance as well as for their potential public use.

It would include the restoration of *johads* through various measures—dredging, treating the influent, afforesting with appropriate species, improving water percolation capacity, preventing erosion and filling and preventing its encroachment for unsustainable uses. These methods would further help in creating a habitat conducive to the growth of the receding aquatic and avian biodiversity in the region. It would also augment the depleted groundwater reserve, create a better micro-climate and act as a wetland that mitigates local flooding of surrounding areas through effective storm water management strategies and enhanced retention during the monsoons.

Secondly, to create cost-effective, easy-to-maintain and sustainable landscapes that cater to all age groups and sensibilities, various recreational facilities like walks, cycling tracks, grounds, orchards, cultural zones and other robust amenity spaces for the surrounding communities can be explored which can also facilitate other social needs.



These ponds, once revived, will instill a sense of pride within the local community, make them realize their value and inspire them to remain actively involved in their upkeep and maintenance.

Most of the settlement near these *johads* are quite old. They still retain the basic characteristics of a typical Indian village, with many of these having Panchayati system. The villagers have witnessed transformation of these *johads*. Once the backbone of the settlement, they now lay neglected. Even in some of the cases they are not even visible from the main access road.

The task in hand is quite complex due to multiple issues like difficulty in bringing machinery to site, unmanaged solid waste disposal, non segregation of storm water and waste water, absence of a sewerage network, unclear status of surrounding land ownership to name a few. Lastly, for the success of the project it needs to be ensured that once works are completed, local communities take pride in the natural asset and get involved in its upkeep and maintenance for perpetuity, restoring ecological value and putting management regimes that are sustainable for the long term. By doing so, they will create a public asset that they can use and enjoy with pride.

All images courtesy the Author



↑ *Water body at Mohammadpur Majri*

CLIENT
National Environmental Engineering
Research Institute [NEERI]

DURATION
2018—Ongoing

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