Department of Architecture
Faculty of Architecture & Ekistics
Jamia Millia Islamia, New Delhi

SCHOOL OF WATER & WASTE
AAETI

CSE Knowledge Partnership to Strengthen Capacities to Develop Water Sensitive Cities

2ND ONLINE IMPACT WORKSHOP CUM MASTER CLASS ON CAPACITY BUILDING INITIATIVE FOR CITYWIDE WATER AND SANITATION MANAGEMENT

Prof. Hina Zia
Head of the Department, Department of Architecture
Faculty of Architecture & Ekistics, Jamia Millia Islamia

Department of Architecture
Faculty of Architecture & Ekistics
Jamia Millia Islamia, New Delhi

in collaboration with

SCHOOL OF WATER & WASTE AAETI

NOVEMBER 2020 to JUNE 2021

ONLINE + ON-CAMPUS

ONLINE COURSE ON

'GREEN INFRASTRUCTURE - EFFECTIVE MEASURES TO MANAGE URBAN FLOODING AND WATER SUPPLY'

Course Dates: 2nd November to 30th November, 2020

ONLINE

ONLINE COURSE

WATER SENSITIVE URBAN DESIGN AND PLANNING

DATES: 26th of May to 4th of June, 2021

VENUE: Online mode (Moodle and Zoom platform)

LANGUAGE OF INSTRUCTION: English

Participation by Invitation only

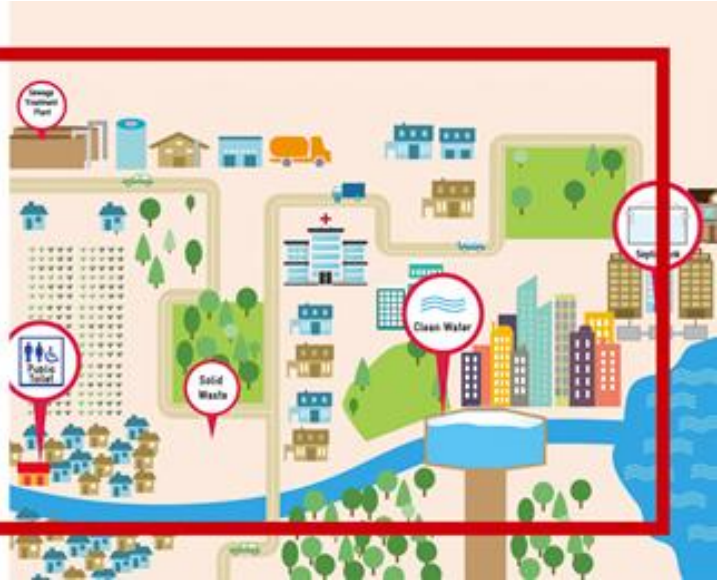
ONLINE

ONLINE TRAINING ON

CITY-WIDE SANITATION PLANNING

Training Dates: 5th June to 14th June, 2021

Total Study Hours: 24 hours (6 hours per week)



Participants:
Faculty Members (B.Arch & M.Arch) and
Students (M.Arch Urban Regeneration/ Ekistics/ Recreation Architecture)

Department of Architecture
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in collaboration with

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AAETI

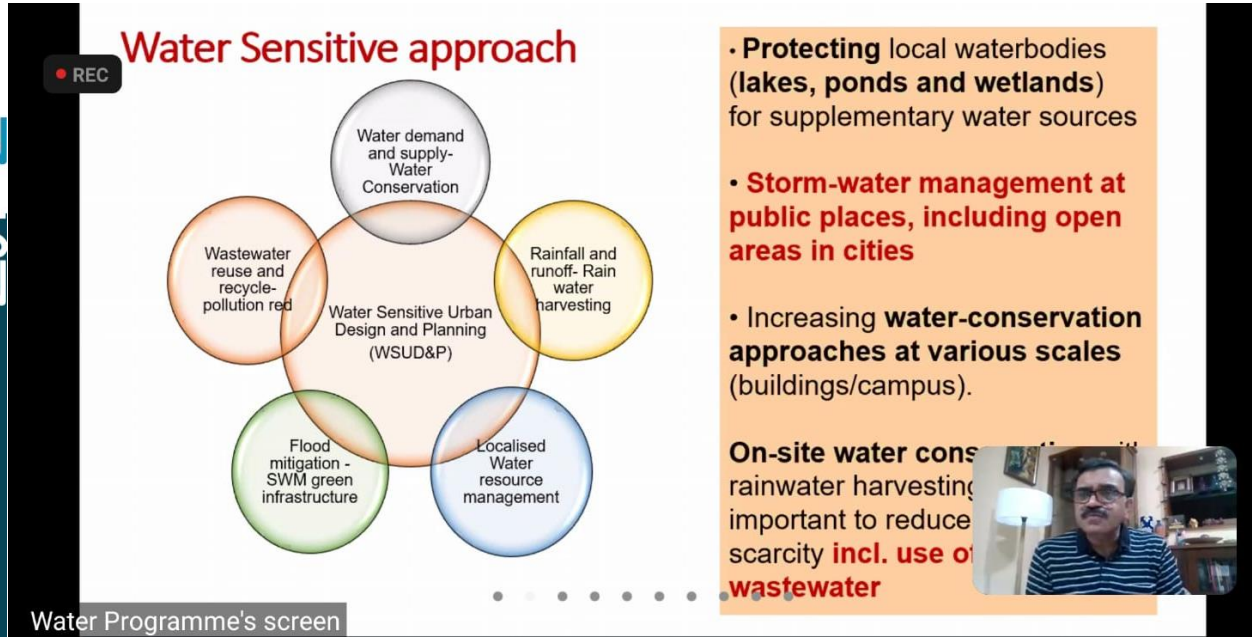
On-Campus Training at AAETI**: Green Infrastructure – Effectives Measures to Manage Urban Flooding and Water Supply**, **January, 2021**

-

Participants: *Faculty Members (B.Arch & M.Arch)*
and Students (M.Arch Urban Regeneration/ Ekistics/Recreation Architecture)

Department of Architecture
Faculty of Architecture & Ekistics
Jamia Millia Islamia, New Delhi

in collaboration with CSE SCHOOL OF WATER & WASTE AAETI



Online Training by School of Water & Waste, AAETI**: WSUDP and Citywide Sanitation**
May-June 2021

-

Participants: *Faculty Members and Students of M.Arch Urban Regeneration (Sem II)*

The learning from the three workshop and training programs were incorporated by the faculty members and students in the following subjects at the undergraduate and postgraduate programs (table below). The objective is to include the GI, WSUDP and CITY SAN components in the syllabus to further streamline the learning and make it part of pedagogical practice.

Program	Subjects
B.Arch	AR 201: Architectural Design Studio -II AR 401: Architecture Design Studio-IV AR 405: Landscape
M.Arch Urban Regeneration	MAR 256: City Studio (Sem II) MAR 452: Thesis (Sem IV)
M.Arch Recreation Architecture	MAR 442: Thesis (Sem IV)
M.Arch Ekistics	EK 402: Thesis (Sem IV)

STUDENT/ALUMNI WORKS

Green Infrastructure	**Landscape (B.Arch 4th Year)**
	Thesis (M.Arch Urban Regeneration)
	Thesis (M.Arch Recreation Architecture)
WSUDP	**City Studio (Sem II_M.Arch Urban Regeneration)**
CITYWIDE SANITATION PLAN	**City Studio (Sem II_M.Arch Urban Regeneration)**

Department of Architecture,
Faculty of Architecture & Ekistics,
JAMIA MILLIA ISLAMIA

Program: Master of Architecture
in **Urban Regeneration**
Semester II_Studio II_2021

UR URBAN REGENERATION

WATER URBANISM

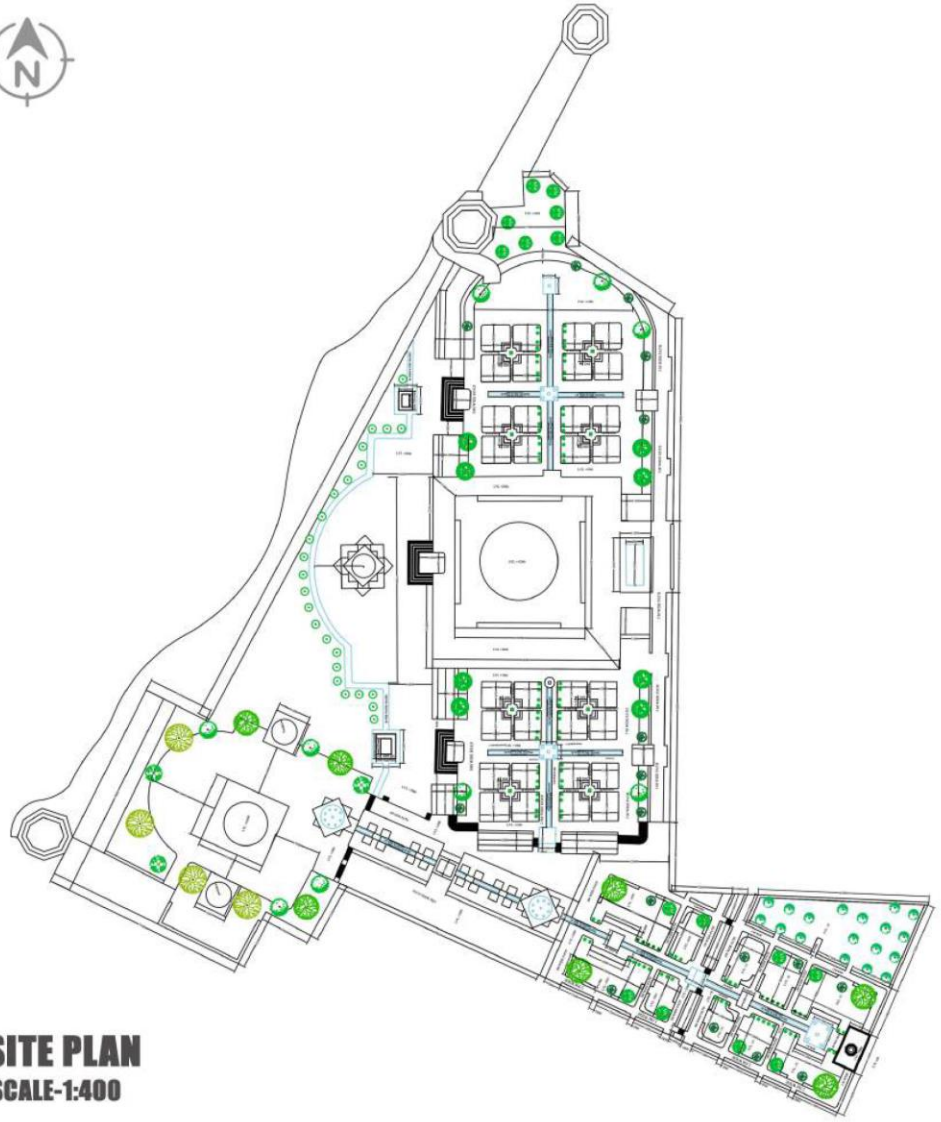
INFRASTRUCTURE & HYDROLOGY

CITY LABORATORY: DELHI

CHINI KA RAUZA
AGRA

UMBER SHOAIB KHAN | B.ARCH 4TH YR (DAY) | LANDSCAPE

1



SITE PLAN
SCALE-1:400

RAINWATER HARVESTING POTENTIAL

SURFACE	AREA(sqm)	Run off Coeff.	Peak Rainfall intensity(m)	RWH Potential (cum/hr)
PERMEABLE PAVERS	15,436	0.7	0.4	4322
FILTER DRAINS	922	0.5	0.4	184.4
ROOFTOP	2634	0.8	0.4	842.4
HARD PAVED	4437	0.65	0.4	1153.6
TOTAL STORM WATER LOAD				**6501**
Considering 15 min(0.25) retention period				1625.25
Taking effective volume of RWH pits 8m x 6m				96
RWH pits required				17
RWH pits proposed				**12**
GROUNDWATER RECHARGE POTENTIAL	18,986	0.3	0.4	2278.32

SUDS FEATURES

CHINI KA RAUZA
AGRA

UMBER SHOAIB KHAN | B.ARCH 4TH YR (DAY) | LANDSCAPE

LANDSCAPE MASTERPLAN
SCALE-1:400

HARDSCAPE PLAN

THE HARDSCAPE PLAN SHOWCASES THE CIRCULATION ROUTE THAT SHALL BE OPTED BY VISITORS TO CHERISH THE CHINI KA RAUZA COMPLEX.THE ROUTE MAJORLY STANDS DIVIDED INTO LINEAR PATHS OPENING INTO PLAZAS,PLAZAS BEING THREE IN TOTAL.THESE PLAZAS ARE WIDER RELATIVE TO PAVED PATHS STARATEGICALLY PLACED AS POINTS OF REST AND OBSERVANCE.

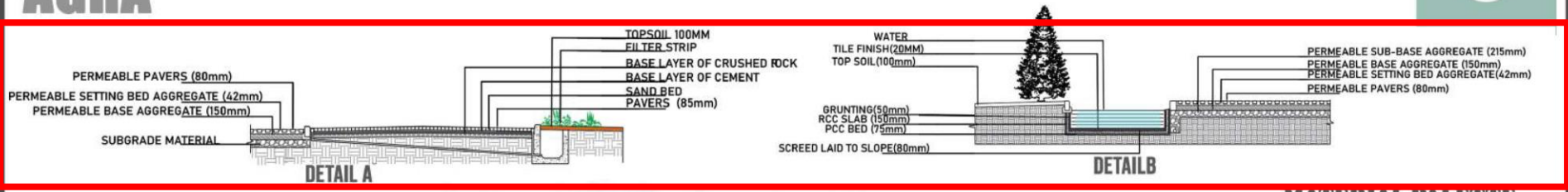
SOFTSCAPE PLAN

THE SOFTSCAPE PLAN INDICATES THE AMOUNT OF LAND RATIO DEDICATED AS PLANTATION AND LAWNS.OVERALL THE EFFORT OF DESIGN SCHEME HAS BEEN TO UTILIZE MAXIMUM POSSIBLE AREA UNDER GREEN TO MAINTAIN GROUND WATER POTENTIAL OF SITE.THE SOFTSCAPE ALSO FOLLOWS A SENSE OF ORDER,SYMMETRY AND LINEARITY ADHERING TO BASIC CONCEPTS OF MUGHAL GARDENS WHILE THE PLANTATION SCHEME RORROWS ITS COLOR PALETTE THAT FROM THE DECORATIVE FACADE OF CHINI KA RAUZA.

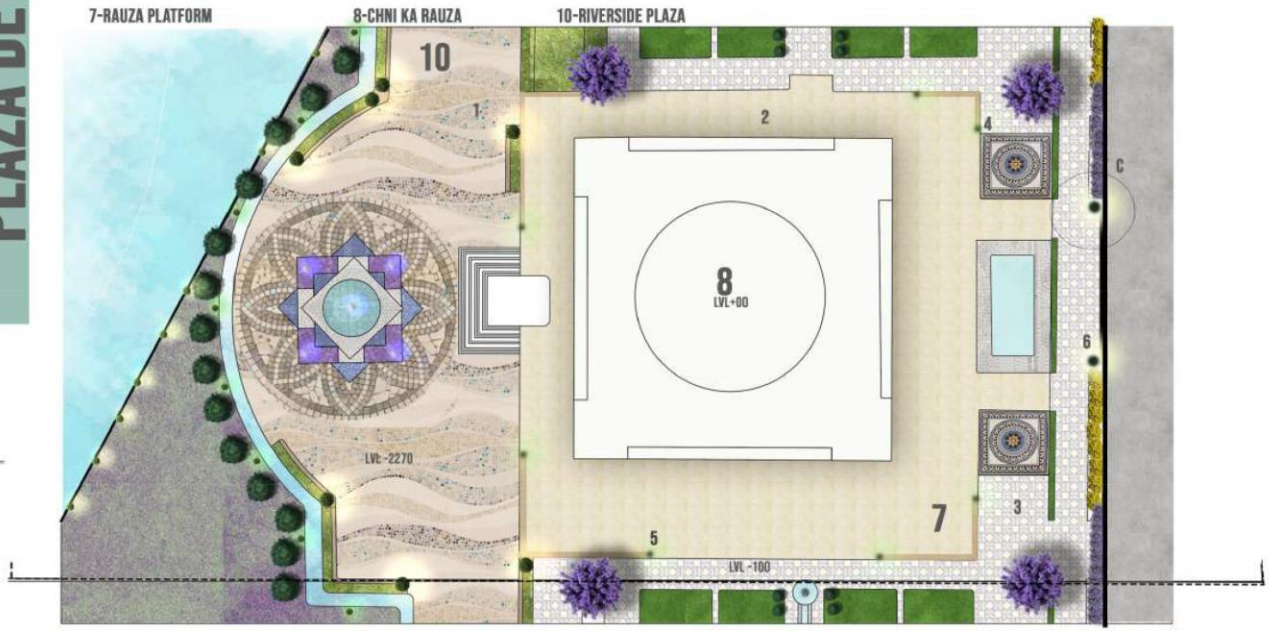
CHINI KA RAUZA
AGRA

UMBER SHOAIB KHAN | B.ARCH 4TH YR (DAY) | LANDSCAPE

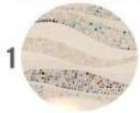
5



PLAZA DETAILS



MATERIAL PALETTE


1 STONE MOSAIC


2 PERMEABLE PAVERS


3 COLORED PAVERS


4 MARBLE PLATE

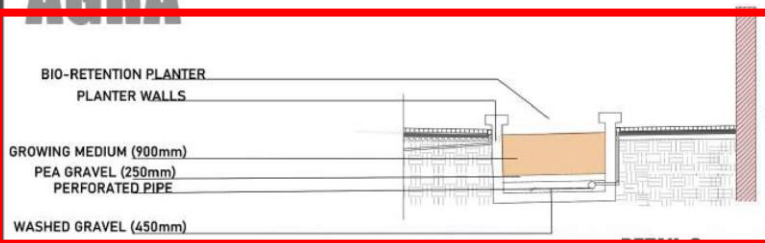
LIGHTING REFERENCE

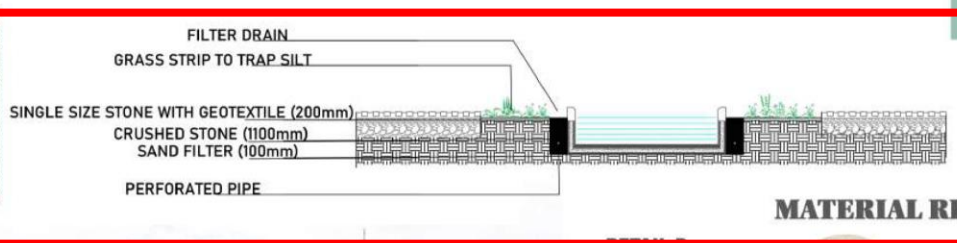

5 SOLAR POWERED COLORED LIGHTS


6 GLOWING ORBS

CHINI KA RAUZA
AGRA

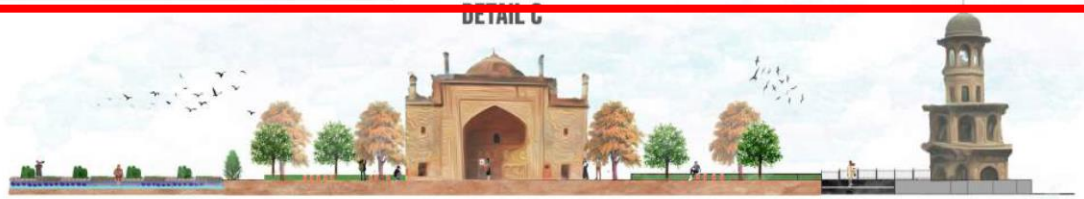
UMBER SHOAIB KHAN | B.ARCH 4TH YR (DAY) | LANDSCAPE





PLAZA DETAILS

DETAIL C



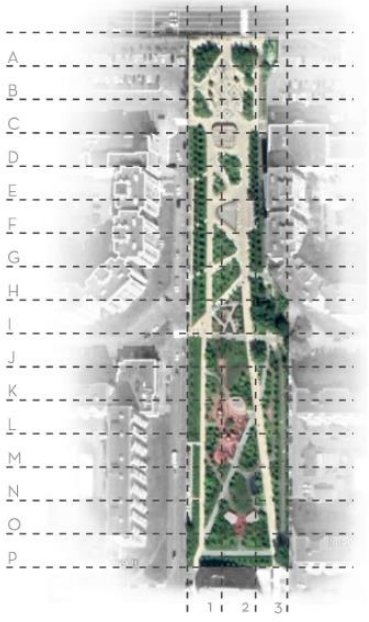
DETAIL D

MATERIAL REFERENCE

1 PERMEABLE PAVERS
2 WOOD
3 COLORED PAVERS
4 METAL STOOLS

LIGHTING REFERENCE

6 HEAVY DUTY SOLAR BRICKLIGHTS
7 PATH LIGHTS

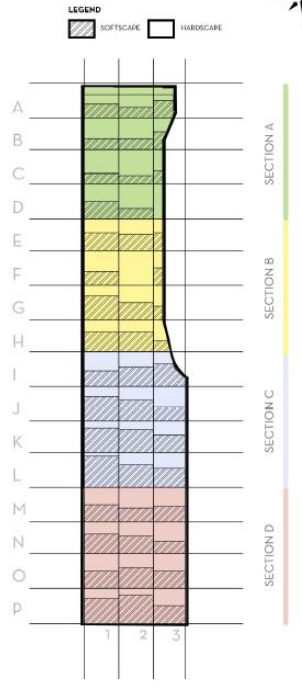


The project has been divided such that
Grid: 20m x 20 m
Squares: 16 x 3
=48

Grid Name	Area of Softscape (sqm)	Percentage of Softscape (%)	Recharge Potential = Area of Softscape (sqm) x Annual Rainfall(m)	Area of Hardscape (sqm)	Percentage of Hardscape (%)	Harvest Potential= Area of Hardscape (sqm) x Annual Rainfall(m)
A1	113	42	60	156	58	83
A2	78	28	42	203	72	108
A3	83	52	44	78	48	42
B1	108	27	58	292	73	156
B2	108	27	58	292	73	156
B3	93	63	50	55	37	29
C1	116	29	62	284	71	151
C2	94	24	50	306	77	163
C3	55	39	29	85	61	45
D1	191	48	102	209	52	111
D2	107	27	57	293	73	156
D3	0	0	0	114	100	61
E1	230	58	123	170	43	91
E2	221	55	118	179	45	95
E3	78	53	42	68	47	36
F1	152	38	81	248	62	132
F2		0	0	400	100	213
F3	78	53	42	68	47	36
G1	268	67	143	132	33	70
G2	206	52	110	194	49	103
G3	78	41	42	110	59	59
H1	225	56	120	175	44	93
H2	233	58	124	167	42	89
H3	78	33	42	157	67	84
I1	179	45	95	221	55	118
I2	217	54	116	183	46	98
I3	195	64	104	110	36	59
J1	278	70	148	122	31	65
J2	244	61	130	156	39	83
J3	157	39	84	243	61	130
K1	323	81	172	77	19	41
K2	300	75	160	100	25	53
K3	206	52	110	194	49	103
L1	349	87	186	51	13	27
L2	259	65	138	141	35	75
L3	221	55	118	179	45	95
M1	193	48	103	207	52	110
M2	164	41	87	236	59	126
M3	184	46	98	216	54	115
N1	214	54	114	186	47	99
N2	209	52	111	191	48	102
N3	140	35	75	260	65	139
O1	213	53	114	187	47	100
O2	248	62	132	152	38	81
O3	196	49	104	204	51	109
P1	280	70	149	120	30	64
P2	322	81	172	78	20	42
P3	190	48	101	210	53	112
TOTAL	8474	50	4517	8459	50	4509

Table illustrating the areas and potential for each square.

Water Potential of the Site
Harvesting Potential & Recharge Potential



Softscape v/s Hardscape

Annual Rainfall in Kazan, Russia = .533 m

RECHARGE POTENTIAL = Area of Softscape (sqm) x Annual Rainfall (m)

SECTION -A
Area of Softscape = 1146 sqm
Recharge Potential = 610 cu. m.

SECTION -B
Area of Softscape = 1847 sqm
Recharge Potential = 984 cu. m.

SECTION -C
Area of Softscape = 2928 sqm
Recharge Potential = 1560 cu. m.

SECTION -D
Area of Softscape = 2553 sqm
Recharge Potential = 1360 cu. m.

Total Recharge Potential = 4517 cu. m.

HARVEST POTENTIAL = Area of Hardscape (sqm) x Annual Rainfall (m)

SECTION -A
Area of Hardscape = 2367 sqm
Harvest Potential = 1261 cu. m.

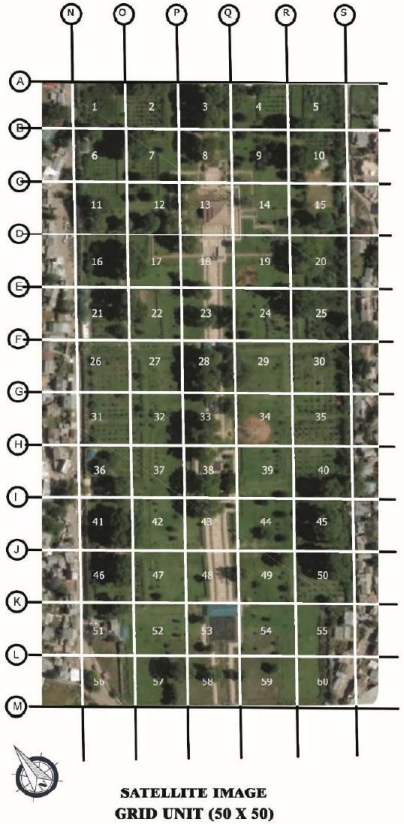
SECTION -B
Area of Hardscape = 2068 sqm
Harvest Potential = 1102 cu. m.

SECTION -C
Area of Hardscape = 1777 sqm
Harvest Potential = 947 cu. m.

SECTION -D
Area of Hardscape = 2247 sqm
Harvest Potential = 1197 cu. m.

Total Harvest Potential = 4509 cu. m.

SHALIMAR BAGH
KASHMIR



SATELLITE IMAGE
GRID UNIT (50 X 50)

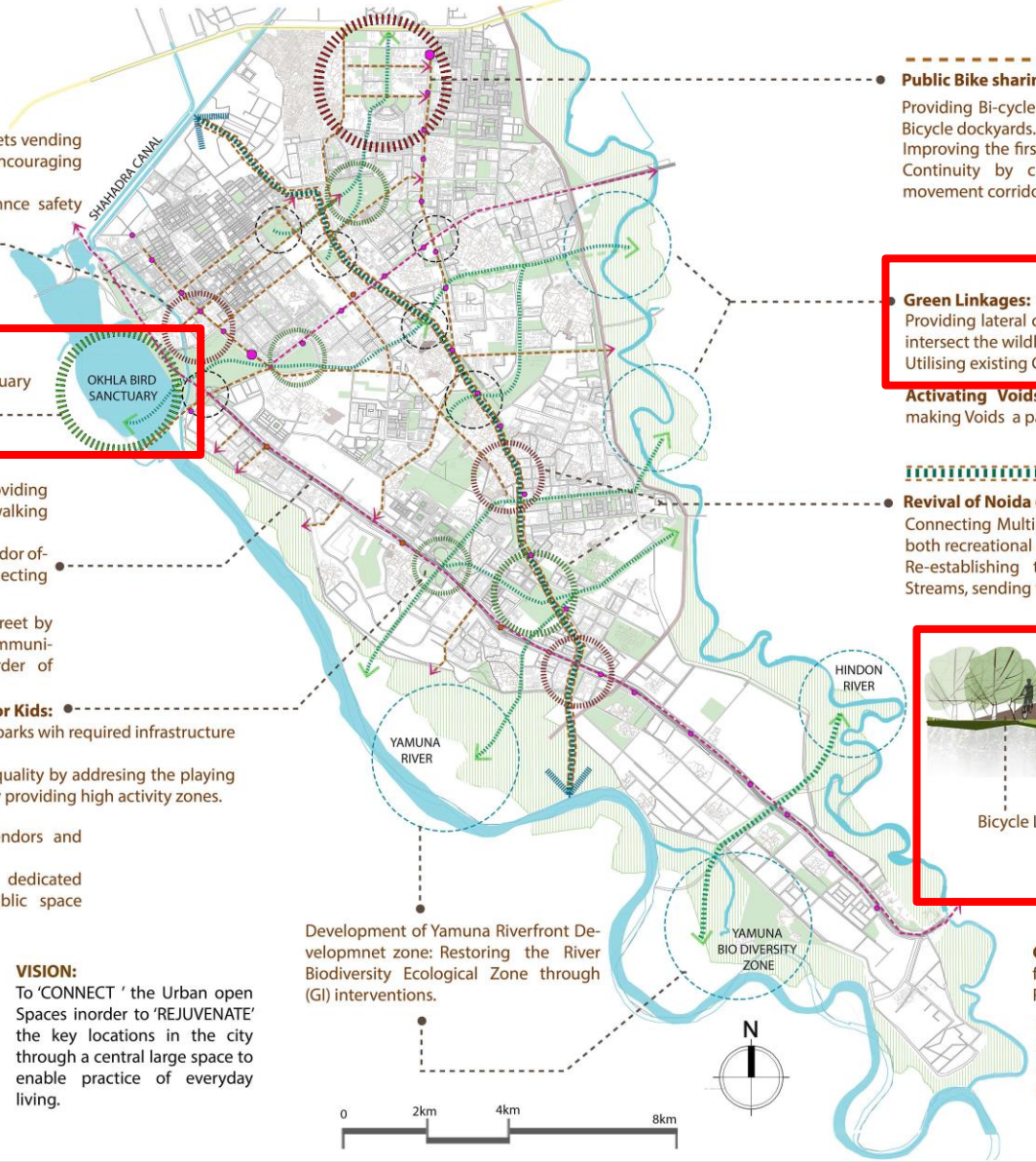
THESIS 2021
MAR 452

REGENERATION OF OPEN PUBLIC SPACE SYSTEMS

NOIDA | NEW OKHLA INDUSTRIAL DEVELOPMENT AUTHORITY |

HIMANI CHAHAL
19MUR008
M.ARCH - URBAN REGENERATION

STRUCTURE PLAN



Sector 18
Street Market and Public Plaza:
Regularizing / Regulating the streets vending activities in Atta Market while encouraging safe road infrastructure.
Improving paths legibility to enhnce safety and comfort.

Restoration of Okhla Bird Sanctuary for sustaining ecological values

Re-structuring of ROW :
Giving streets back To people by providing obstacle free dedicated lanes only for walking and cycling.
Developing a versatile movememt corridor offering a variety of street types connecting nodes and neighbourhoods

To re-establish the lost character of street by increasing outdoor serving areas for community participation establishing first order of linkages.

Placemaking for Kids:
Facilitating the parks wih required infrastructure and amenities.
Improving the quality by addresing the playing needs of kids by providing high activity zones.

Re-organizing the street for both vendors and pedestrians.
Facilitating the weekly bazars with dedicated spaces and integrating them in public space network corridor.

ISSUE:
Open spaces are fragmented and left under-utilised due to lack of accessibility.
Absence of a Large 'CENTRAL PUBLIC SPACE that could connect isolated spaces in a hierarchy.

VISION:
To 'CONNECT ' the Urban open Spaces inorder to 'REJUVENATE' the key locations in the city through a central large space to enable practice of everyday living.

Development of Yamuna Riverfront Developmnet zone: Restoring the River Biodiversity Ecological Zone through (GI) interventions.

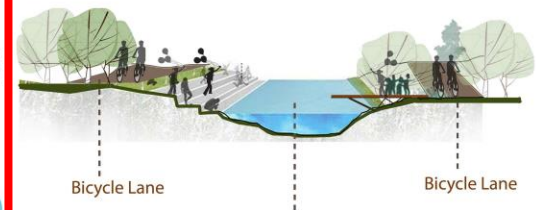
Metro Sation

Public Bike sharing System (PBS):
Providing Bi-cycle network linked with Metro Stations
Bicycle dockyards.
Improving the first and last mile connectivity as well as Continuity by creating destination-based intra-city movement corridors.

Green Linkages:
Providing lateral connections through Green Corridors to intersect the wildlife across main Riverbeds.
Utilising existing Greens as a 'Connective Tissue'.

Activating Voids (Un-used open spaces) and making Voids a part of green corridor.

Revival of Noida drain as a Central Recreational Spine:
Connecting Multiple Nodes through a central Corridor for both recreational and ecological functions.
Re-establishing the lost significance/value of urban Streams, sending them back to front-yards.



Constructed Wetland system:
To improve the water Quality

Creation of the multi-cultural Hub, and venues for city-level events (Free & Accessible to all). Providing infrastructure for art, music and festivals.

Removing physical and visual barriers for achieving socially-inclusive plubic spaces, Increasing the sense of ownership among residents, by creating invitations for all user groups..

Guided By: Dr. NISAR KHAN
Ar. IQTEDAR ALAM
Ar. INTEKHAB ALAM

JAMIA MILLIA ISLAMIA
FACULTY OF ARCHITECTURE & EKISTICS

THESIS 2021
MAR 452

REGENERATION OF OPEN PUBLIC SPACE SYSTEMS

NOIDA | NEW OKHLA INDUSTRIAL DEVELOPMENT AUTHORITY |

HIMANI CHAHAL
19MUR008
M.ARCH - URBAN REGENERATION

PROJECT ZONING

ECOLOGICAL ZONE | RECREATIONAL ZONE | ECONOMIC ZONE | CULTURAL ZONE | ECOLOGICAL ZONE

STREETS FOR ALL

Cycle-tracks, and free pedestrian movement corridors building inter-connections within different zones . Street-scaping for re-defining sidewalks as a shared space.

Place-making to provide mult-entertain-ment zones with Colorful and playful spaces, interesting flooring patterns and dynamic forms creating a high-active zone. Creating Playscapes with wooden boards, ropes, tyres.

Providing affordable market space for Bazars like fish, Meat, farmers, Books. Waste management by segregation, Re-Use and and Recycle. A place where a person can sit, eat, shop and read.

Multi-cultural hub that could host festivals, celebrations and colourful events. Bringing diverse Community together for creating a sense of belonging and increasing sociability.

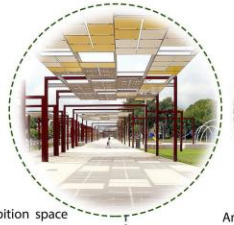
The Green zone is Restoring ecological services through GI interventions to manage storm water. Multi-dimensional spine offering comfortable environments to enhance user experience through landscapes.

Promenades

Bicycle Corridors

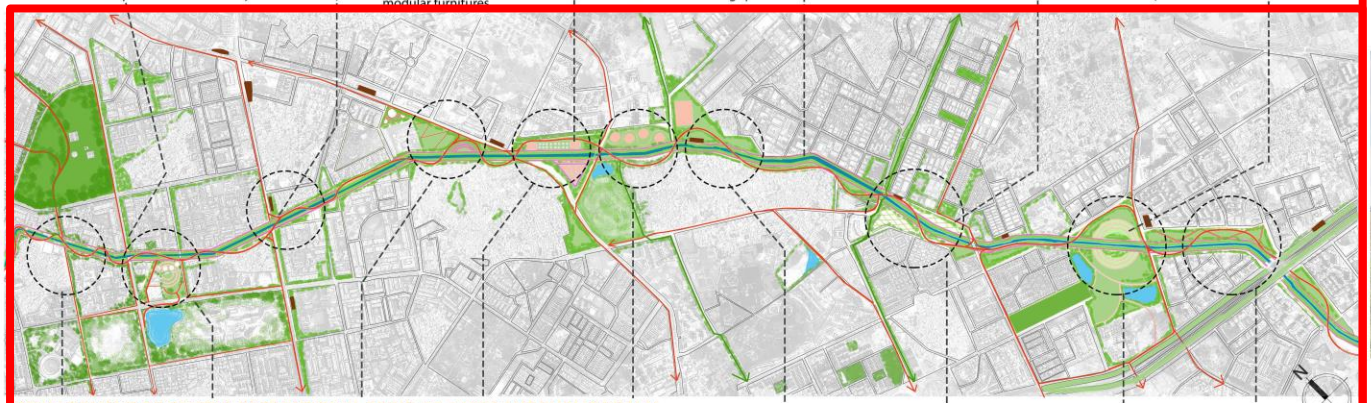
Flexible spaces with recycled modular furnitures

Interactive Seating spaces



Exhibition space

Amphitheatre



DEVELOPMENT OF CENTRE RECREATIONAL SPINE AS A VIBRANT PUBLIC REALM

Street Corridors | Entertainment zone | Kids zone | Market zone | Food Zone | Multi-Athletic Field | Multi-Cultural Hub | Bio Diversity Park | Green Zone

THE PUBLIC REALM

The design is an attempt to facilitate a large central space that could bring communities together, creating a sense of belonging and inclusivenesss.

Designing public spaces for multiple users, with multiple functions across all the nodes creating an integrated open public space system for different typologies and hierarchy.

Changing character of spaces along the spine with different Break-out zones offering recreational spaces. Streetscapes and Landscape designs to represent the needs of women, children, aged, vendors, villagers, and other marginalised groups who are not well served by public spaces.

Dissolving the boundaries through natural landscaping removing visual barriers and creating direct free access from different movement corridors. Replacing high boundary walls with greenscapes like mounds and buffers.

Guided By: Dr. NISAR KHAN
Ar. IQTEDAR ALAM
Ar. INTEKHAB ALAM

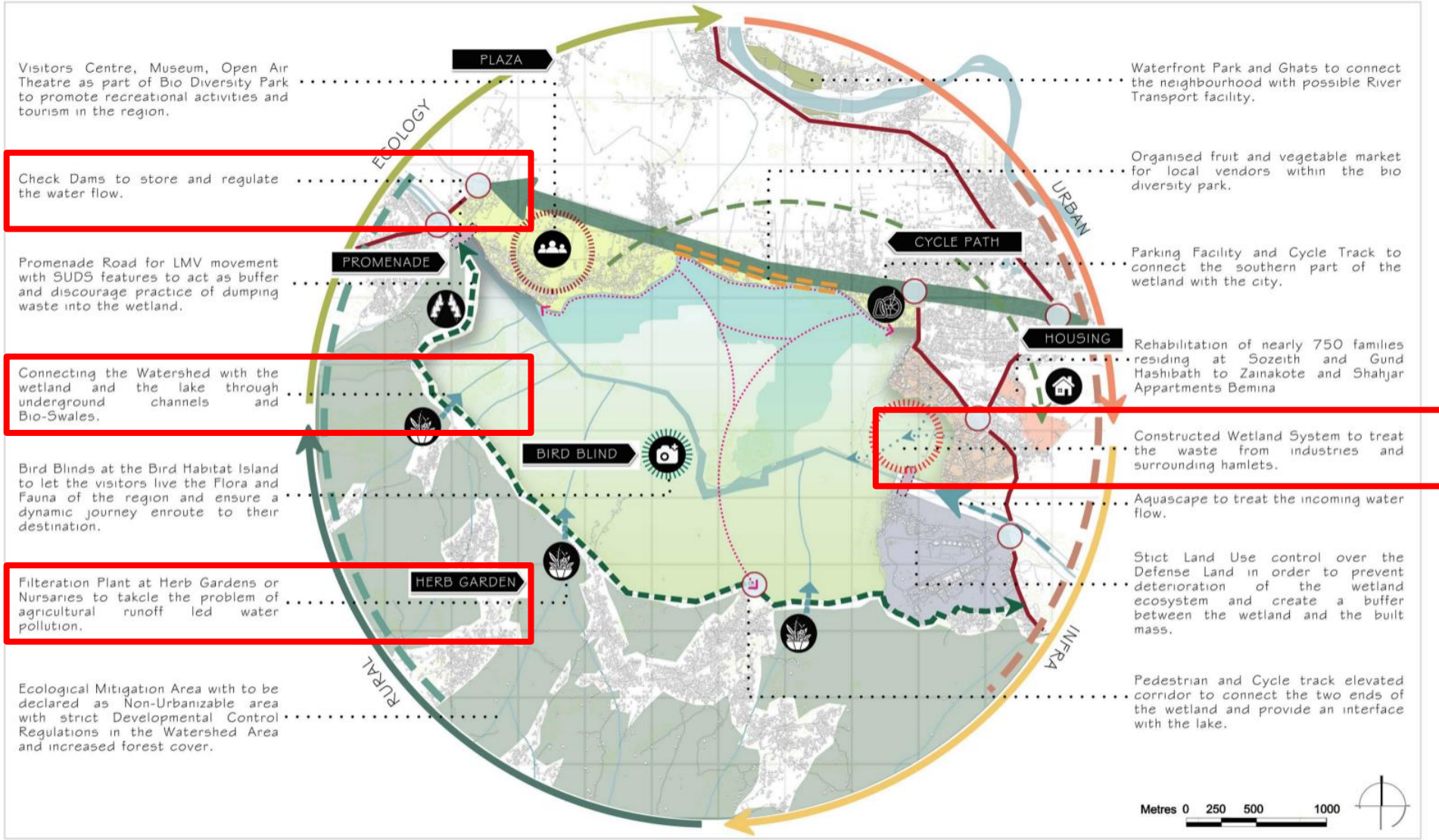
JAMIA MILLIA ISLAMIA
FACULTY OF ARCHITECTURE & EKISTICS

THESIS 2021
MAR 452

ECOLOGICAL REGENERATION

HOKERSAR, SRINAGAR

TAHA MASOODI
19MUR015



Visitors Centre, Museum, Open Air Theatre as part of Bio Diversity Park to promote recreational activities and tourism in the region.

Check Dams to store and regulate the water flow.

Promenade Road for LMV movement with SUDS features to act as buffer and discourage practice of dumping waste into the wetland.

Connecting the Watershed with the wetland and the lake through underground channels and Bio-Swales.

Bird Blinds at the Bird Habitat Island to let the visitors live the Flora and Fauna of the region and ensure a dynamic journey enroute to their destination.

Filteration Plant at Herb Gardens or Nursaries to takcle the problem of agricultural runoff led water pollution.

Ecological Mitigation Area with to be declared as Non-Urbanizable area with strict Developmental Control Regulations in the Watershed Area and increased forest cover.

Waterfront Park and Ghats to connect the neighbourhood with possible River Transport facility.

Organised fruit and vegetable market for local vendors within the bio diversity park.

Parking Facility and Cycle Track to connect the southern part of the wetland with the city.

Rehabilitation of nearly 750 families residing at Sozeith and Gund Hashibath to Zainakote and Shahjar Appartments Bemina

Constructed Wetland System to treat the waste from industries and surrounding hamlets.

Aquascape to treat the incoming water flow.

Stict Land Use control over the Defense Land in order to prevent deterioration of the wetland ecosystem and create a buffer between the wetland and the built mass.

Pedestrian and Cycle track elevated corridor to connect the two ends of the wetland and provide an interface with the lake.

SHEET
14

STRUCTURE PLAN

INTERVENTIONS / PROPOSALS / AMENITIES

GUIDED BY:
DR. NISAR KHAN
AR. IQTEDAR ALAM
AR. INTEKHAB ALAM

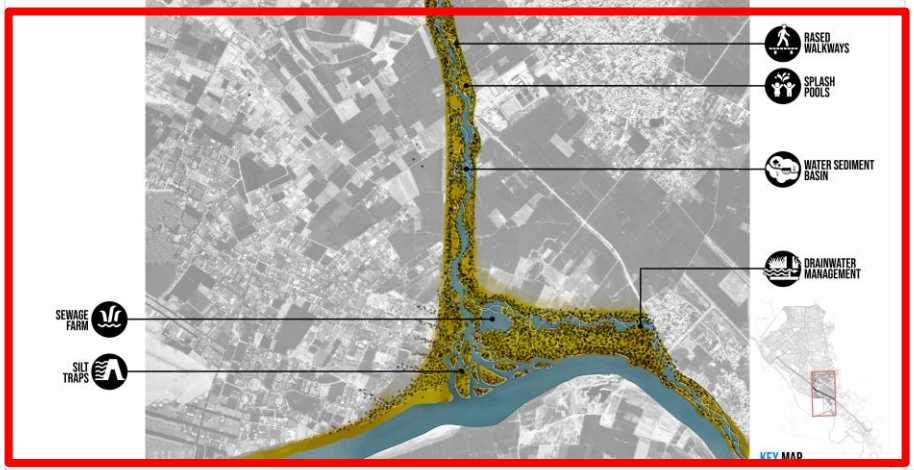
JAMIA MILLIA ISLAMIA
FACULTY OF ARCHITECTURE & EKISTICS
M.ARCH IN URBAN REGENERATION (2019 -21)

EDI(TA)BLE URBANISM
REPURPOSING UNDERUTILIZED URBAN VOIDS IN NOIDA U.P.

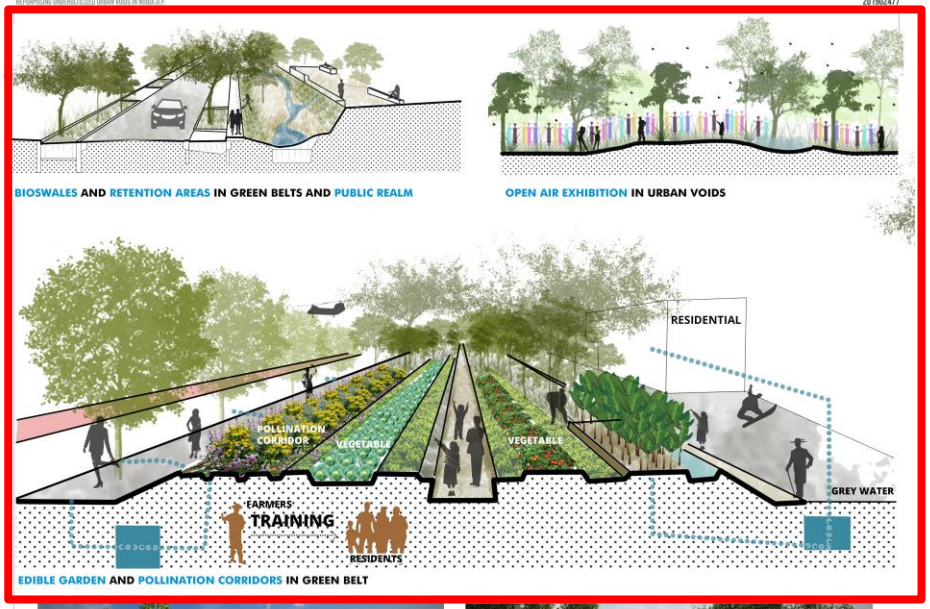
RAHUL PALLIPAMULA
2019802477

RESTORATION RING

- SPORTS GROUND
- CANAL EDGE RESTORATION
- NEIGHBORHOOD PARKS
- FISHING PARK
- URBAN FOREST
- BIO SWALES
- PERMEABLE PAVERS
- URBAN FOREST
- BIO-RETENTION PONDS
- FLORICULTURE FEILDS
- GREEN BELT
- GRASSED WATERWAYS
- STREAM BUFFERS
- NEIGHBORHOOD PARKS
- RAIN GARDENS
- POLLINATOR STRIPS
- RETENTION PONDS
- FARMLANDS
- FLORICULTURE FEILDS
- SOIL QUALITY RESTORATION
- WETLANDS
- BICYCLE TRACKS
- STREAM STABILIZATION
- CANAL EDGE RESTORATION
- SUNKEN PUBLIC SPACES
- FLORICULTURE STRIP
- POLLINATOR STRIPS



EDI(TA)BLE URBANSIM
REPURPOSING UNDERUTILIZED URBAN VOIDS IN NOIDA U.P.
RAHUL PALLIPAMULA
2019802477



POLLINATOR CORRIDORS IN THE GREEN BELTS

CYCLE TRACKS AND PUBLIC BIKE SHARING SYSTEM ALONG THE GREEN BELTS TO CREATE PUBLIC SPACE SYSTEM AND CONNECT OTHER PUBLIC SPACES

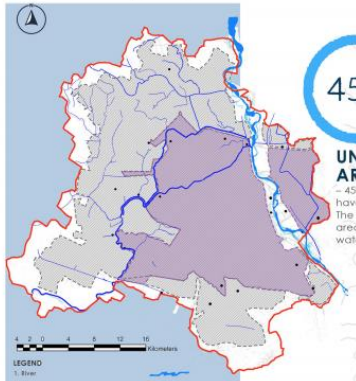
RETENTION AREAS AS LANDSCAPE OF MOUNDS AND GRASS DURING DRY SEASONS ALONG WITH SEATING SPACES AND CYCLE TRACKS

WATER URBANISM

INFRASTRUCTURE & HYDROLOGY
CITY LABORATORY: DELHI

MAR 256: Studio II

Anthropogenic Activities and Water Bodies

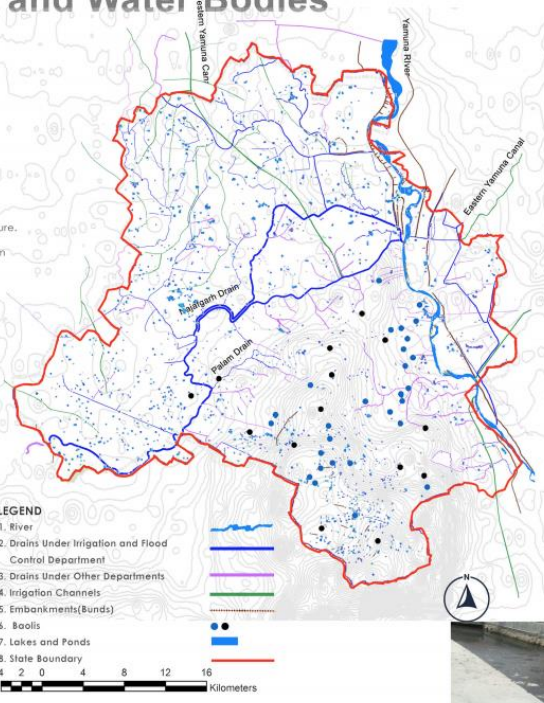


Sewage in Delhi

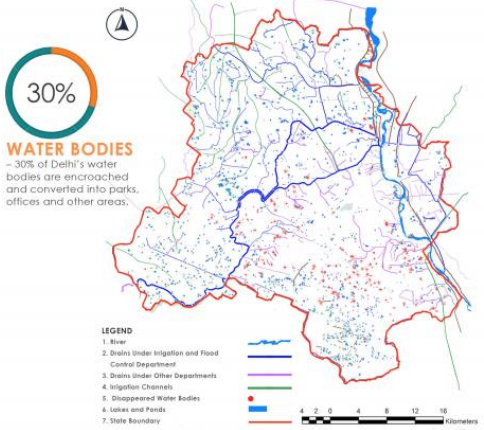
SEWAGE SYSTEM
– Only 55% area is sewered
– The system is inefficient to even take care of this area and a major part lands up into Yamuna

STORM WATER DRAINAGE
– Increasingly losing its capacity due to encroachment, silting and dumping of solid waste
– Majority of storm drains are carrying sewage

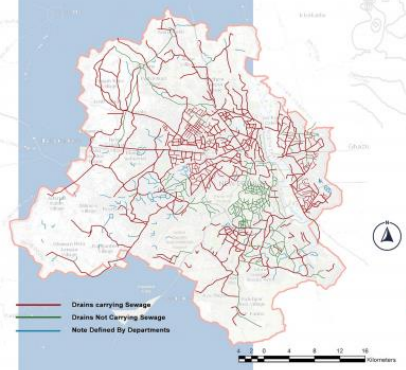
SOLID WASTE
– A lot of solid waste finds its way to storm water drains and eventually to RIver Yamuna.



Water Bodies in Delhi



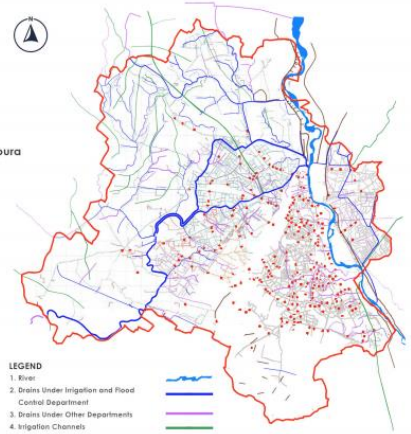
Disappeared Water Bodies



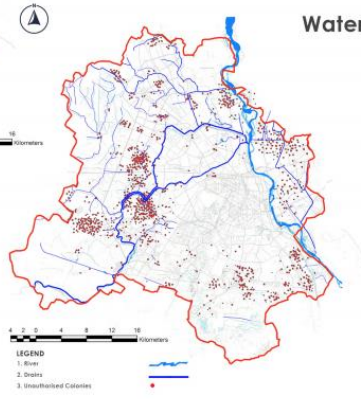
Storm Drains Carrying Sewage

Natural Storm Drain Concretized & Carrying Sewage

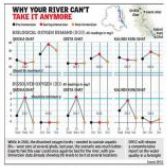
Barapulla nala from I.N.A to Yamuna river, Jangpura

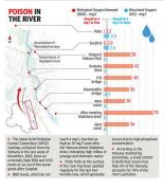


Water Logging Zones in Delhi



Unauthorized Colonies in Delhi



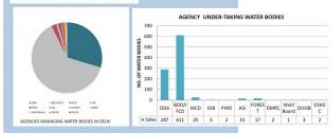


Storm Drain filled with Solid Waste

Storm Drain Filled with Waste and Silt Near Ramesh Nagar Metro Station

Encroachment of Storm Drain Okhla Ph-1 To Sarita Vihar, Okhla Phase-1

Sewage Entering Natural Drains

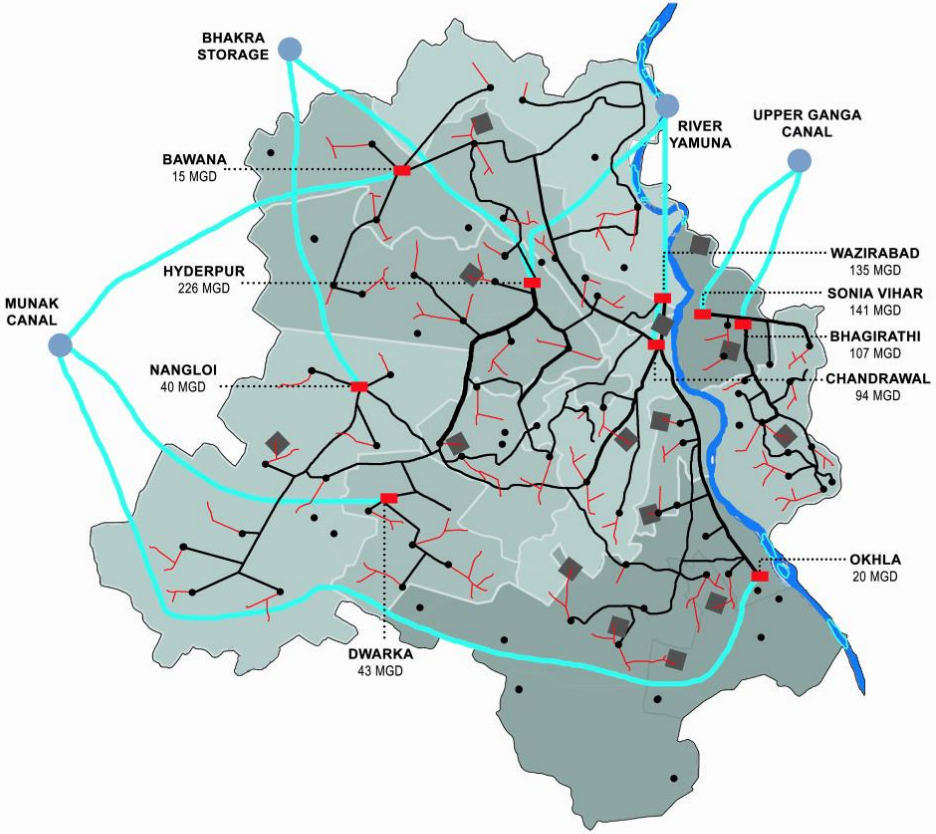


WATER URBANISM

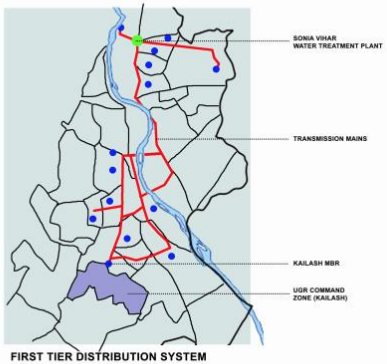
DELHI

RIVER, STREAMS, DRAINS | LAKES & JOHADS(PONDS) | TRADITIONAL WATER SYSTEMS

WATER DISTRIBUTION IN DELHI

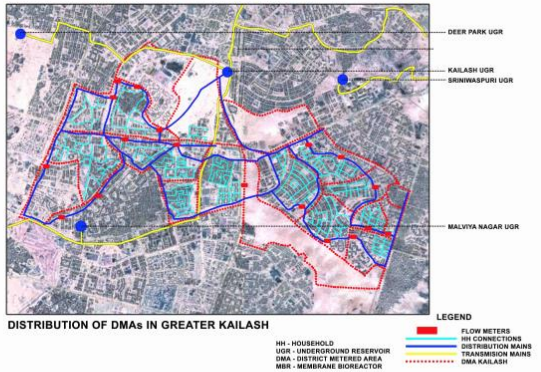


WATER DISTRIBUTION AT SMALLER SCALE



FIRST TIER DISTRIBUTION SYSTEM (SONIA VIHAR)

WATER COMMAND ZONES IN DELHI



DISTRIBUTION OF DMAs IN GREATER KAILASH

S.No.	Issues	Disruption in Natural Watershed	Excess ground water extraction	Change in Landuse / Land cover	Slum Encroachment along flood Plain	Lack of Public Awareness towards Historical water infrastructure & Natural Water Resource	SOCIAL ACTIVITY (Rituals,Recreational, Bathing,Washing)	Agricultural activities along Yamuna	Excess use of fertilizers in agricultural fileds	Discharge of Untreated runoff water into water bodies	Population Growth	Climate change	Open Drains	Eutrophication	Organic Matter in Sewage	In organic Matter in sewage	STP/WTP/ CETP	Combined Sewers	Centrallised Wastewater System	Public Health	Revenue	Pipe line water supply	Municipal water management	Municipal supply water quality	Ground water quality	Ground water accumulation	
1	Depletion of groundwater	■	■	■			■				■	■									■		■		■	■	10
2	Degradation of traditonal water infra-structure (Baoli, Hauz, Johads)	■	■	■		■	■				■	■														■	8
3	Enchroachment of Water Bodies (Lakes & Ponds)	■		■	■	■		■			■														■	■	8
4	Change in Land-use pattern along waterbodies			■	■		■	■			■				■	■				■	■					■	11
5	Urban Flooding	■		■	■					■	■		■					■	■								10
6	Diversion of natural runoff through stormwater drain	■		■	■								■					■		■							6
7	Drying of Lakes and Ponds	■		■							■	■		■							■		■			■	9
8	Treating waterbodies as waste dumping sites					■	■	■		■	■									■	■		■				10
9	Revenue Losses		■		■																■		■				6
10	Gap in demand and supply of water										■										■		■	■		■	6
11	Water Losses-30 to 40%																■				■		■				4
12	Degradation of Water Quality and Vegetation (Lakes & Ponds)			■	■	■	■		■	■	■			■							■			■	■		11
13	Inefficient working of water Treatment Plants																■						■	■			3
14	Ground Water contamination					■		■	■	■			■	■	■	■				■					■	■	10
15	Negligence/Unwareness towards water resource					■	■						■	■	■	■					■		■	■		■	11
16	Unauthorised ground water Extraction		■	■	■	■					■									■	■		■			■	8
17	Open defecation				■	■				■			■				■			■					■		7
18	Mass bathing and Religious activities		■	■		■	■			■	■				■	■				■					■		8
19	Degradation of Flood Plain along Yamuna	■		■	■	■	■	■	■	■	■	■	■	■	■	■										■	13
20	Limited migratory birds visitng wetlands	■		■			■		■			■															3
22	Water Borne Diseases (Typhoid,Cholerea,Malaria,Dengue,Diarrhea)			■	■		■						■							■			■				8
24	Under-utlization of Sewage treatment plants		■							■	■			■			■	■	■		■		■			■	8
25	Flow Rates			■			■			■	■				■	■		■	■								7
25	Water Inquitable Distribution		■																								7
26	Unauthorised Connections	■			■	■	■				■								■				■	■	■	■	10
27	Unmetered areas																				■		■	■	■		3
28	Historical water infrastructure being used only for recreational					■	■																			■	3
29	Small Size Water bodies with Large Number of Pilgrims	■		■	■		■				■									■							4
30	Centralised Water Supply System	■																			■	■	■	■			3
31	Dependecy on Outside water Resources	■		■													■									■	3
32	Leakage of industrial chemicals into the groundwater															■				■					■		3
33	Lake is turning salty and disease prone	■		■		■	■			■										■					■		5
34	Borewells turning into dry bowls		■					■				■									■		■	■		■	6
35	Addition of agriculture chemicals to the ground water resource		■			■		■						■						■			■	■			7
36	Poor maintenance and negligence from authorities	■	■										■					■	■		■	■	■			■	9
37	Pollution- solid waste and sewage													■				■		■			■				7
38	Poor Sanitation			■										■			■	■		■							10
39	Unsewered Areas				■		■	■						■			■			■		■			■		11
40	Discharge of untreated runoff water during Monsoon	■								■		■	■		■		■	■		■			■				10
41	Increasing events/Religious actitivies along waterbodies			■	■	■	■																				3
42	Under developed Small pilgrim			■			■				■																2
43	Old technology used in STP & WTP													■			■		■		■		■				5
44	Limited recharging structures			■		■												■					■			■	4
45	Enchroachment in the form of religious structures	■		■	■	■	■				■																4
		15	8	22	14	15	19	9	6	11	17	6	10	5	3	5	9	6	6	19	17	11	23	10	14	20	

WATER URBANISM
INFRASTRUCTURE & HYDROLOGY
CITY LABORATORY: DELHI

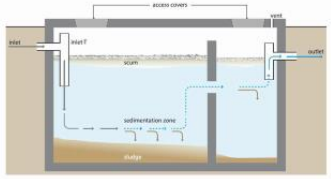
Decentralised Waste water treatment plant

Total Waste water generation - 2520 cu.m (2.52 MLD)

According to the standards more than 1 MLD cpaccity is not advisible becuase of the space requirement.
Considering the Water scarcity in the site. The DWWT proposed for Floating population requirement which is 1350000 Litres
Proposal for DWWT for the capacity of 1000000Litres (1000 Cum)

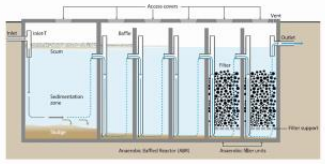
Settler

Space requirement - 0.5 sq.m per Cu.m
Area - 500 Sq.m
Size - 13m X 39m X 2m



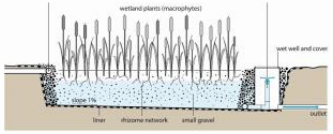
Anerobic baffled reactor

Space requirement - 1 Sq.m per Cu.m
Area - 1000 Sq.m
Size - 18m X 54m X 2m



Filter bed

Space requirement - 4 Sq.m per Cu.m
Area - 4000 Sq.m
Size - 40m X100m X 1.5m



Polishing pond

Space requirement - 1.2 Sq.m per Cu.m
Area - 1200 Sq.m
SIze - 28m X 44m X 1.5m

Water saving fixtures

Water requirement for Office - 25 + 20 = 45 Lpcd
Water demand for office space
40000 X 45 = 1800000 Litres (1.8 MLD)
Using water saving fixtures
Dual flush (Min 4 lt), Sensor urinals (min 2 lt)
40000 X 34 = 1360000 Litres
440000 litres can be saved

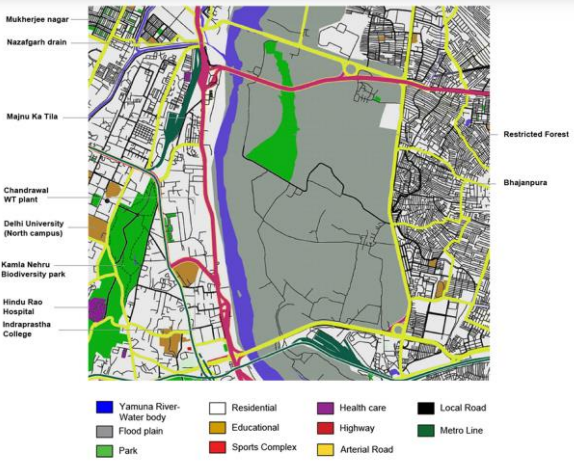
Result

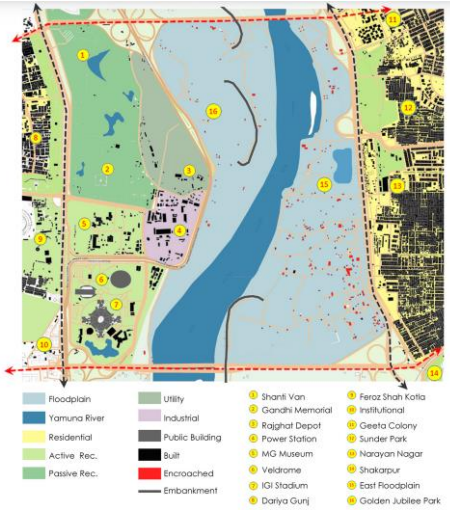
1. Catcing and recharging 65KL surface runoff water
2. Regenrating recreation space with native species
3. Recycle and reuse of waste water of 1 MGD
4.Manage and Conservation of water with Water efficient fixtures around 440KL

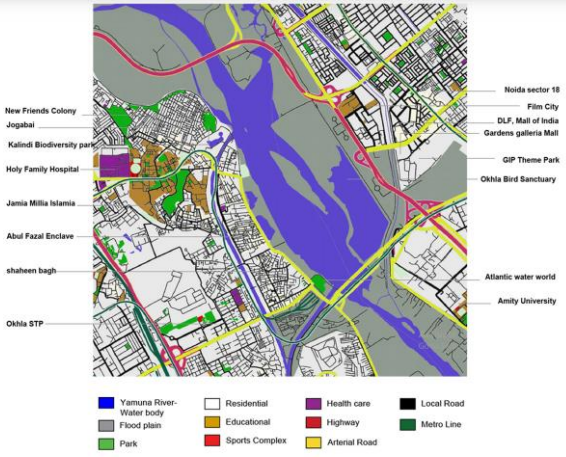
WATER URBANISM

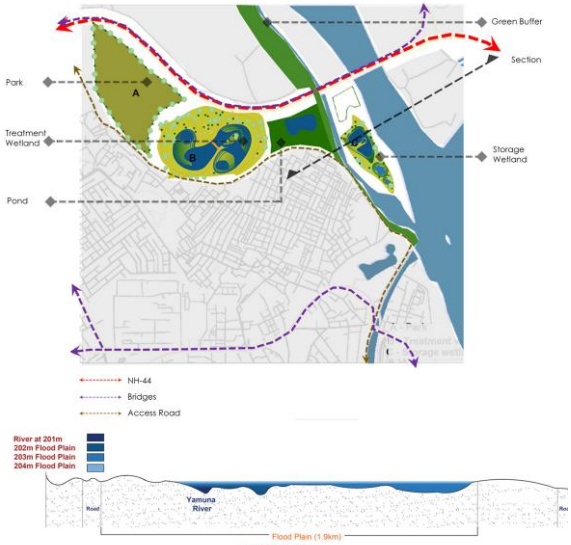
INFRASTRUCTURE & HYDROLOGY
CITY LABORATORY: DELHI

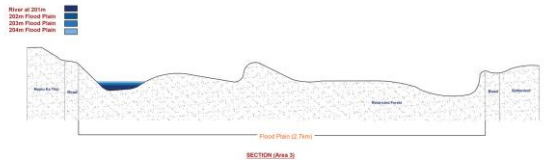
MAR 256: Studio II











S.No 04

Group Members
Mohd Amir I Prateek Gangwar

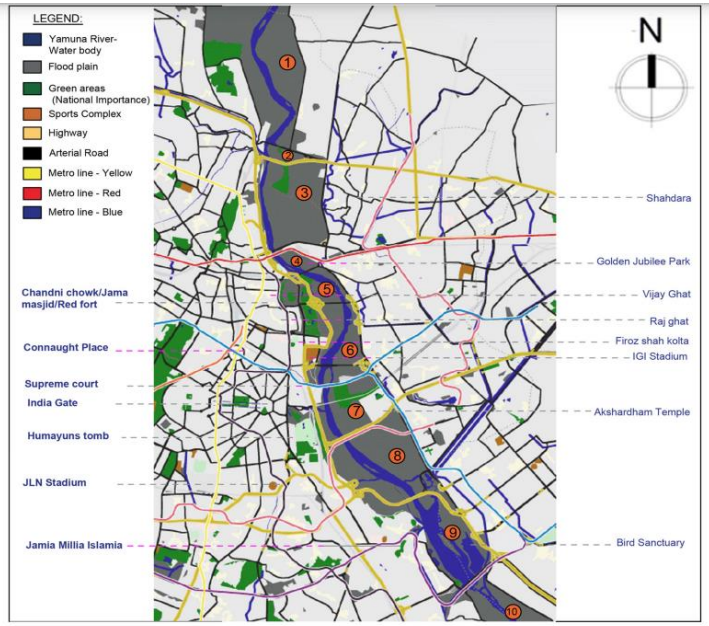
WATER URBANISM

"DELHI-RIVER YAMUNA - LAND MANAGEMENT"

WATER URBANISM

INFRASTRUCTURE & HYDROLOGY
CITY LABORATORY: DELHI

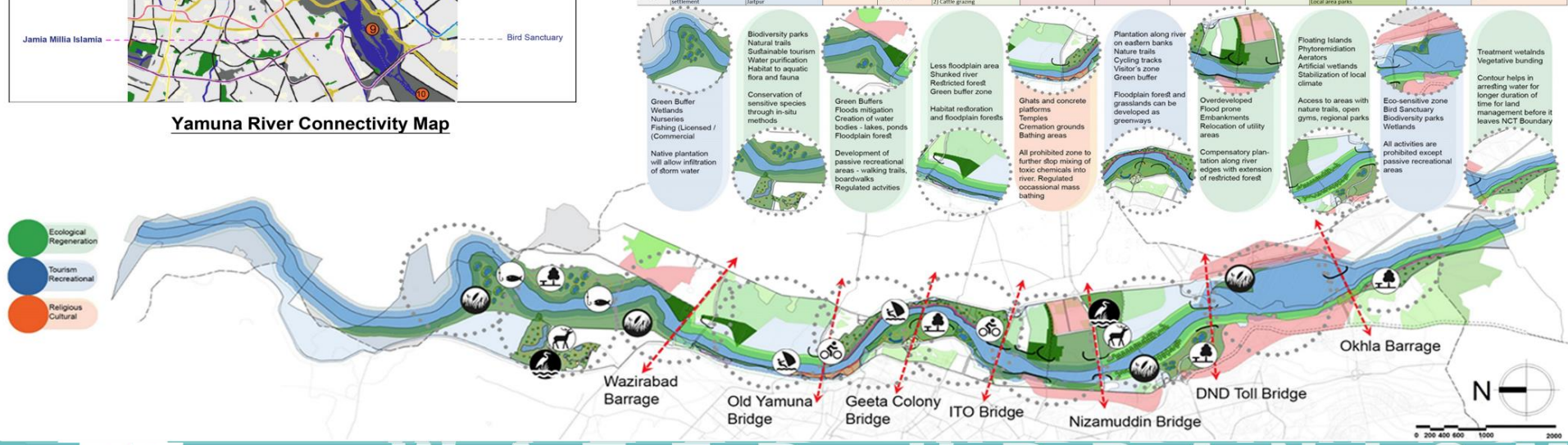
MAR 256: Studio II



Yamuna River Connectivity Map

Framework For river Yamuna

Stretch	Location	Areas	Flood plain east	Flood plain west	Activities happening	Prohibited	Permitted	Regulated	Remarks	Ecological regeneration strategies	Religio cultural strategies	Tourism and recreation strategies
1	Entering point to Wazirabad barrage	Yamuna Biodiversity park Wazirabad colony Shyam ghat, temple	100m to 1.5km	600m to 1.1km	1) Nature trails 2) Preservation of different ecosystem 3) Tourism 4) Boating 5) Irrigation/Agriculture 6) Cremation/Ritual 7) Worshipping	Rituals (Floral and other offerings) Mass bathing Construction of concrete structures (ghats, platform, buildings) Idol Immersion Concrete ghats Cremation Commercial/ Marketing Farming Cattle grazing Festival - Immersion or visarjan (Related to idols or any structure) Pooja or Aarti (related to any kind of offerings directly to river)	Viewing Points Sight Seeing Walking/Jogging Nature trail Permeable surfaces for tracks (Walking, Jogging) Wetland restoration Maintaining foresrs Afforestation Tourism - nature trails, garden, parks	Bathing and Toilets (Facilities) Fishing and boating Social - gathering - Environmental training programme		Farming Nursery	NA	Passive recreational areas
2	Wazirabad barrage to Signature bridge	Sur ghat Graveyard	2km	300m	1) Religious 2) View Points 3) Walking, Jogging				Surghat, mazar and graveyard present	Floodplain forest & Wetlands Deep & Shallow Wetland Reduces chances of flood Reduce pollution	NA	NA
3	Signature bridge to Yudhishtir setu bridge	DDA Admin flats Majnu ka tilla Chandrawal WT Plant Khyber pas IP College Ladakh budhist vihar	2km	100m	1) Viewing Points 2) Leisure 3) Boating 4) Walking/Jogging 5) Cremation ritual 6) Ritual & Worshipping 7) Commercial/Shopping					Biodiversity parks - walking trails , boardwalks	NA	NA
4	Yudhishtir setu bridge to Old yamuna bridge	Yamuna ghat Nigambodh ghat (Cremation ground) Temple	600m	100m	1) Ritual & Worshipping 2) Bathing 3) Idol Immersion 4) Viewing Points				Shrunk river, less flood plain	Green Buffer zone	NA	NA
5	Old yamuna bridge to Geeta colony bridge	Golden jubilee park Vijay ghat Gandhi nagar (E)	300m	1 to 2 km	5) Leisure 6) Walking/Jogging 7) Tourism				North to south all toursim spots	Natural trails - Tourism spots	NA	Passive recreational areas
6	Geeta colony bridge to ITO Bridge	IG Stadium Power house Bus depot	300m to 1400m	200m to 1500m	8) Festival/Celebration 9) Cremation Ritual				North to south all toursim spots	Afforestation	NA	NA
7	ITO Bridge to Nizamuddin Bridge	Akshardham Protected forest Bus depot Nursery Thermal power plant Temple	1800 to 1200m	300m	1) Ritual & Worshipping 2) Bathing 3) Leisure 4) Walking/Jogging 5) Viewing Points 6) Sight Seeing				Already overdeveloped and should be used for yamuna regeneration	Green Buffer zone	Mass bathing - Monthly & Yearly Festivals	NA
8	Nizamuddin bridge to DND	Mayur vihar (E) Jangpura (W)	1 to 2km	1km	1) Farming 2) Nursery				Transportation connectivity Akshardham	NA	NA	Active Recreational Areas Regional Parks - Open gyms, Cycling Tracks, Walking/Jogging tracks
9	DND to Okhla barrage	Biodiversity park Bird sanctuary Hangout valley Atlantic Water World Okhla Head Park Gautam Buddh Park Sailing & Boating club		200 to 500 m	1) Ritual & Worshipping 2) Sight Seeing 3) Viewing Points 4) Bathing 5) Leisure 6) Walking/Jogging				Surrounding ecology	Green Buffer zone	NA	NA
10	Okhla barrage to Jaitpur settlement	Madanpur Khadar Jaitpur		200 to 700m	1) Farming 2) Cattle grazing					Wetlands Local area parks	NA	NA



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