

Guwahati Urban Labs

COMMUNITIES OF PRACTICE ON NATURE-BASED SOLUTIONS FOR BUILDING URBAN RESILIENCE WITH GENDER LENS IN GUWAHATI, ASSAM

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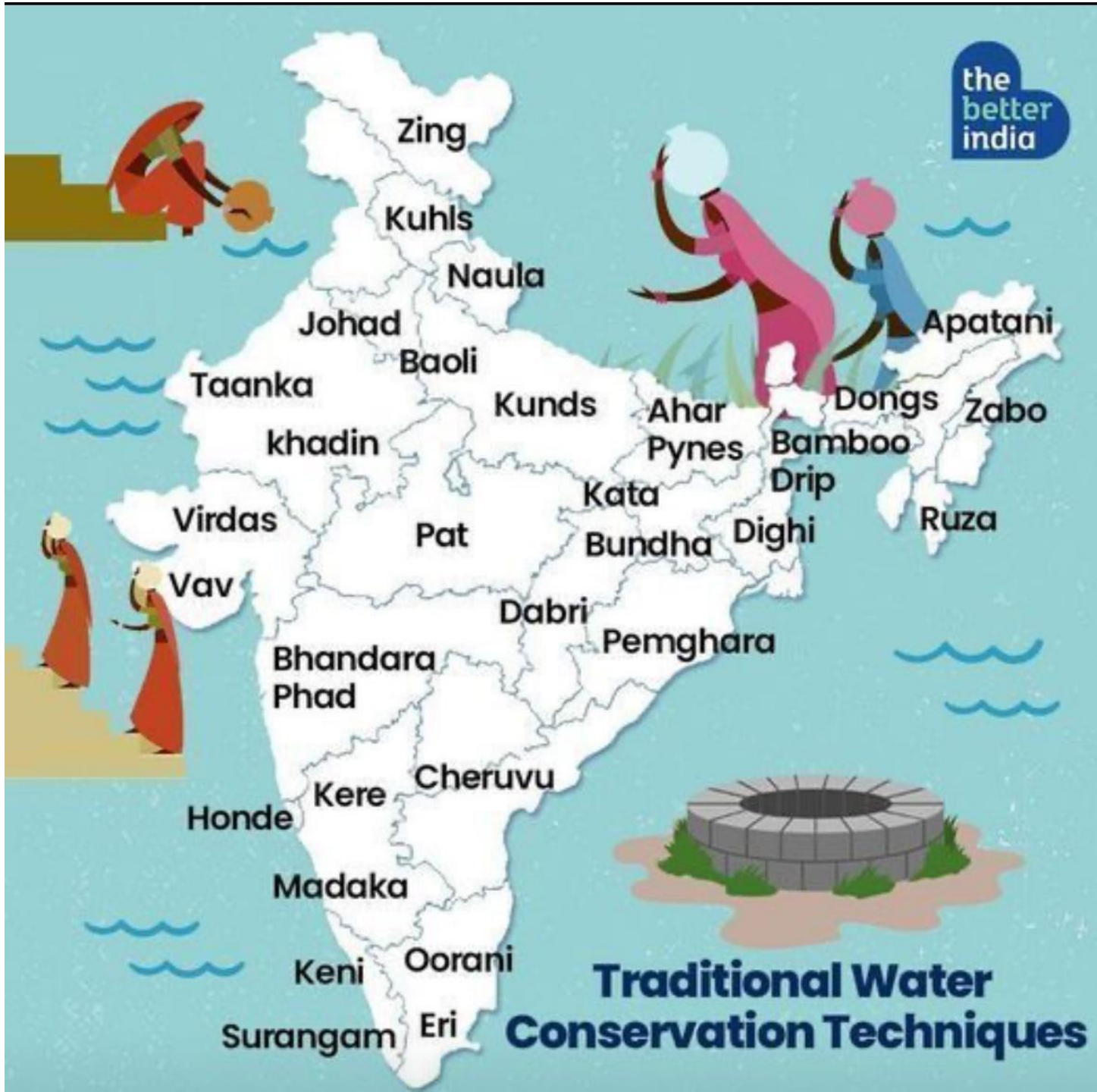


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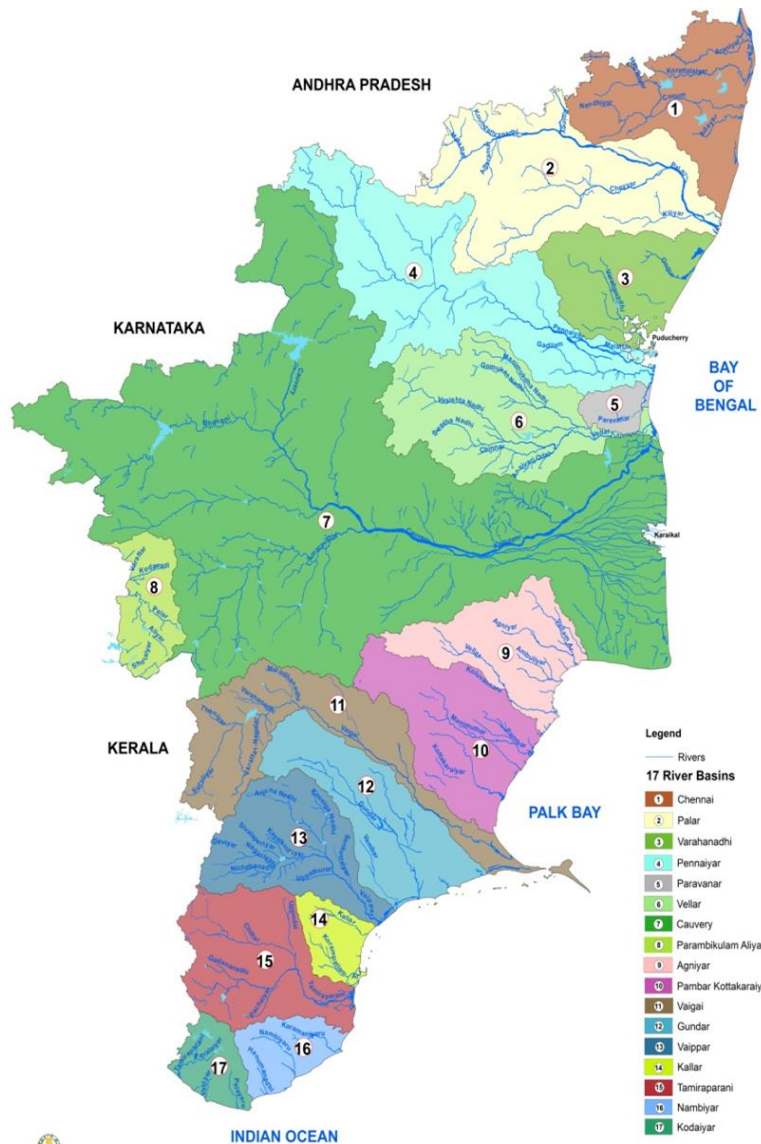


BACK FROM THE BRINK

Rejuvenating India's Lakes, Ponds and Tanks
A compendium of success stories



TAMIL NADU WATER RESOURCES



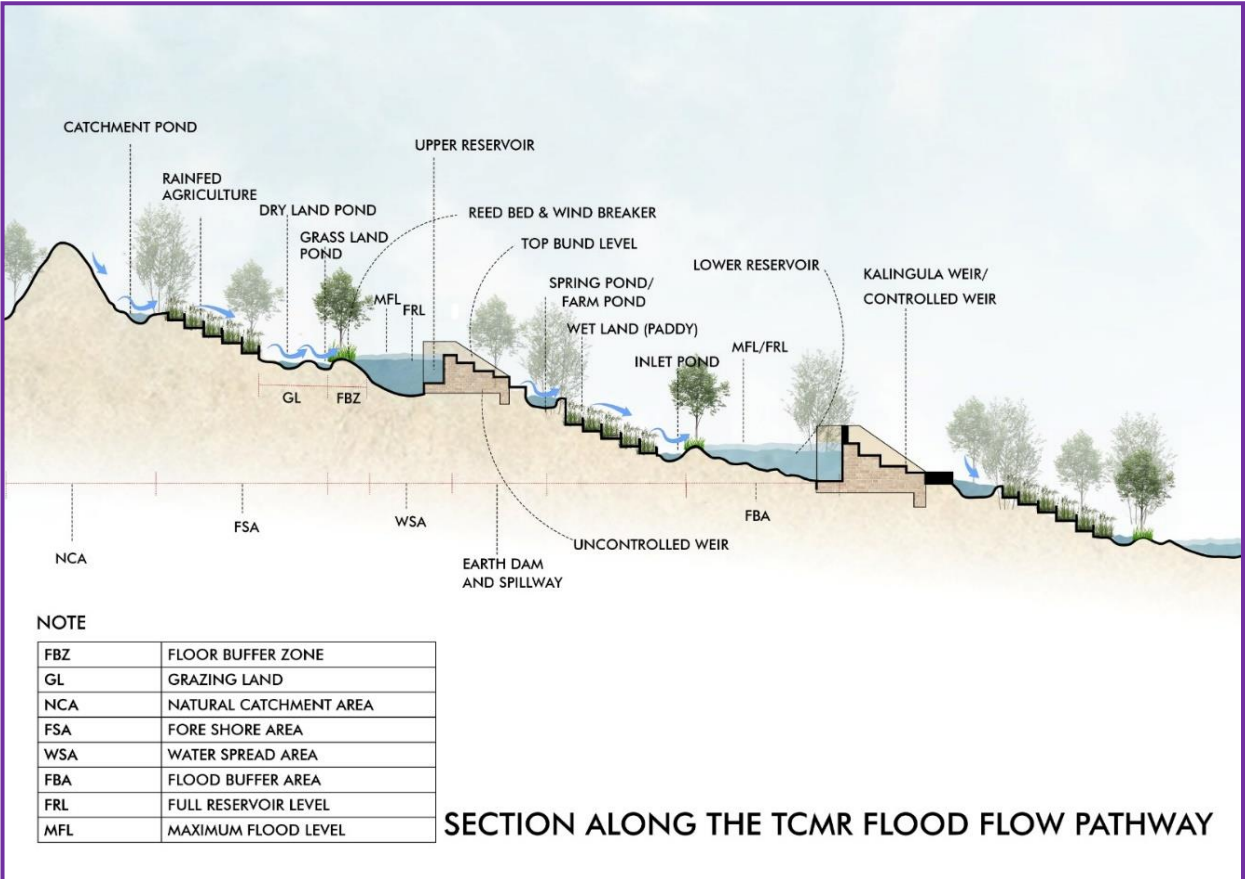
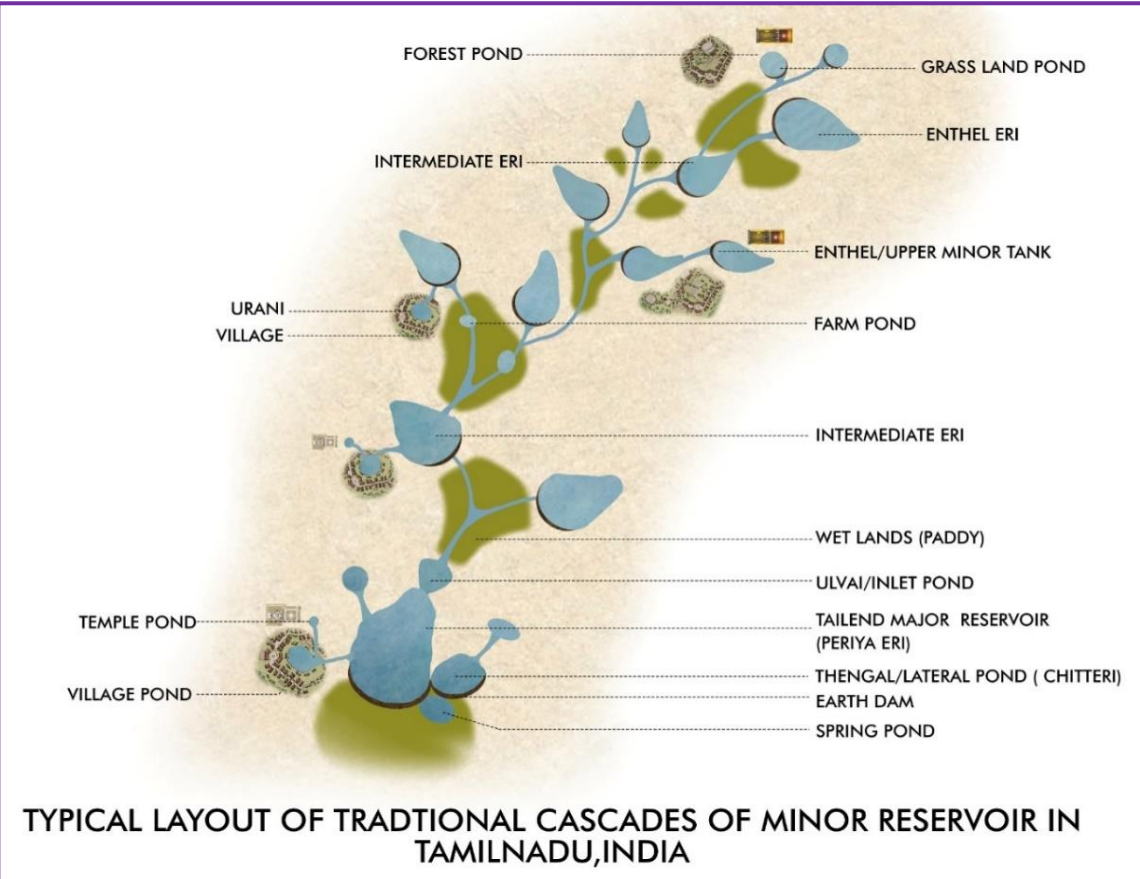
Average rainfall	925 mm
34 river basins	Grouped into 17 major river basins with 127 sub basins
Surface water potential	865 TMC (249 TMC from neighboring States)
Ground water potential	632 TMC (Total wells 19,08,695)
Total potential	1,497 TMC
Storage Structures	123 DAMS (85 WRD & 38 TNEB) 39,601 Tanks (14,098 PWD TANKS)
Holding capacity	232.50 TMC (DAMS) 178.92 TMC (TANKS) Total : 411.42 TMC



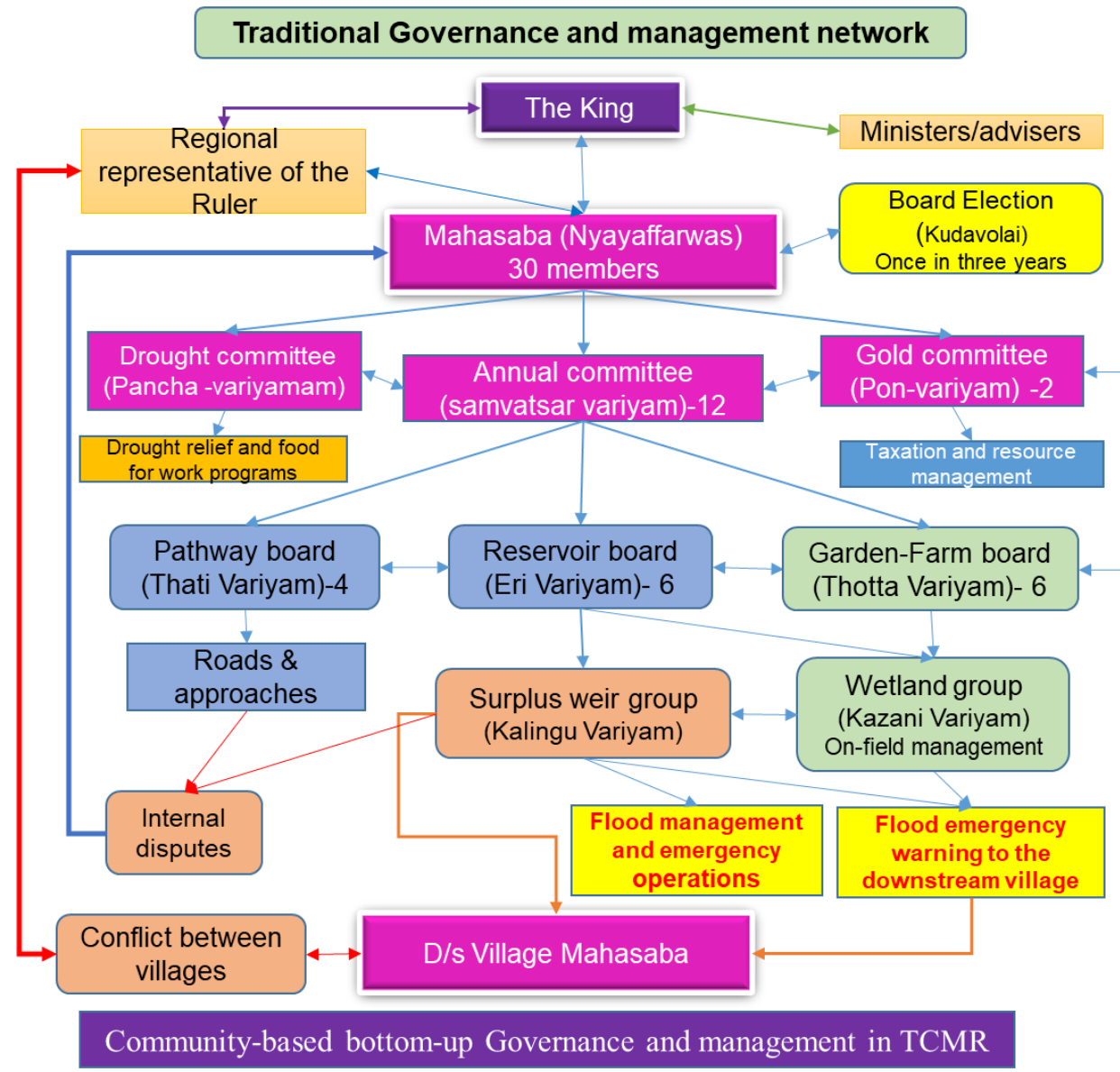
Traditional Legacy : Far ahead of present

Mapping the component of a Traditional Cascades of Minor Reservoirs(TCMR)

- Every component has a specified role in controlling the run-off for use and reuse.
- The underlying principle in the creation of TCMR includes intertwined social, managerial, governance, technical, and sustainable practices of flood management.



Water Management and Governance in TCMR



Traditional and present operation and maintenance system

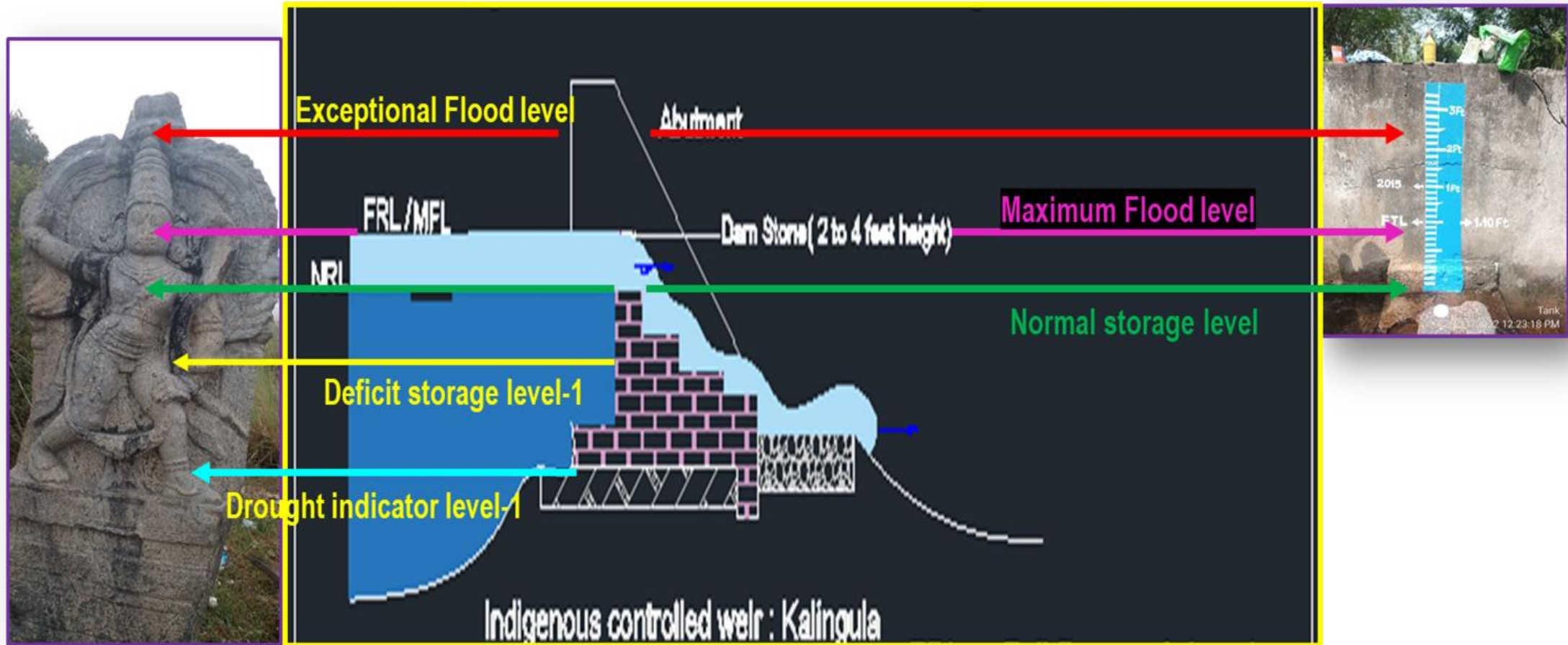
Domain of the TCMR in FMP	Key findings	
	Traditional	Present
Governance	Mahasaba-local	Hierarchical and centralised
Management	Local village board(Variyams)	SMDA, DDMA and 7 Departments
Rain forecasting and flood monitoring		Indian meteorological Department(IMD)
Long-term	Panchang	
Medium and Short-term	Panchang, biotic and abiotic indicators	IMD
Real-time	Grinders, mortars and Idols	Scales and gauging
Pre and Post monsoon flood management activities	integrated and proactive	fragmented and reactive
Flood management during extreme floods	synchronised with the flooding process and local operation of the K-weir and wetlands. Human relay across TCMR	Limited control and access to the field before flooding events. Robust rescue, relief and a temporary restoration

Traditional rain and flood monitoring for FM

Contrasting flood and reservoir gauging: Traditional vs Modern

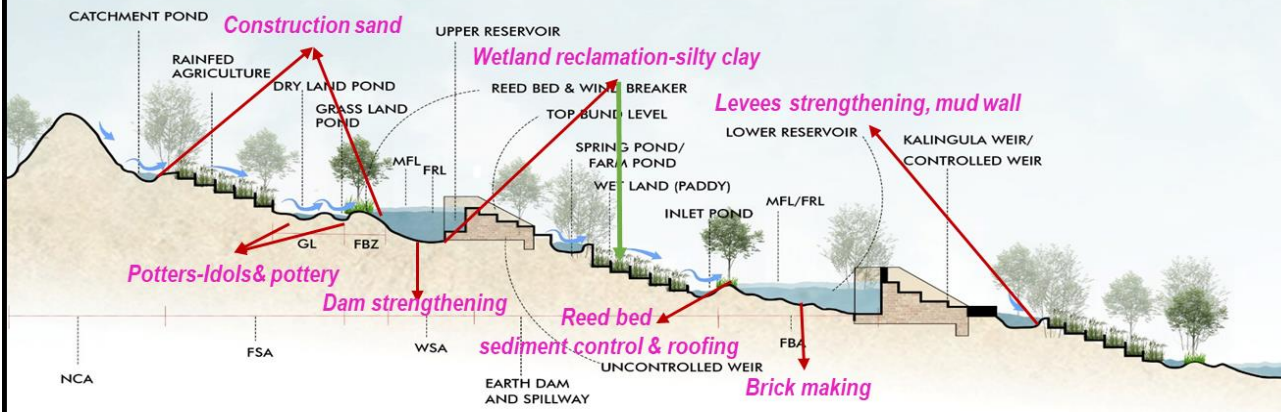
Traditional: Symbol of emotional and logical correlation

Modern: Symbol of abstract and vague scientific expression



Sediment management strategies and Sustainability

Periodical sediment removal from TCMR: Location & purpose



NOTE

FBZ	FLOOR BUFFER ZONE
GL	GRAZING LAND
NCA	NATURAL CATCHMENT AREA
FSA	FORE SHORE AREA
WSA	WATER SPREAD AREA
FBA	FLOOD BUFFER AREA
FRL	FULL RESERVOIR LEVEL
MFL	MAXIMUM FLOOD LEVEL

SECTION ALONG THE TCMR FLOOD FLOW PATHWAY

Contrasting cultural change in sediment management of TCMR



Courtesy: Mylapore times

Traditional Vinayaka idols in clay form TCMRs



Courtesy: JohnPeter

Modern Plaster of Paris Vinayaka

Compulsory removal of sediments from reservoir bed: 6 m³ person/year



Credit: DownToEarth-Manish CM



Credit: Alamy



Credit: Alamy

Water Body / Part of TCMR	Sediment control	Functional Stakeholders
Upper Ponds (Enthal)	Course sand / Silty-sand	House building with a fibre-reinforced mud wall, Pottery (God idols, offerings, utensils, granaries) and forming roads.
Thangal and Eri's / Reservoirs	Silty Clay, Fine Sand mixed with clay and silt	Pottery, clay idols, Farm fertilisation, strengthening of the und
Wetlands	Silty-clay	Wetland farmers
Channels	Silty-clay, Silty-fine sand	Strengthening and forming levees in the adjacent land with turfing

CHALLENGES IN WATER RESOURCES MANAGEMENT



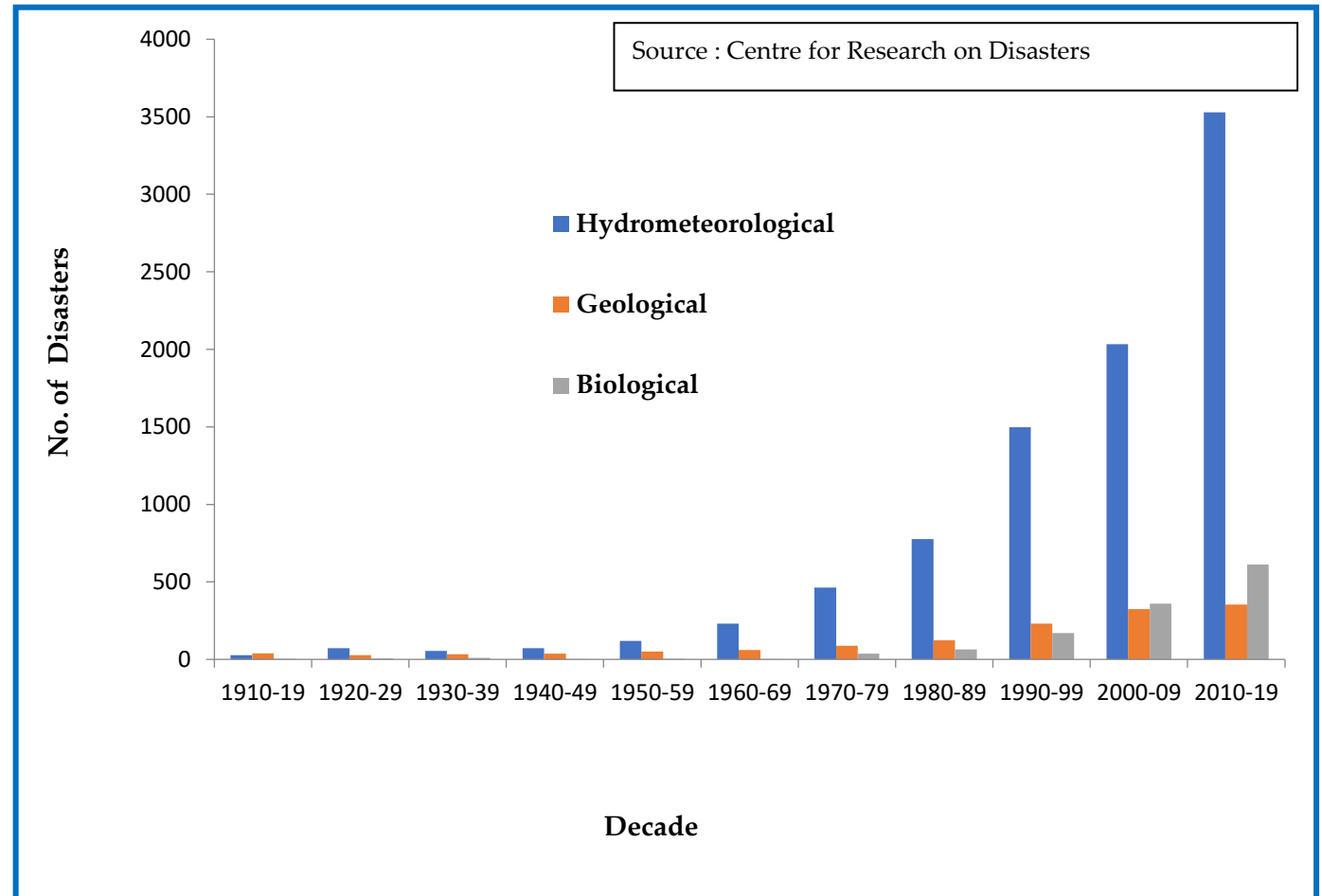
INTENSE & ERRATIC RAINFALL PATTERN DUE TO CLIMATE CHANGE

INCREASING RATE OF SEDIMENTATION

INCREASED RUNOFF DUE TO CHANGING LAND USE PATTERN

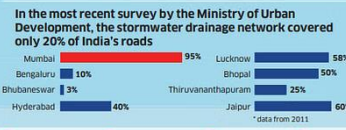
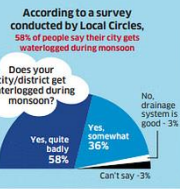
ENCROACHMENTS & POLLUTION OF WATER BODIES

SHORTAGE OF GRANTS FOR MAINTENANCE OF WATER BODIES



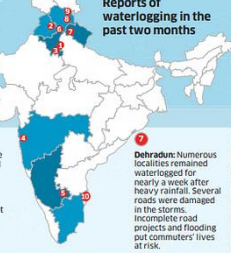


Overflowing drains - flooded homes



Causes of urban flooding

- Rapid urbanisation, leading to reduced capacity of urban drainage channels
- Rate of urban population growth higher than rate of sewer system development
- Undersized drainage systems in major cities
- Encroachments on lake beds, wetlands, drainage channels and riverbeds
- Climate change has led to an increase in the frequency of short duration heavy rainfall



Major flooding incidents

2001: Ahmedabad	2009: Delhi
2002: Delhi	2010: Guwahati
2004: Chennai	2014: Srinagar
2005: Mumbai	2015: Chennai
2006: Surat	2017: Hyderabad
2007: Kolkata	2017: Ahmedabad
2008: Jamshedpur	2018: Kerala

- Delhi:** Three minors drowned to death due to waterlogging. As many as 15 houses collapsed following high-intensity rain for 3 days. All major drains were flowing with full discharge capacity.
- Ludhiana:** More than three hours of continuous rain left Ludhiana, one of the Centre's first 'smart cities', severely waterlogged for days. Newly constructed subways and underpasses were inundated.
- Gurgaon:** Master roads, arterial roads, underpasses and highways were flooded with rainwater for hours. Water entered low-lying houses in several sectors.
- Mumbai:** Waterlogging and power cuts occurred due to heavy rainfall. Long traffic jams were also reported in some areas, and landslides were reported in others.
- Bengaluru:** A young woman lost her life to waterlogging after her car was submerged in the rain at an underpass. Lakes in the city overflowed due to encroachment of stormwater drains.
- Chandigarh:** While the city authorities spend nearly Rs 1.2 crore every year on the mechanical cleaning of roads, the old drainage system is not equipped to handle the rain, leading to waterlogging every year.
- Dehradun:** Numerous localities remained waterlogged for nearly a week after heavy rainfall. Several roads were damaged in the storms. Incomplete road projects and flooding put commuters' lives at risk.
- Shimla:** By-pass road flooded due to the lack of proper drains alongside the new roads built. Hundreds of homes were submerged following waterlogging.
- Chandertal, Spiti:** Across Himachal Pradesh, flash floods and landslides claimed 18 lives following two days of heavy rainfall. Over 300 tourists and locals were left stranded.
- Chennai:** Commuters were unable to navigate through the city. Schools closed due to heavy rainfall and waterlogging. Chennai Corporation planned to take up road repairs and construct micro drains to address the issue.

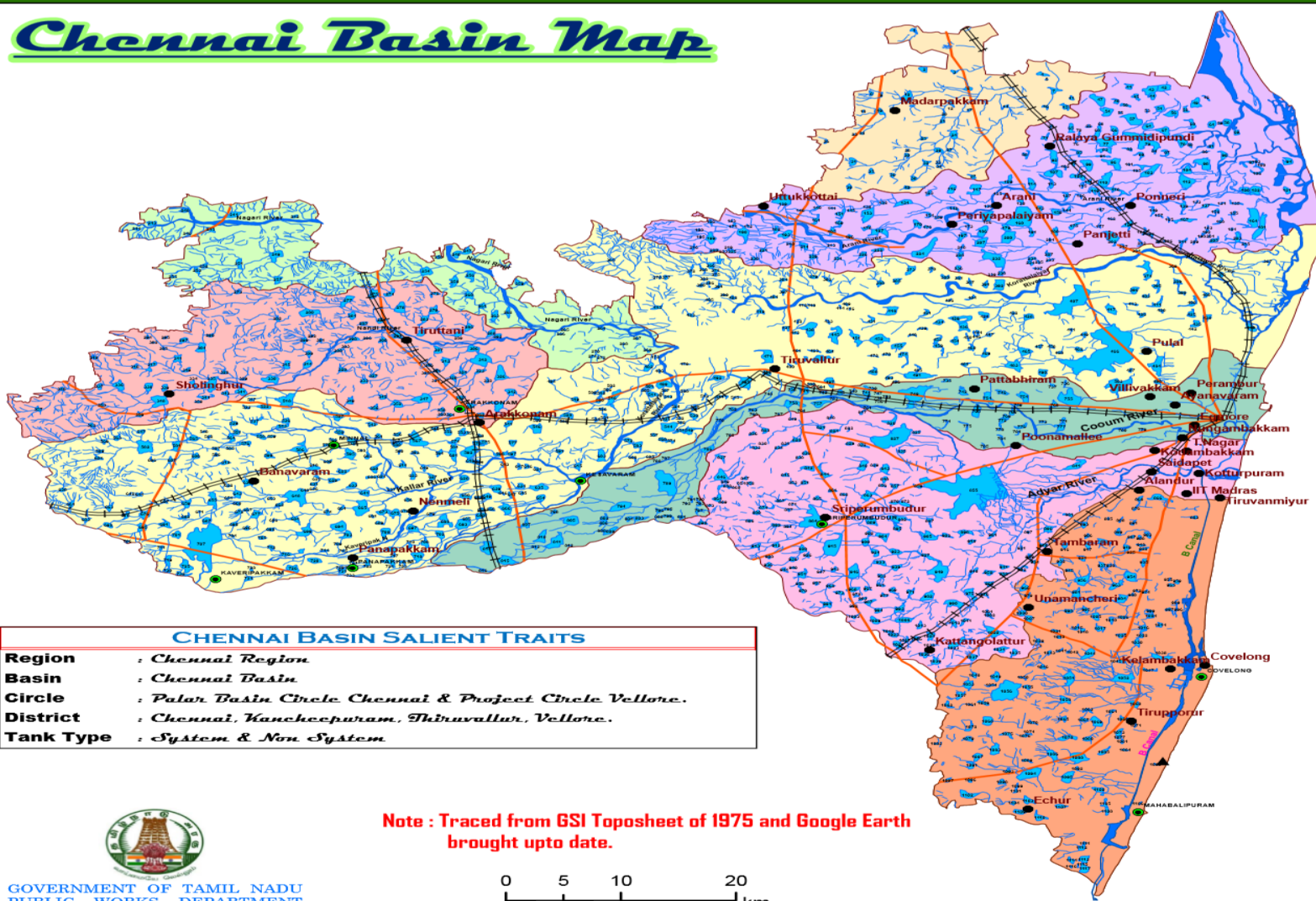
Source: Local Circles survey, Royal Society's 'Challenges in developing urban flood resilience in India' Image for representative purpose only

MUMBAI MERI JAAN BY MANJUL



CHENNAI DRAINAGE BASIN MAP

Chennai Basin Map



Legend

- Tanks
- Drainage
- Rivers
- Town / Village Points
- Rain Gauge Station
- Railway Line
- Roads

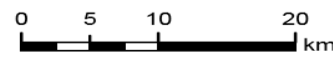
CHENNAI BASIN SALIENT TRAITS

Region	: Chennai Region
Basin	: Chennai Basin
Circle	: Palur Basin Circle Chennai & Project Circle Vellore.
District	: Chennai, Kancheepuram, Thiruvallur, Vellore.
Tank Type	: System & Non System

Legend

1. Gummidipoondi
2. Araniyar
3. Nagariyar
4. Nandhiyar
5. Kosasthalaiyar (Korattalaiyar)
6. Cooum
7. Adyar
8. Kovalam

Note : Traced from GSI Toposheet of 1975 and Google Earth brought upto date.



1 cm = 6 km

GOVERNMENT OF TAMIL NADU
PUBLIC WORKS DEPARTMENT
WATER RESOURCE DEPARTMENT

Adyar River

0 1 2 km

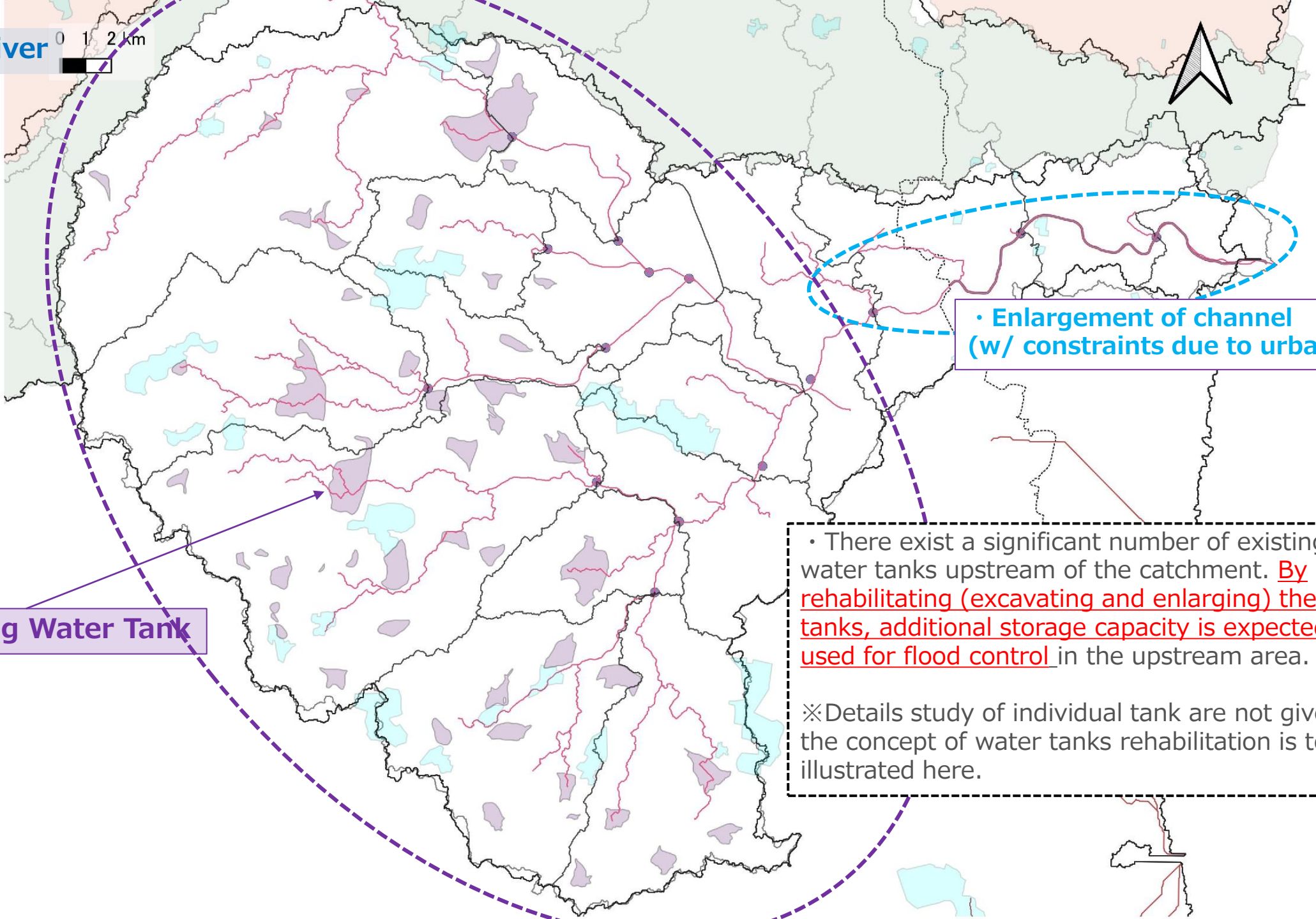


Existing Water Tank

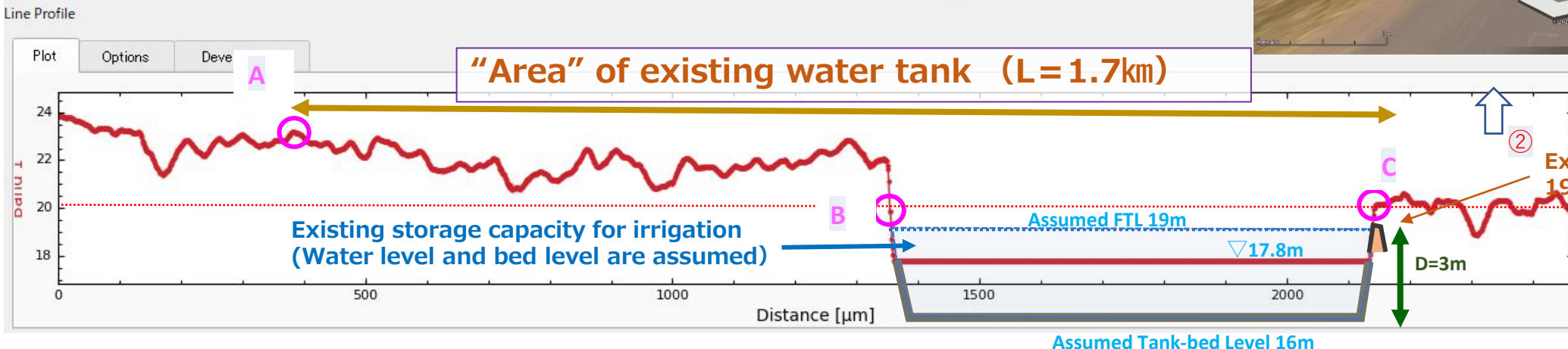
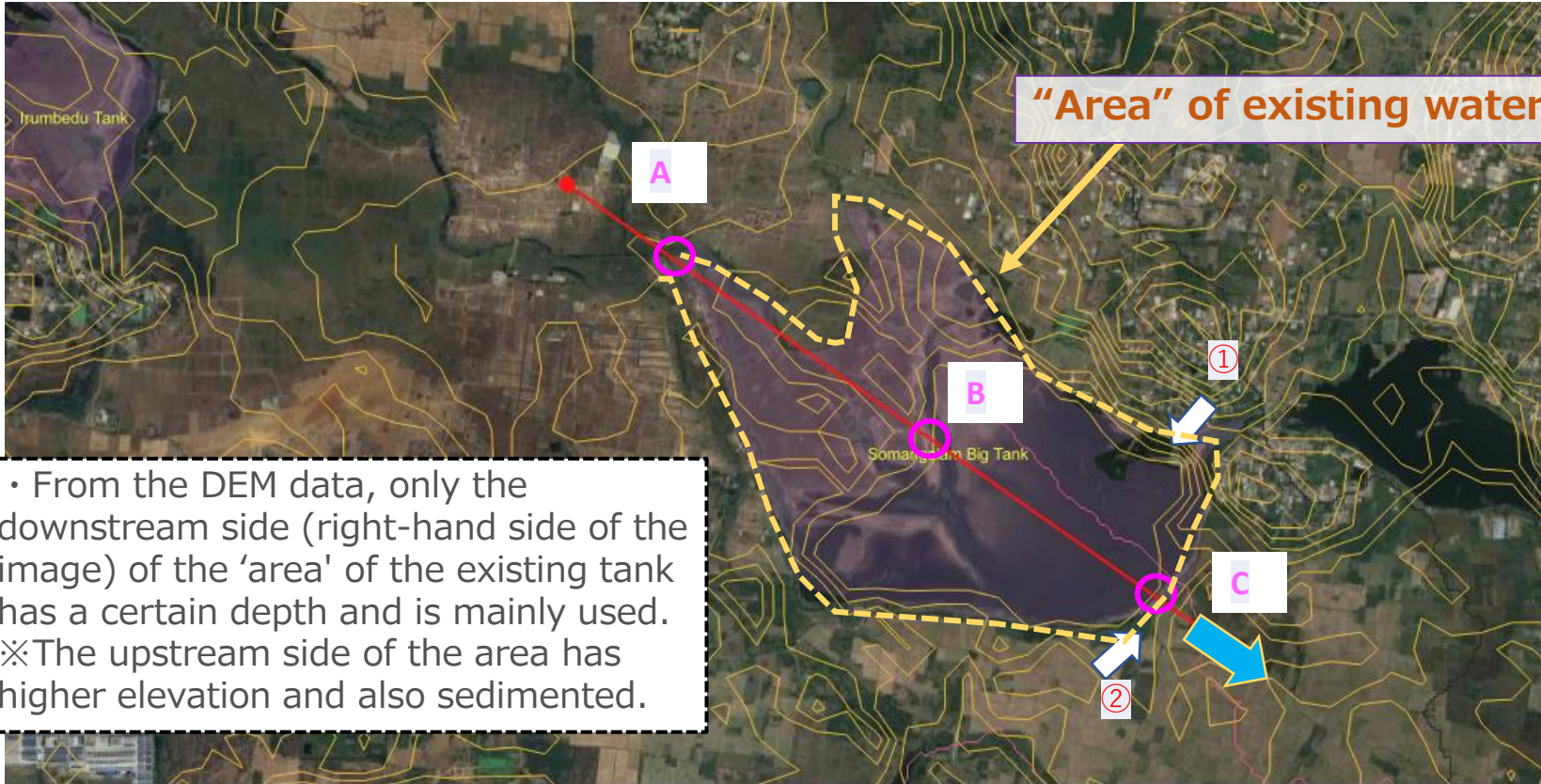
• Enlargement of channel
(w/ constraints due to urbanization)

• There exist a significant number of existing water tanks upstream of the catchment. By rehabilitating (excavating and enlarging) the water tanks, additional storage capacity is expected to be used for flood control in the upstream area.

※Details study of individual tank are not given but the concept of water tanks rehabilitation is to be illustrated here.



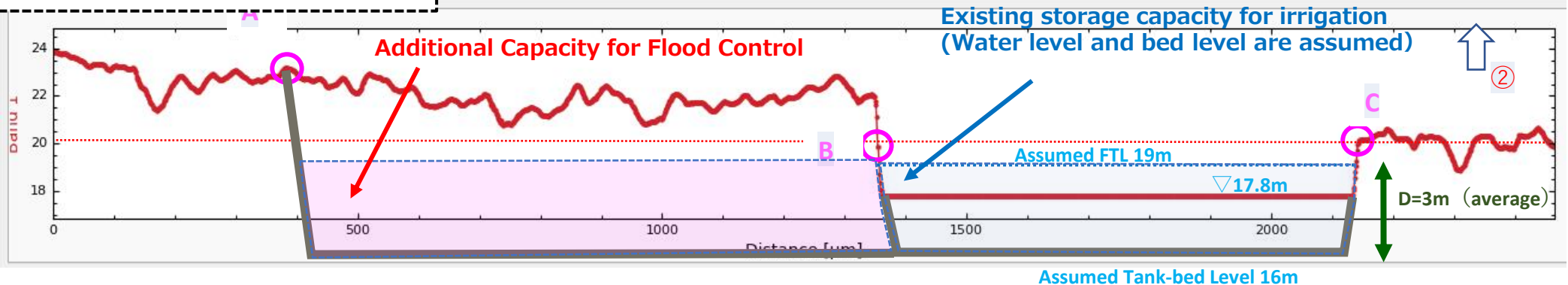
Current Condition of Wetland (A typical Tank)



Rehabilitation of Existing Wetland: Basic Concept

- The existing tank area will be excavated and the increased storage capacity will be used for flood control.
 - The existing tank area (downstream of the tank) is assumed to have a maximum depth of about 4 m and an average depth of about 3 m.
 - The water storage capacity is therefore increased by uniformly excavating to an average depth of about 3 m.
 - The embankment will not be raised.
 - Water intake operations (water intake levels) for irrigation purpose to be considered.
 - The tank dries up in the late dry season.
- ⇒ Removal of sediment to be carried out during this period, if necessary.

⇒ **Rehabilitation of 50 tanks in the Adyar catchment can provide additional storage capacity of 53 MCM for flood control, compared to the existing storage capacity of 59 MCM.**

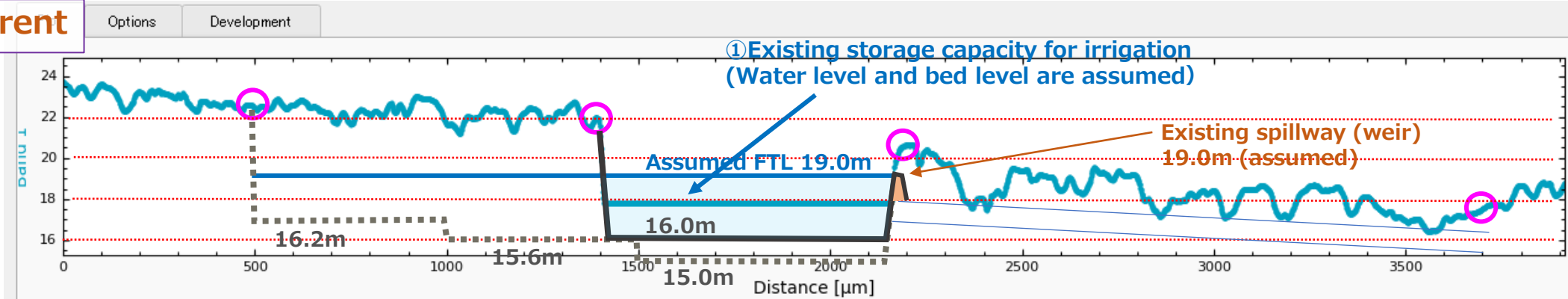


Rehabilitation of Existing Water Tank: Revised Concept reflecting TNWRD's comment

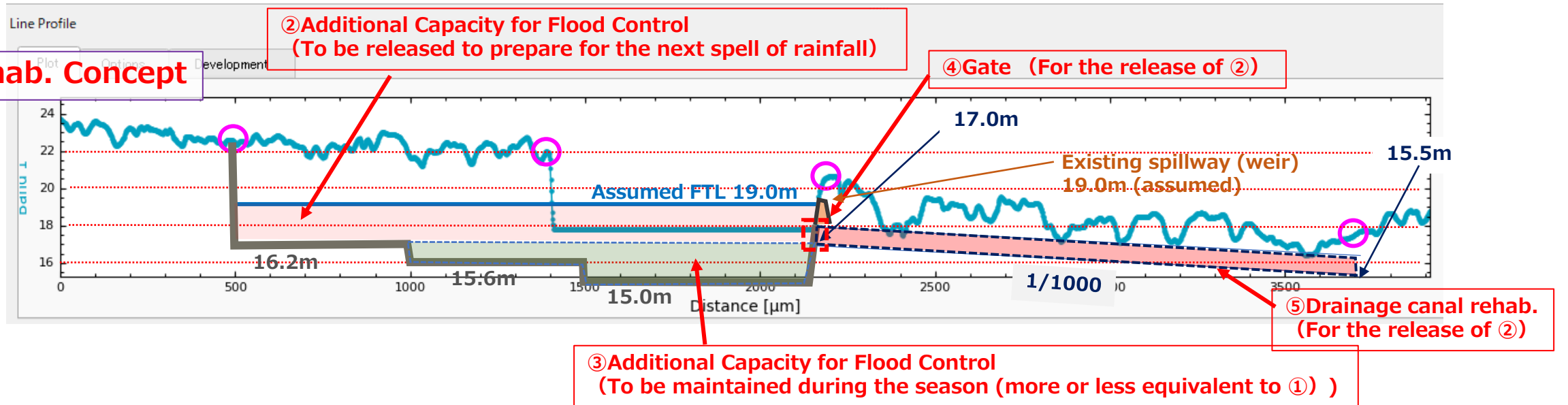
TNWRD's comment A & B

- ✓ A: Release the stored flood discharge and prepare them for the next rainfall spell in the monsoon season.
 ⇒ Install a gate in the downstream to release water.
- ✓ B: To facilitate drainage and water intake, a gradient / elevation difference should be considered at tank bed.
 ⇒ Consider steps at tank bed (The steps of a minimal level to ensure water storage capacity)

Current

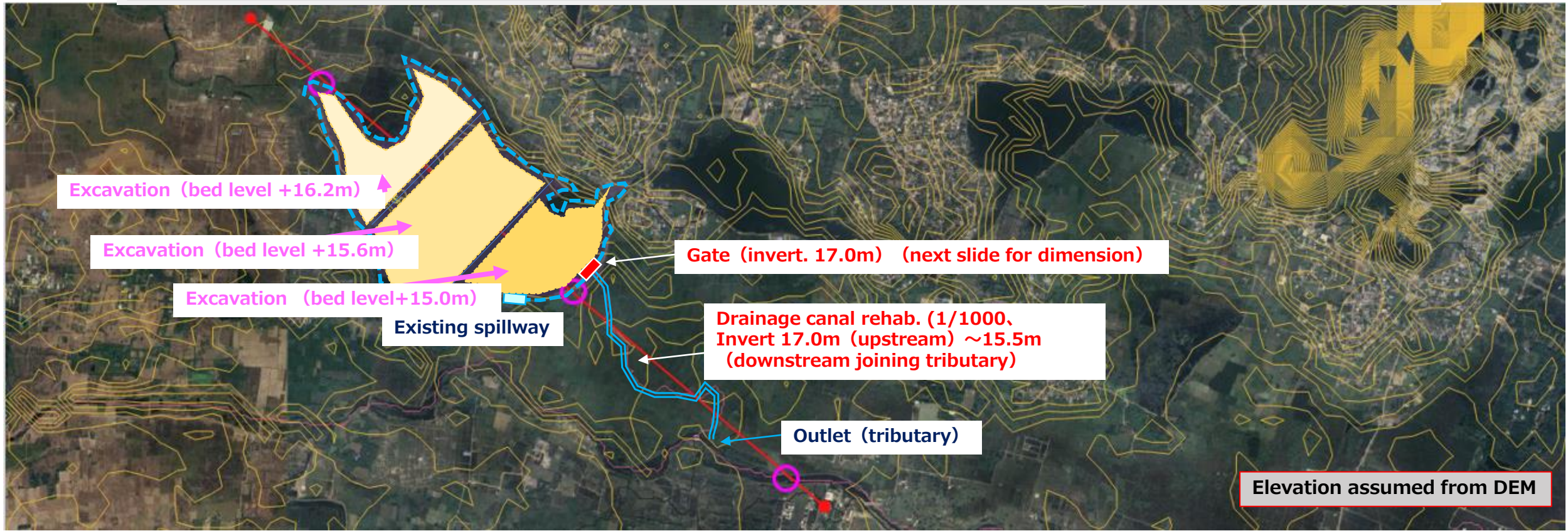
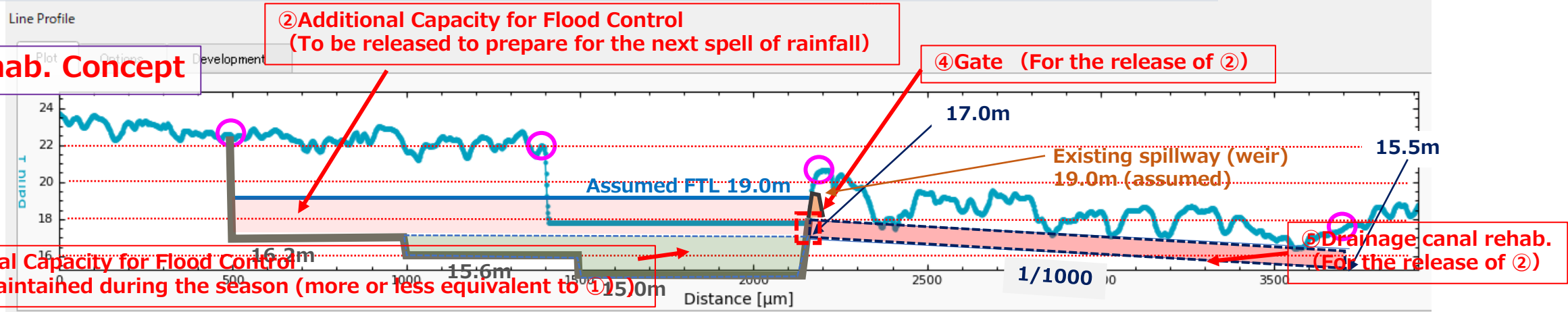


Rehab. Concept



Rehabilitation of Existing Water Tank: Revised Concept reflecting TNWRD's comment

Rehab. Concept



Our Understanding on the Guwahati Urban Flood Vulnerability Statistics

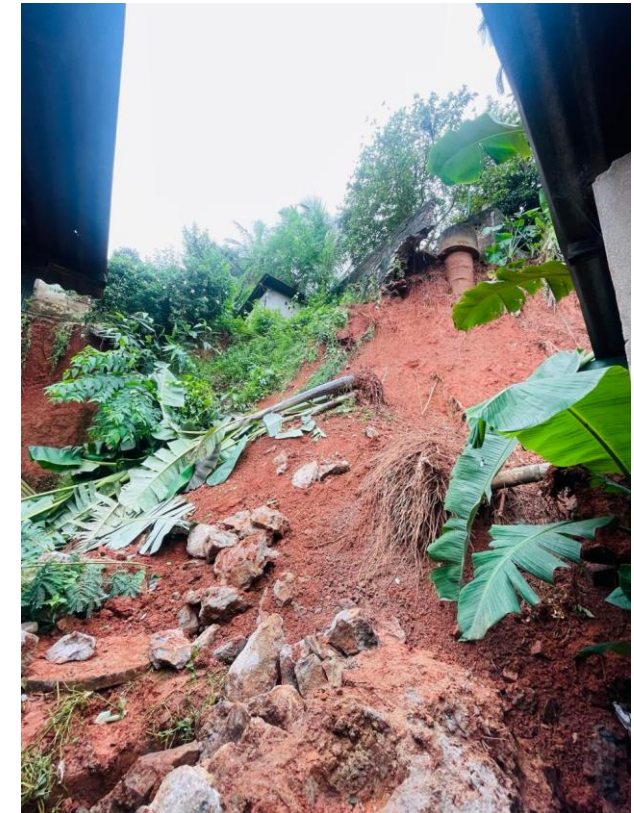


Guwahati Urban Statistics

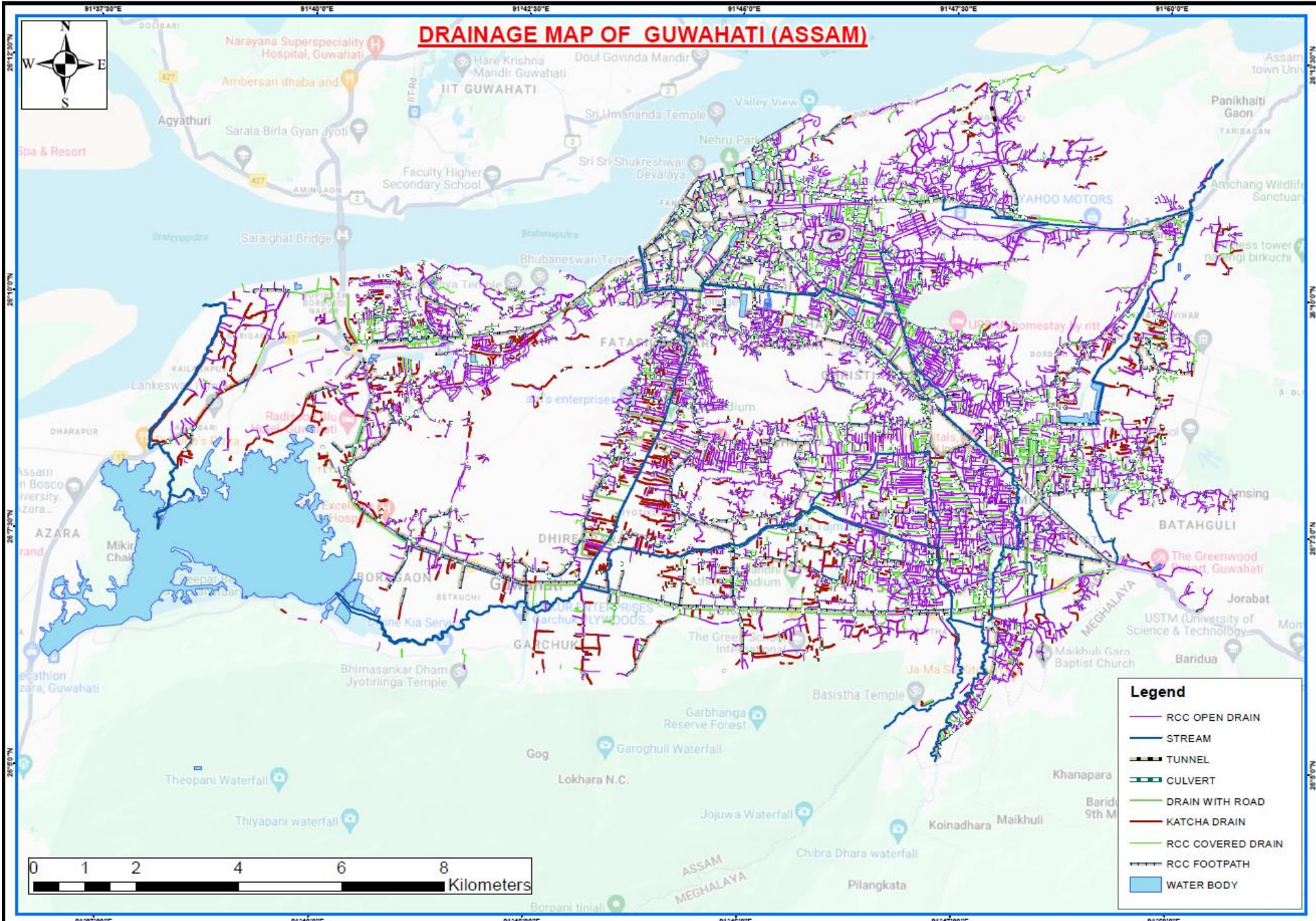


Guwahati urbanisation	GMC	GMDA
Area	274 sq.kms	328 sq.kms
Population as per 2011 census	9,63,429	11,41,699
Population Density in Guwahati persons/sq.km	4444	3480
% of Assam's urban population in Guwahati		25%

1. Annual Urban floods
2. Landslides
3. Water crisis during summers in Guwahati



DRAINAGE MAP OF GUWAHATI (ASSAM)



91°36'0"E

91°42'0"E

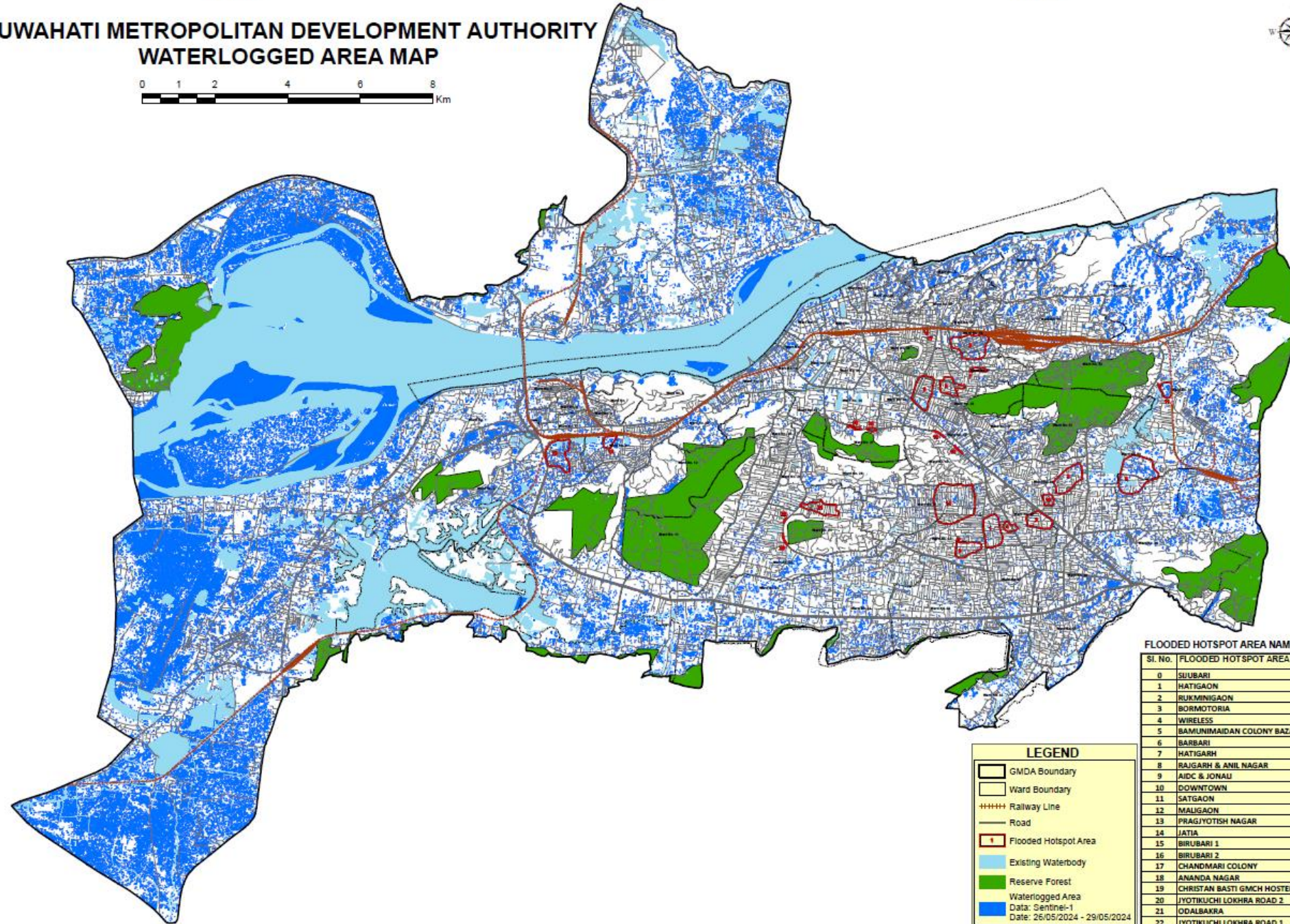
91°48'0"E

GUWAHATI METROPOLITAN DEVELOPMENT AUTHORITY WATERLOGGED AREA MAP



26°12'0"N

26°12'0"N



26°16'0"N

26°16'0"N

LEGEND

- GMDA Boundary
- Ward Boundary
- Railway Line
- Road
- Flooded Hotspot Area
- Existing Waterbody
- Reserve Forest
- Waterlogged Area

Data: Sentinel-1
Date: 26/05/2024 - 29/05/2024

FLOODED HOTSPOT AREA NAME LIST

Sl. No.	FLOODED HOTSPOT AREA NAME
0	SIUBARI
1	HATIGAON
2	RUKMINIGAON
3	BORMOTORIA
4	WIRELESS
5	BAMUNIMAIDAN COLONY BAZAR
6	BARBARI
7	HATIGARH
8	RAJGARH & ANIL NAGAR
9	AIDC & JONAI
10	DOWNTOWN
11	SATGAON
12	MALIGAON
13	PRAGJYOTISH NAGAR
14	JATIA
15	BIRUBARI 1
16	BIRUBARI 2
17	CHANDMARI COLONY
18	ANANDA NAGAR
19	CHRISTIAN BASTI GMCH HOSTEL ROAD
20	JYOTIKUCHI LOKHRA ROAD 2
21	ODALBAKRA
22	JYOTIKUCHI LOKHRA ROAD 1

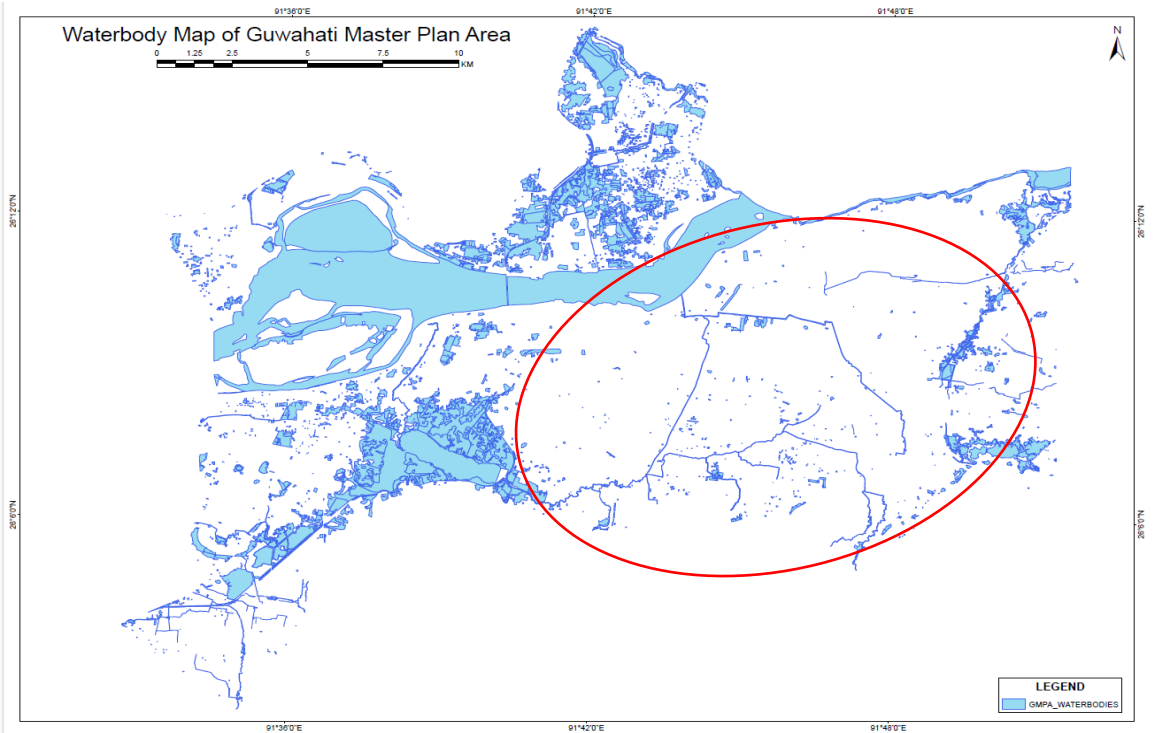
91°36'0"E

91°42'0"E

91°48'0"E

Where has Guwhati gone wrong in last few decades?

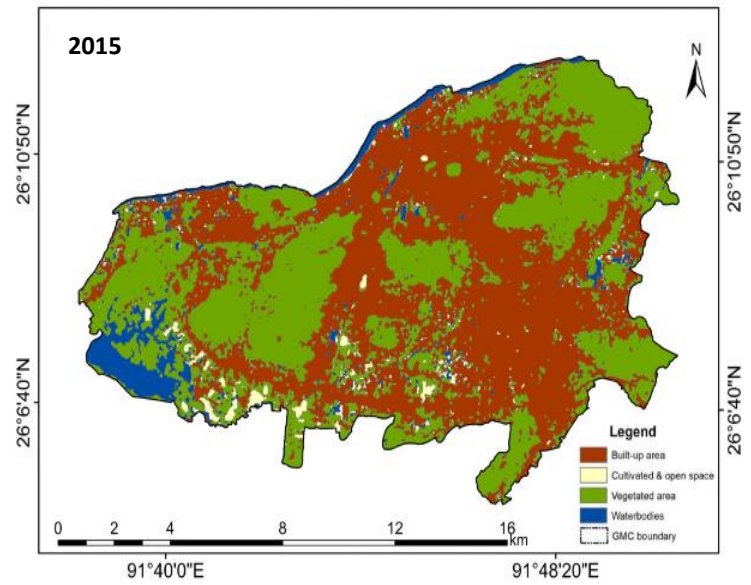
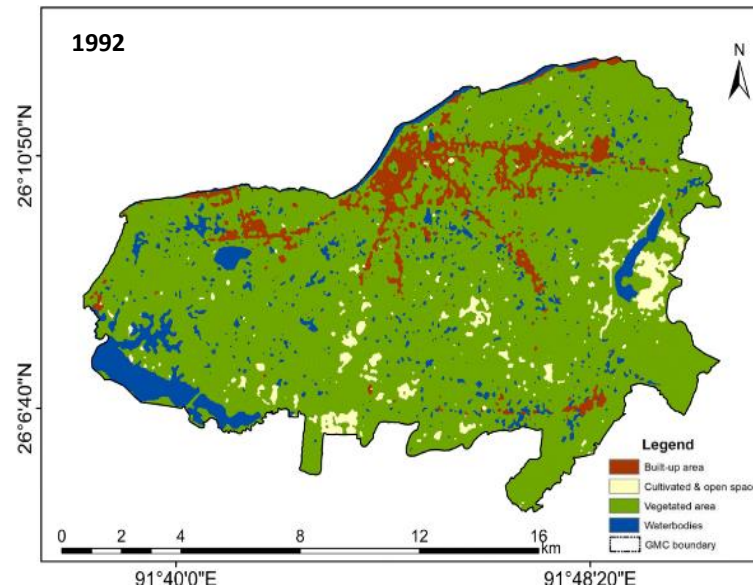
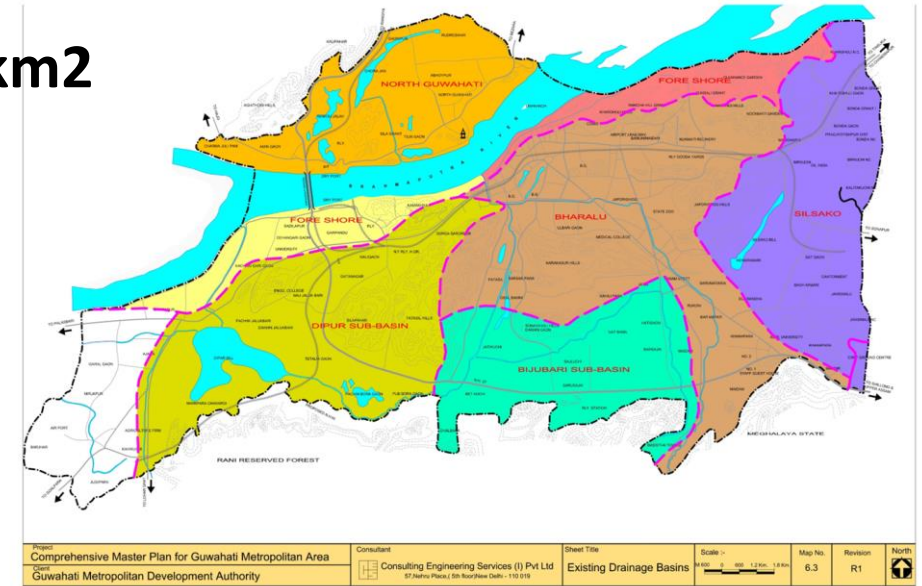
- Complete dependence on concrete interventions
- Indiscriminate built-up across flood plains, water bodies, hills, greens with encroachments
- Urban Master Plans not addressing vulnerability
 - Riverine floods (fluvial and flash) and
 - Urban flood (pluvial)
 - No proper hydraulic design for the SWDs
- Extraction of ground water – poor supply network from surface water
- No proper sewage collection, treatment and disposal



Urban Storm Water Drainage Issues in Guwahati

- Fragmented drains - lack of complete networks with unscientific planning
- Lack of Watershed based approach
- Adhoc storm water drainage design; issues with gradients and outflows,
- Lack of sewerage systems polluting the natural channels,
- Lack of legal inventory on **wetlands and other waterbodies and their catchments** – no authority specifically protecting against built-up on them
- Absence on the use of traditional wisdom in flood management

Combined catchment: 403 km²
GMDA Area = 216 km²



Challenges in Urban Flood Management



Drainage Master Plan & Sponge city plan

- Redoing the **Guwahati Drainage Master Plan** after 20 years
- Developing **Guwahati Sponge city plan & DPR** : *Re-looking at city hydrology and catchment areas*
- Mapping all natural and built drains as well as flood vulnerable areas using DGPS and ETS (Electronic Total Station) Surveys

Multi-stakeholder interventions

- ⊙ **Mission Flood free Guwahati** addressing artificial flooding for Guwahati
- ⊙ Multiple stakeholders GMC, GMDA, PWD, Water Resource, ASDMA led by DC Kamrup and C&S DoHUA
- ⊙ Focus on:
 - > Redesigning of drains,
 - > Manual desilting & Mechanical super-suckers,
 - > removal of encroachment on water bodies, etc

Building Resilience in Guwahati

Towards Risk-informed Master Plan



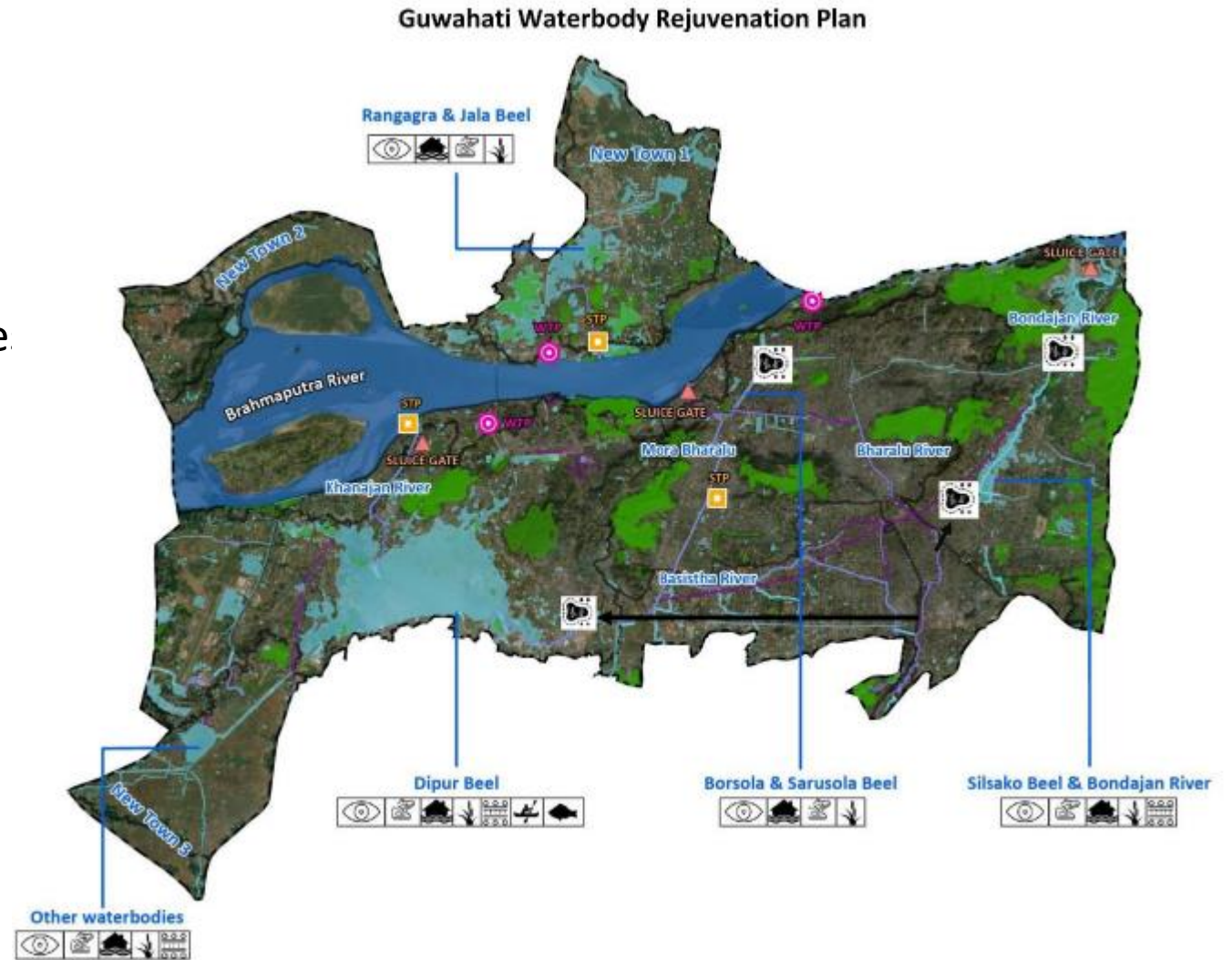
Edge to edge built-up on Bharalu R.

- **Development control regulations along the water bodies** in the urban areas initiated through Assam Unified Building Byelaws, 2022
- RFP for **Integrated Urban Drainage Master Plan for Guwahati** – watershed and hydro-dynamic based approach which looks at entire watershed uptill the outfall.
- Urban Lab, being set up with support of GIZ to **navigate stakeholder involvement** to develop climate resilient, inclusive drainage master plan
 - **Real Time Data Acquisition System (RTDAS) for urban areas to be setup**
 - **Rainfall Forecasting (GFS, ECMWF & IMD) and Flood Forecasting for Brahmaputra Basin is available and integrated with SDMA**
 - **Hydro Modelling for the Urban Areas of Guwahati City**
 - **Area / Street Flood Forecast with web-based flood alert dissemination**
 - **Flood Mitigation Measures.**

Building Resilience in Guwahati

Silsakoo Revitalisation

- The **Guwahati Water bodies Conservation & Restoration Act, 2008** recognised 5 water bodies for restoration within GMDA area, including Deepor Beel, Silsakoo Beel, Bondajan, Borsola and Sorusola beel.
- Silsakoo beel rejuvenation was taken up to address the critical degradation and encroachment issues affecting the beel.



Outcomes from the Silsako Beel Rejuvenation

- 1. Increase of retention capacity:** Catchment area is 52 sqkm. Present retention capacity is 0.8 Million cubic meter, but increasing with reclamation and revitalization of beel peripheries.
- 2. Diversion of Bahini river:** Work is on progress to divert around 5 cubic meter water through mechanical measures into Silsakoo, so as to **reduce the inflow of Bahini river to the flood-prone** low-lying residential zones of Dispur revenue circle.
- 3. Bio-remediation of Silsako Beel:** Bioremediation of Silsako beel and 3 upstream channels shall be started. This work is taken as per NGT direction & action taken report submitted by Govt. of Assam.
- 4. Climate change:** Around **8000 trees** will be planted and Riparian zone of Silsakoo beel will be created. Plantation begun under Hon'ble CM's Chief Minister's Institutional Plantation Programme (CMIPP).

STRATEGIES FOR GUWAHATI

- ❖ **The interventions proposed in this project are focused on the following three strategies based on the River basin approach and hydrological analysis carried out in a holistic manner.**
 1. **Conservation of Flood Water**
 - a. Riverine Reservoir / Barrages / Check Dams / Dykes
 - b. Capacity addition by Deepening and foreshore reclamation
 - c. Intra-Basin Transfers & interconnecting drains
 2. **Climate Change adaptive Rehabilitation and Ecological Restoration.**
 - a. Providing Flood Regulators / additional Outlets and eco-restoration
 - b. Increased freeboard and flood buffering capacity.
 - c. Increasing carrying capacity of Macro drain
 3. **Flood Protection and River Training works**
 - a. Construction of Flood protection wall and Bunds
 - b. Formation of new link Channels and river training works
 4. **Artificial Recharge Works**
 - a. Check Dams/ Dykes
 5. **Inter and Intra Basin/Sub Basin Transfer**
 - a. Riverine Reservoir / Barrages / Check Dams / Dykes / Abundant Quarries with Pumping System

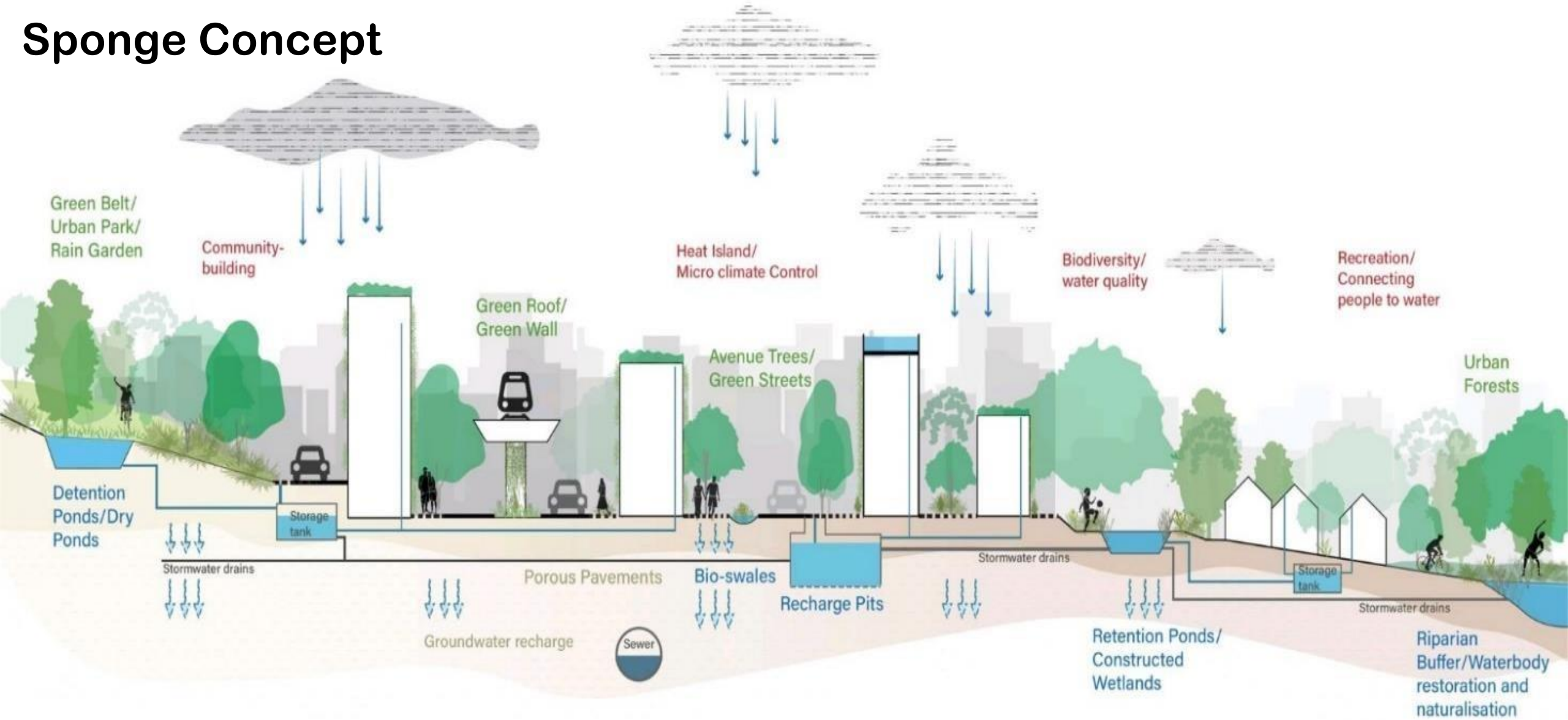
Building Resilience through Sponge city plans - First State in India to develop an integrated Master Plan

Building Sponge Cities

- Framework for Sponge city along with DPR prepared for: Guwahati
- Sponge city Planning framework

- **Integrated Water Resource Management Plan** to manage increased demand for water
 - Increased wastewater generation
 - Inadequate sewage collection
 - Ground water quality & localised flooding
- **Water Rejuvenation plan** for selected water bodies
- **Stormwater management strategy**
- Identification of **Sponge City Infrastructure** projects and costing

Sponge Concept



Detention

Reduce stormwater run-off



Retention

Capture water for storage



Recharge

Increase infiltration of rainwater into ground

Blue Green Infra Interventions for Guwahati through Sponge City Plan

Waterbody Rejuvenation Projects

Rejuvenation of Bondajan Channel

Rejuvenation of Bharalu River

Rejuvenation of Mora Bharalu channel

Rejuvenation of Basistha River

Rejuvenation of Barsola & Sarusola Beel

Protection & conservation of Deepor Beel

Water Recycling & Green Corridors

Incentive to reuse recycled water

Green corridor along ROW of OIL

Naturalized channel to convey runoff to

Redirection of storm runoff

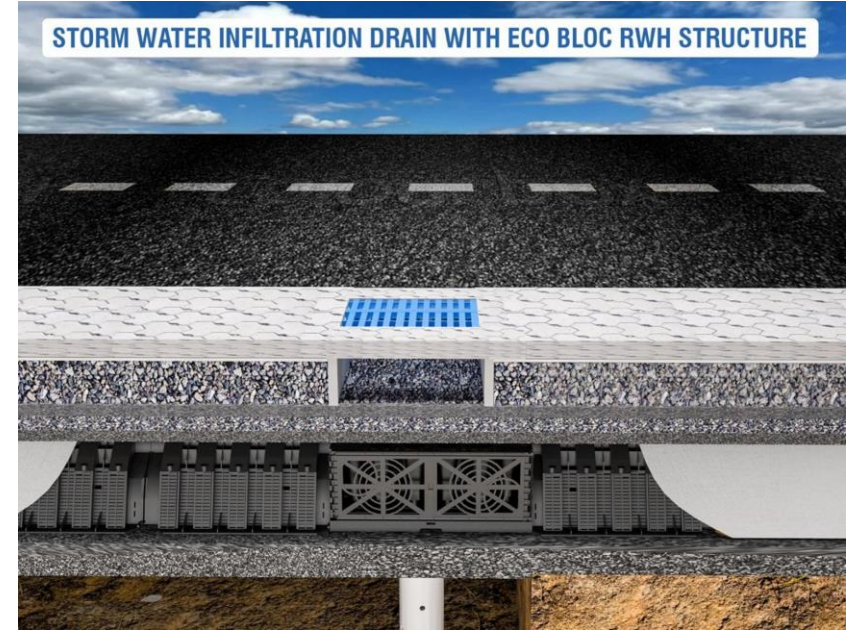
Storages & Detention

Rainwater Harvesting & groundwater recharge for households

Installation of injection wells

Creation of Rain gardens near CE Irrigation office

STORM WATER INFILTRATION DRAIN WITH ECO BLOC RWH STRUCTURE



Rain Water Harvesting Infiltration tanks using Ecoblocs implemented by Chennai Corporation successfully in the Integrated Storm Water Drain

Solutions Implemented by Chennai City through Storm Water Infiltration Tanks Using Ecoblocs

INFILTRATION TANK பெருநகர சென்னை மாநகராட்சி
GREATER CHENNAI CORPORATION

Products	Ecobloc Light, Ecobloc mass and Ecobloc flex
Application	Infiltration
Storage capacity	500 m ³
Specifics	<ul style="list-style-type: none"> • 1 Ecobloc Light Infiltration tank of 500 m³, 10m x 7m and 3.5m high • 1 Ecobloc mass Infiltration tank of 50 m³ • 1 Eco Ecobloc Light Tank and 1 Eco Ecobloc Mass • 1 Ecobloc flex Infiltration tank • Installation time taken: 25-30 days, 3 people

INFILTRATION TANK பெருநகர சென்னை மாநகராட்சி
GREATER CHENNAI CORPORATION

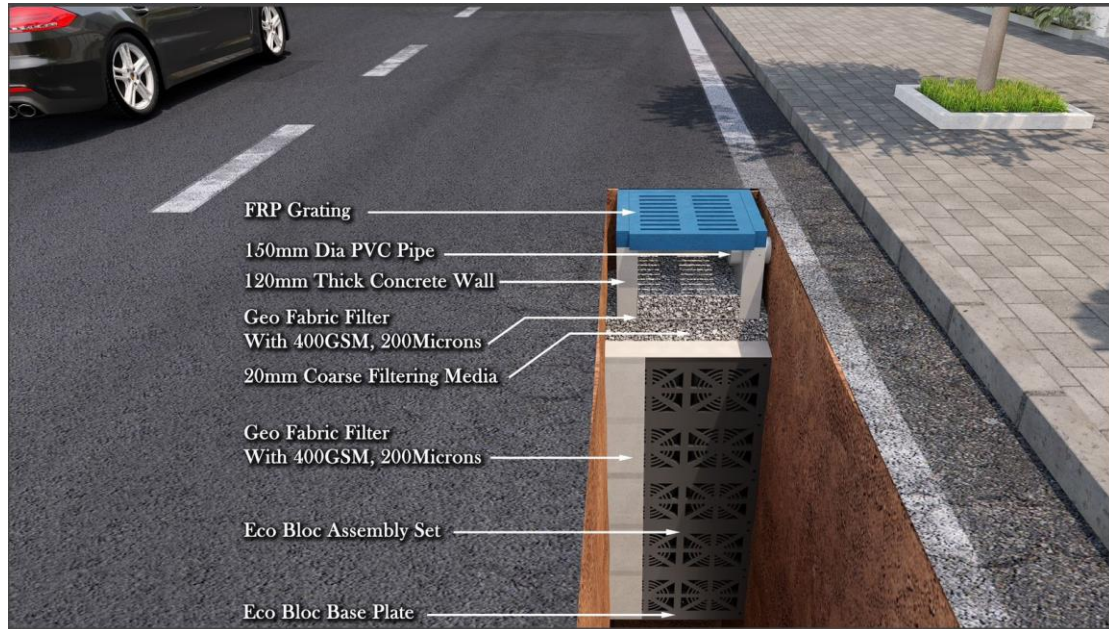
Products	Ecobloc Light, Vario Eco flex
Application	Infiltration
Storage capacity	110 m ³ (530 Ecobloc Light)
Collecting surface area	800 m ²
Specifics	<ul style="list-style-type: none"> • 100.00 m x 5.80 m x 3.50m • 7 Layers • 5 Installers • Installed in 2 days

Rainwater Harvesting & groundwater recharge infiltration tanks at the OSR Land parcels and at the Public Parks can be created in Guwahati as Rainfall-Runoff Source Control Measure

INFILTRATION TANK பெருநகர சென்னை மாநகராட்சி
GREATER CHENNAI CORPORATION

Products	EcoBloc Inspect flex
Application	Infiltration
Storage capacity	148 m ³
Collecting surface area	70 m ²
Specifics	<ul style="list-style-type: none"> • 16.8 m x 4 m x 2.3 m • 3 Installers • 6.5h installation time

ECO BLOC SPONGE PARK



ECO BLOC RAIN WATER HARVESTING STRUCTURE



கோவை மாநகராட்சி
COIMBATORE CITY MUNICIPAL CORPORATION

Integrating Green, Blue and Heritage components in the Old City Local Area Plan & River-front development plans of Guwahati

Stage	Details
<p>Draft Proposals – Green, Blue and Heritage</p>	<p>The following are the Draft proposals for Green, Blue and Heritage:</p> <ul style="list-style-type: none"> • Connecting Existing Green and Blue spaces within the site • Enhancing connections with the Riverfront • Provision of NMT lanes along existing major roads. • Improving the existing green spaces • Connecting all important green, blue and heritage areas (defining a trail for tourists) • Enhancing pedestrian connections • Pedestrianizing of SS Road

- A. Development of Botanical Garden on Old Jail land
- B. Riverfront Development Part 2 - Demolishing CP Bungalow & Revitalisation of Padam Pukhuri
- C. Riverfront development Part 2 - Demolishing DC Bungalow & Proposal for Landscaping of the area
- D. Remodelling Nehru Park
- E. Development of Jor Pukhuri
- F. Road Network Improvement around Botanical Garden
- G. Revitalisation of Dighuli Pukhuri
- H. Improvement of M.G Road
- I. Improvement of Jail Road
- J. Pedestrianisation of SS Road (from M.G to M.N Road & Improvement from M.N Road to G.B Road)
- K. Proposal of Cycle track on Riverfront
- L. Riverfront Development Part 1 & Part 3
- M. Preserving the Ambari Heritage Precinct



Restoration of Historical Water Tanks and Ponds within the City



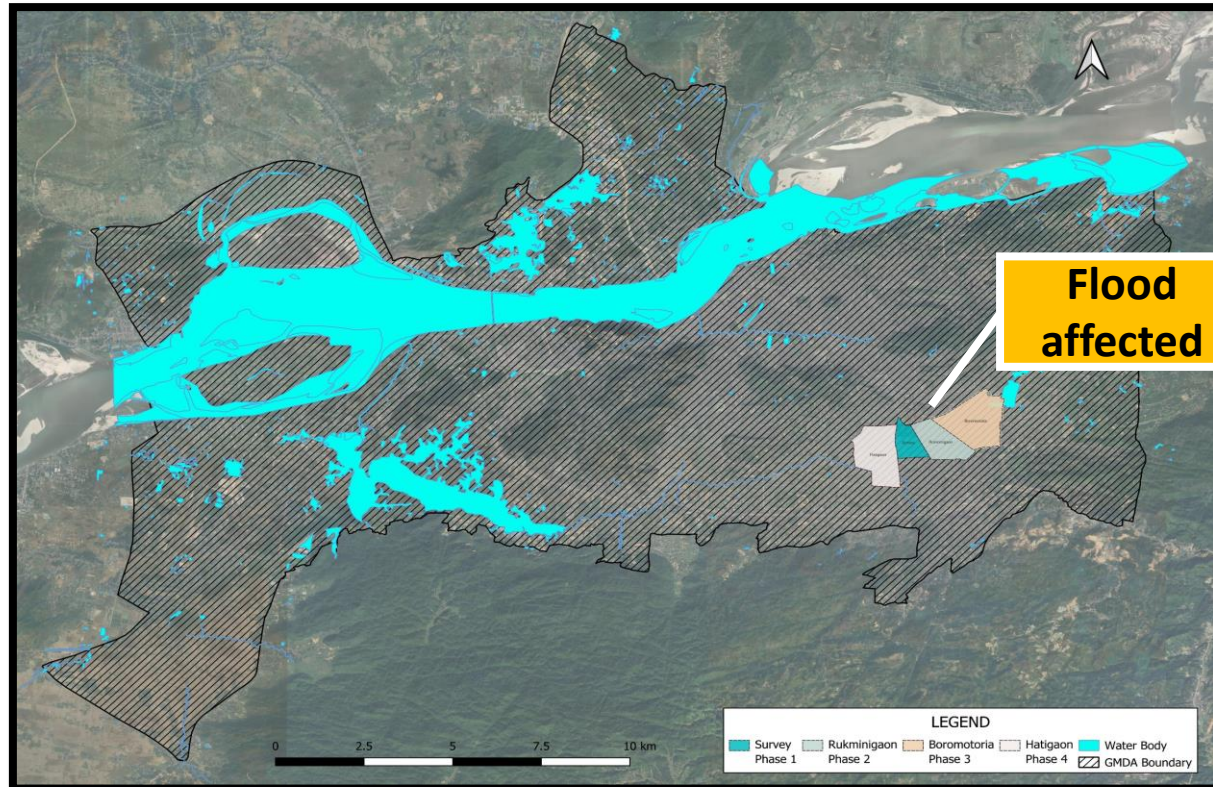
Twin Ponds of Jur-Pukhuri, reviewed and upgraded to a public park by GMDA



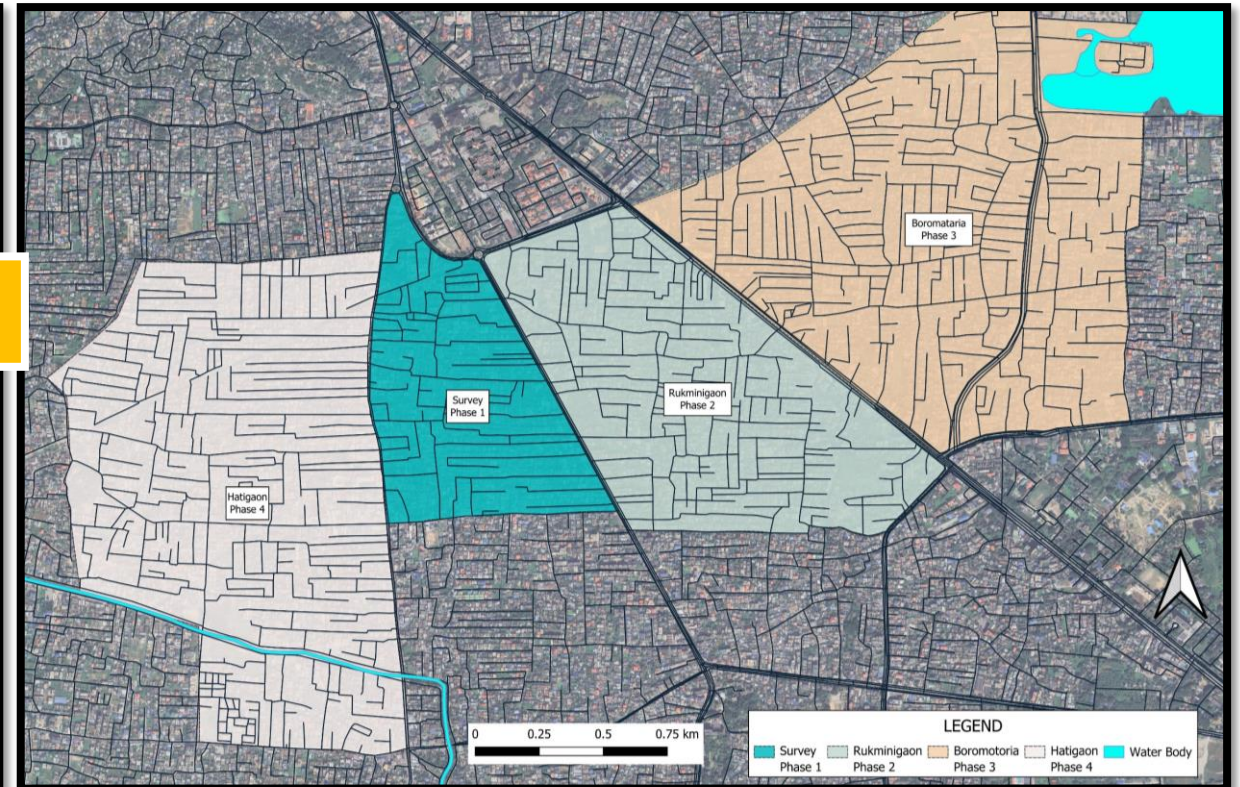
Additionally AUKH project: Ward-level drainage solutions

- Problem area mapping for water logging solutions through Assam Urban Knowledge Hub
- DGPS Survey on major affected drainage channels
- Reconnaissance survey of every road and drain in the ward

Study Location in Guwahati master plan area



Wards selected: Bormotaria-Sorumotaria-Survey-Rukminigaon

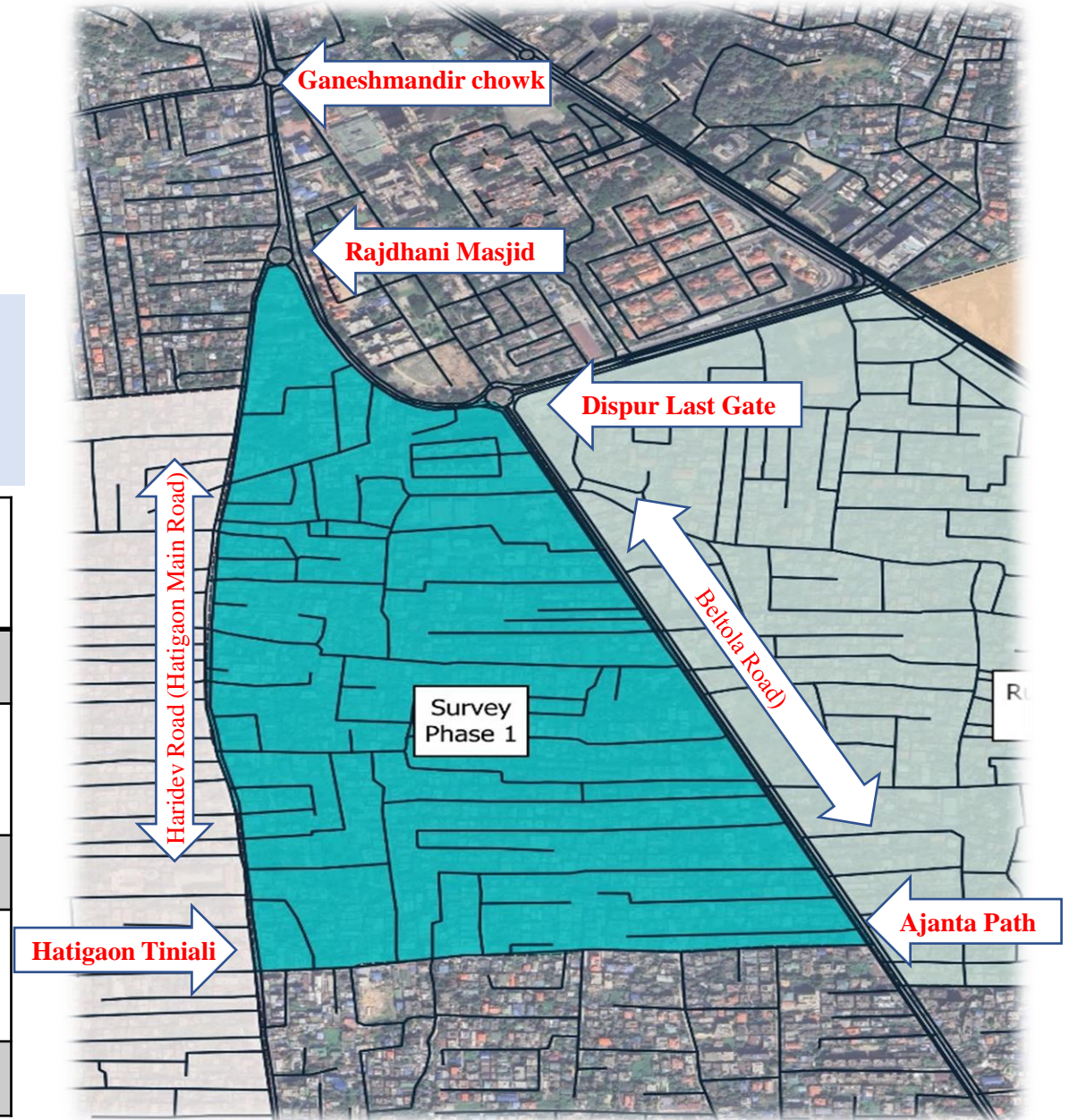


DRAINAGE PLANNING SURVEY AREA- Phase 1

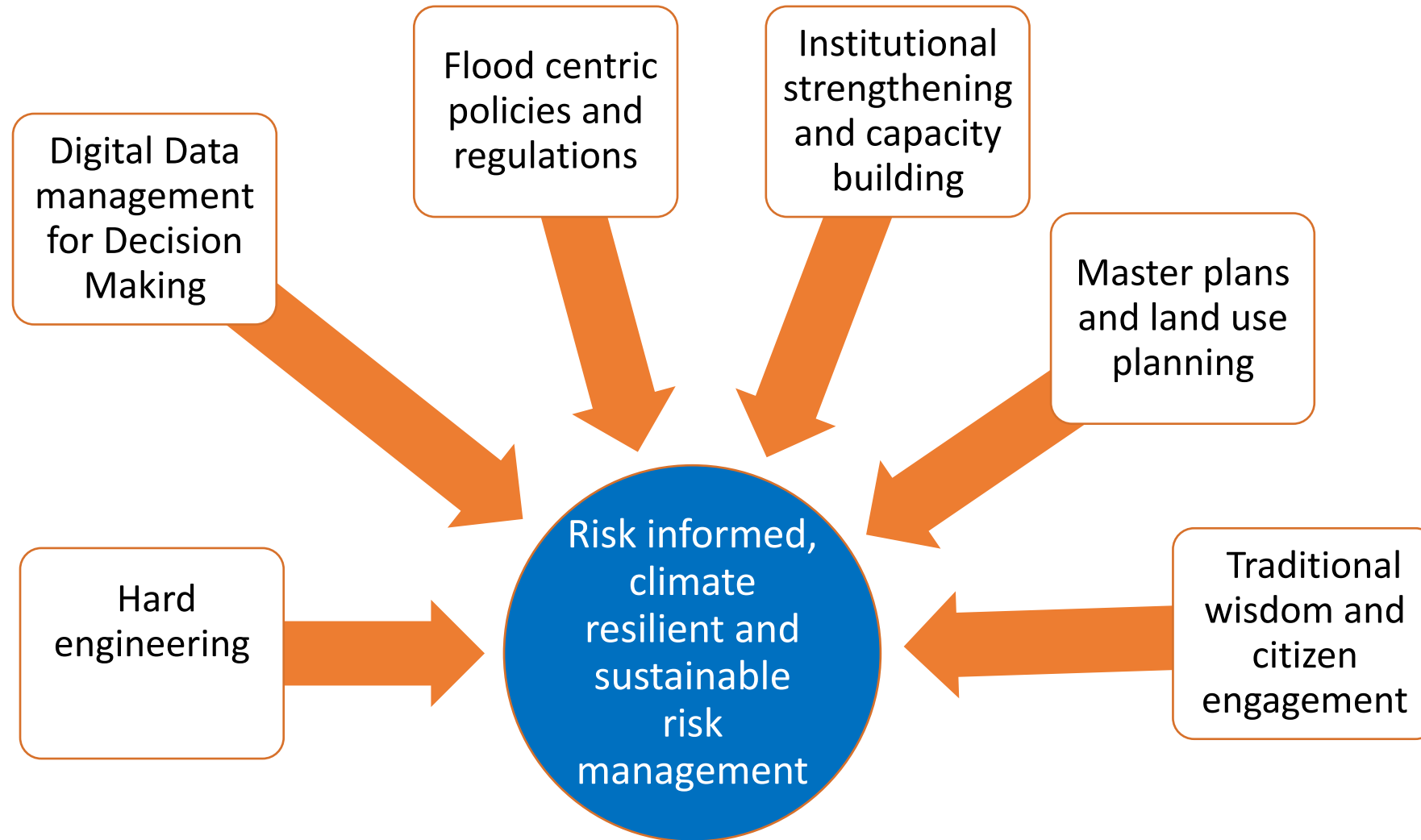
Area covered in 1st ward= 0.789 Sq.Km (78.9 Ha)

Total No of Water Logging Area = 10 (appx)

SL. NO	TYPE OF DRAIN	TOTAL LENGTH (KM)
1	Pakka with Open	9.79
2	Pakka with Covered	12.2
3	Katcha (open)	0.47
4	Under Construction	0.45
	Total Drains	22.71



Comprehensive Solution Approach through Setting up of “Urban Labs” for Integrated Disaster Management



GIZ – Urban Labs – Development of Check List for the Urban Drainage Master Plan

Problems in existing Drainage system in our cities	Steps for the Urban Drainage Master Plan
Issues in drain gradients and engineering due to non-existent/non-scientific Survey & Planning	<p>Engineering Survey</p> <ul style="list-style-type: none"> • LiDAR survey for creation of DEM to assess natural flow network • RTK Survey for drain gradients, DGPS/Bathymetric survey for gradients of bigger drains & natural channels • Mapping & Evaluation of existing Drainage Network • Mapping of the Flood levels based on historical observations using RTK DGPS
No link from catchment up to outfall resulting in water logging	<p>Watershed Based Approach</p> <ul style="list-style-type: none"> • Mapping of entire Basin for assessment of local conditions from catchment up to outfall • Micro catchment delineation analysis
Non-scientific evaluation of run-off and siltation	<p>Rainfall – Runoff Analysis and Modeling as per CPHEEO Guidelines</p> <ul style="list-style-type: none"> • Assessment of run-off through rainfall analysis, study of land use for built-up, etc • Hydrodynamic Modelling with 1D and 2D simulations
Non-assessment of existing water bodies and channels for retention & carrying capacity	<p>Flood Zoning & Inundaton Mapping</p> <ul style="list-style-type: none"> • Maximum capacities of water bodies • Carrying capacity of major Nals/drains • Development of Flood Zoning and Flood Inundation Maps for various return period events
Changed weather pattern and increased occurrence of high intensity rainfall events due to climate change	<p>Flood Mitigation and Climate Resilient Solutions with O&M Plan</p> <ul style="list-style-type: none"> • Climate resilience integrated through water sensitive designs and nature based solutions with O&M Plans

Principles of risk-informed, integrated, resilient, inclusive and sustainable urban development



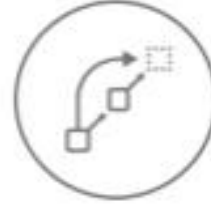
Design with the user and foster **citizen-centric governance**



Implement for **sustainable, climate-friendly and gender-responsive urban development** that considers **disaster risk reduction**



Contribute to **urban governance and existing urban planning processes**



Design for **scale and facilitate transferability and scaling-up** of digital solutions and processes



Address **local urban challenges and improve municipal services**



Be **data driven, use disaggregated data for women** and make a responsible use of data



Strengthen the **local economy and digital ecosystem** in order to **enable prosperity for all**



Prioritize **open source**

Thank you.



We Deliver Our Commitments

We also

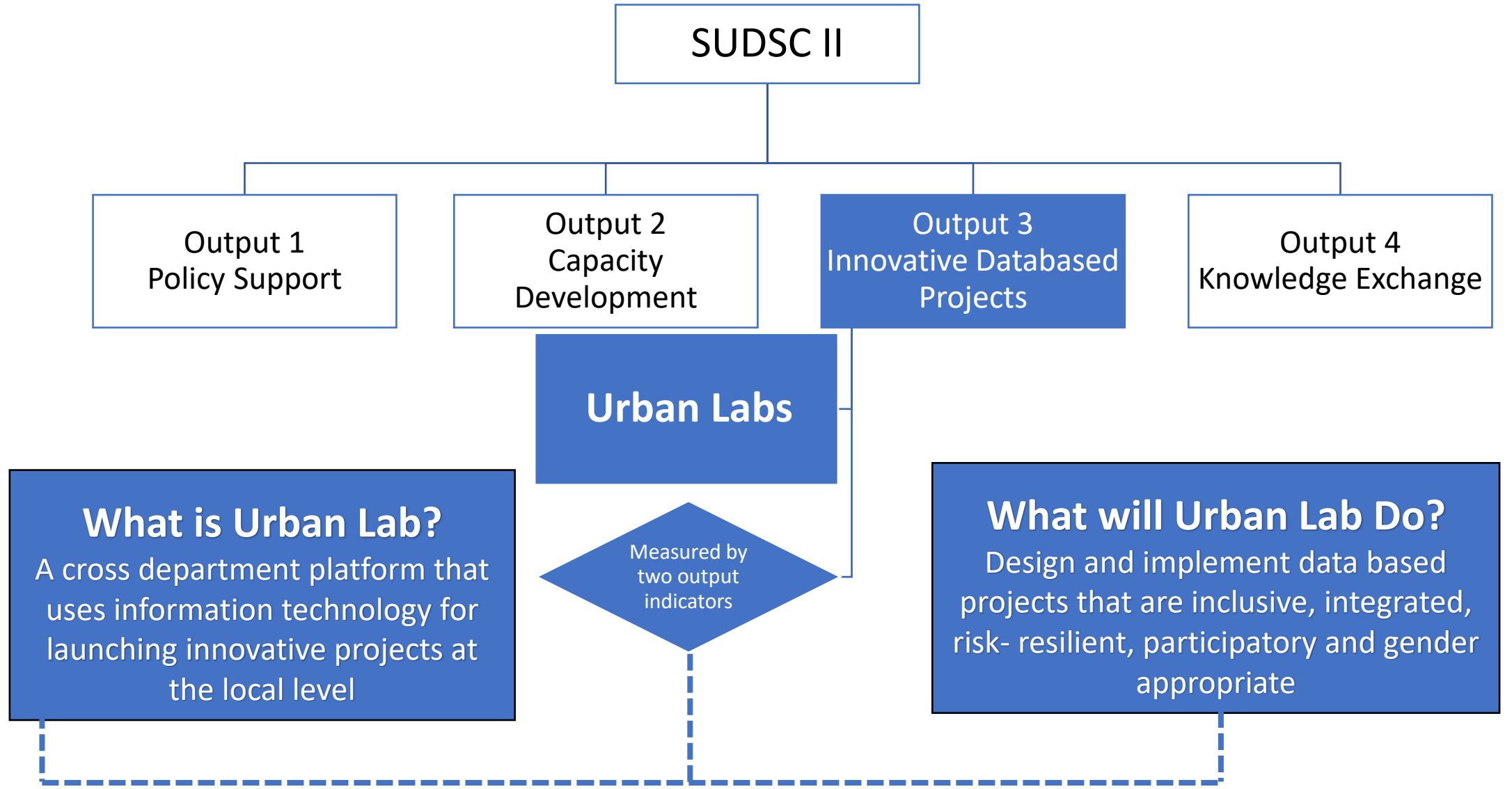
tie Reason and

Passion together

to put Urban Labs into

Operation

Outputs of SUDSC II and Urban Labs



Synergistic Approach of SUDSC II

Data-based
Decision
Making

Participatory interventions for data-based decision-making, showcasing data-based, digital solutions for sustainable urban development in achieving the UN Sustainable Development Goals (SDGs)

Sustainable
Urban
Development

Create synergies between public sector (MoHUA, state and city level), private sector, academia, and civil society for further development of data-based, digital solutions for sustainable urban development

Participatory, inclusive and gender-responsive, innovative, data-based projects are implemented in the areas of disaster risk management, public spaces, urban green spaces and peri-urban space.

Data-based digital tools for cross-sectoral spatial planning are integrated into innovative projects for informed decision-making

What are our Tasks?

- Support decision-making and provide citizens with high quality services in urban planning, disaster management, and operational management
- Design and provide support for implementing public policies
- Hold regular meetings of inter-departmental stakeholders to exchange knowledge and co-create innovative solutions for urban challenges
- The approach is data based, participatory, cross-sectoral, gender sensitive, inclusive and sustainable

Our contribution

Integrated urban planning
(Land use, infrastructure, environment, climate resilience
all tied together)



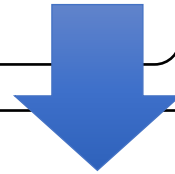
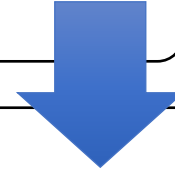
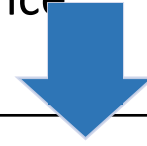
Gender responsiveness



Disaster Risk management



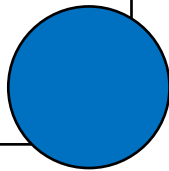
Innovative digital tools & technologies



Partners for Collaboration

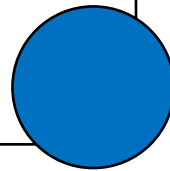
- GMC
- Guwahati Smart City Ltd
- GMDA
- AUIDFL

City level



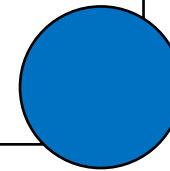
- GMDW&SB, FREMAA, WRD, Housing & Urban Affairs, ASDMA, Bio-diversity Board, ULM (for gender component), PWD, Revenue Dept

State level



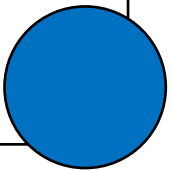
- MoHUA, Regional office of CWC, IMD, Brahmaputra Board, NIUA, NDMA

National level



- IIT, Engineering institutes, Drainage contractors, NGOs, Community entities

Others



- Deeper Stakeholder Participation in Urban Planning
- Data Analysis to enable evidence based Decision Making
- Integrate (spatial, economic, social, environmental, and gender-centric) Urban Planning
- Develop capacities to embed climate resilient Disaster Response
- Promote Knowledge Sharing (internal and external)

- Improvements in Urban Planning Framework, Drainage Master Plan and Zoning Regulations (to make city climate resilient, risk informed, gender focused and inclusive) in alignment with SDGs (SDG 5, 11 and 17)
- Implementation plan for responding to abnormal hydrological events, drainage and urban flooding issues to make the city climate resilient (e.g. Urban Lab to develop parameters, processes and protocols for engineering designs)
- Recommendations on innovative *pilot* projects with costs using digital tools (e.g. App based alerts, proximity to rescue and rehabilitation centres). Standard designs for a shelf of projects to be warehoused in Urban Lab
- Implementation plan for gender responsive approaches (e.g. during disasters). Gender data to be warehoused in Urban Lab

Tasks for the Team in this Visit

- Discuss Work Plan, Deliverables and Time Frame
- Meet with officials of Guwahati Smart City Ltd and GMC officials
- Consult the local **giz** team and understand expectations and obligations
- Meet up with all Stakeholders and collect relevant quantitative and qualitative data (ward data, population data, flood loss estimates, GSCL and GMC budget, past flood responses, staffing & training, capacity building needs. Understand the Needs from the lens of Stakeholders
- Conduct site visits to “flood hot spots”, interact with women, NGOs/CSOs and SHGs
- Understand the current status of Drainage Master Plan and assess gaps