

Swachh Delhi - A Sampoorna Approach

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Outline of Presentation

- Ingredients for a city to be *Swachh*
- Where Delhi stands
- What is required to be done?
- How to achieve the goal?
- Your role in it

Ingredients for a city to be *Swachh*

A city can be termed a Swachh city if it disposes off in a sustainable and safe manner

- Its sewage
 - Through a well designed sewerage system to take sewage to STPs
- Its storm water
 - Through well protected and maintained storm drains
- Its solid waste
 - Through well organized collection and disposal system

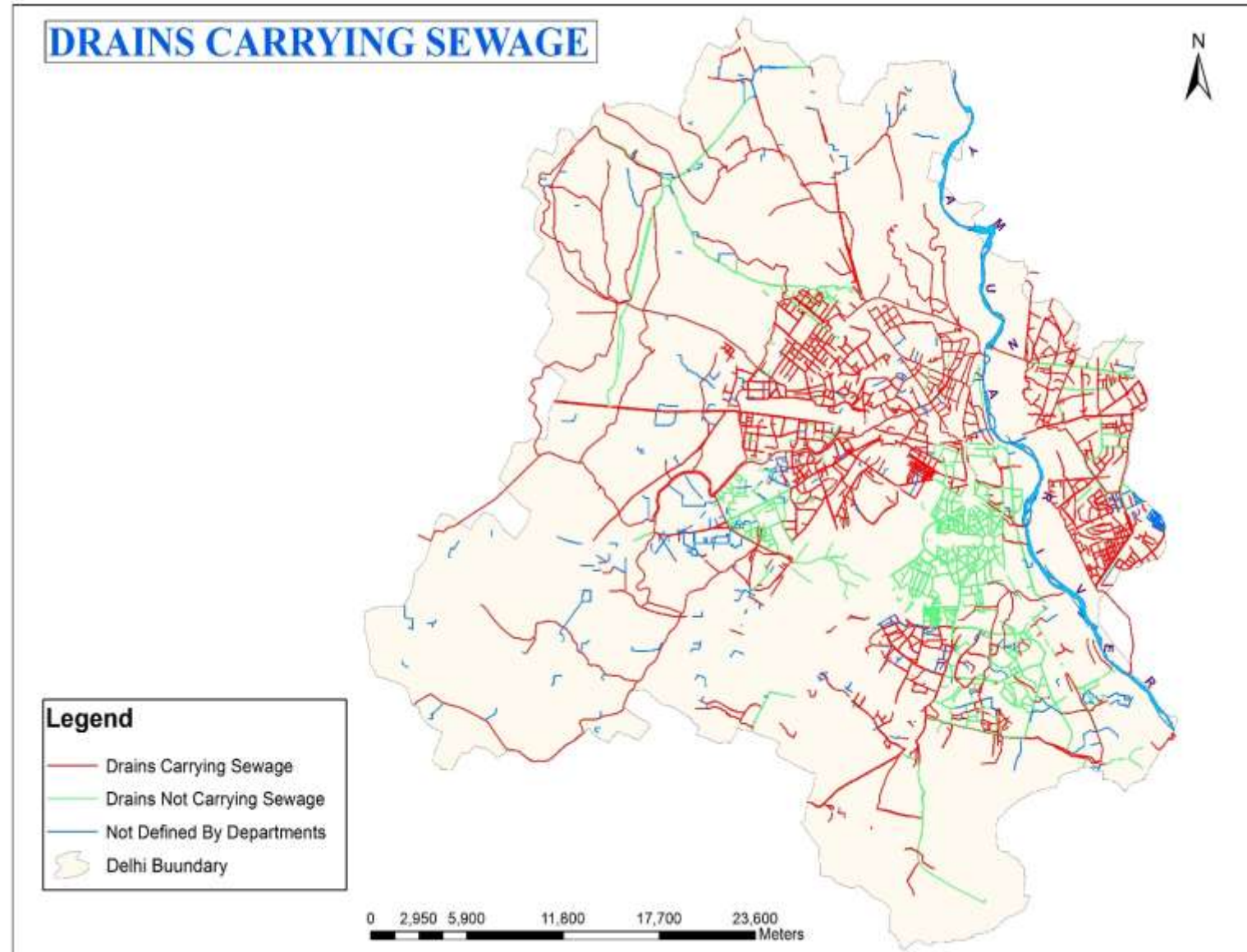
Where Delhi stands on this criteria?

- Sewerage system
 - Only 55% area is sewerred
 - The system is inefficient to even take care of this area and a major part lands up into Yamuna
- Storm drainage
 - Increasingly losing its capacity due to encroachment, silting and dumping of solid waste
 - Majority of storm drains are carrying sewage
- Solid waste
 - All of you know more than me since it is so much visible all over Delhi

**WE WILL SHOW YOU SOME GLIMPSES OF THE
PRESENT STATUS ...**

Fate of Natural and Artificial Storm Drains

- Most of the drains (all shown in red) in Delhi Carry Sewage throughout the year
- Storm drains are supposed to run only during the monsoon
- Many of them are getting encroached and disappearing



Storm Drain Carrying Sewage (May)



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

Storm Drain filled with Solid Waste



Chirag Delhi To Defence Colony Nala, Lajpat Nagar

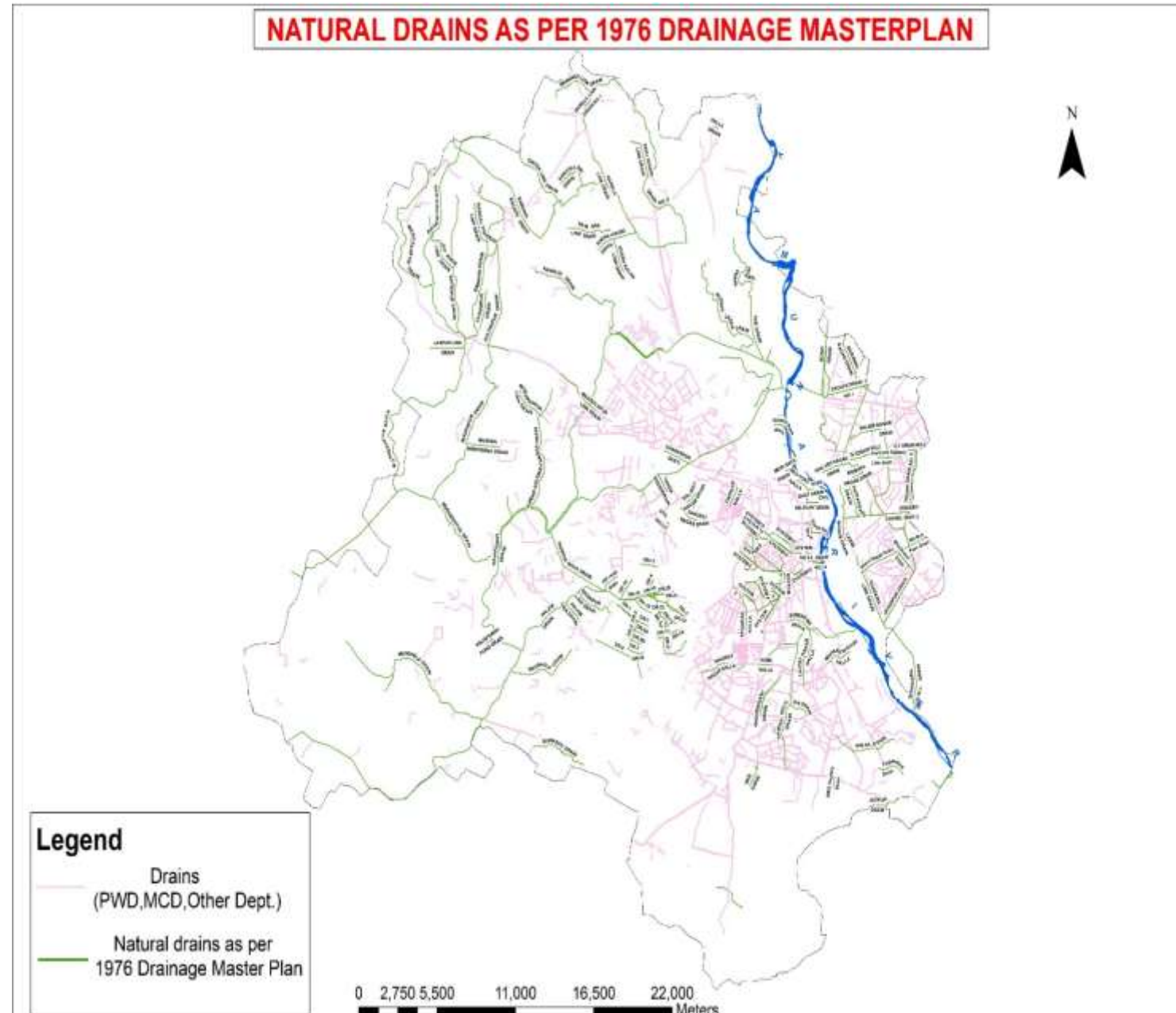
Encroachment of Storm Drain



Okhla Ph-1 To Sarita Vihar, Okhla Phase-1

Extent of Natural Storm Drains

- Natural drains perform a range of environmental functions
 - Recharging groundwater
 - Provide safe exit to flood waters
 - Support biodiversity
- Delhi is losing these Drains to concretisation, covering and encroachment
 - They are full of sewage
- If Yamuna is to be made pollution free then these drains need to be freed of pollution first



Natural Storm Drain Concretized & Carrying Sewage



Drain along Wazirabad Road, Bhajanpura

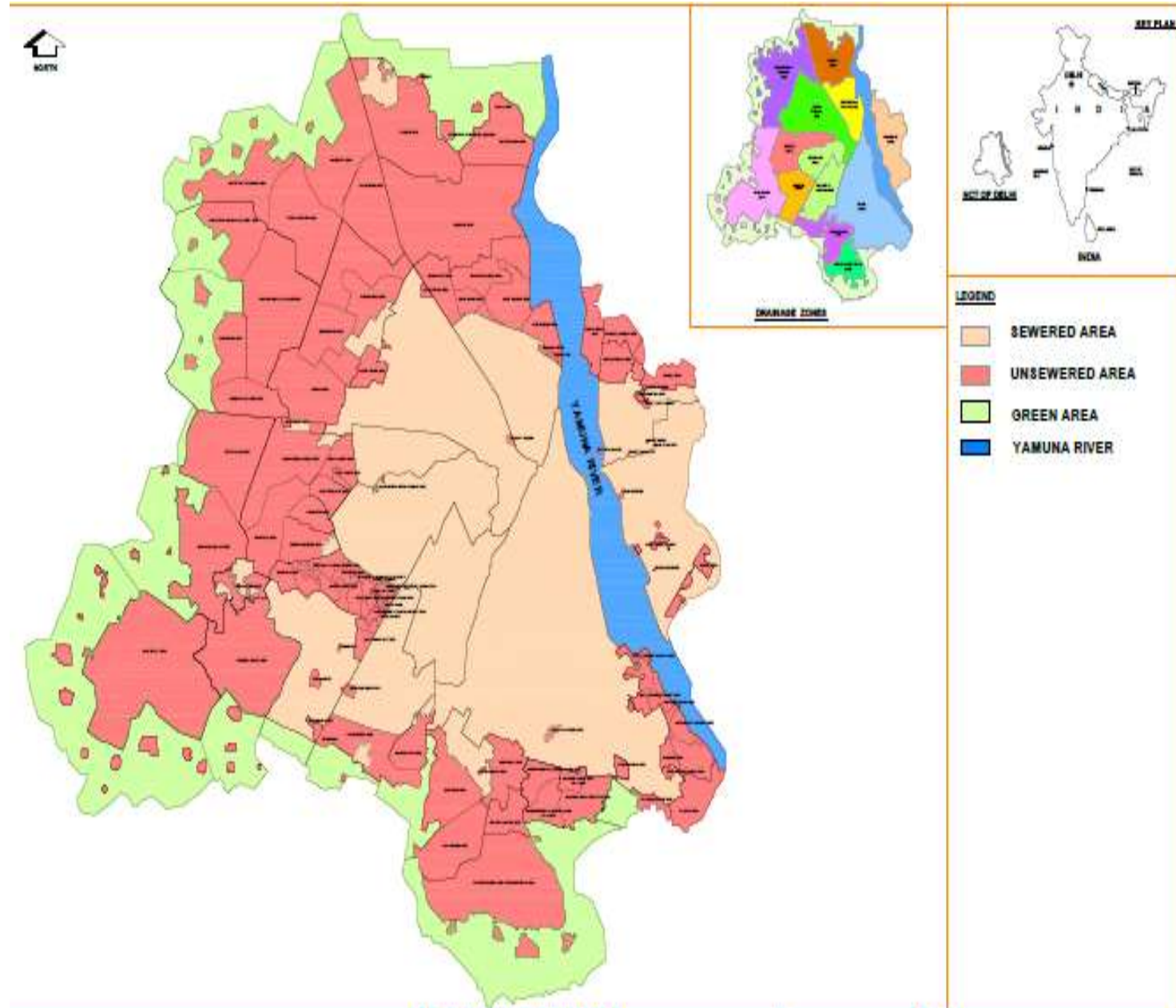
Storm Drain Filled with C&D Waste and Silt



Near Ramesh Nagar Metro Station

Status of Sewered Area in Delhi

- Only 55% area of Delhi is sewerred
- Sewage from the remaining 45% goes into Yamuna through storm drains
- It shall take 20 years and Rupees 20000 crores to sewer these areas (DJB)
- Should Delhi and Yamuna keep suffering that long



Sewage Entering Natural Drains



Sagarpur

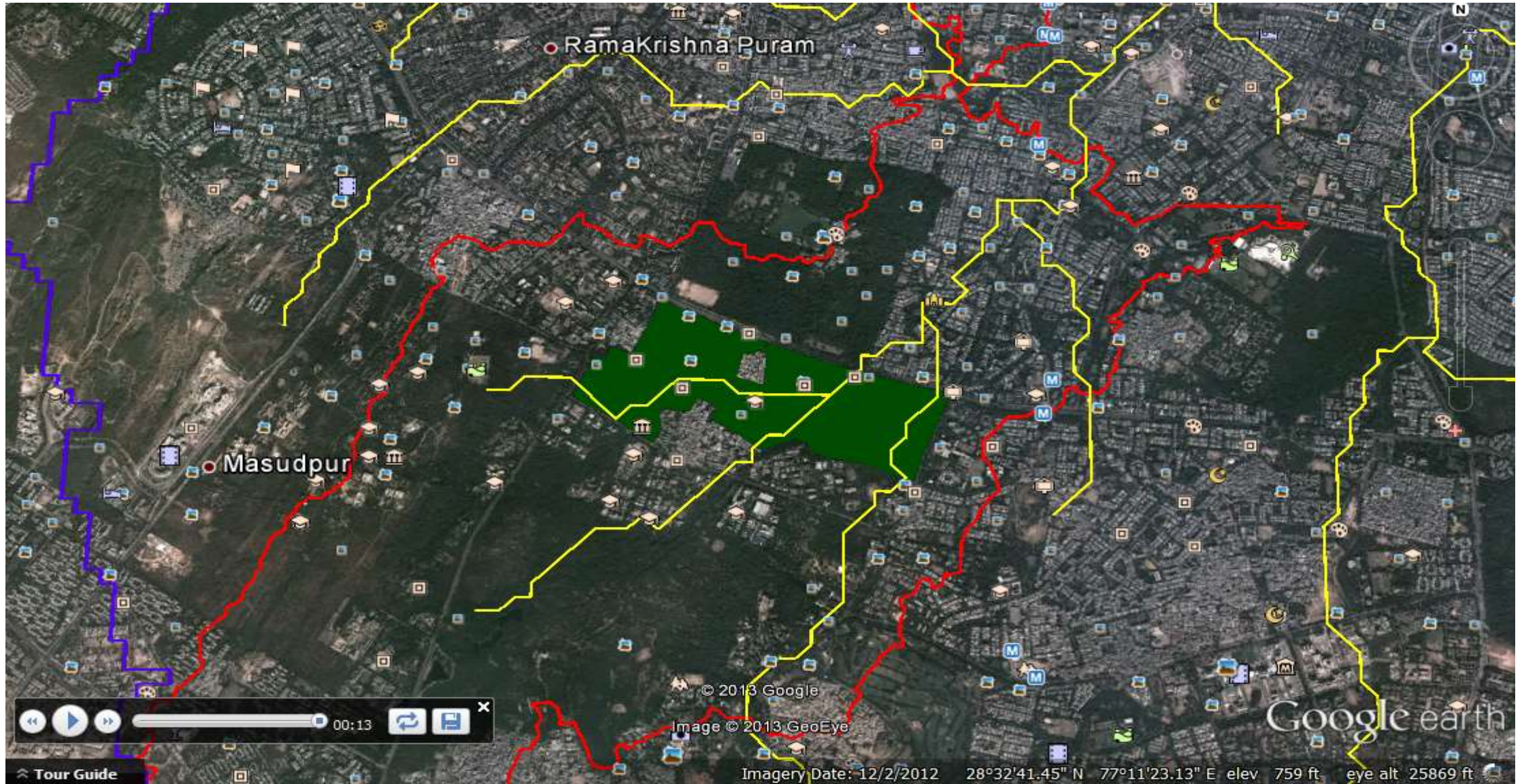
Comprehensive all round approach

IIT DELHI ENGAGEMENT

Tasks Undertaken in Drainage Master Plan of NCT

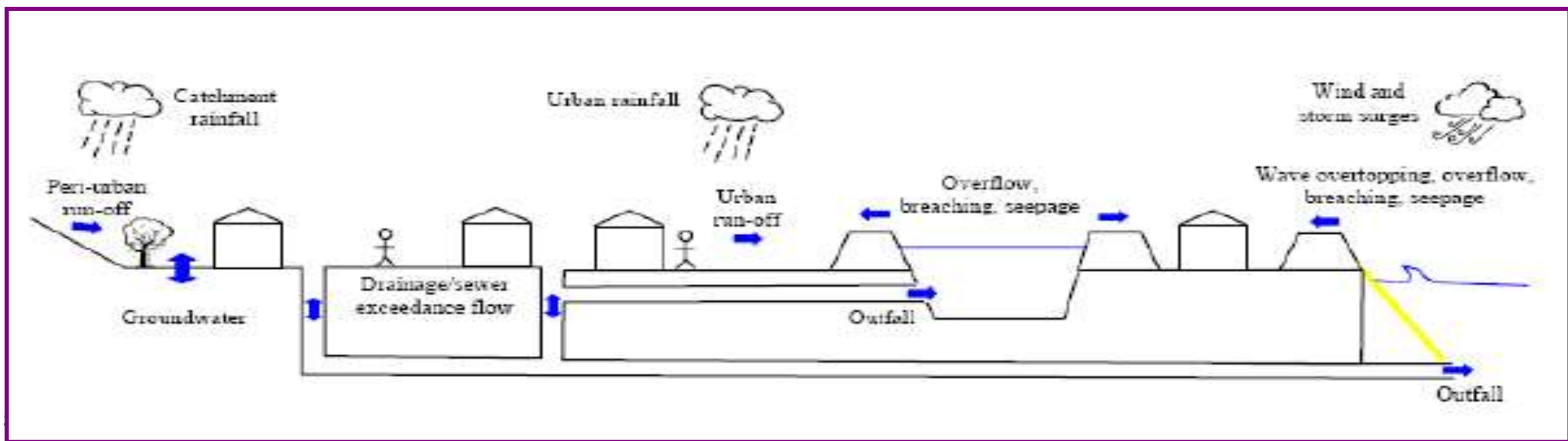
- Simulate the translation of rainfall into runoff using hydrologic modelling
 - Uses Terrain, Soil Type and Land Use information
- Conveyance adequacy of existing drains using hydrodynamic modelling
 - Uses cross-sections and longitudinal slopes of the drains
- This shall also reveal the inefficiency of the existing drains due to
 - Silting
 - Clogging with solid waste
 - Encroachment
 - Change of cross-sections

Catchment Delineation & Drain Analysis

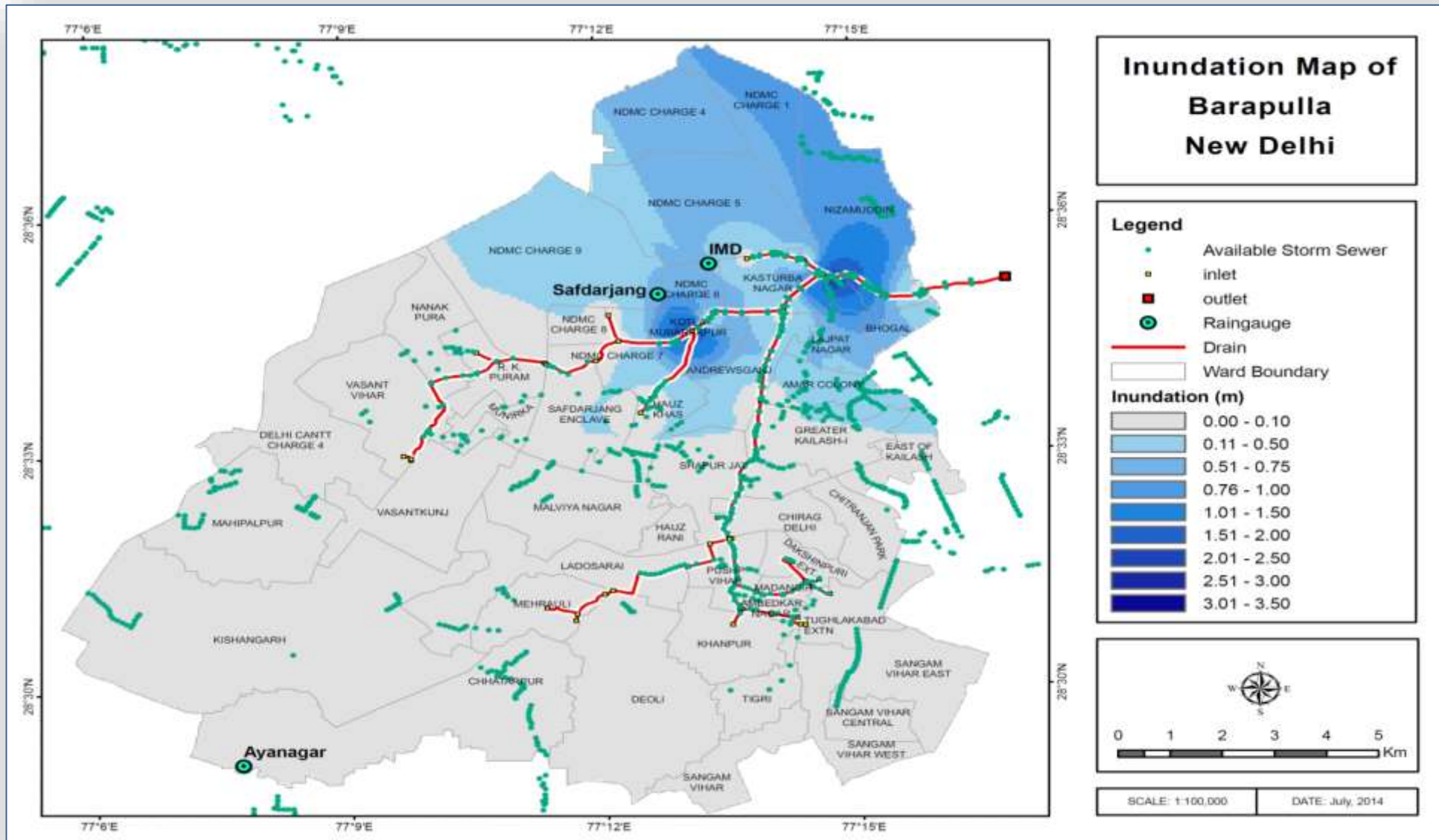


Model Used

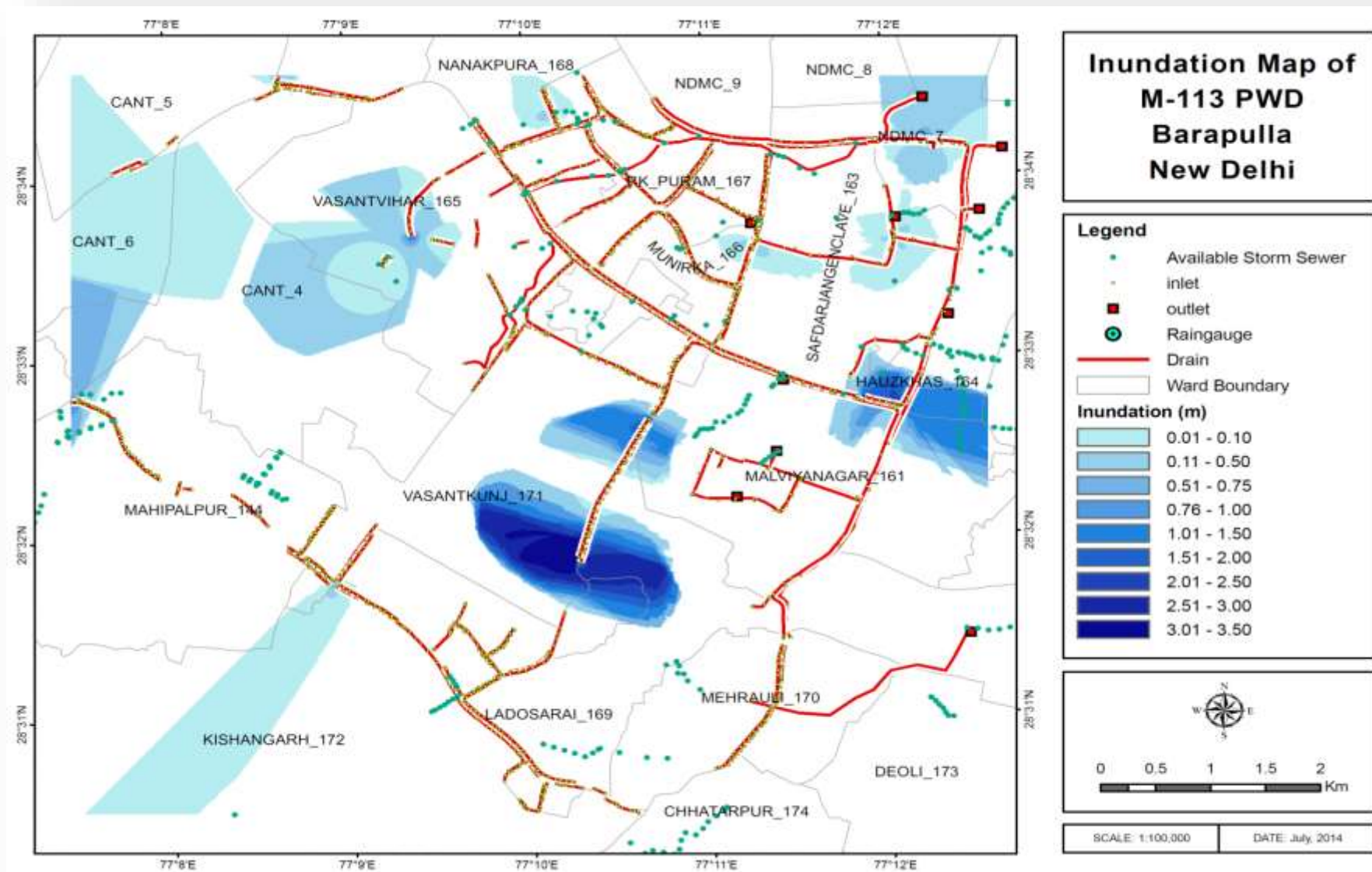
- The Storm Water Management Model (SWMM)
 - Dynamic rainfall-runoff simulation model
 - Simulates the runoff quantity and quality from primarily urban areas



Inundation Mapping using Natural Drains- Barapulla



Inundation Mapping using PWD-M113, Barapulla

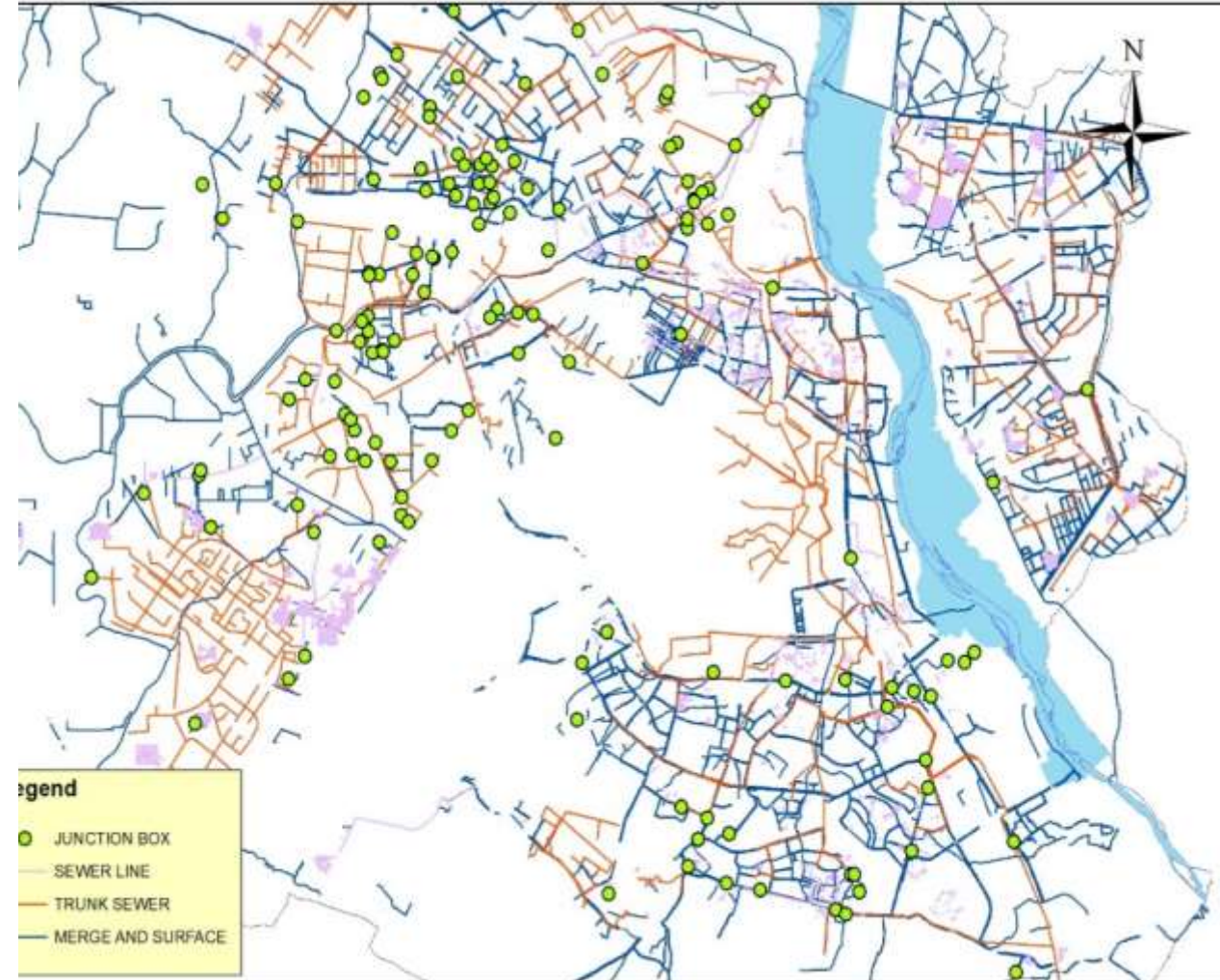


Hinderances to the Modelling Process

- Absence of reliable data on the storm and sewerage network
 - Sizes and invert levels of storm drains
 - Sizes and invert levels of sewer drains
- IIT Delhi was promised all this data since Delhi Government had spent a huge amount of money to digitize the whole Delhi and put in GIS format
- Struggling for the past one year to get the information put in place
 - Delhi has a very complex jurisdiction of the drainage infrastructure between the departments
 - There is no system in place to keep the basic information and update it though a company was formulated (GSDL) for the purpose

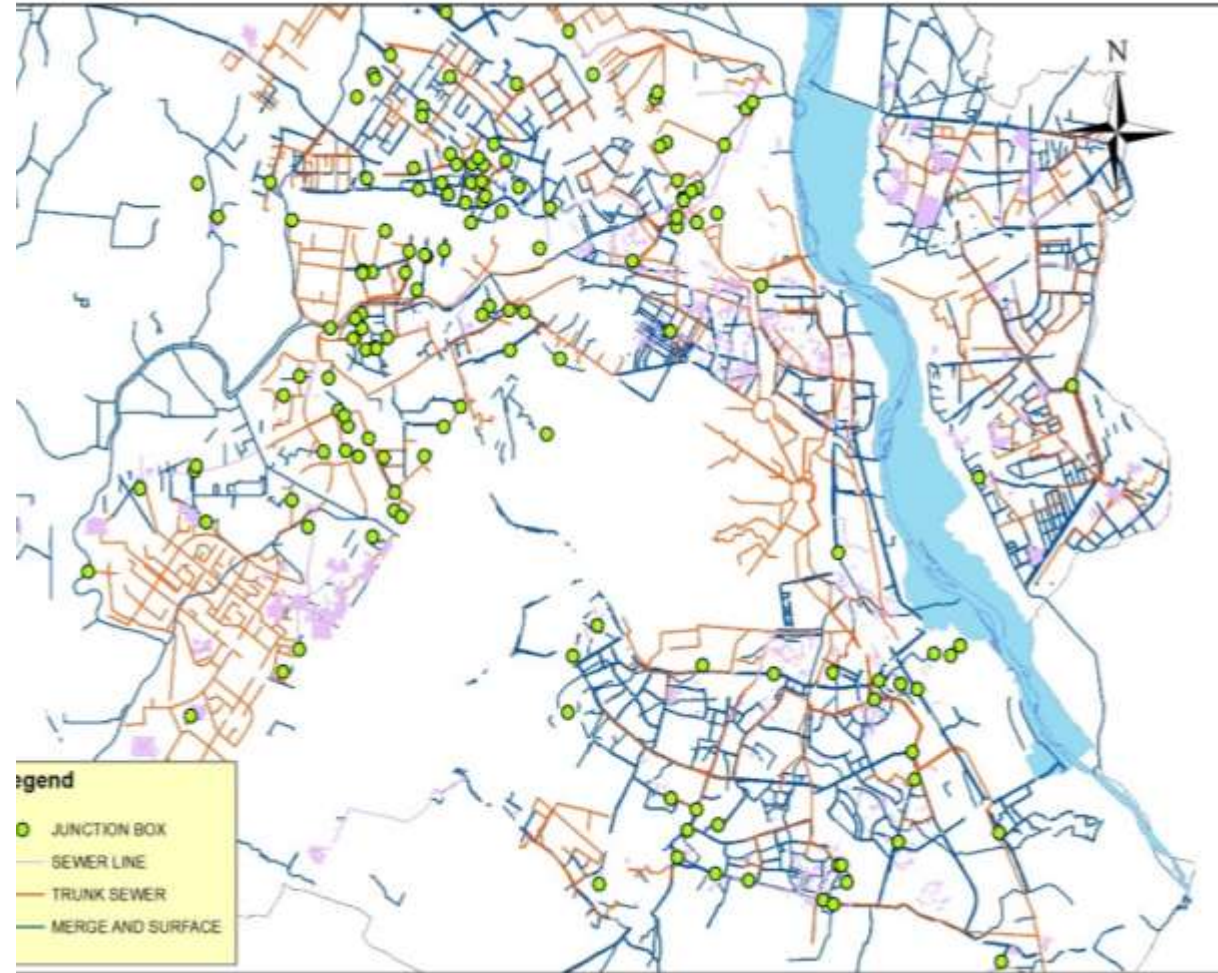
Some Ground Realities in Delhi

- As mentioned above 45% of unsewered Delhi is polluting natural storm drains and Yamuna
- In the sewered Delhi also
 - A large number of sewers that are punctured are sending sewage to storm drains (DJB has identified 300 such points)
 - A large amount of storm water flows into sewers, thus surcharging the sewers resulting in their overflow
- Solid waste is totally mis-managed and creating havoc
 - C&D (Construction & Demolition) Waste
 - Street Sweeping waste



Ways to Address These Issues

- For Unsewered Areas:
 - Sewage from unplanned areas should be intercepted before entering natural storm drains and taken to secondary or main sewer on to nearest STP
 - DJB agrees this can be achieved in 3 years
- For Sewered Areas:
 - Plug all the leakages from the sewers (action DJB)
 - Plug all entries of storm water in sewer lines (action all Municipalities)
- Solid Waste Management:
 - Tracking and effective management of all kinds of solid waste



Gain for Delhi Shall Be

- Sewage not flowing in natural storm drains
 - Remove stink from various areas in Delhi
 - Make Yamuna pollution free
 - Storm drains shall be dry for most of the time thus facilitating desilting
- Storm water not entering sewer lines
 - Shall avoid flooding of areas with sewage overflow
 - Shall reduce silting of sewers

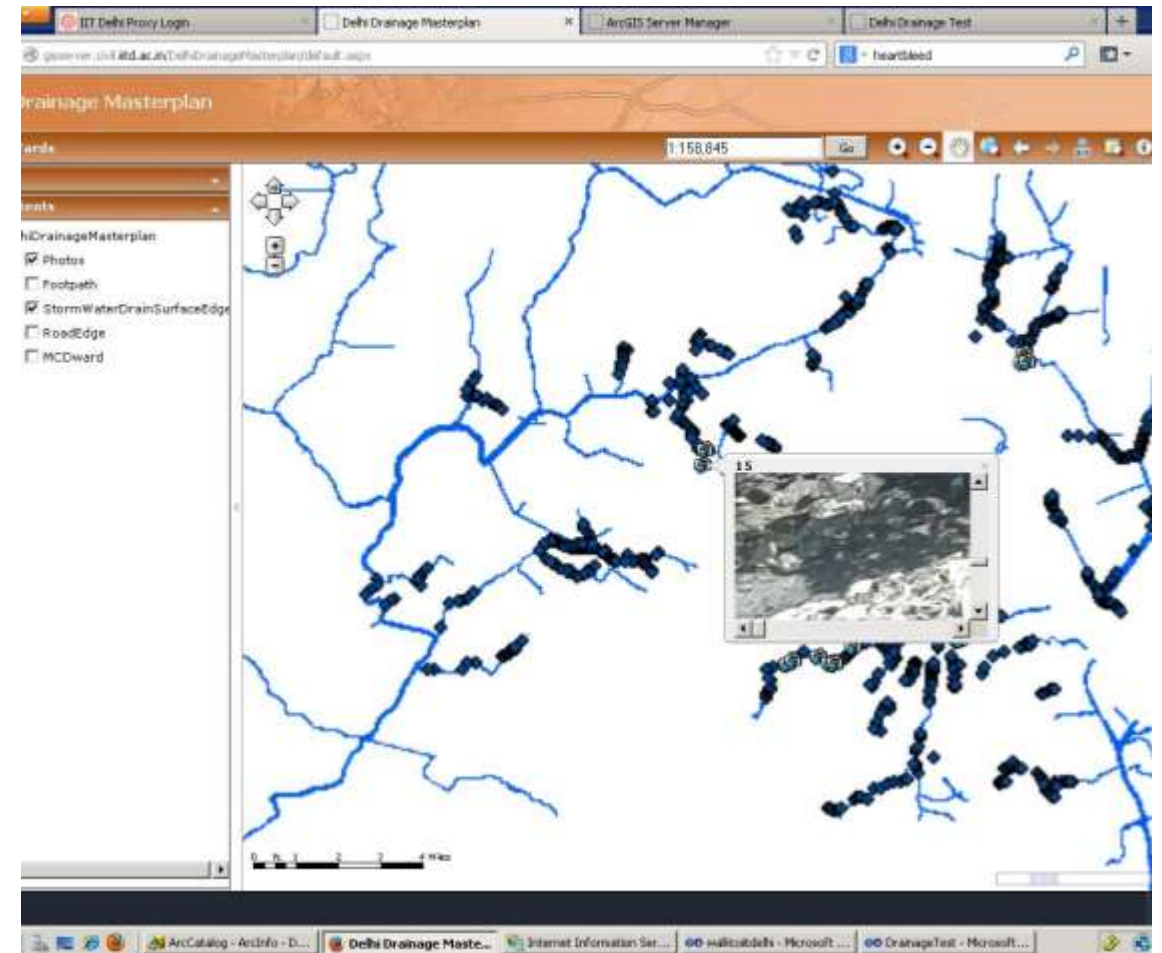
**DELHI SWACHH ABHIYAN IS INCOMPLETE WITHOUT
PUBLIC PARTICIPATION**

Desired Role of Public

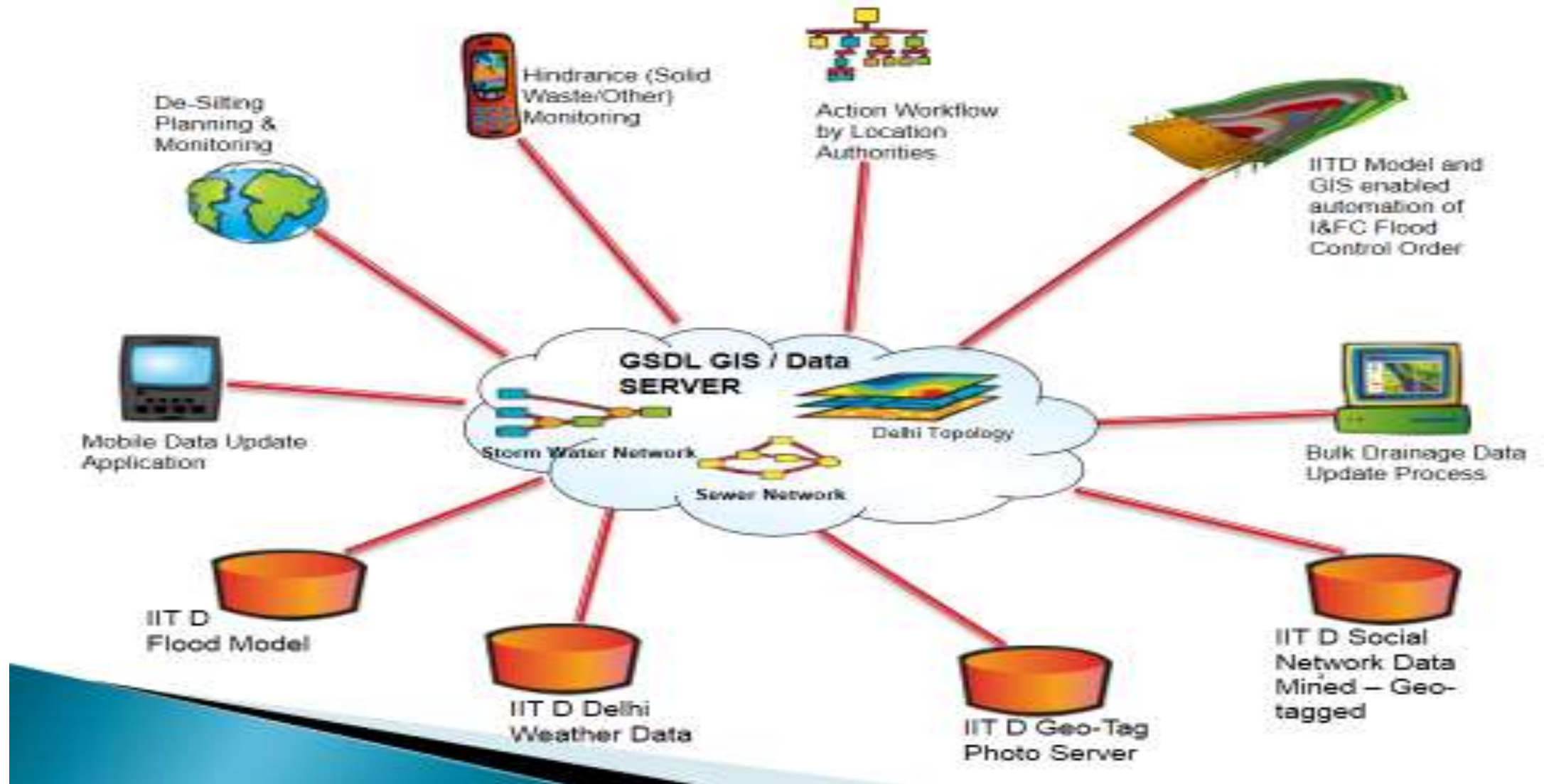
- Effective monitoring of the networks in your locality
 - Which drain is carrying sewage
 - Which area gets flooded
 - Whether the drain is silted up
 - Solid waste management
- However, this requires a proper system to be designed and implemented

Example of Data Capture on Drain Condition

- Wanted first hand information on the status of Storm Drains
 - 800+ IITD students visited various drains and captured geo-tagged photographs with their cell phones
 - Photos sat in their respective place on GIS – Server is set up to store the photographs along the drains
- Similar captures can be made on other aspects as well



eGov Model with Public Participation



Resolve

- Let us join hands to address the issues in a systematic and comprehensive manner by
 - Understanding the issues
 - Contributing towards monitoring & upkeep of infrastructure
 - Work for enhanced accountability and transparency

I am sure if we can achieve this then it is possible to enjoy Delhi which is Swachh in the true sense

Thank You