



ROLE OF GEOSPATIAL TECHNOLOGY IN SUSTAINABLE CITY DEVELOPMENT

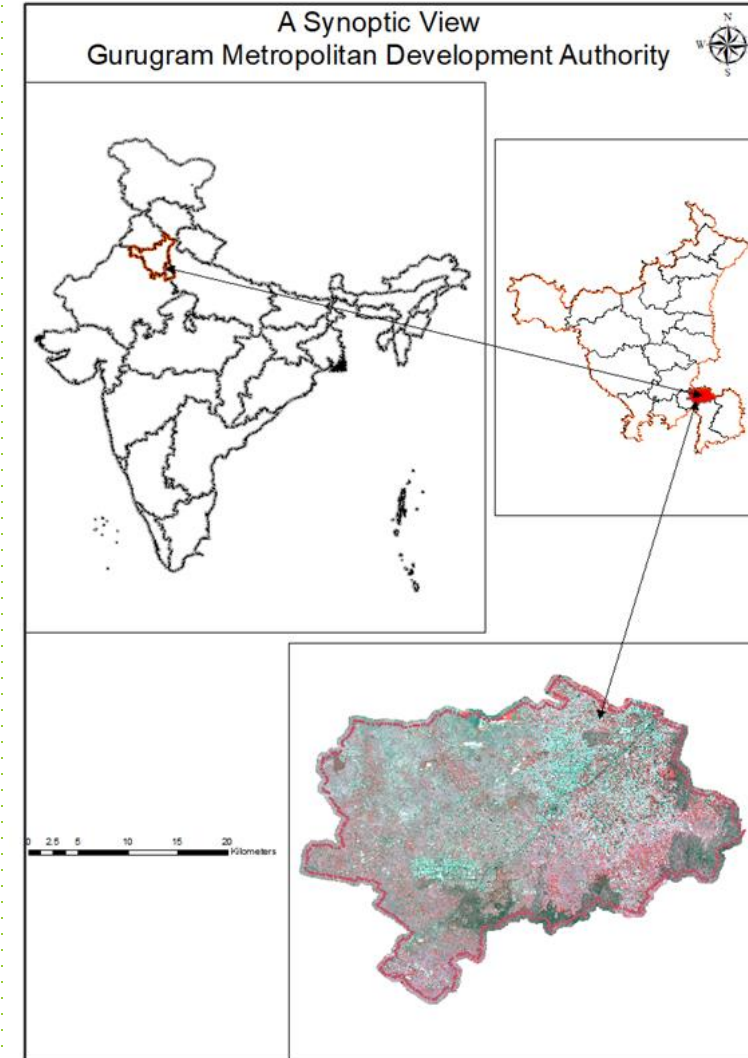
Darshna Vashistha

Research Officer

Urban Environment Division,
Gurugram Metropolitan Development Authority

ABOUT GMDA (GURUGRAM METROPOLITAN DEVELOPMENT AUTHORITY)

Area:	475 sq. Kms
Known as :	Cyber City / Historical named on Guru Daronacharya
Climate :	Semi Arid
Hills:	Aravali Hill
Population:	3 lakh (projected population for the year 2021)
Connectivity:	National Capital Delhi, Jaipur, Noida, Faridabad
National Park:	Sultanpur, Bhindawas Wetland / Ramsar site
Major Industry:	Maruti Suzuki, Hero Honda and hub of MNCs



CLEAN AND GREEN GURUGRAM

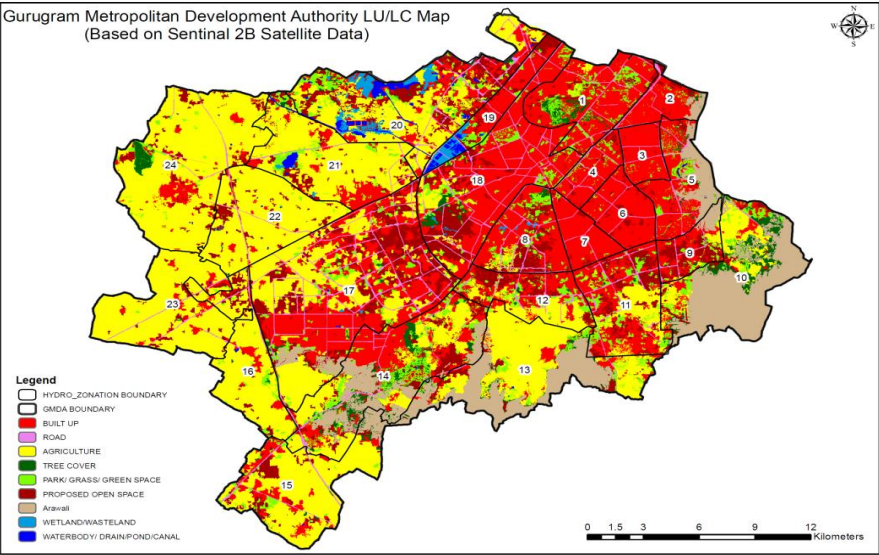
Keeping in mind the motto of SDGs Goal 6, 11, 13 & 15



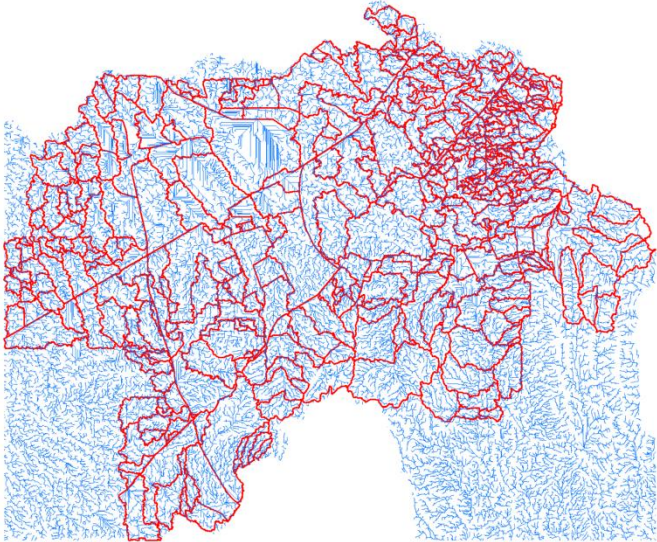
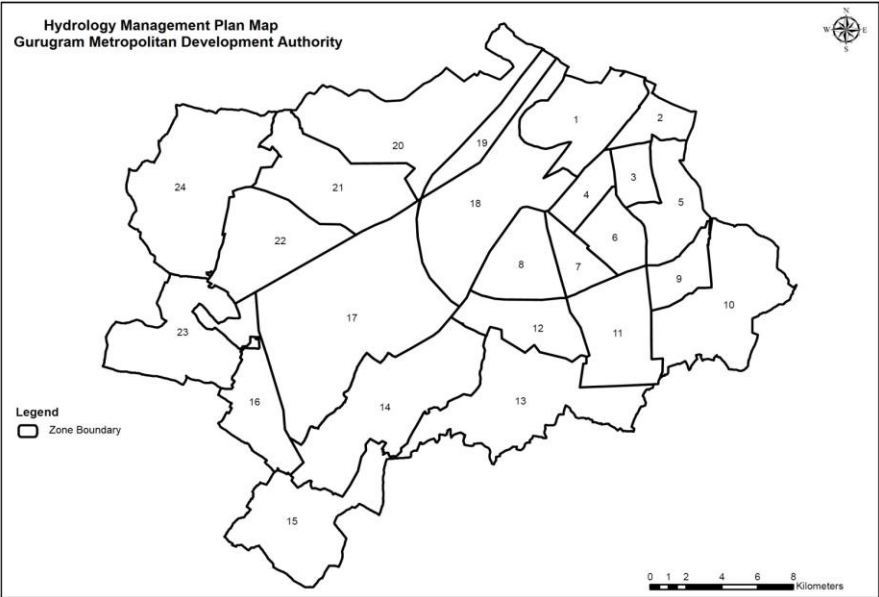
WATER MANAGEMENT AND GEOSPATIAL TECHNOLOGY

- ❑ Identification of water logged area
- ❑ Use of treated waste water network system in the city
- ❑ Water conservation in Aravali by Check Dam preparation
- ❑ HDPE pipe line for greenbelt management and dust control
- ❑ Greenbelt Trenching
- ❑ Pond / Lake /waterbody rejuvenation and monitoring Decision support system
- ❑ Parks /Nagar Van (City forest) managment

OVERALL WATER CONSERVATION ASSESSMENT



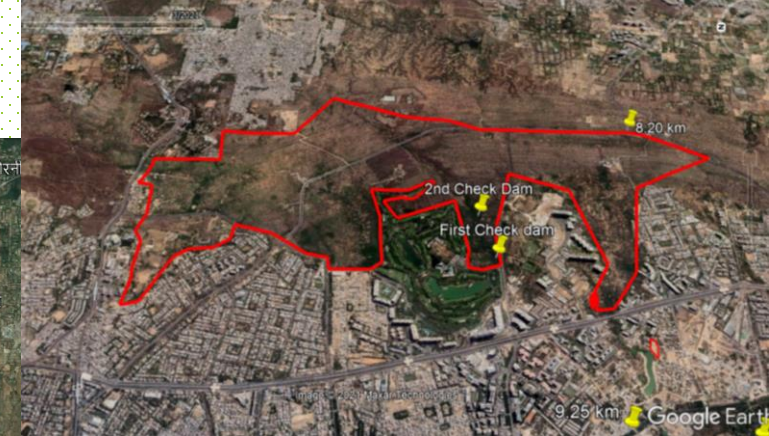
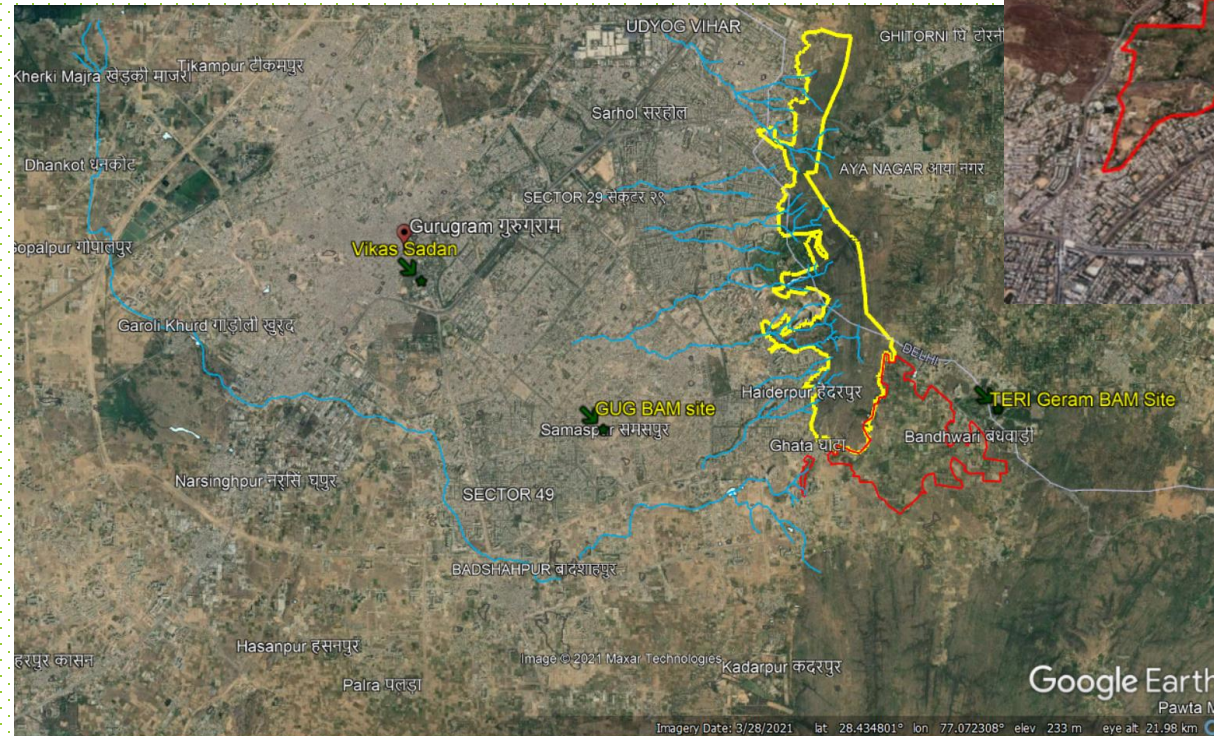
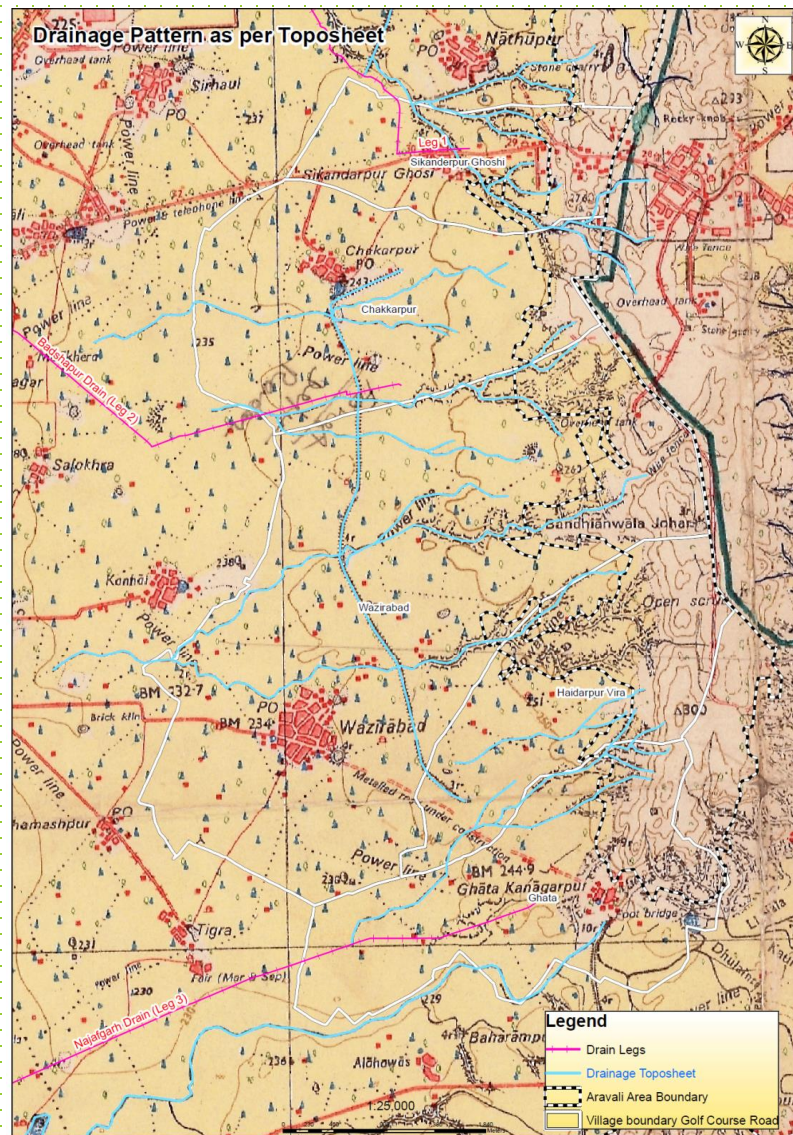
Zone/LULC Classes (Area in Ha)	Built Up	Road	Agriculture	Tree Cover	Park/ Grass/ Green Space	Proposed Open Space	Arawali	Wetland / Waste-land	Waterbody/ Drain/ Pond/Canal	Total
Zone 1	1657	128	41	147	405	124	0	0	0	2504
Zone 2	607	58	0	0	35	63	116	0	0	879
Zone 3	666	61	0	0	15	6	0	0	0	749
Zone 4	625	79	0	0	65	61		0	0	831
Zone 5	914	86	0	25	174	66	553	0	7	1823
Zone 6	1042	58	0	0	12	77	0	0	0	1188
Zone 7	761	66	0	0	13	35	0	0	0	875
Zone 8	948	148	85	26	219	388	1	18		1833
Zone 9	292	54	80	5	75	332	131	0	0	969
Zone 10	209	16	677	9	241	129	2596	0	1	3877
Zone 11	980	137	532	14	349	521	27	0	0	2560
Zone 12	560	93	519	11	227	347	18	0	0	1774
Zone 13	244	17	2072	4	231	200	1703	0	2	4473
Zone 14	1109	135	1225	127	526	459	1147	0	1	4730
Zone 15	384	86	2256	8	136	289	199	0	2	3360
Zone 16	162	68	1803	8	88	185	0	0	4	2318
Zone 17	2606	640	2363	27	416	1550	238	6	7	7853
Zone 18	2729	434	233	95	394	710	0	15	1	4612
Zone 19	518	86	10	4	88	188	0	131	87	1112
Zone 20	692	231	1970	40	408	921	0	343	254	4858
Zone 21	404	71	2261	11	210	285	0	17	66	3324
Zone 22	61	60	2495	3	16	227	0	5	4	2871
Zone 23	181	70	2744	2	15	128	0	0	1	3140
Zone 24	311	56	4240	123	103	317	0	0	6	5156
Total	18664	2938	25606	689	4458	7608	6731	535	442	67670



Zone wise pondage (CN-curve number)

- Total 440 pondage or watershed demarcated.
- This calculation was made on the basis of above table and watershed analysis tool.

CHECK DAM SITE SELECTION



Water collected: Area 600 ha in Aravallis

Rainfall data:

191 mm on July 19, 2021

35 mm on July 20, 2021

July 19, 2021 : 600 ha x 10000 sqm x 0.191 m
= 1146000 cum = 1146000000 lit
= 1146000 kl

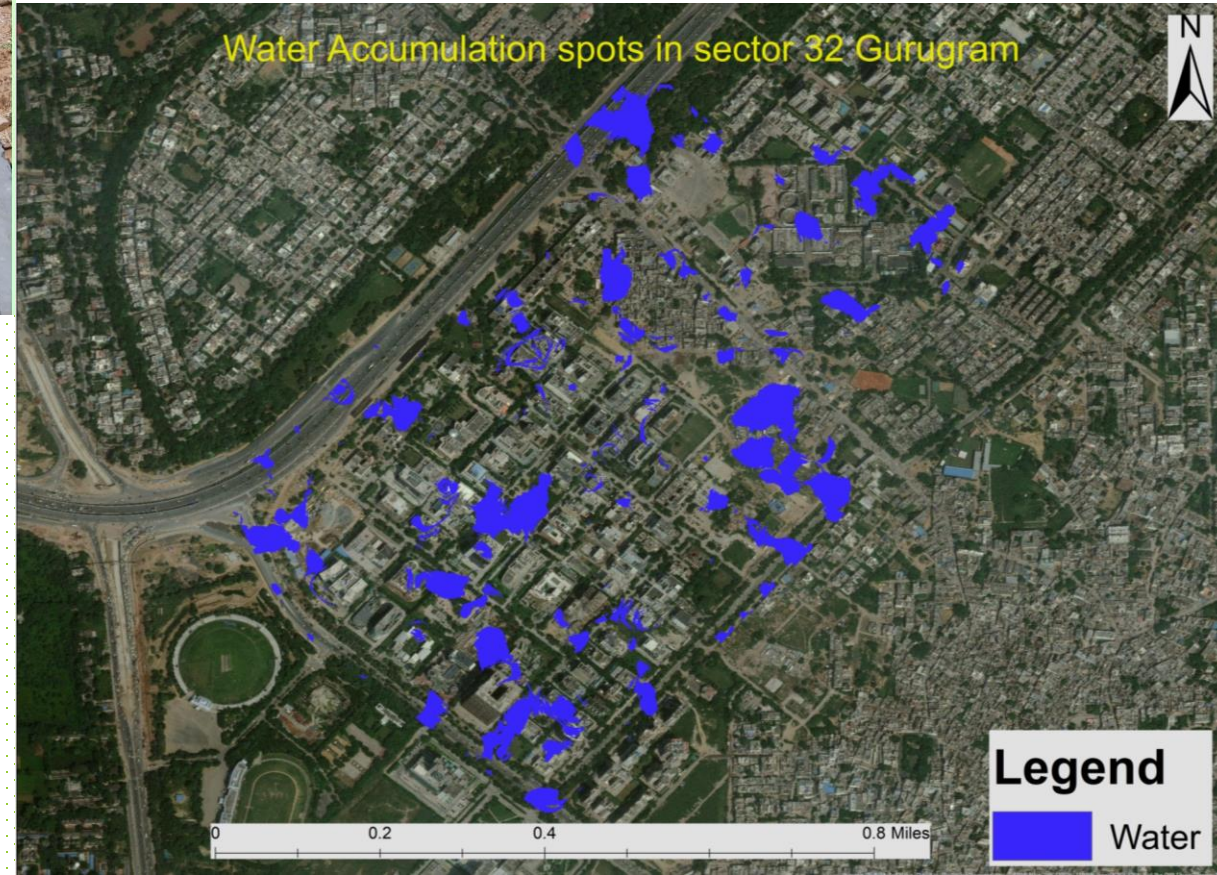
July 20, 2021 : 600 ha x 10000 sqm x 0.035 m
= 210000 lit = 210 kl



WATER CONSERVATION & WATER LOGGED AREA MAPPING

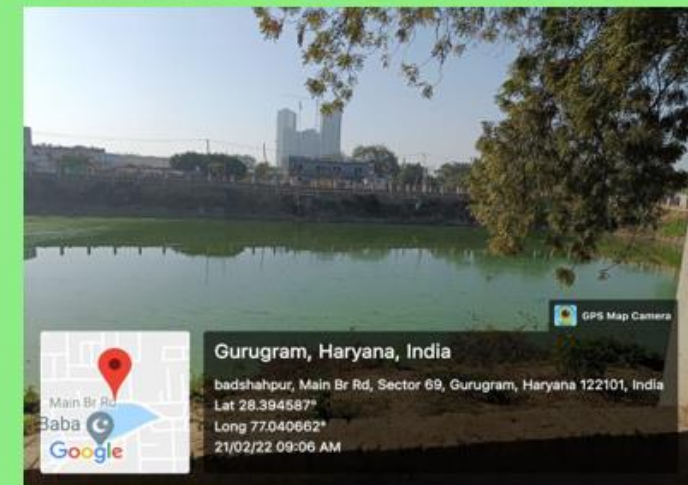


Waterbody in
Creek 1

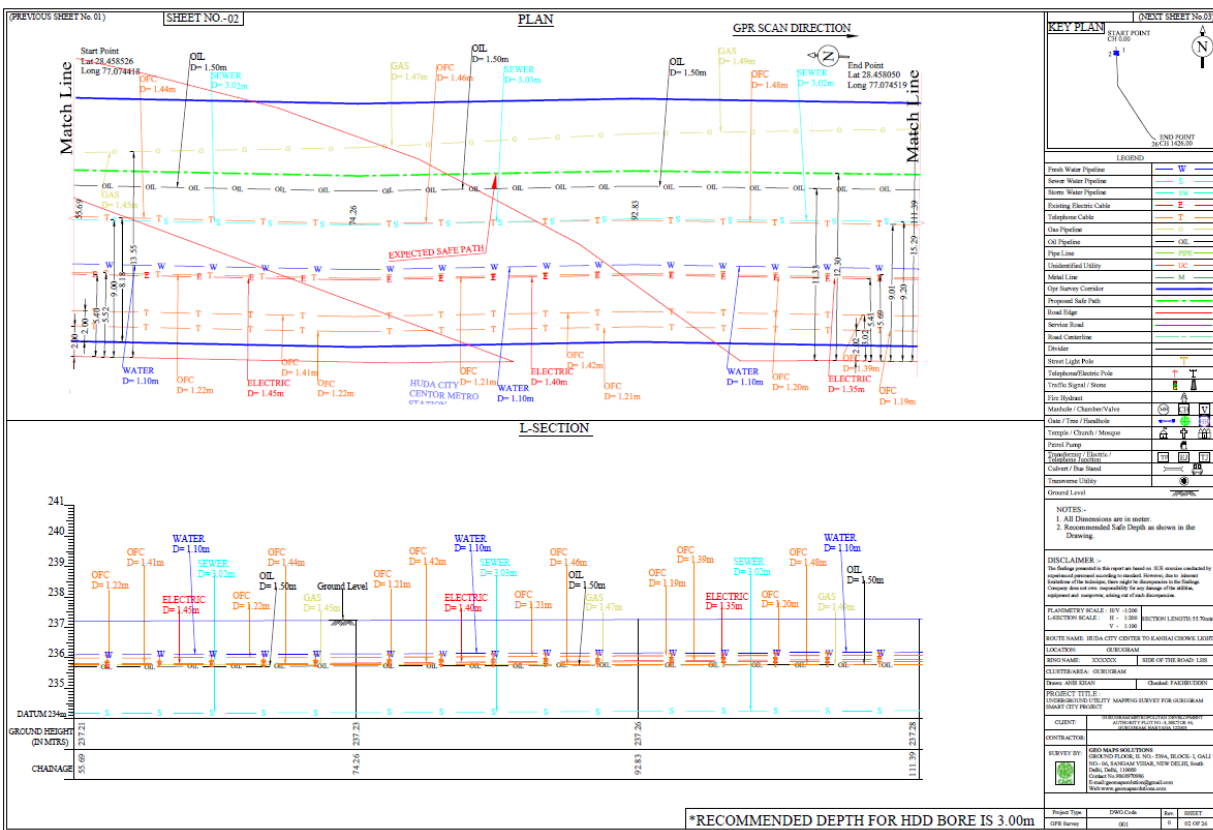


POND REJUVENATION & CLEANING

- ❑ Identification & Mapping
- ❑ Development
- ❑ Updation on Jal shakti portal and Pond authority portal

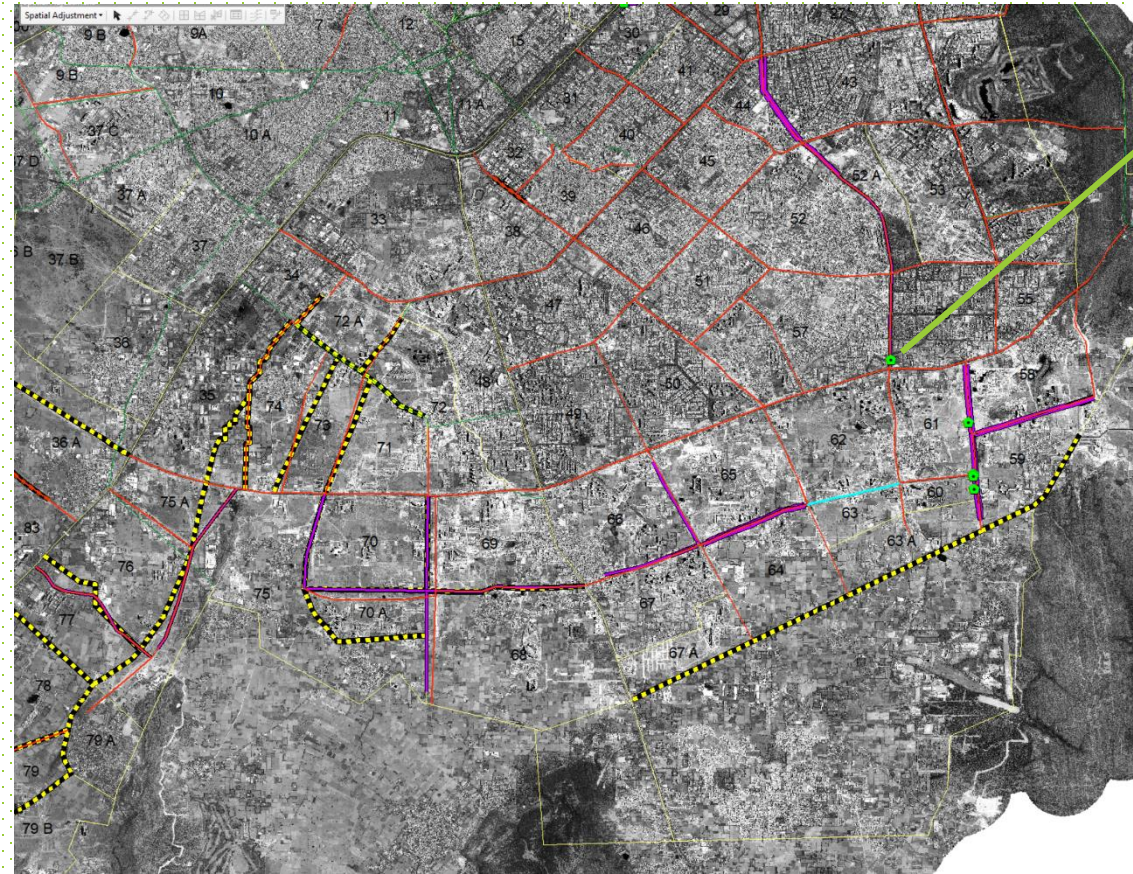


GREENBELT TRENCHING



Lowering of greenbelts by trenching to hold water Sector 27, near Max hospital

TREATED WASTE WATER (HDPE) PIPE LINE



GIS ENABLED ENVIRONMENT MANAGEMENT ACTION TAKEN

Nagar Van (City Forest) (A CSR initiative)

Location: Sikanderpur/ Chakkarpur Aravalli Hills , Gurugram- ARAVALI OXY VAN FOREST

Area: 175 acre

CSR: IamGurgaon

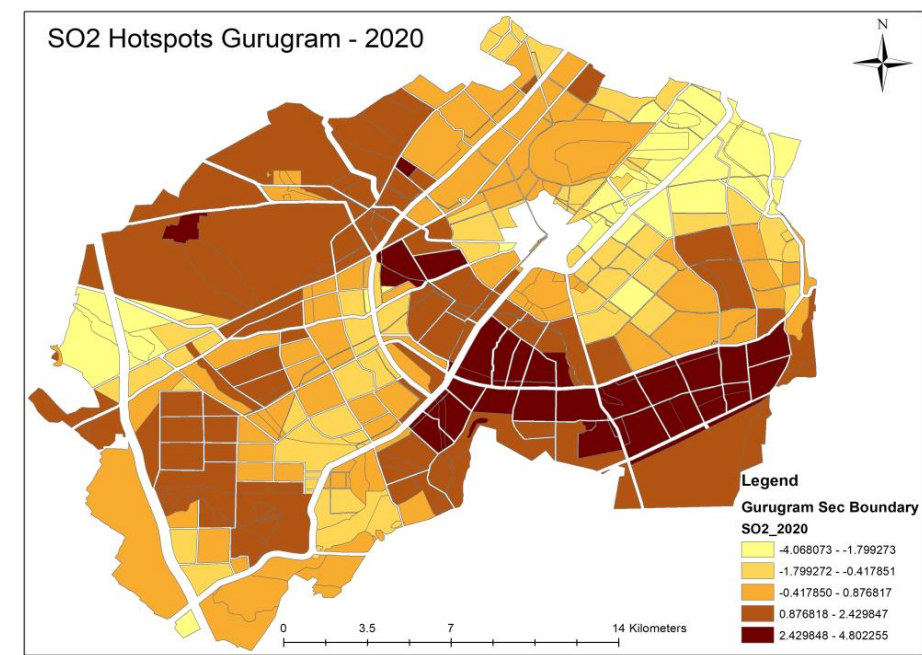
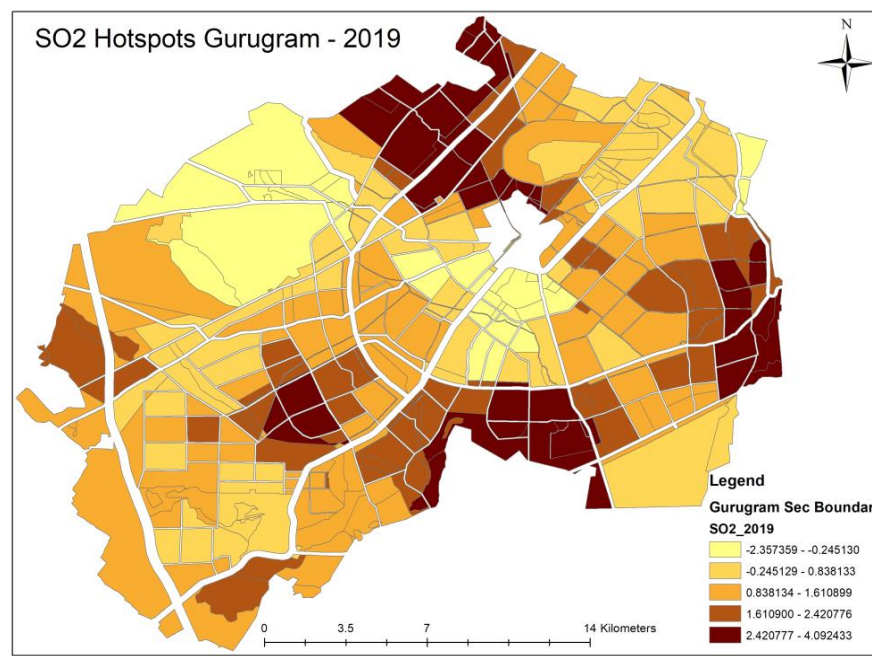
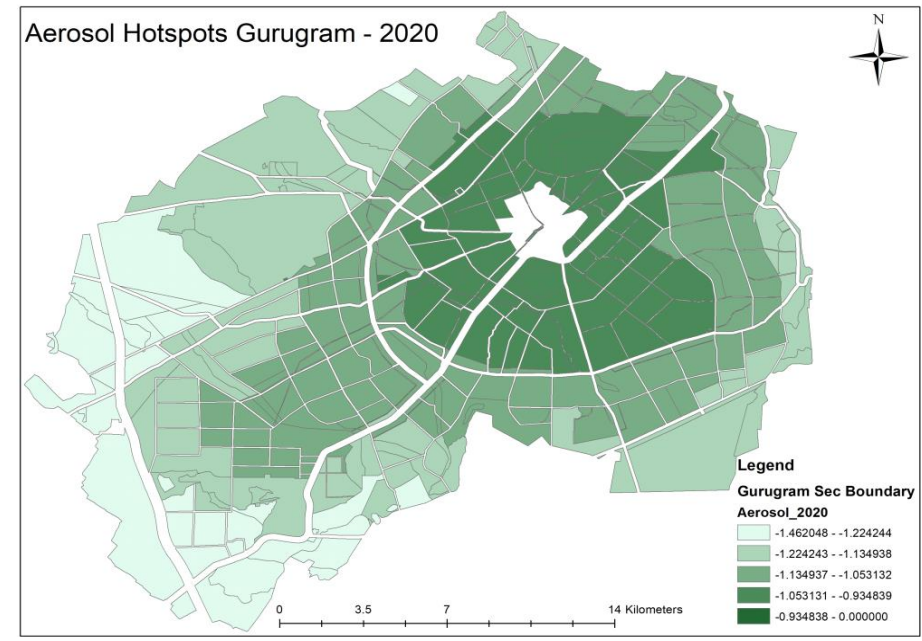
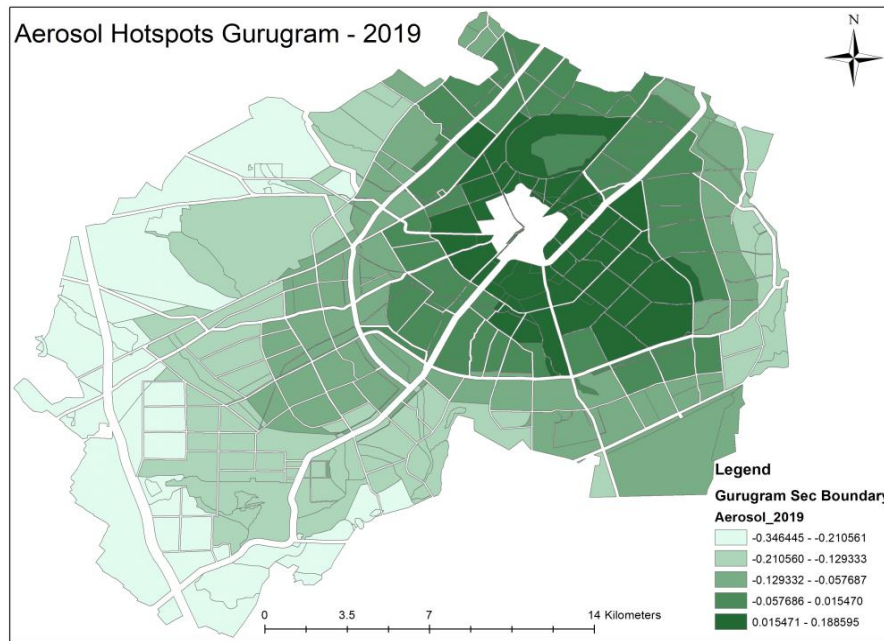
Landscape: Aravali range and comprises of several small ridges that formed manyseasonal streams and quarry pits



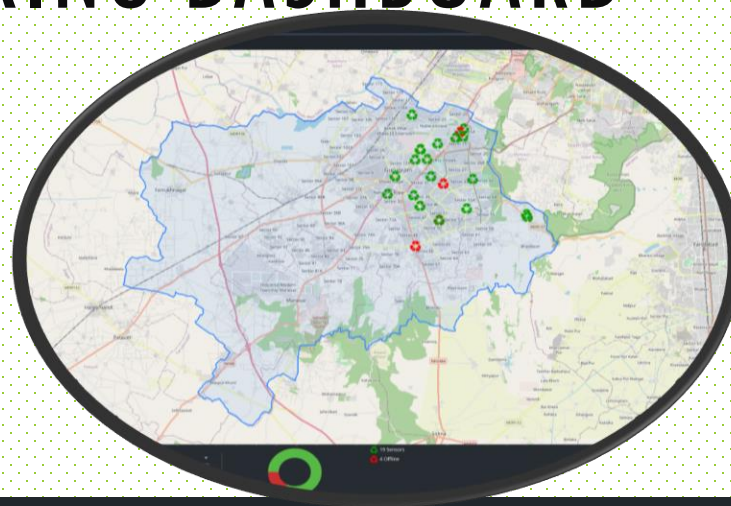
AIR QUALITY

- ❑ Hot spot area identification by using Geospatial technology
- ❑ Air Quality Monitoring System (AQMs)
- ❑ HDPE pipeline for dust mitigation in hot spot areas
- ❑ Plantation drive in air polluted area
- ❑ Site selection action taken research for Noise problematic areas

AIR QUALITY STUDY



AIR QUALITY MONITORING DASHBOARD





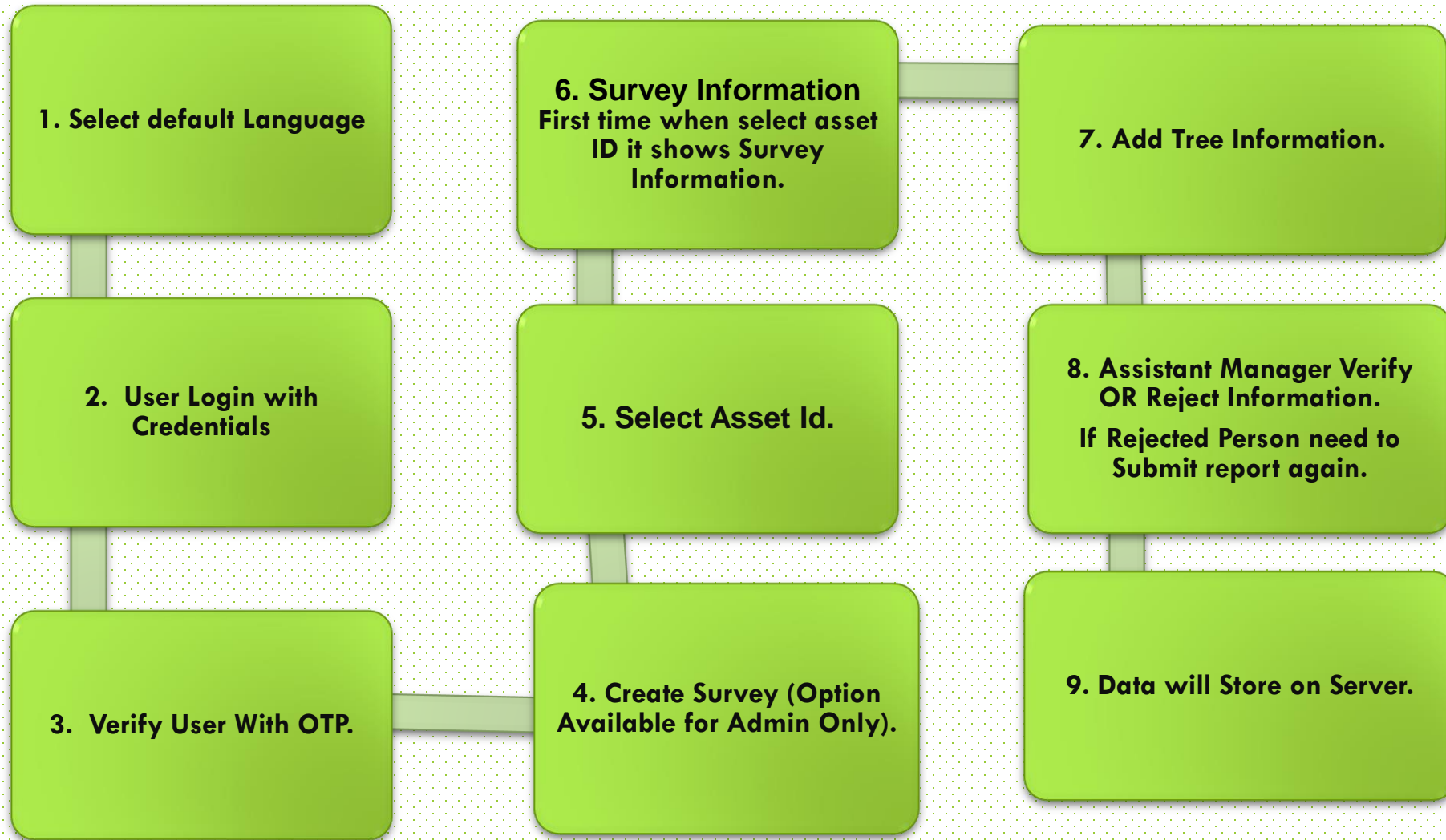
GEETA (GIS ENABLED ENUMERATION OF TREES) MOBILE APPLICATION

GEETA is the platform which provides various kinds of services, maps and application to the department through OneMap Portal such as Web maps & Applications, GIS based operation dashboards, feature as service, map as services etc.

- ☐ Geo enabled IT Mobile application for Tree Survey in the Gurugram City.
- ☐ This application is integrated with GIS platform OneMap Gurugram where Tree location is captured with photograph.
- ☐ This App is indigenous developed by GMDA in house.
- ☐ It is hosted on GMDA dedicated Cloud for security point of view.

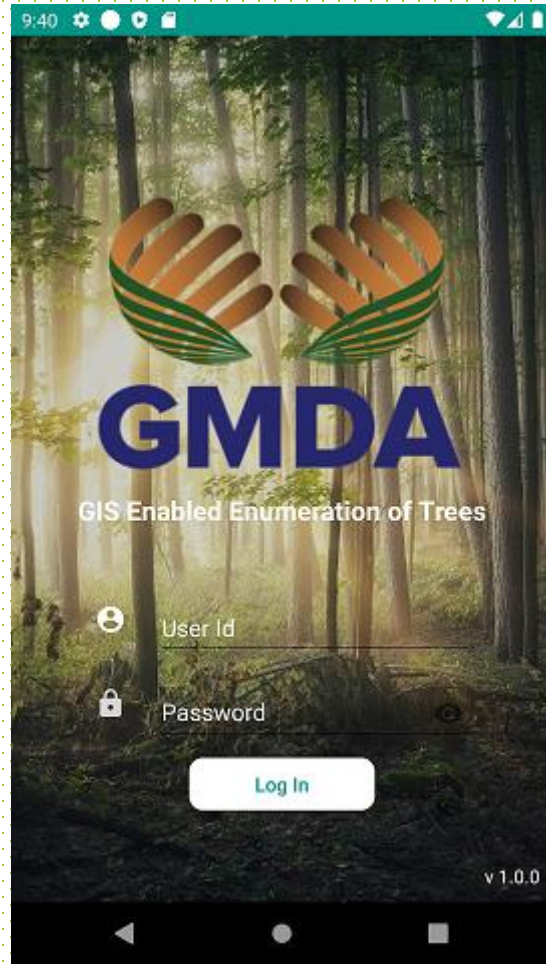


PROCESS FLOW

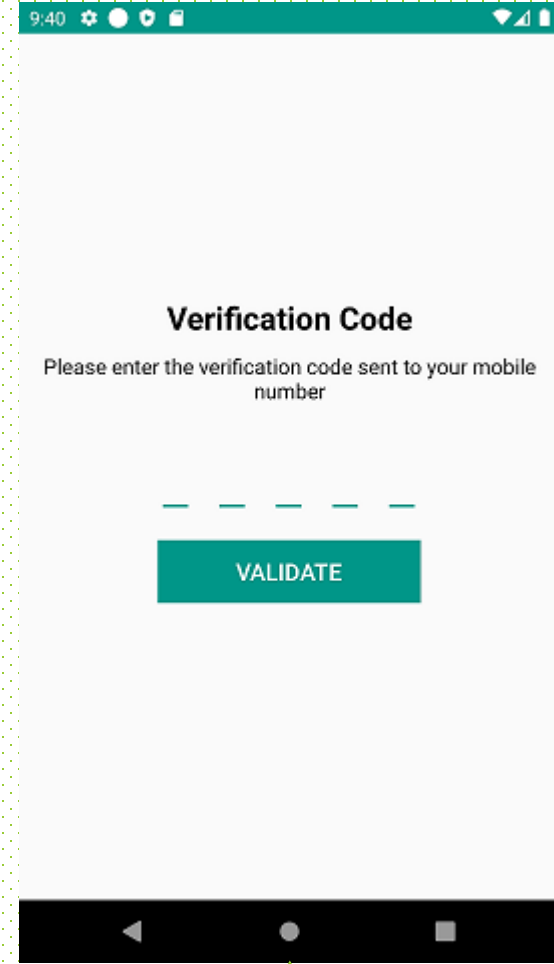




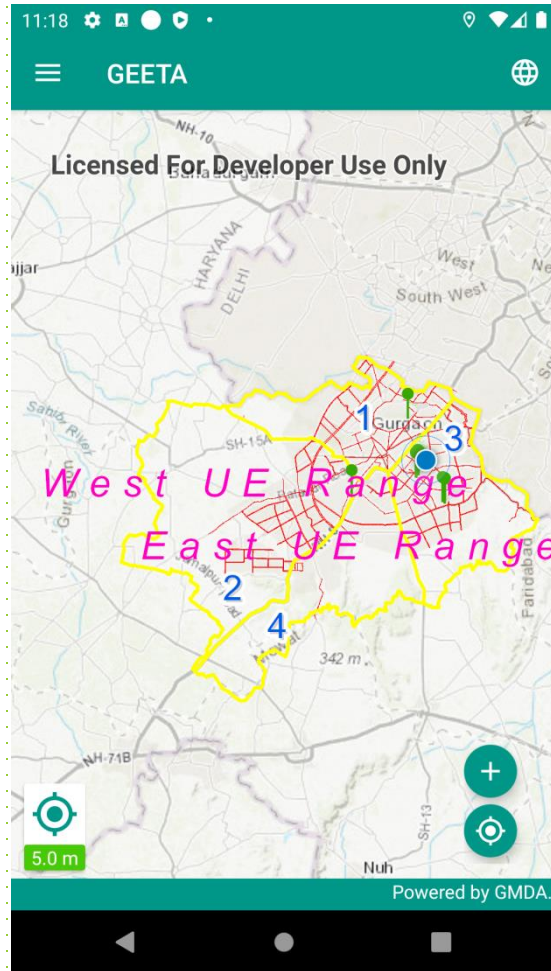
Step 1- Select Language



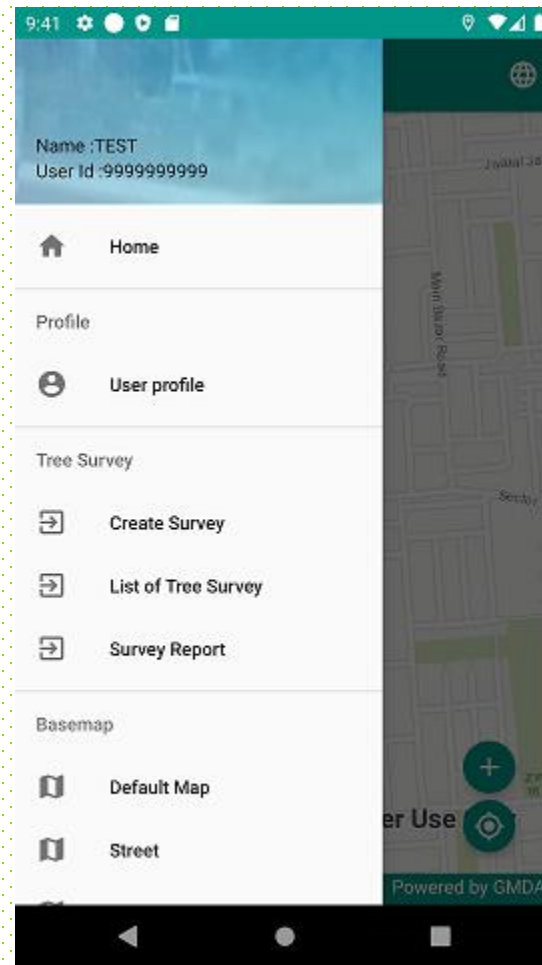
**Step 2- User Login with
Credentials**



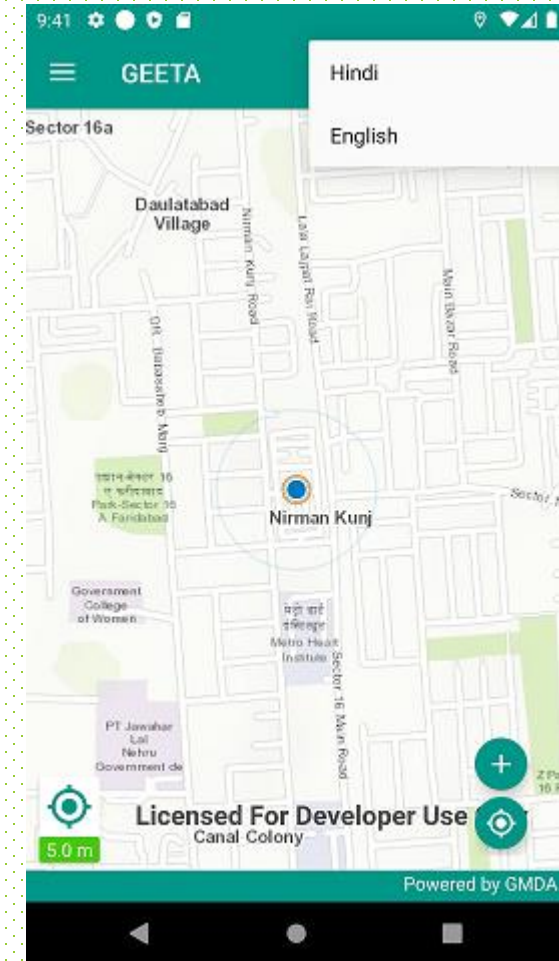
**Step -3 Verify User
With OTP.**



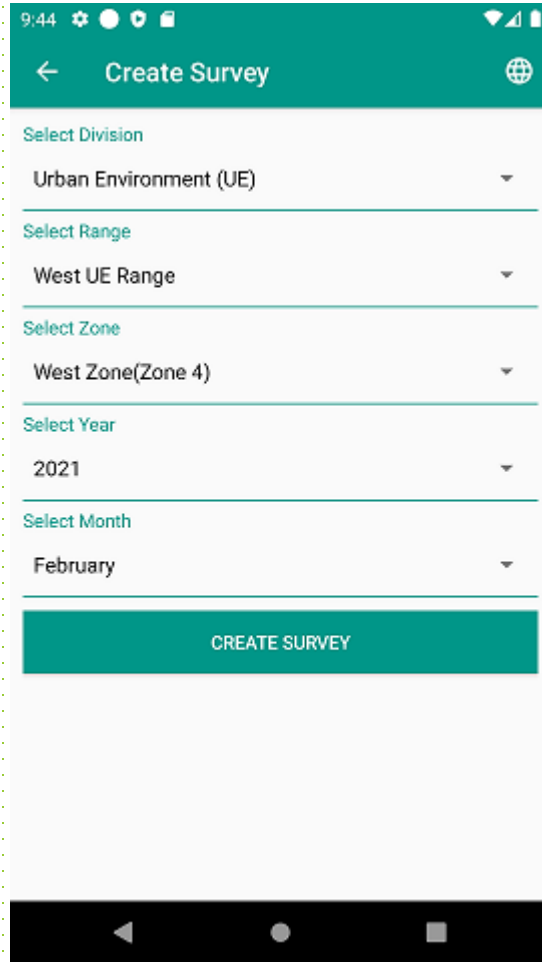
Live location comes automatically, User must be in the GMDA boundary



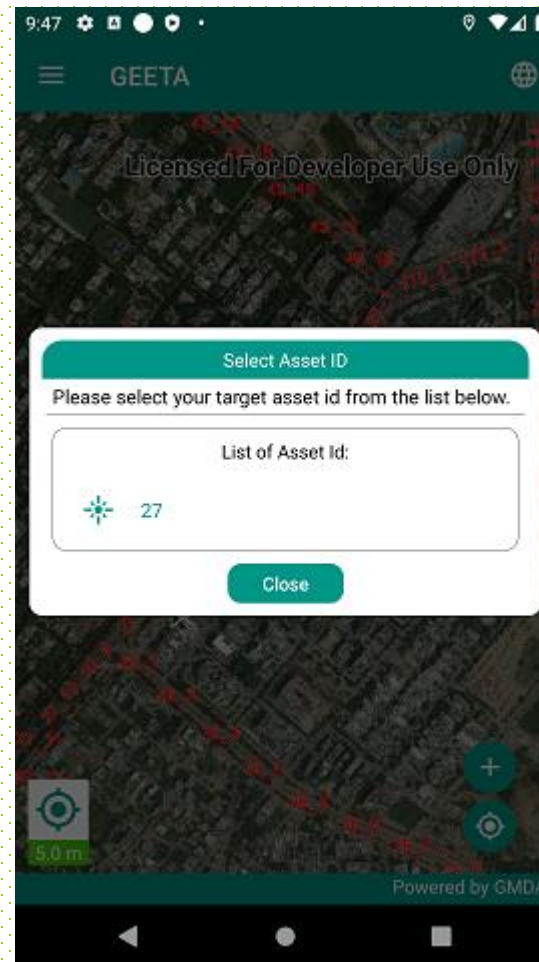
Menus



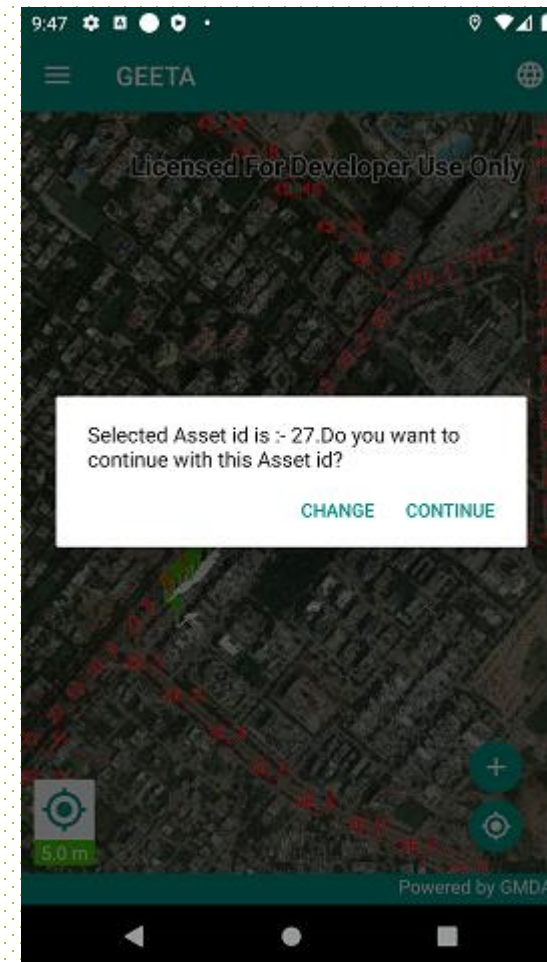
Change Language Option



Step 4- Create Survey (Option Available for Admin Only).



Step 5- Select Asset ID



Confirm selected Asset id.

9:47

← Tree Survey Review

Survey id	12
Division	Urban Environment (UE)
Range	West UE Range
Zone	Zone 3
Asset Id	27
Asset Name	Dividing Road 39/46, 40/45, 41/44
Start Point	HUDA City Centre
End Point	Bakhtawar Chowk

START SURVEY

Step 6- Survey Information

11:28

← Add Tree

Asset Id
27

Select Side *
Select Side *

Serial No. of Trees *

Select species name *
Select species name

Select Girth Type *
Select Girth Type *

Girth(cms)

Girth Class

Volume

Select Condition of Tree

Step 7- Add Tree Information.


11:28


← Add Tree

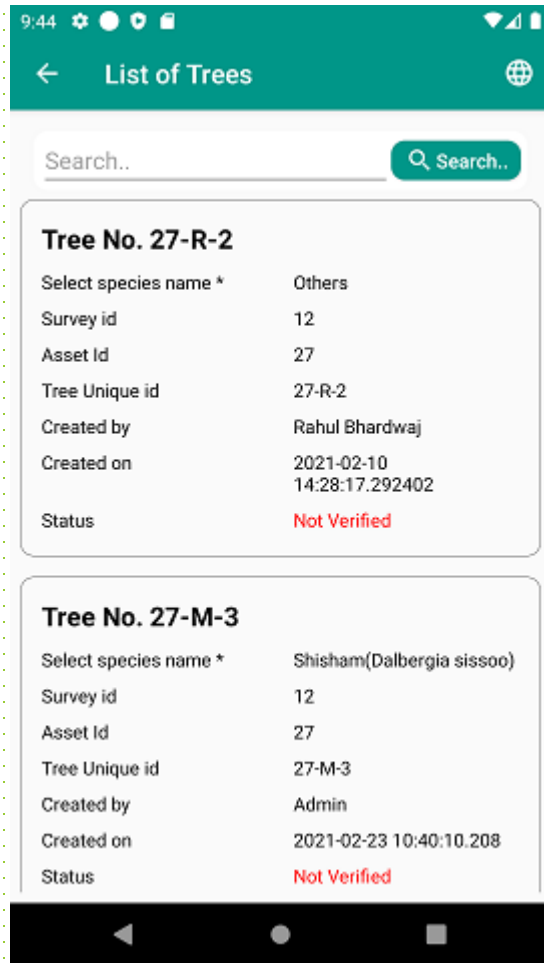
Girth Class

Volume

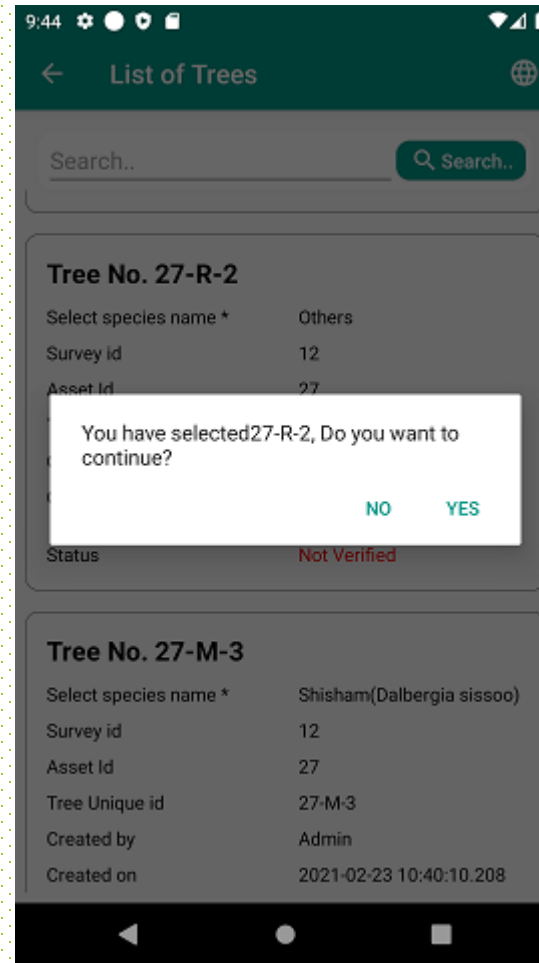
Select Condition of Tree

{Tree Image *}
{Tree Image *} 

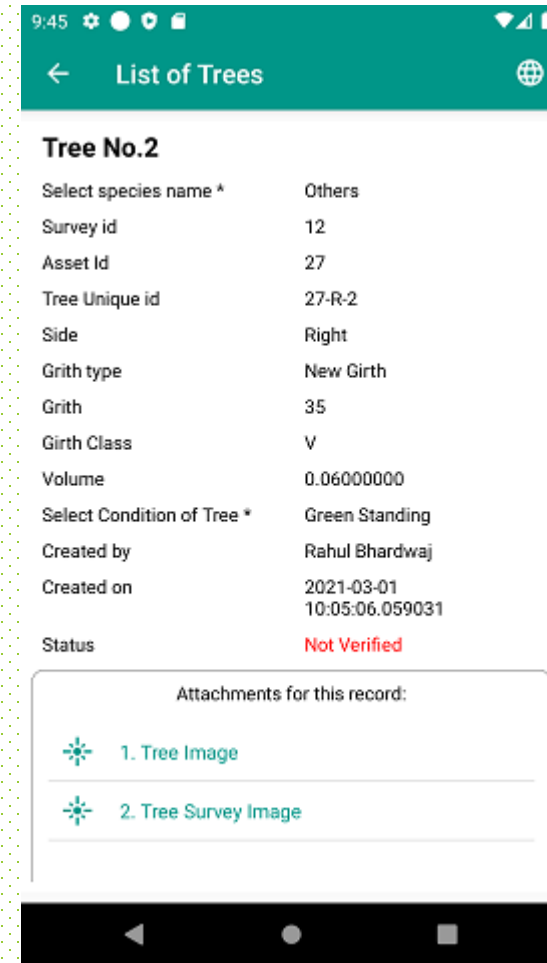
{Signature of Assistant Manager*}
Signature 



List Of Trees



Confirm Selected Tree



Tree Information

9:45

← List of Trees

(Tree Image *)

(Tree Image *)

(Signature of Assistant Manager*)

Signature

VERIFY REJECT

**8. Assistant Manager
Verify OR Reject
Information.**

9:46

← List of Trees

Tree Unique id 27-R-2

Side Right

Grith type New Girth

Grith 35

Girth Class V

Volume 0.06000000

Select Condition of Tree * Green Standing

Created by Rahul Bhardwaj

Created on 2021-03-01 10:05:06.059031

Status Rejected

Attachments for this record:

1. Tree Image

2. Tree Survey Image

3. Rejected Image

EDIT

Edit Option

9:46

← List of Trees

Asset Id 27

Select Side * Right

Serial No. of Trees * 2

Select species name *

Select species name

Select Girth Type *

Select Girth Type *

Girth(cms)

Girth Class

Volume

Select Condition of Tree *

Edit Tree Information

9:45

← List of Trees

(Tree Image *)

(Tree Image *)

(Signature of Assistant Manager*)

Signature

VERIFY REJECT

**8. Assistant Manager
Verify OR Reject
Information.**

9:46

← List of Trees

Tree Unique id 27-R-2

Side Right

Grith type New Girth

Grith 35

Girth Class V

Volume 0.06000000

Select Condition of Tree * Green Standing

Created by Rahul Bhardwaj

Created on 2021-03-01 10:05:06.059031

Status Rejected

Attachments for this record:

1. Tree Image

2. Tree Survey Image

3. Rejected Image

EDIT

Edit Option

9:46

← List of Trees

Asset Id 27

Select Side * Right

Serial No. of Trees * 2

Select species name *

Select species name

Select Girth Type *

Select Girth Type *

Girth(cms)

Girth Class

Volume

Select Condition of Tree *

Edit Tree Information

Sr.NO.	Name of Species	Grith Class							Total Volume
		V	IV	III	II	IIA	I	IA	
1	Eucalyptus(Eucalyptus)	5	0	0	0	0	0	0	0.5
2	Shisham(Dalbergia sissoo)	5	0	0	0	0	0	0	0.3
3	Kikar(Vachellia nilotica)	5	2	0	0	0	0	0	0.58
4	Khair(Senegalia catechu)	0	1	0	0	0	0	0	0.33
5	Others	4	1	0	0	0	0	0	0.44
6	Siris(Albizzia lebbbeck)	1	0	0	0	0	0	0	0.06
7	Neem(Azadirachta indica)	10	7	0	0	1	0	0	2.71
8	Semal(Bombax ceiba)	3	0	0	0	0	0	0	0.18
9	Peepal(Ficus religiosa)	0	1	0	0	0	0	0	0.14
10	Kigelia(Kigelia pinnata)	0	1	0	0	0	0	0	0.14

Survey Report

9:43

Profile

T

Name : TEST
Mobile No. : 9999999999
Email ID:
Role : Super Admin

List of Asset Ids Assigned:

177

93

28

35

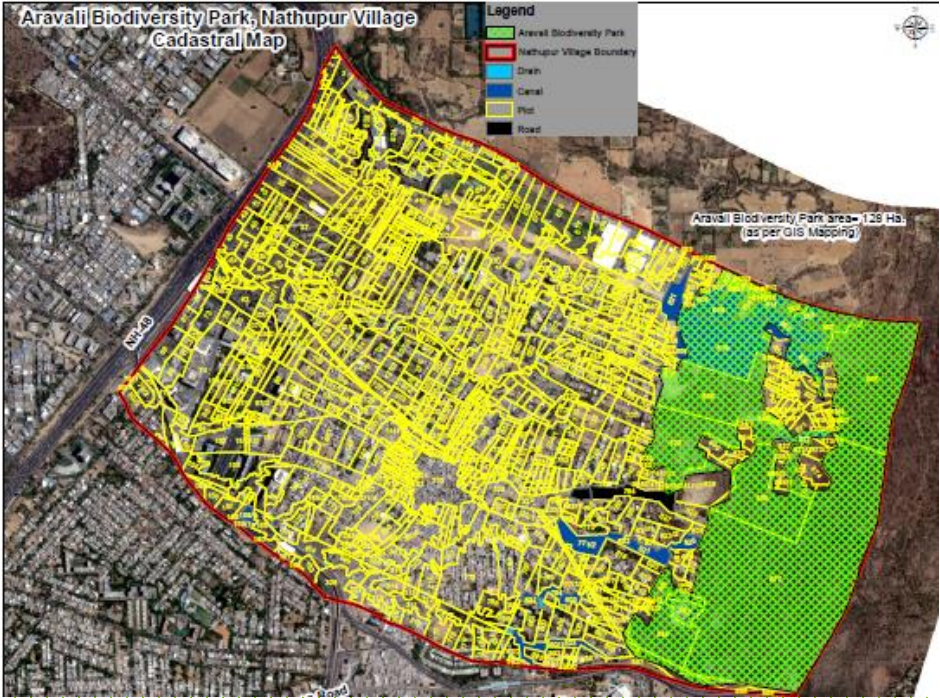
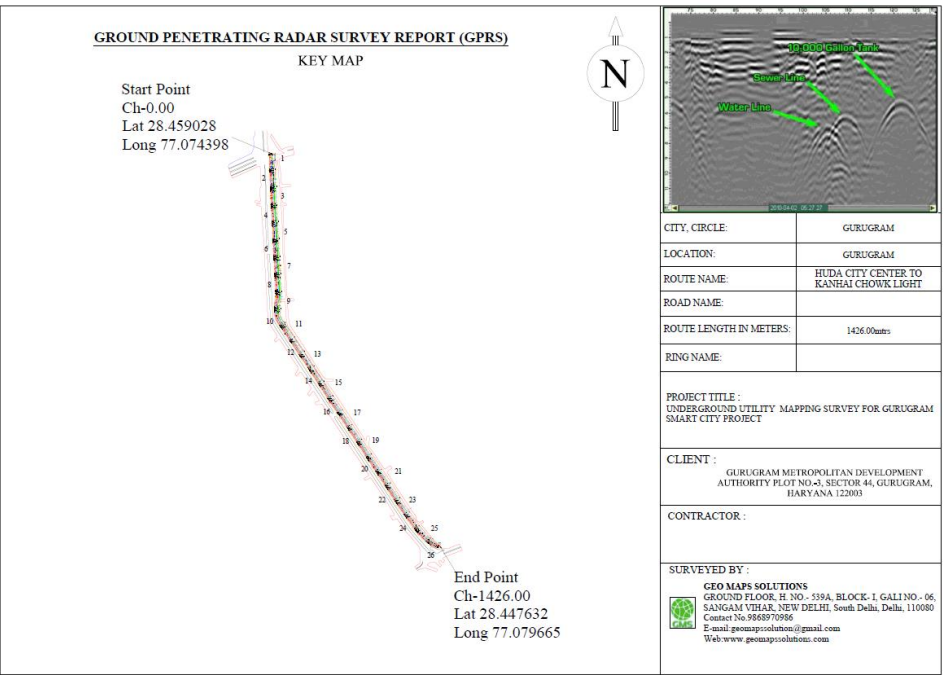
91

Change Password

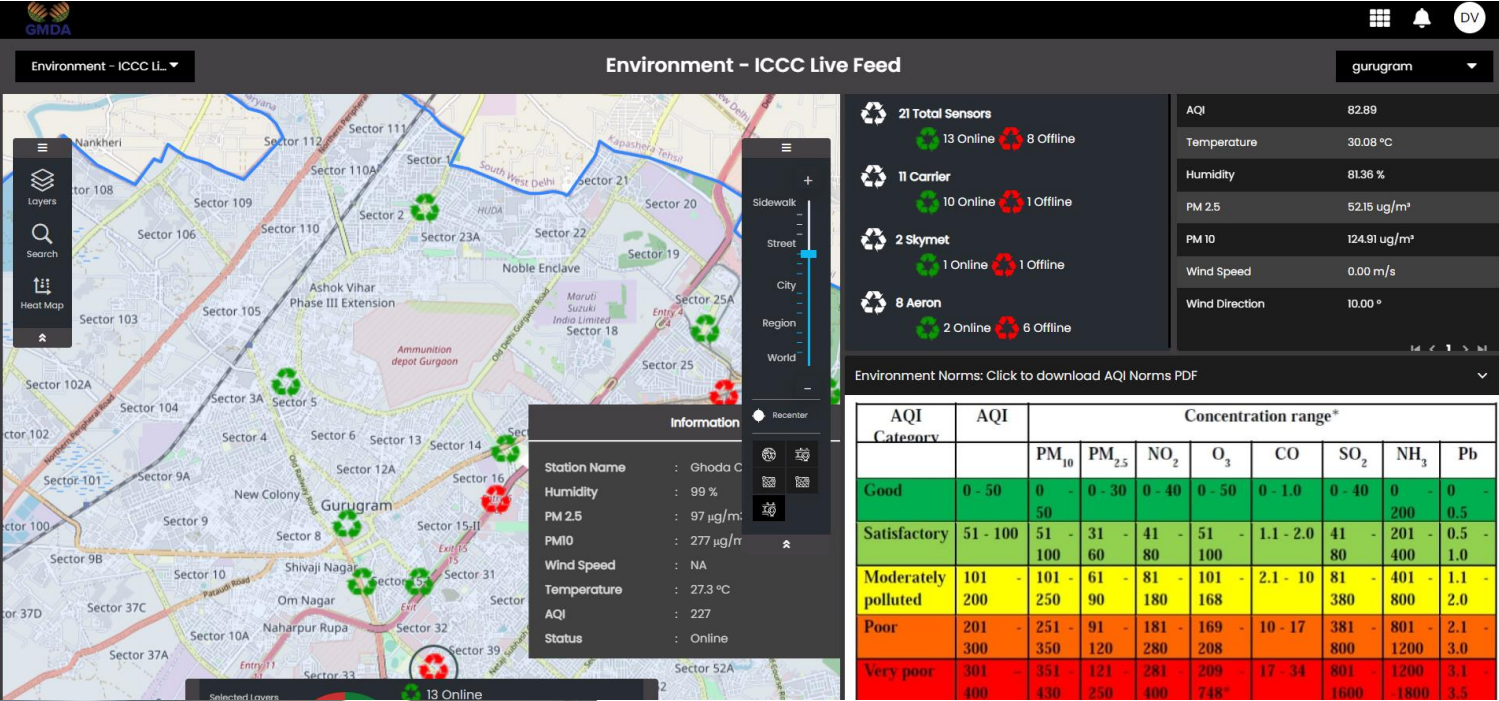
User Profile

[illegible]

GREEN COVER ENHANCEMENT



SMART CITY DASHBOARD



REFERENCES

- UN-Habitat The Strategic Plan 2020-2023
- World Urbanization Prospects The 2018 Revision (Department of Economic and Social Affairs Population Division, United Nation).
- GMDA Act 2018
- <https://www.gmda.gov.in/?language=en>
- <https://onemapggm.gmda.gov.in/GIS/Auth/OneMap2D>

Thanks for kind attention