



ATLAS ON

OPEN SPACES OF GUWAHATI CITY 2016



Prepared By: Assam State Disaster Management Authority (ASDMA)

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Assam State Disaster Management Authority

ASSAM STATE DISASTER MANAGEMENT AUTHORITY

GOVERNMENT OF ASSAM

Sarbananda Sonowal



**Chief Minister, Assam
Guwahati**

Message

Assam is located in "the very earthquake severe intensity zone (Zone-V)". Assam has a history of major earthquakes in 1897 and 1950. During the year 2015 the State experienced around 22 earthquakes. Hence, Government of Assam is committed to being prepared in case of any major eventuality. The experience of Nepal has shown the importance of open spaces in the post-earthquake scenario for providing shelter to the affected people.

Guwahati, being one of the fastest growing cities is at a high urban seismic risk with increase in population growth and its urban sprawl. The population of the Guwahati has drastically increased from 584,342 in 1991 to 957,352 in 2011.

As a preparedness measure, the Assam State Disaster Management Authority (ASDMA) has carried out an in-house activity to map out the open spaces of Guwahati city using space based technology. This Atlas, I believe would help the administration in identifying the open spaces and thereby providing shelter in case of a major disaster.

I compliment and congratulate Assam State Disaster Management Authority for preparing this Atlas.


(Sarbananda Sonowal)

Introduction

With increasing population and urbanization, the losses from any disasters have been increasing significantly in hazard prone developing countries. Since cities are the main growth centre in terms of population and economy, risk is high in dense urban areas. To mitigate the risk of life the concept of open space was introduced by the researchers. Open spaces refers to areas of land without human-built structures. Open spaces not only significantly contributes to the quality of everyday urban life but also has the capacity to facilitate recovery during a disaster. Open spaces plays a vital role in planning any rescue and recovery operations. It can act as a short-term shelter area during any emergency or disasters.

Assam, popularly known as the gate way of north-east India is at very high risk of being devastated by an earthquake. Geomorphologically Assam is located in what we call “very severe intensity zone” or zone V, the highest risk earthquake zone. The State of Assam has experienced several devastating earthquakes in the past resulting in great loss to life and properties. Active seismicity in the region has also caused extensive landslide, rock falls on the hill slopes. As per the plate tectonics, Assam is in the eastern-most projection of the Indian Plate, where the plate is thrusting underneath the Eurasian Plate. This led the State of Assam fall under the seismic zone V, making the entire State prone to earthquake of moderate to very high intensity. The State has experienced two major earthquakes in the year 1897 and 1950. The intensities of these two earthquakes were 8.7 and 8.5 on the Richter scales respectively. Apart from these, there is a recorded history of around twenty destructive earthquakes which has affected this region in the past century. Earthquakes during non-instrumental period in Assam are in the year of 1548, 1596, 1601, 1642, 1663, 1696, 1756, 1772, 1838, & 1841 and in the instrumental period are during 1869, 1897, 1923, 1930, 1943, 1947, 1950, 1985, 1984 & 1988.

Urban seismic risk in Guwahati is increasing with population growth and its urban sprawl. The city lies in zone V and is the gateway to seven north-eastern states of India. The Guwahati Municipal Corporation covers an area of 216 km² under its jurisdiction and is divided into 31 Municipal wards. Huge urban population combined with poor quality and ill maintained infrastructure, low quality building stock, and lower resilience of the high-density society increases the risks to earthquakes in the city of Guwahati. Moreover, urban infrastructure is often designed and constructed without satisfying minimum safety standards. Open spaces therefore plays a vital role in minimising the loss of life during a disaster and especially during earthquake.

Objective

Knowing the importance of open spaces in Disaster Management and specially earthquake in Assam, Assam State Disaster Management Authority (ASDMA) therefore, made an attempt to map out the available open spaces under Guwahati Municipal Corporation area with the following objectives.

1. To map the open spaces under all the 31 wards within the GMC boundary using Google earth satellite imagery.
2. To study whether the existing open spaces within the GMC boundary will be sufficient to provide shelter to the existing population within the ward in case of major disaster.

The mapping exercise has been done as a preparedness measure for the administration for providing relief and shelter in case of a major disaster.

Methodology

In obtaining the objective to map open spaces in Guwahati city, GIS & Remote Sensing technology was immensely used. The ward boundaries of all the 31 wards within Guwahati city along with the household statistics were provided by the Guwahati Municipal Corporations both in GIS format as well as in text format. These ward boundary shapefiles were then exported to kml layers for mapping open spaces ward wise on Google Earth imageries for the years 2015/2016. As such open spaces of 31 wards of the Guwahati Municipal Corporation were done. Open Spaces in each ward were digitized and was verified on the ground using handheld GPS devices. ArcGIS software was then used to import the digitized open spaces in Google earth to derive the area of each ward. The imported open space layers were finally overlaid with other GIS layers within the ward i.e. buildings, water bodies, roads etc. Statistical data were later drawn out from the study.

While calculating the total open spaces required for accommodating a total population in a given area a standard of 3.5 meter square per person was followed. This was taken from the Sphere Handbook “Humanitarian Charter and Minimum Standards in Humanitarian Response”2015. As such open space required for accommodating total population of the ward, deficit in open spaces in the ward were calculated for each ward using the formula given below. Total Population that can be accommodated in open space= Total open space/3.5m²

Total open space required for accommodating the ward population= Total population x 3.5m²

Deficit Open space =Total Required Open Space- Available open space within the ward

Findings

The findings of each ward are presented below:-

1) Ward No 1

Sl No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Garigaon Eidgah	26.16	91.66	6002.14	Open area	Yes	33305	2223
2	Guwahati university	26.15	91.67	22737.23	Playground	Yes		
3	Guwahati university	26.16	91.66	17361.57	Playground	Yes		
4	APRO Ground	26.14	91.65	9752.73	Open area	Yes		
5	AEC	26.14	91.66	14781.41	Playground	Yes		
6	AEC Hostel 6	26.15	91.66	16911.31	Open area	Yes		
7	Guwahati university RCC 2 Boy's Hostel	26.15	91.66	2672.59	Open area	Yes		
8	Institute of Science & Technology, GU	26.15	91.66	1041.37	Small Open area	Yes		
9	RCC 1 Boys Hostel, GU	26.15	91.66	2426.55	Small Open area	Yes		
10	Assam Engineering college	26.14	91.66	4460.36	Open area	Yes		
11	Assam Engineering college	26.14	91.66	4412.34	Open area	Yes		
12	AEC Hostel 1	26.14	91.66	11079.07	Open area	Yes		
13	AEC Hostel 3	26.14	91.65	1457.15	Small Open area	Yes		
Total				115095.82				

A) Total Area under Open Space: - 115095.82 m²

B) Total Population that can be accommodated in open space under ward no 1:- 32885

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 58283.75 m²

Deficit Open Spaces: - No Deficit

2) Ward No-2

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Mazdoor Shiv mandir	26.17	91.67	1078.29	Open area	Yes	21277	12590
2	Nauka mandir	26.17	91.68	826.25	Open area	Yes		
3	Vidya Niketan school, Pandu port road	26.17	91.68	12116.90	Playground	Yes		
Total				14021.44				

A) Total Area under Open Space: - 14021.44 m²

B) Total Population that can be accommodated in open space under ward no 2:- 4006

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 37234.75 m²

Deficit Open Spaces: - 23213.31 m²

3) Ward No-3

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Bidya Mandir Math	26.16	91.69	1743.58	Open area	Yes	23257	16494
2	Unknown	26.16	91.69	521.83	Open area	Yes		
3	Boripara Field	26.16	91.69	6035.14	Playground	Yes		
4	North jalukbari Eid gah	26.16	91.68	1706.10	Open area	Yes		
5	Kalibari rest camp	26.16	91.69	863.93	Open Area	Yes		
Total				10870.59				

A) Total Area under Open Space: - 10870.59 m²

B) Total Population that can be accommodated in open space under ward no 3:- 3105

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 40699.75 m²

Deficit Open Spaces: - 29829.16 m²

4) Ward No-4

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Near Joy Guru Shankar Namghar	26.17	91.69	1654.66	Open area	Yes	20366	5595
2	Behind Pragjyotish Book Stall	26.17	91.69	2549.09	Open area	Yes		
3	Near Shani Mandir	26.16	91.69	1036.53	Open area	Yes		
4	Ram Krishna Vivekananda English Medium School	26.16	91.7	818.39	Open area	Yes		
5	Kamakhya Mandir	26.17	91.71	3916.16	Open area	Yes		
6	Bishnupur Namghar	26.16	91.71	770.1	Small Open area	Yes		
Total				10744.43				

A) Total Area under Open Space: - 10744.43 m²

B) Total Population that can be accommodated in open space under ward no 4:- 3070

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 35640.50 m²

Deficit Open Spaces: - 24896.07 m²

5) Ward No-5

SI No.	Name/Landmark	Latitude	Longitude	Area Sq.m	Remarks	Road Access	Population	Population Density
1	NF Railway stadium	26.15	91.7	22934.86	Playground	Yes	30076	8898
2	Maligaon Gurudwara	26.16	91.7	5827.47	Open area	Yes		
3	Netaji Vidyapeeth Railway High school	26.15	91.69	11922.02	Open area	Yes		
4	Maligaon Marriage hall	26.15	91.7	4065.89	Open area	Yes		
5	Railway institute	26.15	91.7	1400.29	Open area	Yes		
6	NF Railway field	26.16	91.7	1997.75	Playground	Yes		
7	TR Phukan School	26.15	91.7	4525	Open area	Yes		
8	Sun Flower English school	26.17	91.73	1643.8	Open area	Yes		
Total				54317.08				

A) Total Area under Open Space: - 54317.08 m²

B) Total Population that can be accommodated in open space under ward no 5:- 15519

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 52633 m²

Deficit Open Spaces: - No Deficit

6) Ward No-6

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Gotanagar PHC	26.14	91.68	1113.03	Open area	Yes	49021	1888
2	Champabati High School, Ganeshpara	26.14	91.727	855.45	Small open area	Yes		
3	Milan Jyoti Sangha, Ganeshpara	26.14	91.725	3668.39	Open area	Yes		
4	SBOA Public school	26.12	91.71	18247.14	Open area	Yes		
5	Paschim Bongaon primary school	26.12	91.69	3461.81	Playground	Yes		
6	Royal Group of Institutions	26.11	91.72	25347.5	Open area	Yes		
7	Royal Group of Institutions	26.11	91.72	14594.31	Open area	Yes		
8	Royal Group of Institutions	26.11	91.72	3492.11	Open area	Yes		
9	DPS Guwahati	26.11	91.72	4085.91	Open area	Yes		
10	Unknown	26.12	91.73	11584.89	Open area	Yes		
11	Silver Springs Apartments	26.11	91.74	2795.71	Open Area	Yes		
12	Champabati High School, Ganeshpara	26.14	91.72	5917.54	Open Area	Yes		
13	Unknown	26.11	91.73	5009.73	Open Area	Yes		
Total				100173.2				

A) Total Area under Open Space: - 100173.2 m²

B) Total Population that can be accommodated in open space under ward no 6:- 28620

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 85786.75 m²

Deficit Open Spaces: - No Deficit

7) Ward No 7:- No Open Space

8) Ward No-8

SI No.	Name/Landmark	Latitude	Longitude	Area Sq.m	Remarks	Road Access	Population	Population Density
1	Sonaram High school ground	26.17	91.72	9542.83	Playground	Yes	22388	19639
2	Machkhowa Iddgah Field	26.17	91.73	5566.90	Playground	Yes		
Total				15109.73				

A) Total Area under Open Space: - 15109.73 m²

B) Total Population that can be accommodated in open space under ward no 8:- 4317

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 39179 m²

Deficit Open Spaces: - 24069.27 m²

9) Ward No-9

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Chatribari Hospital	91.75	26.1764	3278.82	Open area	Yes	16816	18479
2	Central Jail	91.74	26.178919	28751.50	Open Area	Yes		
3	Central Jail	91.74	26.178605	10288.36	Open Area	Yes		
4	Presbyterian Church	91.74	26.1738	2942.57	Open Area	Yes		
5	Guwahati Gaushala	91.74	26.1721	33431.56	Open Area	Yes		
Total				49653.84				

A) Total Area under Open Space: - 49653.84 m²

B) Total Population that can be accommodated in open space under ward no 9:- 14186

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 29428 m²

Deficit Open Spaces: - No Deficit

10) Ward No-10

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Sports Authority stadium	91.75	26.18	16728.21	SAI stadium	Yes		
2	Judge field	91.75	26.19	18200.07	Open area	Yes		
3	Latasil playground	91.75	26.19	7062	Open area	Yes		
4	Backside of Hotel Brahmaputra	91.75	26.19	2515.49	Open area	Yes		

5	SRB Hostel, Cotton college	91.75	26.19	4059.08	Open area	Yes	21443	9791
6	Don Bosco School playground	91.75	26.19	3380.52	Playground	Yes		
7	ASTC parking area	91.75	26.18	1993.5	Open area , ASTC parking	Yes		
8	Guwahati Railway station parking	91.75	26.18	1054.41	Railway parking area1	Yes		
9	Guwahati Railway station parking	91.75	26.18	3601.88	Railway parking area	Yes		
Total				58595.16				

A) Total Area under Open Space: - 58595.16 m²

B) Total Population that can be accommodated in open space under ward no 10:- 16741

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 37525.25 m²

Deficit Open Spaces: - No Deficit

11) Ward No-11

SI No.	Name/Landmark	Latitude	Longitude	Area Sq.m	Remarks	Road Access	Population	Population Density
1	Lal singh primary school	26.2	91.77	5262.36	Playground	Yes	22100	10728
2	Uzan Bazar Jahajghat primary school	26.2	91.76	445.49	Small open area	Yes		
Total				5707.85				

A) Total Area under Open Space: - 5707.85 m²

B) Total Population that can be accommodated in open space under ward no 11:- 1631

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 38675 m²

Deficit Open Spaces: - 32967.15 m²

12) Ward No-12

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Assam Engineering Institute	26.18	91.78	6738.08	Chandmari playground	Yes	24443	7936
2	Pub Guwahati Girl's High school, Chandmari	26.19	91.77	968.29	Playground	Yes		
3	Navagraha Mandir	26.19	91.76	2351.14	Open area	Yes		
Total				10057.51				

A) Total Area under Open Space: - 10057.51 m²

B) Total Population that can be accommodated in open space under ward no 12:- 2874

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 42775.25 m²

Deficit Open Spaces: - 32717.74 m²

13) Ward No-13

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Nehru Stadium	26.18	91.76	25771.9	Stadium	Yes	25540	12459
2	Haji Musafir Khana	26.18	91.76	2890.92	Open Space, Eid-Gah	Yes		
3	Nehru stadium	26.18	91.76	1451.83	Parking lot	Yes		
4	Sarania Club, Lachit nagar	26.17	91.77	1522.59	Open area	Yes		
5	Dakhin Pub rongali Bihu Manch, Rajgarh	26.17	91.77	909.364	Open area	Yes		
6	Rajgarh Girl's High school	26.17	91.77	742.202	Small open area	Yes		
Total				33288.81				

A) Total Area under Open Space: - 33288.81 m²

B) Total Population that can be accommodated in open space under ward no 13:- 9511

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 44695 m²

Deficit Open Spaces: - 11406.19 m²

14) Ward No-14

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	CRPF Battalion Outpost, Training area	91.75	26.17	3031.56	Open area	Yes	22340	18311
Total				3031.56				

A) Total Area under Open Space: - 3031.56 m²

B) Total Population that can be accommodated in open space under ward no 14:- 866

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 39095 m²

Deficit Open Spaces: - 36063.44 m²

15) Ward No-15

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	KRB Girl's college	26.17	91.74	3350.37	Open area	Yes	28419	22202
2	Fatasil park	26.16	91.74	2791.38	Open area	Yes		
3	Radha Gobinda baruah college	26.16	91.74	3663.35	Open area	Yes		
4	Unknown	26.16	91.74	2127.02	Open area	Yes		
Total				11932.12				

A) Total Area under Open Space: - 11932.12 m²

B) Total Population that can be accommodated in open space under ward no 15:- 3409

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 49733.25 m²

Deficit Open Spaces: - 37801.13 m²

16) Ward No-16

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	West Guwahati soccer training center	26.16	91.73	4885.69	Playground	Yes	37806	15122
2	Pragati Sangha, Lokhra	26.15	91.74	738.66	Open area	Yes		
3	Eidgah Field	26.15	91.73	2843.00	Open area	Yes		
4	Barsapara Cricket stadium	26.15	91.74	9552.94	Playground	Yes		
5	Dr. Bhupen Hazarika cricket stadium	26.15	91.74	17028.10	Playground	Yes		
Total				35048.39				

A) Total Area under Open Space: - 35048.39 m²

B) Total Population that can be accommodated in open space under ward no 16:- 10014

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 66160.5 m²

Deficit Open Spaces: - 31112.11 m²

17) Ward No-17

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Kahilipara High school	26.15	91.74	1822.605	Open area	Yes	32006	7128
2	Lutuma Prathamik	26.14	91.74	4179.952	Open area	Yes		

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
3	Vidyalaya 4th Assam batallion ground	26.14	91.75	11264.69	Open area	Yes	17267.25	
Total				17267.25				

A) Total Area under Open Space: - 17267.25 m²

B) Total Population that can be accommodated in open space under ward no 17:- 4934

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 56010.50 m²

Deficit Open Spaces: - 38743.25 m²

18) Ward No-18

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Ramakrishna Mission	26.16	91.75	1451.22	Small open area	Yes	31138	10627
2	Madhav das ME high school	26.16	91.75	1308.16	Small open area	Yes		
3	Shree Shree Brindaban Seva Ashram	26.16	91.75	1373.35	Small open area	Yes		
4	Rupnagar LP school	26.15	91.75	1603.71	Open area	Yes		
5	SB Deoraah College	26.16	91.76	2190.61	Playground	Yes		
Total				7927.05				

A) Total Area under Open Space: - 7927.05 m²

B) Total Population that can be accommodated in open space under ward no 18:- 2265

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 54491.5 m²

Deficit Open Spaces: - 46564.45 m²

19) Ward No-19

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	GMC Hospital Auditorium	91.76	26.15	9779.98	Parking area	Yes	27125	7684
2	Dispur College	91.78	26.14	4759.46	Open area	Yes		
3	GMC Hospital	91.76	26.16	4617.70	Open area	Yes		
4	Govt. BDS Deaf & Dumb School	91.76	26.14	4371.65	Open Area	Yes		
Total				23528.80				

A) Total Area under Open Space: - 23528.80 m²

B) Total Population that can be accommodated in open space under ward no 19:- 6722

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 47468.75 m²

Deficit Open Spaces: - 23939.95 m²

20) Ward No-20

SI No	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Japorogog Field	26.16	91.79	2216.03	Playground	Congested	31722	9168
2	Japorigog Bihu sanmilan ground	26.15	91.78	2226.69	Open area	Congested		
Total				4442.72				

A) Total Area under Open Space: - 4442.72 m²

B) Total Population that can be accommodated in open space under ward no 20:- 1269

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 55513.50 m²

Deficit Open Spaces: - 51070.78 m²

21) Ward No-21

SI No	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Unknown	26.17	91.77	1277.28	Open Area	Congested	33057	9838
2	Girl's polytechnic	26.18	91.78	9669.64	Open area with sparse vegetation	Congested		
3	Girl's polytechnic	26.18	91.78	6247.83	Open area with sparse vegetation	Congested		
4	Kali mandir, Railway colony	26.18	91.78	1859.05	Small open area	Congested		
5	Bihu Field,Railway Colony	26.18	91.78	5195.00	Open area with sparse vegetation	Congested		
6	Assam industrial development corporation	26.17	91.78	1435.16	Small open	Yes		
7	Colony area,Hatigarh Chariali	26.17	91.79	2797.82	Open area with sparse vegetation	Yes		
8	Geetanagar High school	26.17	91.79	3642.50	Playground	Yes		
9	RPF Training Ground	26.18	91.78	8633.46	Playground	congested		
10	Holy Child school	26.19	91.78	1810.90	Playground	Yes		

11	Holy Child school	26.19	91.78	968.20	Playground	Yes		
12	Pub Bhaskar Nagar	26.17	91.77	10481.33	Open Area	Yes		
13	Pub Bhaskar Nagar	26.18	91.78	4533.05	Open Area	Yes		
Total				58551.2				

A) Total Area under Open Space: - 58551.20 m²

B) Total Population that can be accommodated in open space under ward no 21:- 16729

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 57849.75 m²

Deficit Open Spaces: - No Deficit

22) Ward No-22

SI No	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Central Power Research Institute	26.18	91.83	3080.21	Open area	Yes	38081	2874
2	ASEB High school	26.18	91.82	6855.07	Playground	Yes		
3	Noonmati Refinery Sector 3	26.18	91.82	9447.27	Playground	Yes		
4	Jagannath Temple	26.20	91.80	1737.36	Open area	Yes		
5	Noonmati Public school	26.20	91.79	3068.51	Playground	Yes		
6	KV Noonmati	26.20	91.79	16298.0	Playground	Yes		
7	Guwahati Refinery High school	26.19	91.80	1305.98	Small open area	Yes		
Total				41792.4				

A) Total Area under Open Space: - 41792.40 m²

B) Total Population that can be accommodated in open space under ward no 22:- 11941

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 66641.75 m²

Deficit Open Spaces: - 24849.35 m²

23) Ward No-23

SI No	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Guwahati Refinery	26.19	91.80	9595.16	Playground	Yes	21462	9982
2	Guwahati College	26.19	91.79	1767.05	Open area	Yes		
3	Near Railway Cooperative store, Bamunimaidan	26.18	91.78	5089.45	Open Area	Yes		
Total				16451.6				

A) Total Area under Open Space: - 16451.60 m²

B) Total Population that can be accommodated in open space under ward no 23:- 4700

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 37558.50 m²

Deficit Open Spaces: - 21106.90 m²

24) Ward No-24

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Narangi Army colony	26.16	91.84	4008.72	Open area	Yes	35524	4359
2	Narangi Army colony	26.16	91.84	2299.48	Small open area	Yes		
3	Narangi Army colony	26.16	91.84	3036.64	Small open area	Yes		
4	SFS school, Satgaon	26.17	91.83	3662.37	School Playground	Yes		
5	Oil India Pipeline Headquarters	26.17	91.84	16190.48	Open area colony playground	Yes		
6	Pathar Quarry Kalyan Samiti	26.17	91.82	3131.48	Playground	Yes		
Total				32329.17				

A) Total Area under Open Space: - 32329.17 m²

B) Total Population that can be accommodated in open space under ward no 24:- 9237

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 62167 m²

Deficit Open Spaces: - 29837.83 m²

25) Ward No-25

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Doordarshan colony	91.81	26.15	2037.38	Open area	Yes	38724	4356
2	Satgaon HS school	91.84	26.16	5021.35	Open area	Yes		
3	PHED Office, Hengrabari	91.84	26.18	826.91	Open area	Yes		
4	Hengrabari LP school	91.84	26.18	626.54	Open area	Yes		
Total				8512.18				

A) Total Area under Open Space: - 8512.18 m²

B) Total Population that can be accommodated in open space under ward no 25:- 2432

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 67767 m²

Deficit Open Spaces: - 59254.82 m²

26) Ward No-26

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Dakhingaon Id-gah	91.76	26.13	1983.03	Open area	Yes	48085	7156
2	Directorate of technical education Assam	91.77	26.14	10112.41	Open area	Yes		
3	Faguna Rabha HS school	91.78	26.14	2189.53	Open area	Yes		
4	Kamal Dayamati Smriti manch	91.80	26.13	1490.82	Open area	Yes		
5	Dispur Play Ground	91.79	26.14	6228.04	Playground	Yes		
6	Dispur Press club	91.79	26.14	520.63	Open area	Yes		
7	Gopal Boro High school	91.79	26.15	849.21	Open area	Yes		
8	Srimanta Shankar Academy	91.80	26.14	4845.22	Open area	Yes		
9	Pub Suraj Nagar Namghar	91.76	26.14	10560.56	Open area	Yes		
10	APDCL Power house, kahilipara	91.76	26.14	7259.20	Low lying Open area	Yes		
Total				46038.65				

A) Total Area under Open Space: - 46038.65 m²

B) Total Population that can be accommodated in open space under ward no 26:- 13154

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 84148.75 m²

Deficit Open Spaces: - 38110.10 m²

27) Ward No-27

SI No.	Name/Landmark	Latitude	Longitude	Area Sq.m	Remarks	Road Access	Population	Population Density
1	Modern High School	26.14	91.75	1755.64	Playground	Yes	31238	3159
2	Modern High School	26.14	91.75	6008.36	Playground	Yes		
3	Sonaighuli Jatiya Vidyalaya	26.13	91.75	5730.19	Open area	Yes		
4	Don Bosco Sonaighuli	26.13	91.75	3239.59	Playground	Yes		
5	Hamendra Choudhary manch, Lokhra	26.11	91.75	7678.40	Open area	Yes		
6	Indira Gandhi athletic stadium	26.12	91.76	21973.49	Open area	Yes		
7	IG Stadium	26.12	91.76	24429.8	Open area	Yes		
8	IG Stadium	26.12	91.76	16888.41	Open area	Yes		
9	M.Tayebulla Hockey stadium	26.12	91.77	6587.49	Playground	Yes		

10	M.Tayebulla Hockey stadium	26.12	91.77	9357.65	Open area	Yes		
11	Bethakuchi High school	26.13	91.75	4360.55	Open area	Yes		
Total				108009.6				

A) Total Area under Open Space: - 108009.60 m²

B) Total Population that can be accommodated in open space under ward no 27:- 30860

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 54666.50 m²

Deficit Open Spaces: - No Deficit

28) Ward No-28

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Assam water Resource & Management Institute	91.79	26.11	5242.47	Open area	Yes	39350	7425
2	Army 151 Base Hospital	91.80	26.11	2221.56	Open area	Yes		
3	Army 151 Base Hospital	91.79	26.11	26498.73	Open area	Yes		
4	Basistha Temple	91.79	26.10	807.81	Open area with gentle slope	Yes		
5	Basistha Temple Bus stand	91.79	26.10	2060.01	Open area	Yes		
6	Beltola college	91.79	26.12	13552.34	Open area	Yes		
Total				50382.92				

A) Total Area under Open Space: - 50382.92 m²

B) Total Population that can be accommodated in open space under ward no 28:- 14395

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 68862.50 m²

Deficit Open Spaces: - 18479.58 m²

29) Ward No-29

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Hatigaon Id Gah	91.78	26.13	4226.74	Open area	Yes	35894	6623
2	Blue Bell School	91.78	26.13	935.44	Open area	Yes		
Total				5162.18				

A) Total Area under Open Space: - 5162.18 m²

B) Total Population that can be accommodated in open space under ward no 29:- 1475

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 62814.50 m²

Deficit Open Spaces: - 57652.32 m²

30) Ward No-30

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Arundhati Pragati Hangha	91.79	26.09	1098.49	Open area	Yes	33460	5328
2	Borpothar LP school	91.79	26.09	1012.79	Open area	Yes		
3	Prabha Devi Gupta ME school	91.80	26.11	1203.16	Small Open area	Yes		
4	Patorkuchi Primary School	91.81	26.11	8560.61	Open area	Yes		
5	Beltola Nimnya Buniadi Vidyalaya	91.80	26.12	7268.86	Open area	Yes		
6	Kendriya Vidyalaya,	91.81	26.12	14600.80	Open area	Yes		
7	Administrative staff college	91.81	26.12	7719.15	Open area	Yes		
8	Administrative staff college	91.81	26.12	2503.77	Open area	Yes		
9	Veterinary College	91.82	26.12	68435.86	Open area	Yes		
Total				112403.5				

A) Total Area under Open Space: - 112403.50 m²

B) Total Population that can be accommodated in open space under ward no 30:- 32115

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 58555 m²

Deficit Open Spaces: - No Deficit

31) Ward No-31

SI No.	Name/Landmark	Latitude	Longitude	Area (Sq.m)	Remarks	Road Access	Population	Population Density
1	Greenwood Resort	91.83	26.12	3323.28	Open area	Yes	39116	3343
2	Greenwood Resort	91.83	26.12	4922.29	Open area	Yes		
3	Greenwood Resort	91.83	26.12	6645.87	Open area	Yes		
4	Veterinary College	91.82	26.12	3066.32	Open area	Yes		
5	Veterinary College, Indoor stadium	91.82	26.12	1772.30	Open area	Yes		
6	Khanapara Primary School	91.82	26.13	9241.45	Open area	Yes		
7	Tissue culture laboratory	91.81	26.13	6562.08	Open area	Yes		
8	Aulia Dargah Sarif	91.81	26.13	2191.57	Open Area	Yes		

9	Dwarkangar Children's park	91.81	26.14	537.75	Open area	Yes
10	Nandimikir Primary school	91.81	26.14	760.45	Open area	Yes
11	Fakruddin Ali Ahmad Id gah	91.81	26.13	1060.94	Open area	Yes
12	Swahid jadhav Nath Homoeopathic Medical College & hospital, Panjabari	91.82	26.14	1942.49	Open area	Yes
Total				42026.79		

15	1.28	6498	28419	22202	0.012	0.037	27.602
16	2.50	9009	37806	15122	0.035	0.031	23.126
17	4.49	7598	32006	7128	0.017	0.038	28.348
18	2.93	7722	31138	10627	0.008	0.046	34.316
19	3.53	6588	27125	7684	0.023	0.023	17.158
20	3.46	8075	31722	9168	0.004	0.051	38.046
21	3.36	8307	33057	9838	0.059	No Deficit	No Deficit
22	13.25	9264	38081	2874	0.042	0.024	17.904
23	2.15	5340	21462	9982	0.016	0.021	15.666
24	8.15	8380	35524	4359	0.032	0.029	21.634
25	8.89	9821	38724	4356	0.009	0.059	44.014
26	6.72	12447	48085	7156	0.046	0.038	28.348
27	9.89	7566	31238	3159	0.108	No Deficit	No Deficit
28	5.30	10079	39350	7425	0.050	0.018	13.428
29	5.42	9012	35894	6623	0.005	0.057	42.522
30	6.28	8090	33460	5328	0.112	No Deficit	No Deficit
31	11.70	9899	39116	3343	0.042	0.026	19.396
Total	176.05	229716	957351	-	1.099	0.709	528.914

A) Total Area under Open Space: - 42026.79 m²

B) Total Population that can be accommodated in open space under ward no 31:- 12008

C) Assuming that 50% of the total population in the ward will get affected, therefore total open space required: - 68453 m²

Deficit Open Spaces: - 26426.21 m²

Summary of the Findings

Mapping of Open spaces in Guwahati city was done to assess the availability of open ground for setting up shelter in the likelihood of earthquake as the city is densely populated. The infrastructure of the city is average including from newly constructed high rise buildings to very old infrastructure. Most of the buildings in the city are not designed to be earthquake resistant and hence the mapping of open spaces is of very much importance. The study was therefore carried out in all the 31 wards of the Guwahati Municipal Corporation. It has been observed that though there is no deficit of open space in 8 wards, however, in 22 wards there is deficit in open space and in 1 ward (Ward No.7) there is no open space. The details are presented in tabular form below

**The ward wise area has been extracted out from the database provided by Guwahati Municipal Corporation and has not been used for any calculation*

*** The deficit open space has been calculated assuming that 50% of the total population in the ward will get affected*

From the study it was observed that a total of 1.099 sq.km open spaces were mapped within the Guwahati Municipal Corporation(GMC) boundary. However, in accordance to the population in each ward a deficit in open spaces has been observed. The total deficit in open spaces with the assumption that 50% of the population in each ward will get affected is 0.709 Sq.km (528.91 bighas). The above table however list down the total open spaces and deficit open spaces of each ward of the Guwahati municipal corporation.

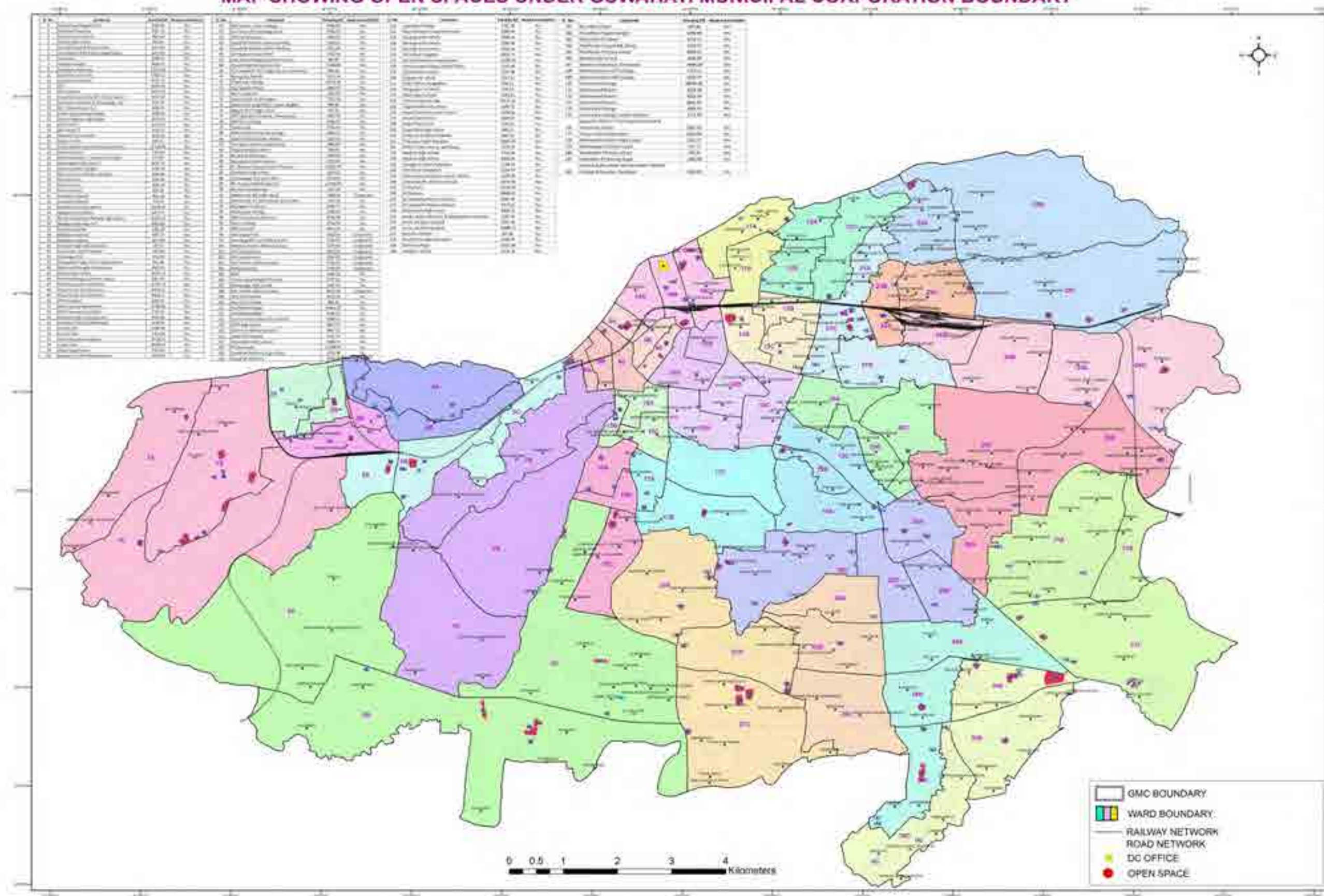
Under this study a total of 182 open spaces have been mapped based on the available satellite data from google earth followed by field verification. Efforts have been made to name the open spaces of the different wards based on the ground reality. However, for open spaces whose names could not identified, the nearest landmarks have collected and categorised.

The details of the type of open spaces categorised for each ward is as follows

Ward No	Area* (Sq. Km)	Household	Population	Population Density	Available Open Space (Sq. Km)	Deficit Open Spaces (Sq. Km)	Deficit Open Spaces (In Bighas)
1	14.98	7269	33305	2223	0.115	No Deficit	No Deficit
2	1.69	4981	21277	12590	0.014	0.023	17.158
3	1.41	5693	23257	16494	0.010	0.029	21.634
4	3.64	4647	20366	5595	0.011	0.024	17.904
5	3.38	6908	30076	8898	0.054	No Deficit	No Deficit
6	25.97	11308	49021	1888	0.100	No Deficit	No Deficit
7	13.03	9693	42772	3283	No Open Space	No Open Space	No Open Space
8	1.14	4663	22388	19639	0.015	0.024	17.904
9	0.91	3220	16816	18479	0.049	No Deficit	No Deficit
10	2.19	4891	21443	9791	0.059	No Deficit	No Deficit
11	2.06	5329	22100	10728	0.006	0.032	23.872
12	3.08	6124	24443	7936	0.010	0.032	23.872
13	2.05	6195	25540	12459	0.033	0.011	8.206
14	1.22	5100	22340	18311	0.003	0.036	26.856

Types of open space	No	Ward 1	No	Ward 12	No	Ward 23	No
Playground/Open Space of Educational Institutes/University	75	Open Space of Religious Places	1	Playground/Open Space of Educational Institutes/University	2	Other Playground/ Open Space	2
Near Apartment open area	1	Playground/Open Space of Educational Institutes/University	12	Open Space of Religious Places	1	Playground/Open Space of Educational Institutes/University	1
Open Space (Unknown)	7	Ward 2		Ward 13		Ward 24	
Open Space in and around Hospitals	4	Open Space of Religious Places	2	Playground/Open Space of Educational Institutes/University	1	Open Space under Defence Area	3
Open Space of Hotel	1	Playground/Open Space of Educational Institutes/University	1	Stadium	2	Playground/Open Space of Educational Institutes/University	1
Open Space of Parking Area	4	Ward 3		Open Space of Religious Places	1	Other Playground/ Open Space	1
Open Space of Parks	2	Open Space of Religious Places	2	Open Space of Sangha/Club	1	Open Space of Sangha/Club	1
Open Space of Religious Places	24	Other Playground/ Open Space	2	Other Playground/ Open Space	1	Ward 25	
Open Space of Sangha/Club	8	Open Space (Unknown)	1	Ward 14		Playground/Open Space of Educational Institutes/University	2
Open Space under Defence Area	6	Ward 4		Open Space under Defence Area	1	Open Spaces in and around Govt. Institutes	2
Open Space within Central jail	2	Open Space of Religious Places	4	Ward 15		Ward 26	
Open Space within Guwahati Gaushala	1	Playground/Open Space of Educational Institutes/University	1	Playground/Open Space of Educational Institutes/University	2	Playground/Open Space of Educational Institutes/University	3
Open Spaces in and around Govt. Institutes	12	Open Space (Unknown)	1	Open Space of Parks	1	Open Space of Religious Places	2
Open Spaces of Bibah Bhawan	1	Ward 5		Open Space (Unknown)	1	Other Playground/ Open Space	1
Other Playground/ Open Space	21	Playground/Open Space of Educational Institutes/University	3	Ward 16		Open Spaces in and around Govt. Institutes	2
Stadium	10	Stadium	1	Other Playground/ Open Space	1	Open Space of Sangha/Club	2
Resort	3	Open Space of Religious Places	1	Open Space of Sangha/Club	1	Ward 27	
Total	182	Other Playground/ Open Space	1	Open Space of Religious Places	1	Playground/Open Space of Educational Institutes/University	5
		Open Spaces of Bibah Bhawan	1	Stadium	2	Open Space of Sangha/Club	1
		Open Spaces in and around Govt. Institutes	1	Ward 17		Stadium	5
		Ward 6		Playground/Open Space of Educational Institutes/University	2	Ward 28	
		Playground/Open Space of Educational Institutes/University	8	Other Playground/ Open Space	1	Open Spaces in and around Govt. Institutes	1
		Open Space in and around Hospitals	1	Ward 18		Open Space under Defence Area	2
		Open Space of Sangha/Club	1	Playground/Open Space of Educational Institutes/University	3	Open Space of Religious Places	1
		Open Space (Unknown)	2	Open Space of Religious Places	2	Open Space (Unknown)	1
		Near Apartment open area	1	Ward 19		Playground/Open Space of Educational Institutes/University	1
		Ward 8		Playground/Open Space of Educational Institutes/University	2	Ward 29	
		Playground/Open Space of Educational Institutes/University	1	Open Space of Parking Area	1	Open Space of Religious Places	1
		Other Playground/ Open Space	1	Open Space in and around Hospitals	1	Playground/Open Space of Educational Institutes/University	1
		Ward 9		Ward 20		Ward 30	
		Open Space in and around Hospitals	1	Other Playground/ Open Space	2	Open Space of Sangha/Club	1
		Open Space within Central jail	2	Ward 21		Playground/Open Space of Educational Institutes/University	6
		Open Space of Religious Places	1	Playground/Open Space of Educational Institutes/University	5	Open Spaces in and around Govt. Institutes	2
		Open Space within Guwahati Gaushala	1	Open Space of Religious Places	1	Ward 31	
		Ward 10		Other Playground/ Open Space	4	Resort	3
		Playground/Open Space of Educational Institutes/University	2	Open Spaces in and around Govt. Institutes	2	Playground/Open Space of Educational Institutes/University	4
		Other Playground/ Open Space	3	Open Space (Unknown)	1	Open Space of Religious Places	2
		Open Space of Hotel	1	Ward 22		Open Spaces in and around Govt. Institutes	1
		Open Space of Parking Area	3	Playground/Open Space of Educational Institutes/University	4	Open Space of Parks	1
		Ward 11		Open Space of Religious Places	1	Open Space in and around Hospitals	1
		Playground/Open Space of Educational Institutes/University	2	Other Playground/ Open Space	1		
				Open Spaces in and around Govt. Institutes	1		

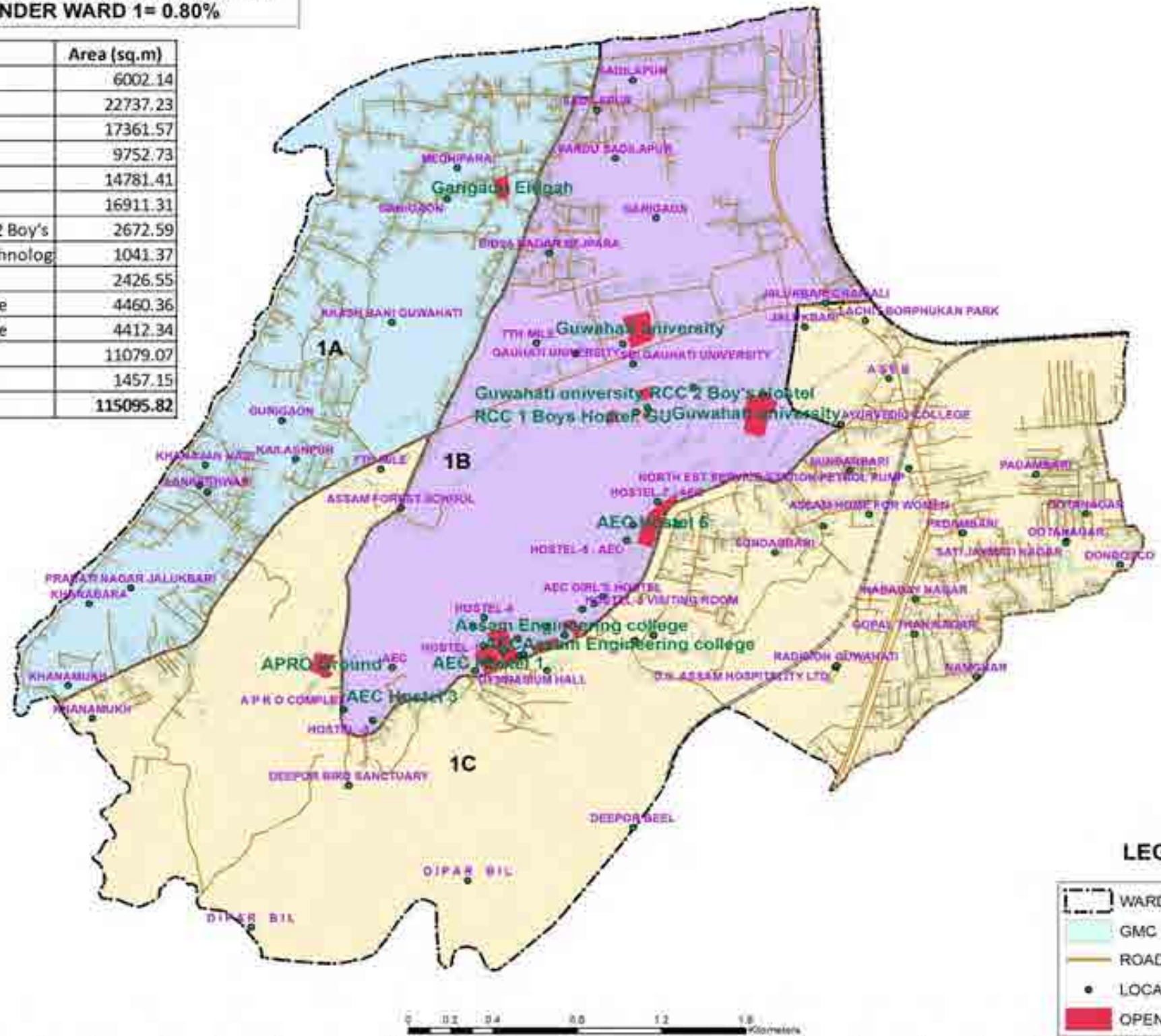
MAP SHOWING OPEN SPACES UNDER GUWAHATI MUNICIPAL CORPORATION BOUNDARY



MAP SHOWING OPEN SPACES UNDER GMC WARD-1

TOTAL NO. OF HOUSEHOLDS = 7269
 APPROXIMATE AREA UNDER WARD 1 = 14.99 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.12 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 1= 0.80%

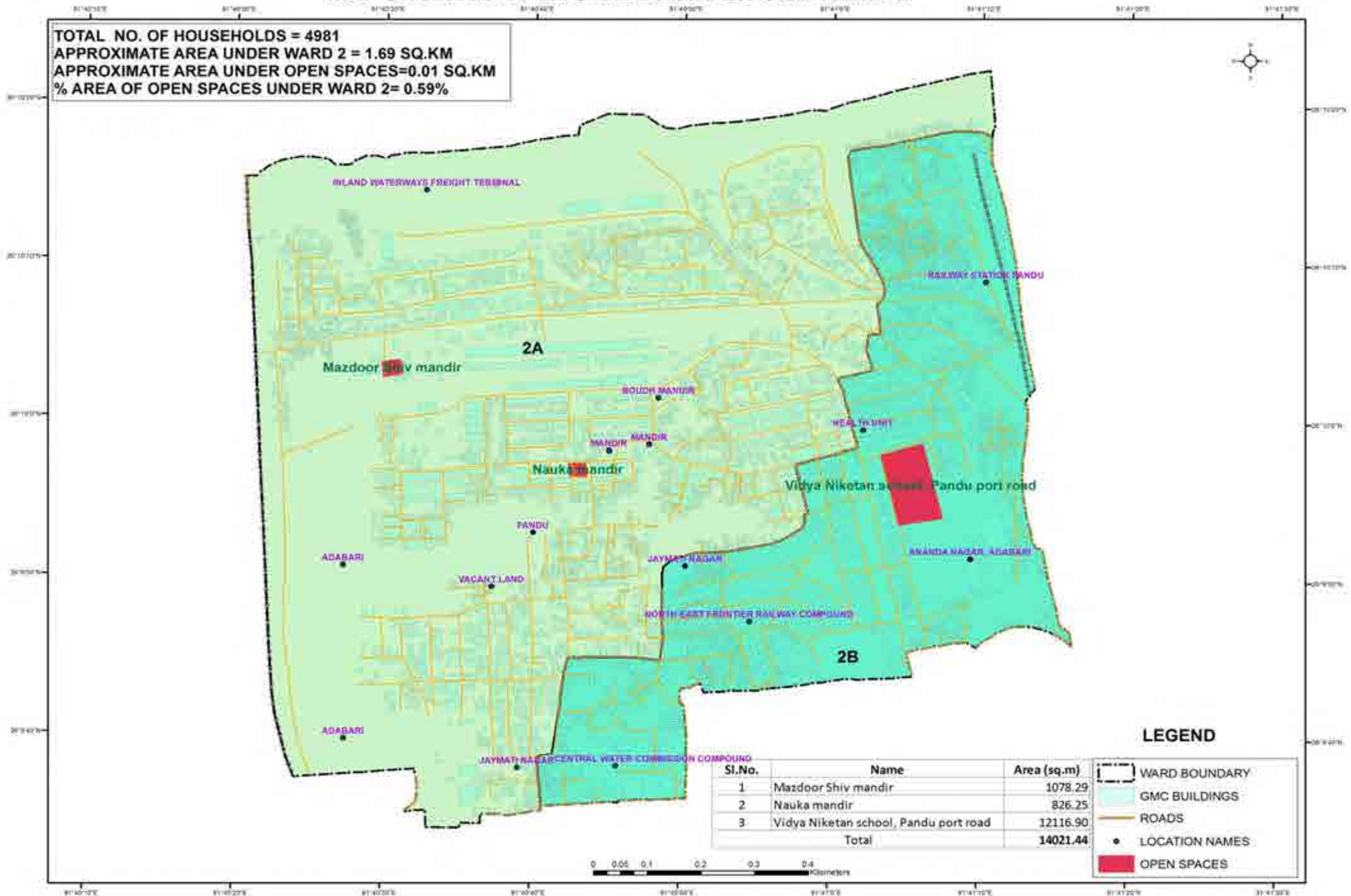
Sl.No.	Name	Area (sq.m)
1	Garigaon Eidgah	6002.14
2	Guwahati university	22737.23
3	Guwahati university	17361.57
4	APRO Ground	9752.73
5	AEC	14781.41
6	AEC Hostel 6	16911.31
7	Guwahati university RCC 2 Boy's	2672.59
8	Institute of Science & Technolog	1041.37
9	RCC 1 Boys Hostel, GU	2426.55
10	Assam Engineering college	4460.36
11	Assam Engineering college	4412.34
12	AEC Hostel 1	11079.07
13	AEC Hostel 3	1457.15
Total		115095.82





MAP SHOWING OPEN SPACES UNDER GMC WARD-2

TOTAL NO. OF HOUSEHOLDS = 4981
 APPROXIMATE AREA UNDER WARD 2 = 1.69 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.01 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 2= 0.59%



Sl.No.	Name	Area (sq.m)
1	Mazdoor Shiv mandir	1078.29
2	Nauka mandir	826.25
3	Vidya Niketan school, Pandu port road	12116.90
Total		14021.44

LEGEND

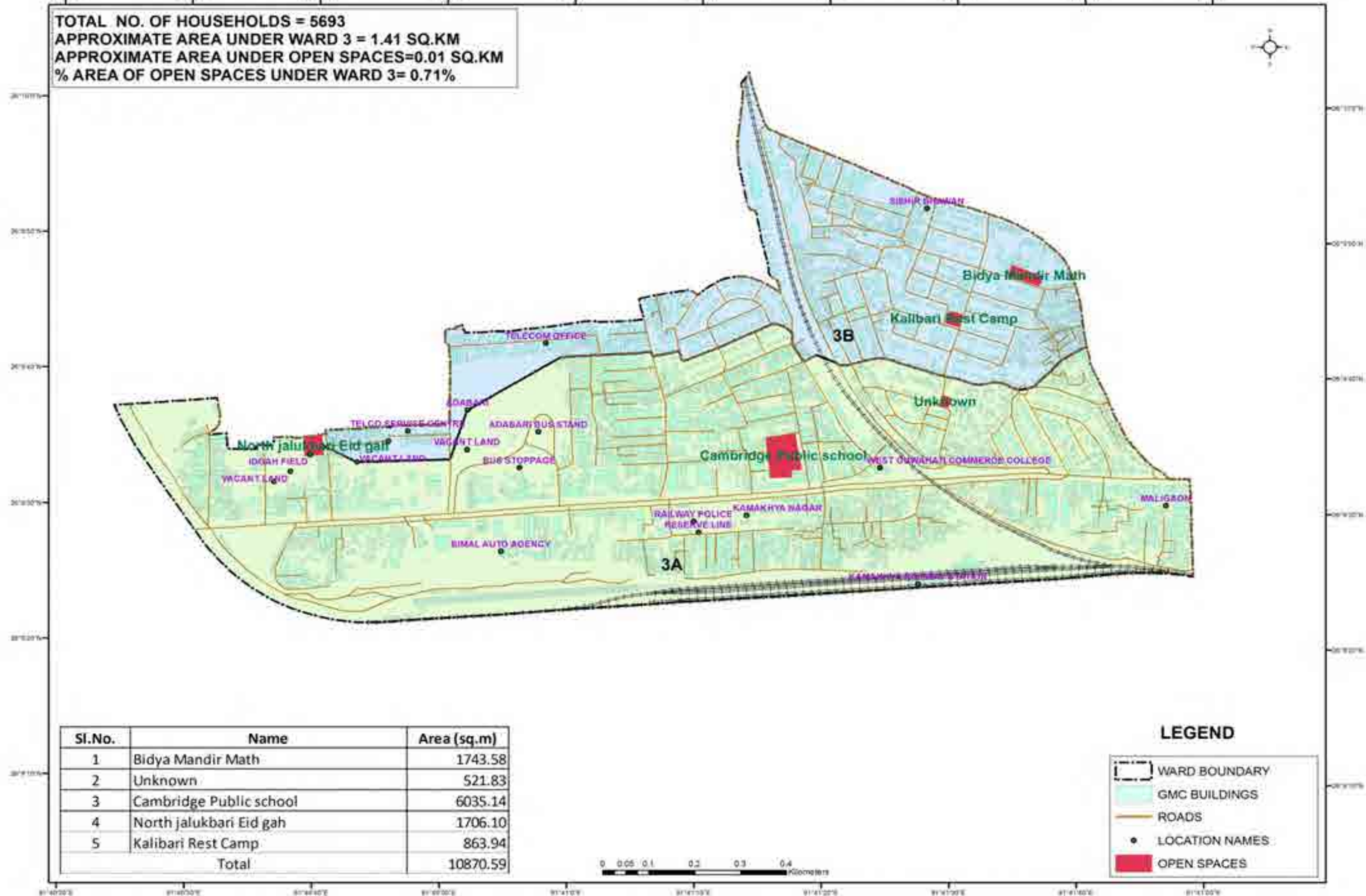
- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES

0 0.05 0.1 0.2 0.3 0.4 Kilometers



MAP SHOWING OPEN SPACES UNDER GMC WARD-3

TOTAL NO. OF HOUSEHOLDS = 5693
 APPROXIMATE AREA UNDER WARD 3 = 1.41 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.01 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 3= 0.71%



Sl.No.	Name	Area (sq.m)
1	Bidya Mandir Math	1743.58
2	Unknown	521.83
3	Cambridge Public school	6035.14
4	North Jalukbari Eid gah	1706.10
5	Kalibari Rest Camp	863.94
	Total	10870.59

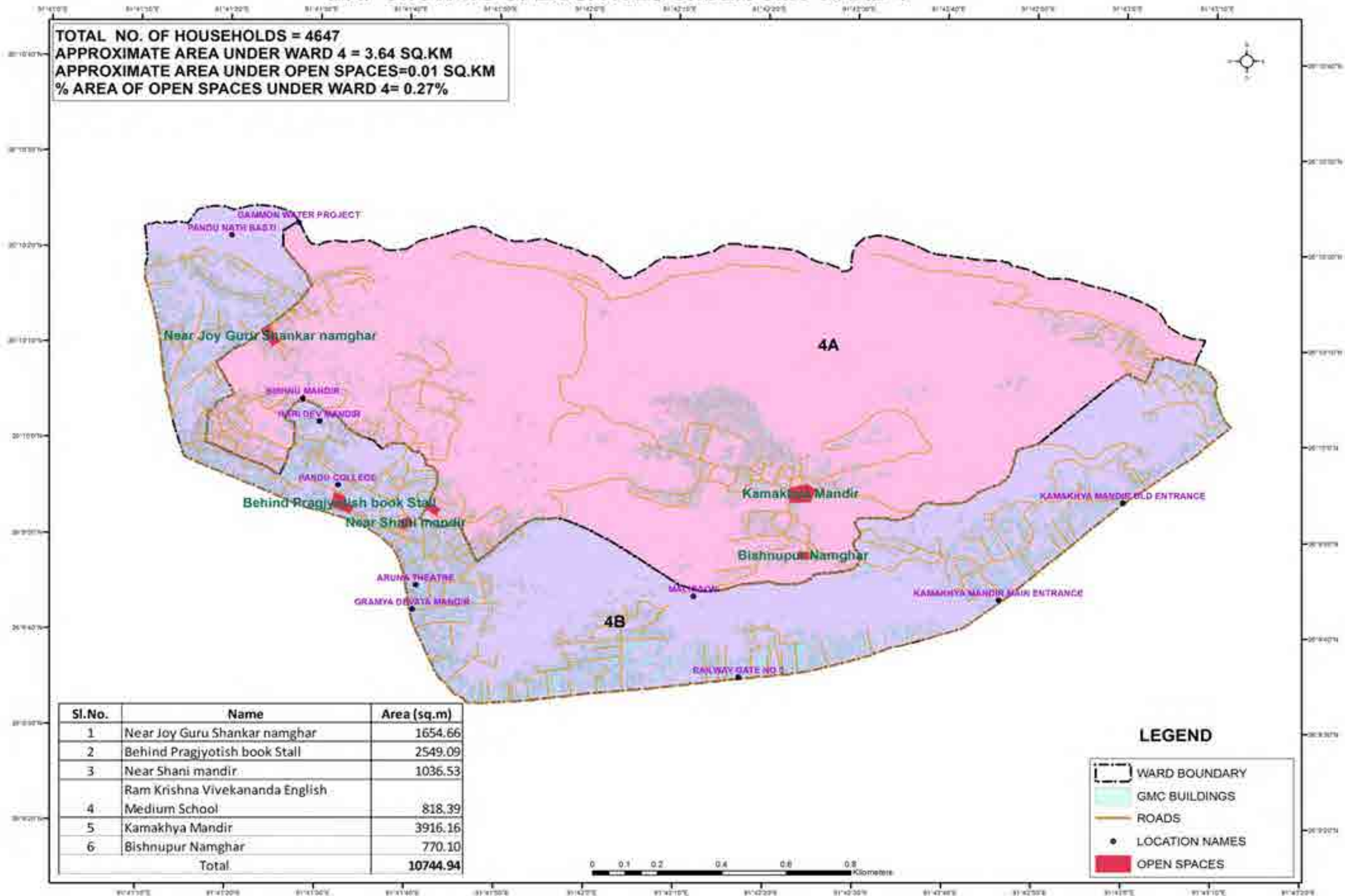
LEGEND

- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES





MAP SHOWING OPEN SPACES UNDER GMC WARD-4

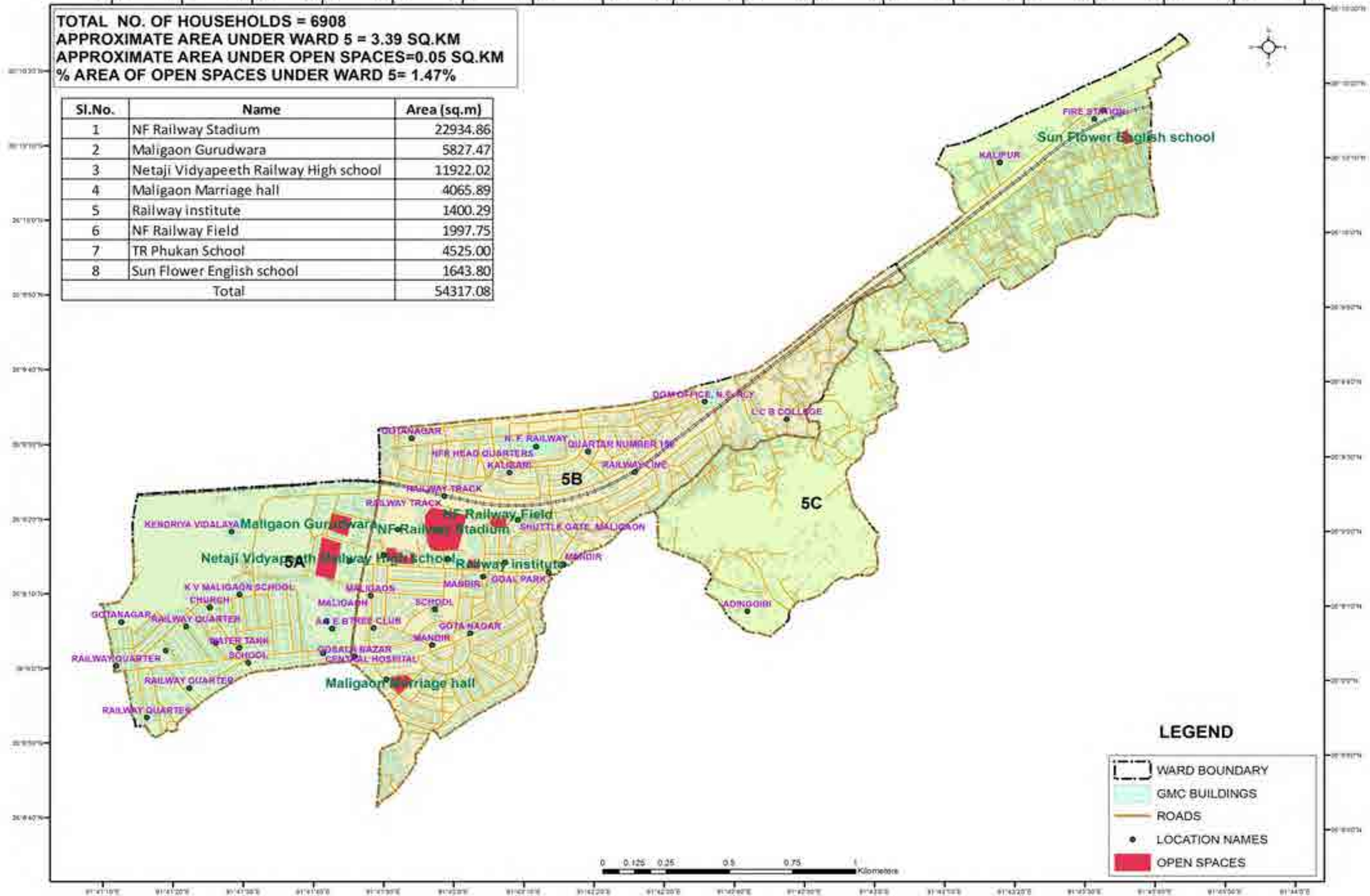




MAP SHOWING OPEN SPACES UNDER GMC WARD-5

TOTAL NO. OF HOUSEHOLDS = 6908
 APPROXIMATE AREA UNDER WARD 5 = 3.39 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.05 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 5= 1.47%

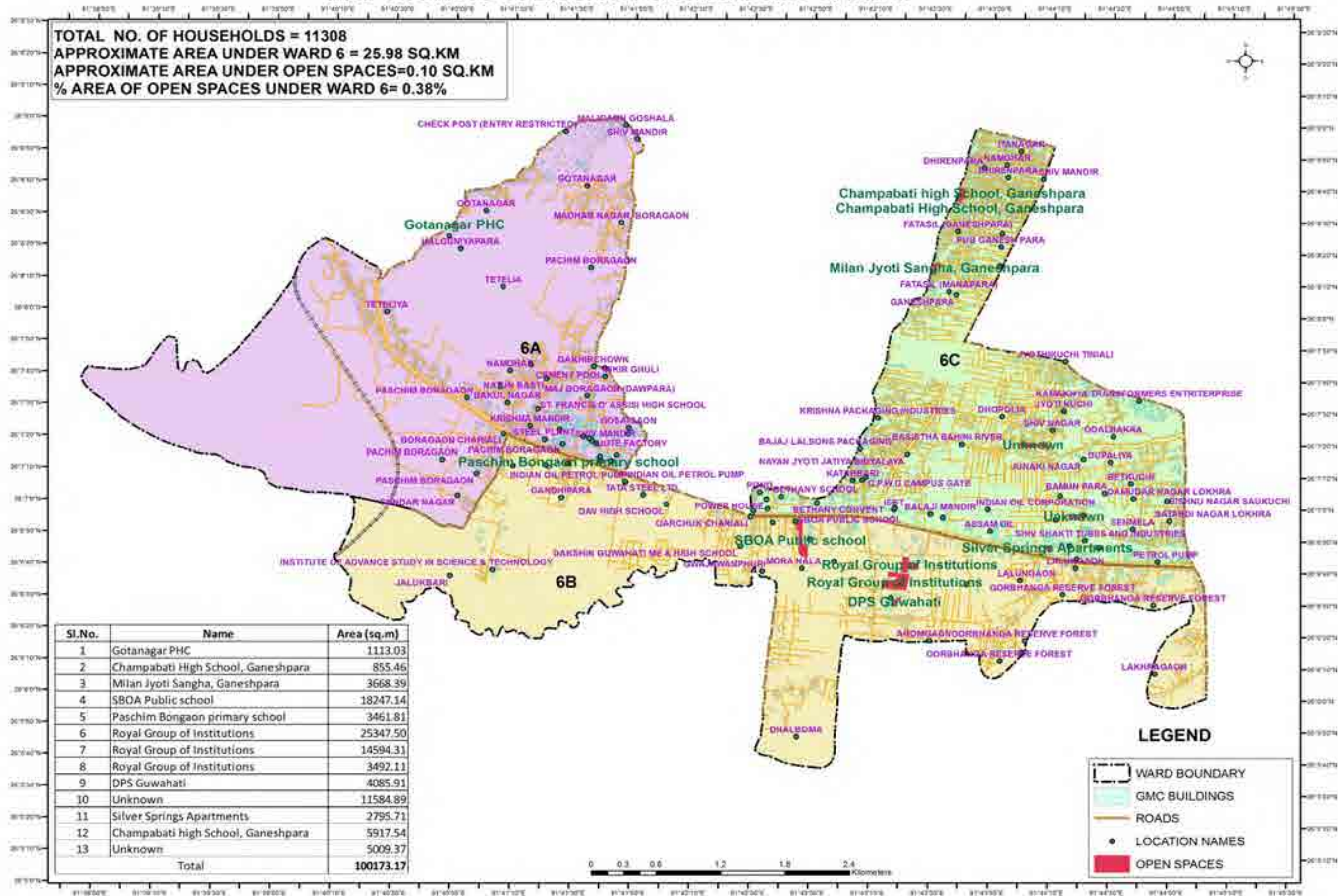
Sl.No.	Name	Area (sq.m)
1	NF Railway Stadium	22934.86
2	Maligaon Gurudwara	5827.47
3	Netaji Vidyapeeth Railway High school	11922.02
4	Maligaon Marriage hall	4065.89
5	Railway institute	1400.29
6	NF Railway Field	1997.75
7	TR Phukan School	4525.00
8	Sun Flower English school	1643.80
Total		54317.08





MAP SHOWING OPEN SPACES UNDER GMC WARD-6

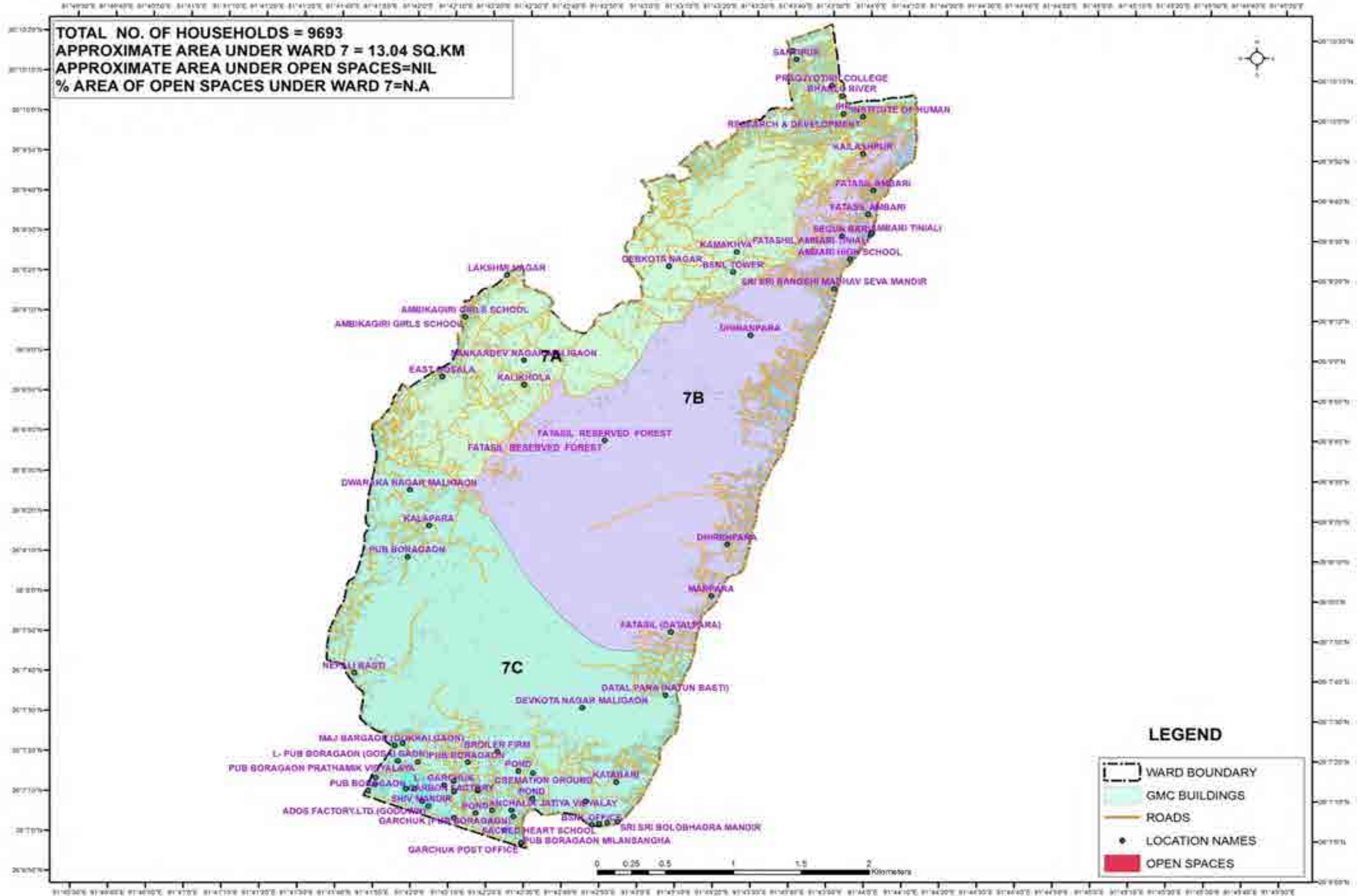
TOTAL NO. OF HOUSEHOLDS = 11308
 APPROXIMATE AREA UNDER WARD 6 = 25.98 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.10 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 6= 0.38%



Sl.No.	Name	Area (sq.m)
1	Gotanagar PHC	1113.03
2	Champabati High School, Ganeshpara	855.46
3	Milan Jyoti Sangha, Ganeshpara	3668.39
4	SBOA Public school	18247.14
5	Paschim Bongaon primary school	3461.81
6	Royal Group of Institutions	25347.50
7	Royal Group of Institutions	14594.31
8	Royal Group of Institutions	3492.11
9	DPS Guwahati	4085.91
10	Unknown	11584.89
11	Silver Springs Apartments	2795.71
12	Champabati high School, Ganeshpara	5917.54
13	Unknown	5009.37
Total		100173.17



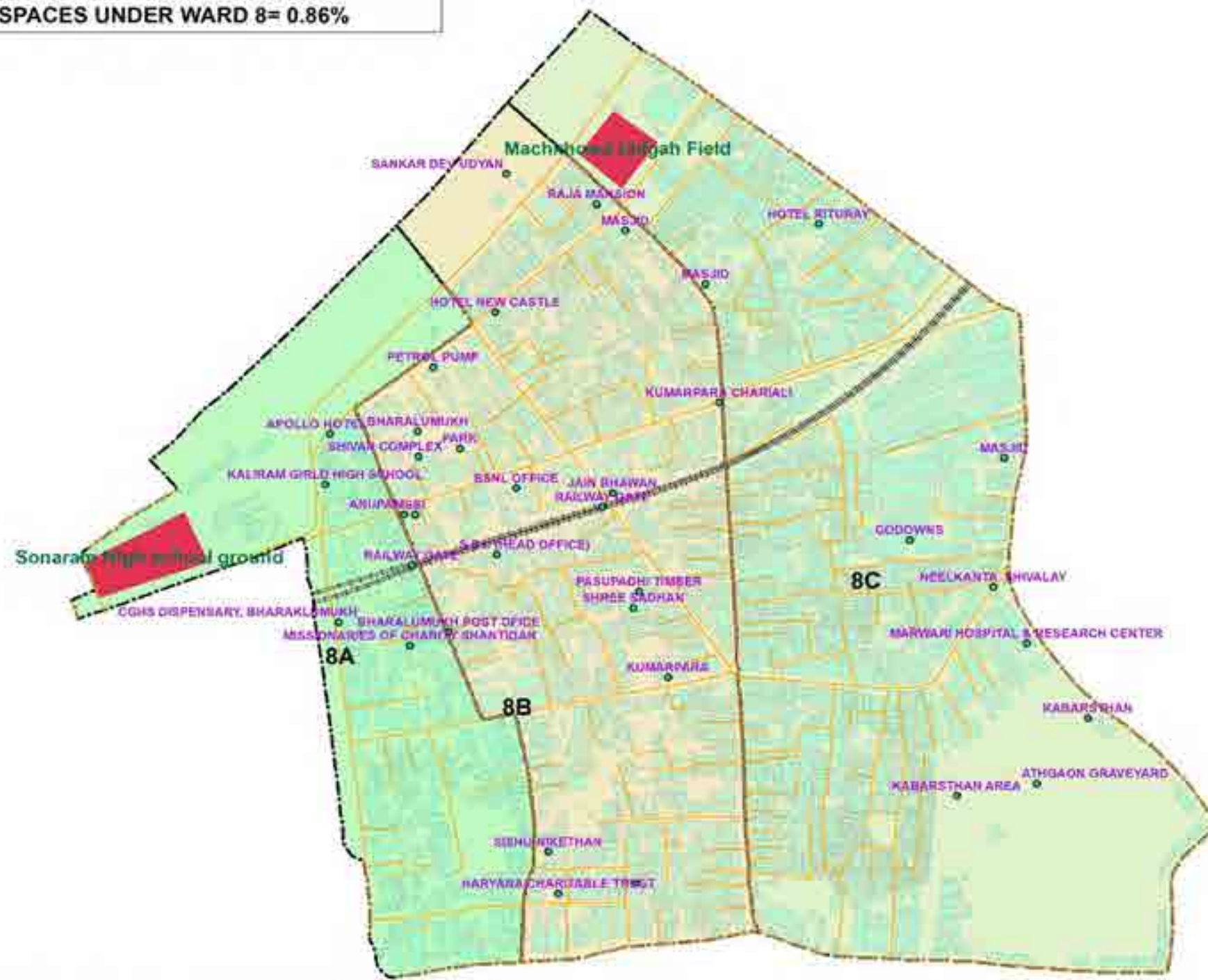
MAP SHOWING OPEN SPACES UNDER GMC WARD-7





MAP SHOWING OPEN SPACES UNDER GMC WARD-8

TOTAL NO. OF HOUSEHOLDS = 4663
 APPROXIMATE AREA UNDER WARD 8 = 1.15 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.01 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 8= 0.86%



Sl.No.	Name	Area (sq.m)
1	Sonaram High school ground	9542.83
2	Machkhowa Iddgah Field	5566.91
Total		15109.74

LEGEND

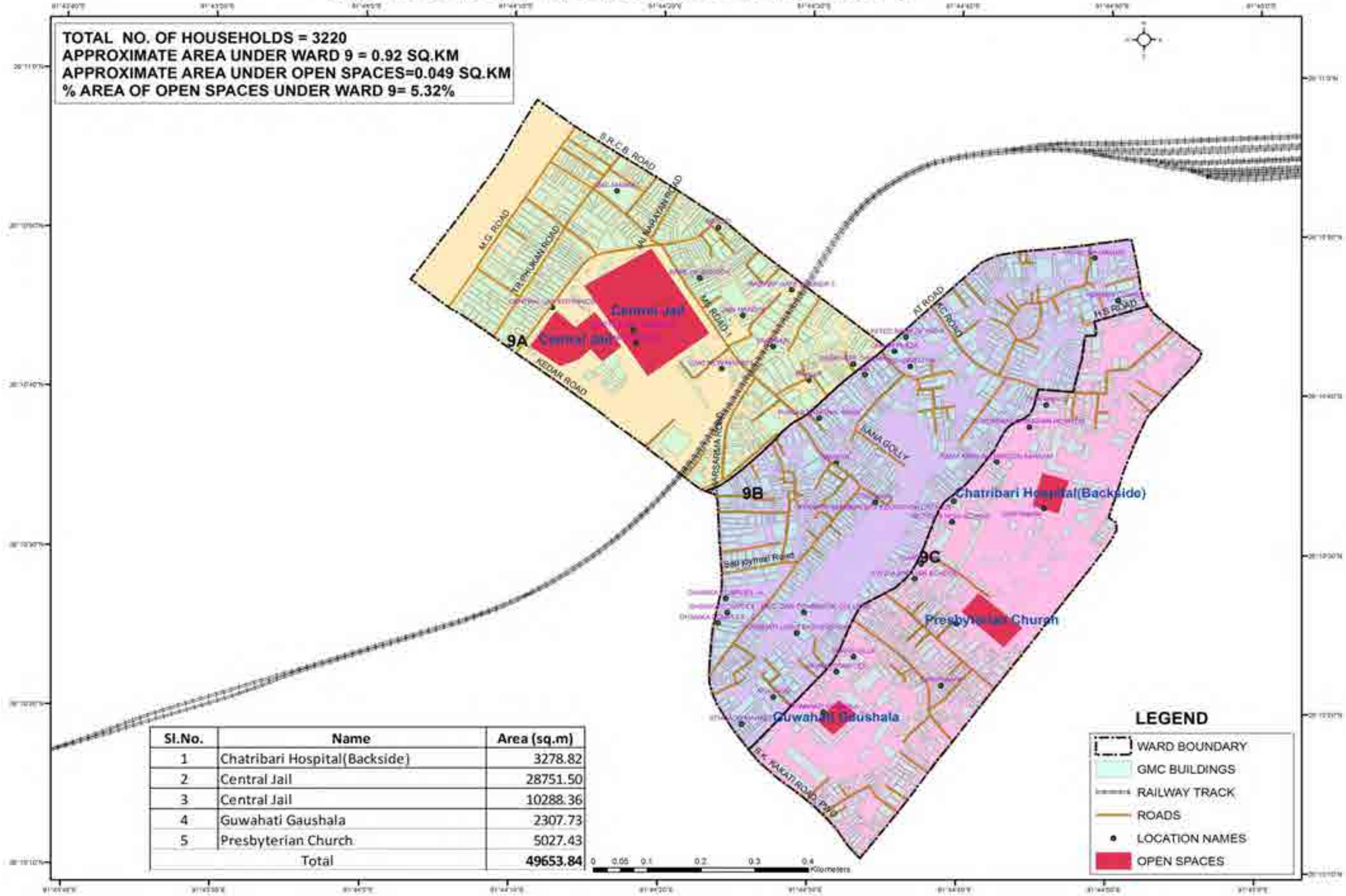
- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES





MAP SHOWING OPEN SPACES UNDER GMC WARD-9

TOTAL NO. OF HOUSEHOLDS = 3220
 APPROXIMATE AREA UNDER WARD 9 = 0.92 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.049 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 9= 5.32%



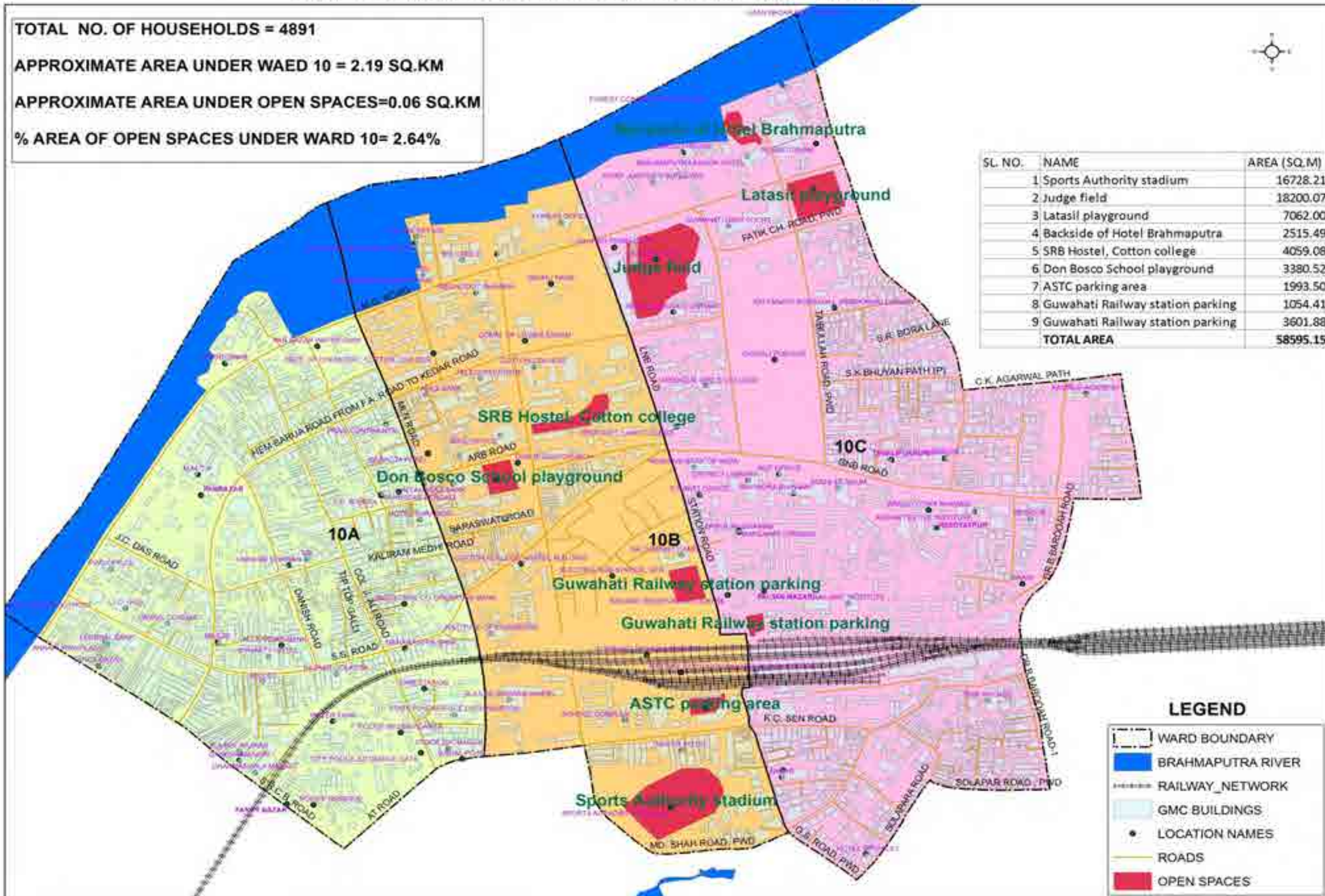
Sl.No.	Name	Area (sq.m)
1	Chatribari Hospital(Backside)	3278.82
2	Central Jail	28751.50
3	Central Jail	10288.36
4	Guwahati Gaushala	2307.73
5	Presbyterian Church	5027.43
Total		49653.84

LEGEND

- WARD BOUNDARY
- GMC BUILDINGS
- RAILWAY TRACK
- ROADS
- LOCATION NAMES
- OPEN SPACES

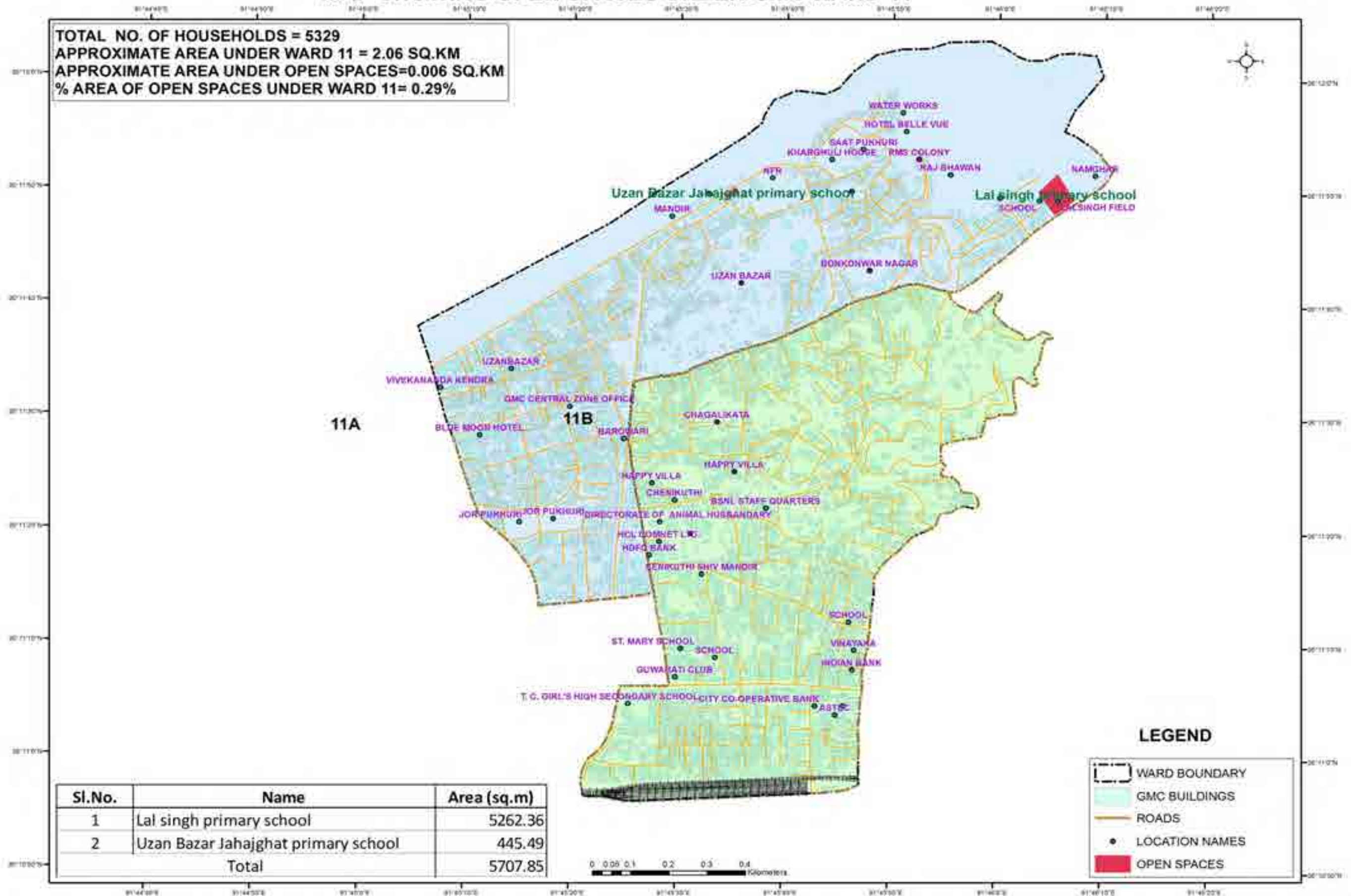


MAP SHOWING OPEN SPACES UNDER GMC WARD 10





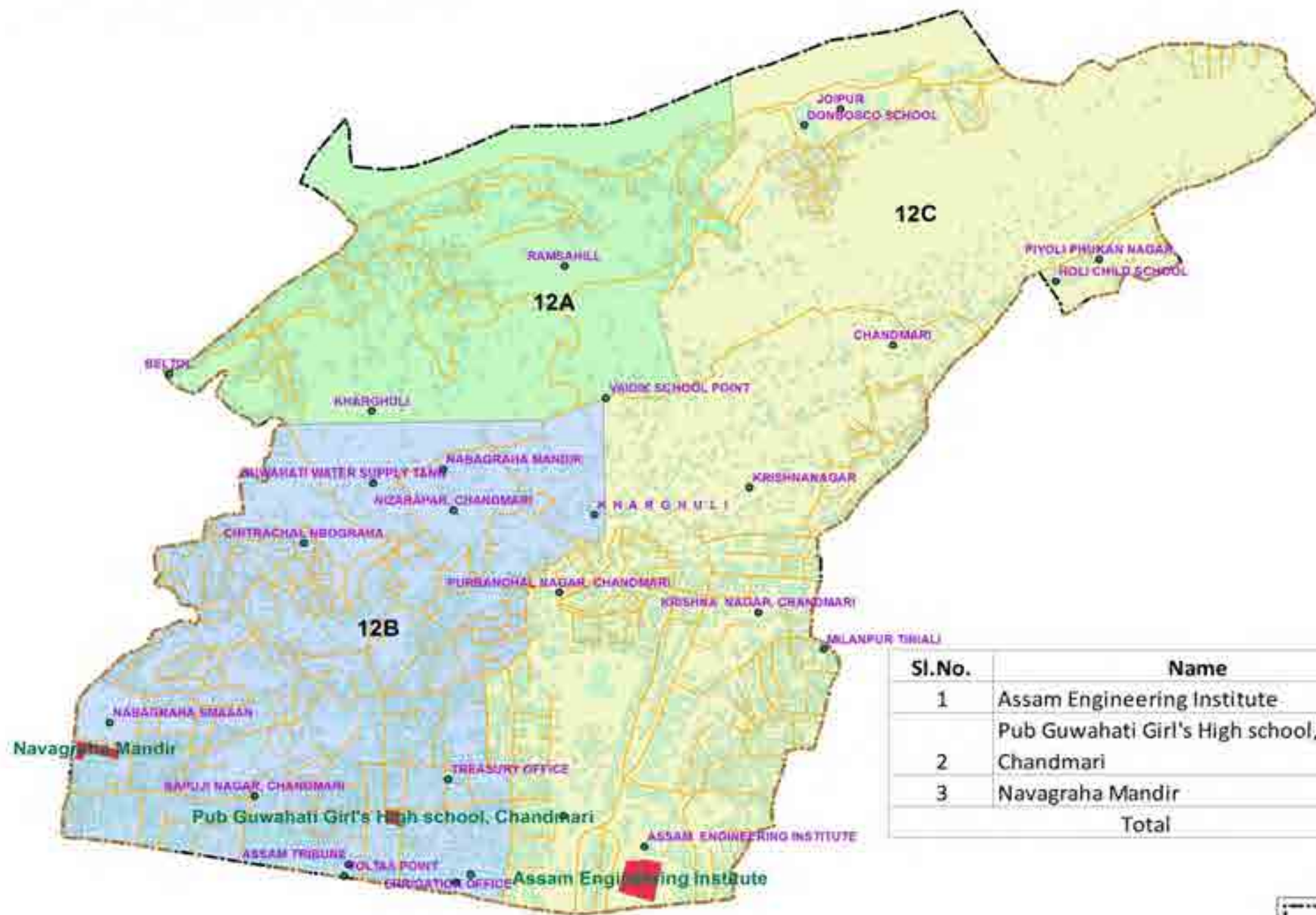
MAP SHOWING OPEN SPACES UNDER GMC WARD-11





MAP SHOWING OPEN SPACES UNDER GMC WARD-12

TOTAL NO. OF HOUSEHOLDS = 6124
 APPROXIMATE AREA UNDER WARD 12 = 2.06 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.006 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 12= 0.49%



Sl.No.	Name	Area (sq.m)
1	Assam Engineering Institute	6738.08
2	Pub Guwahati Girl's High school, Chandmari	968.29
3	Navagraha Mandir	2351.14
Total		10057.51

LEGEND

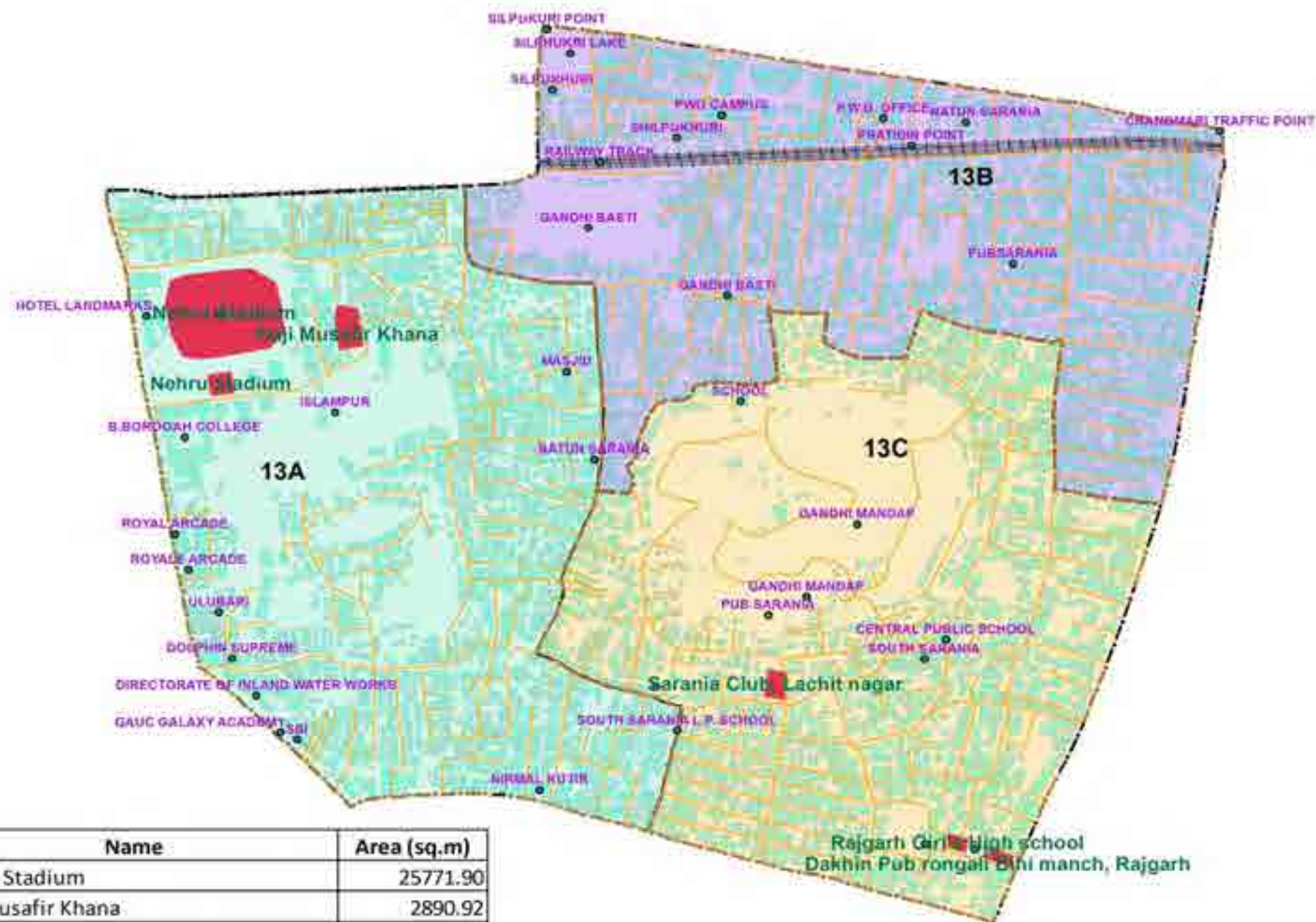
- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES

0 0.1 0.2 0.4 0.6 0.8 Kilometers



MAP SHOWING OPEN SPACES UNDER GMC WARD-13

TOTAL NO. OF HOUSEHOLDS = 6195
 APPROXIMATE AREA UNDER WARD 13 = 2.05 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.033 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 13= 1.61%



Sl.No.	Name	Area (sq.m)
1	Nehru Stadium	25771.90
2	Haji Musafir Khana	2890.92
3	Nehru stadium	1451.83
4	Sarania Club, Lachit nagar	1522.59
5	Dakhin Pub rongali Bihi manch, Rajgarh	909.36
6	Rajgarh Girl's High school	742.20
	Total	33288.80

LEGEND

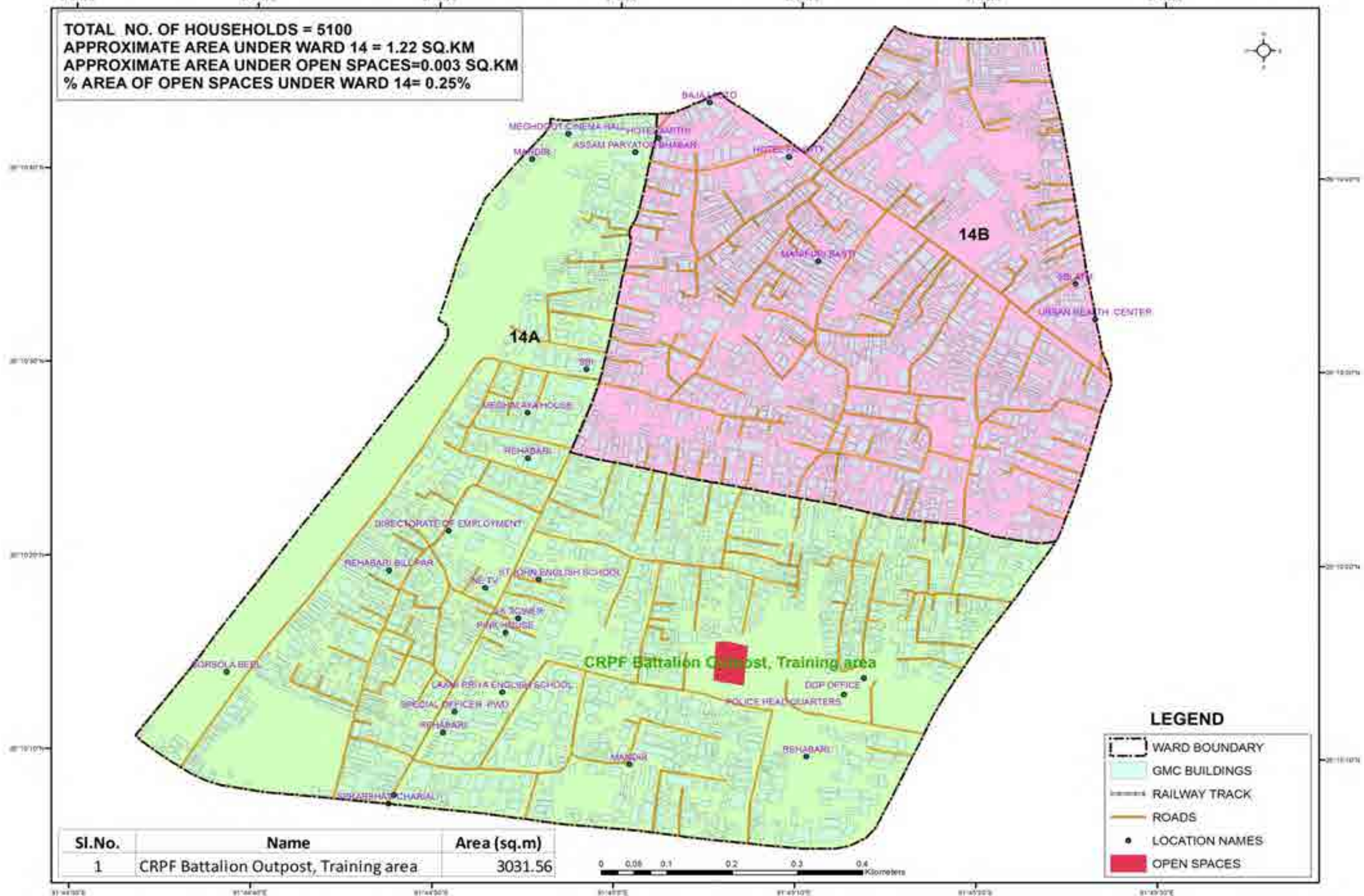
- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES





MAP SHOWING OPEN SPACES UNDER GMC WARD-14

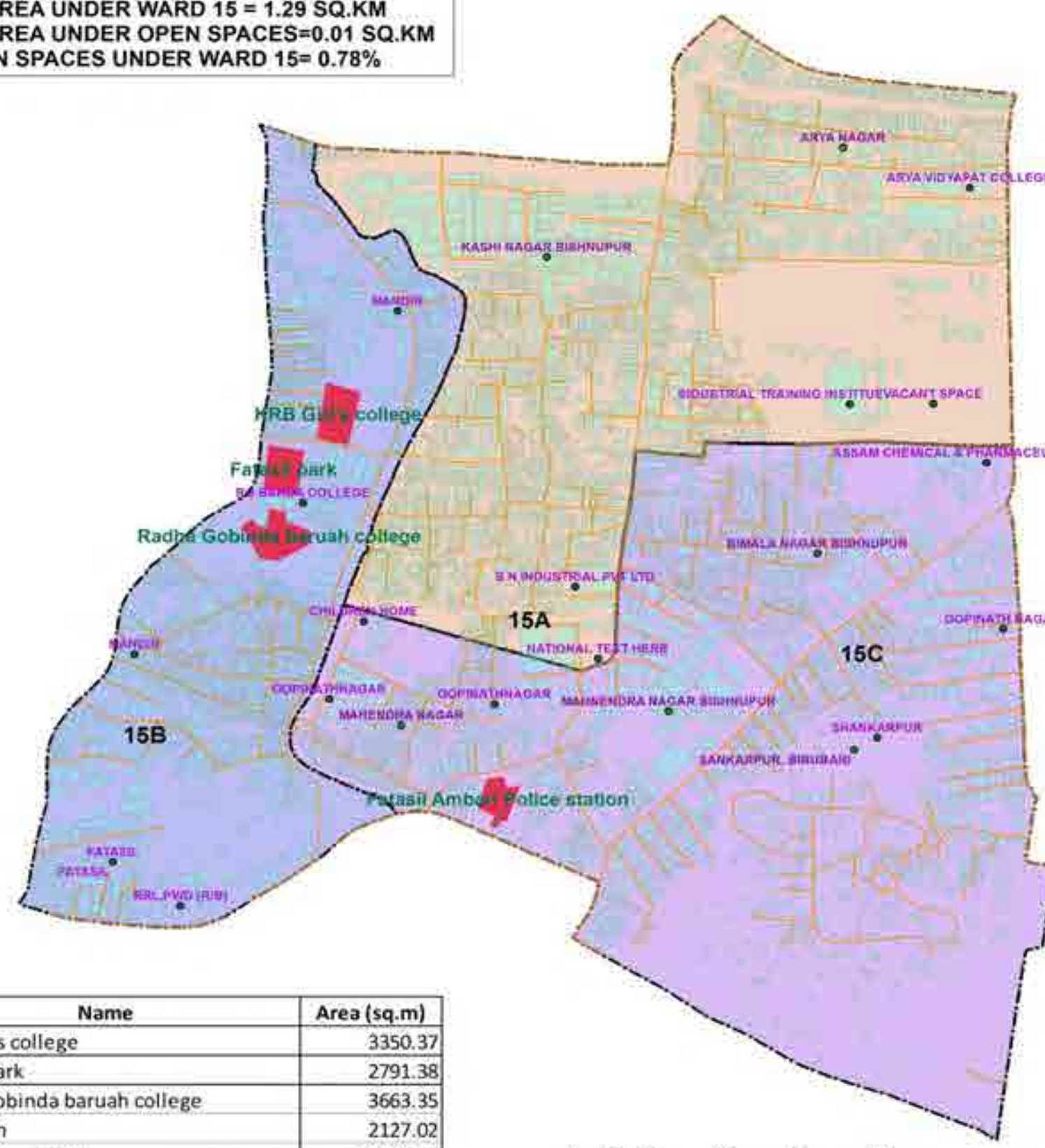
TOTAL NO. OF HOUSEHOLDS = 5100
 APPROXIMATE AREA UNDER WARD 14 = 1.22 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.003 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 14= 0.25%





MAP SHOWING OPEN SPACES UNDER GMC WARD-15

TOTAL NO. OF HOUSEHOLDS = 6498
 APPROXIMATE AREA UNDER WARD 15 = 1.29 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.01 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 15= 0.78%



Sl.No.	Name	Area (sq.m)
1	KRB Girl's college	3350.37
2	Fatasil park	2791.38
3	Radha Gobinda baruah college	3663.35
4	Unknown	2127.02
Total		11932.13

LEGEND

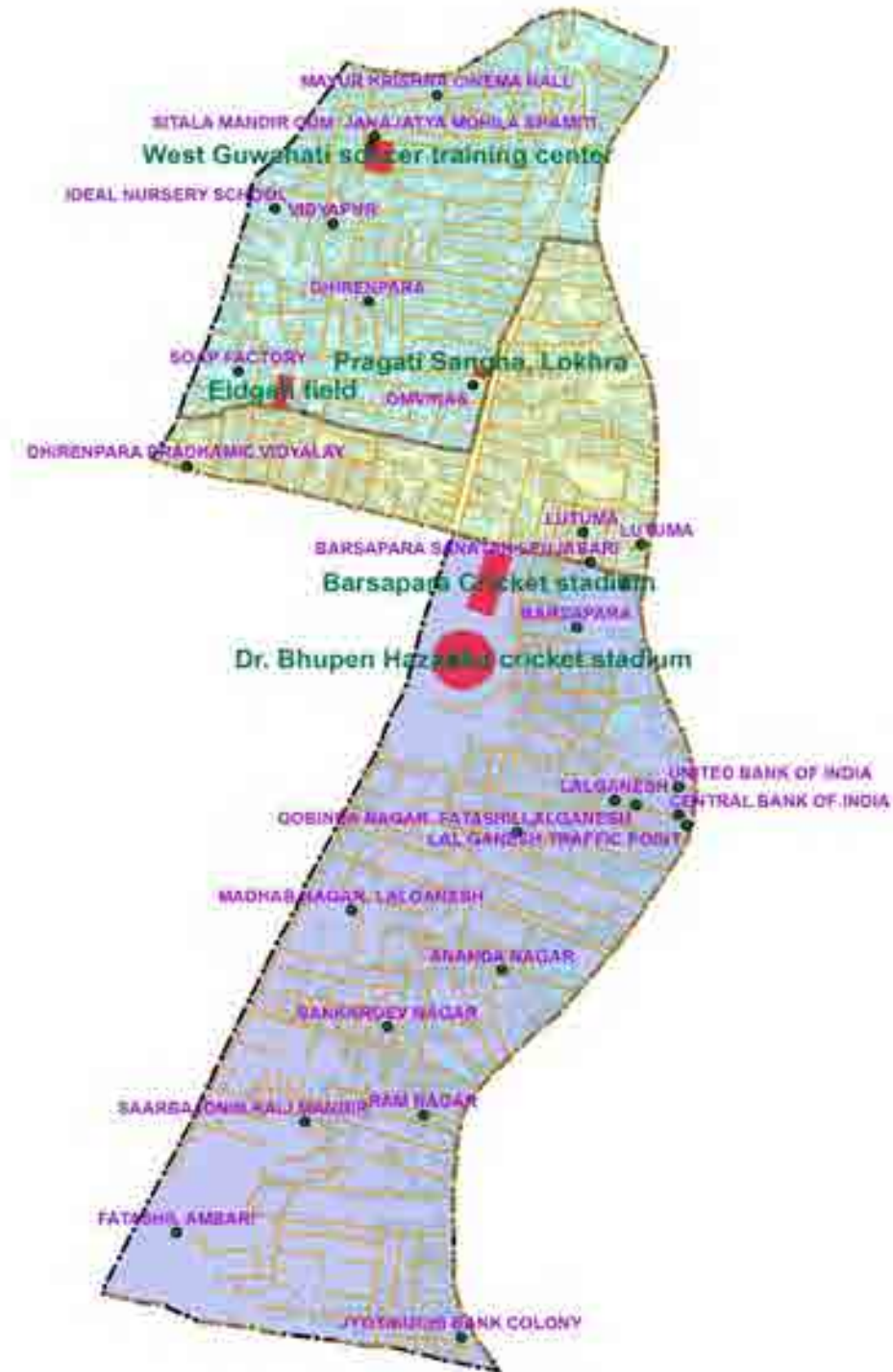
- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES





MAP SHOWING OPEN SPACES UNDER GMC WARD-16

TOTAL NO. OF HOUSEHOLDS = 9009
 APPROXIMATE AREA UNDER WARD 16 = 2.50 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.035 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 16= 1.40%

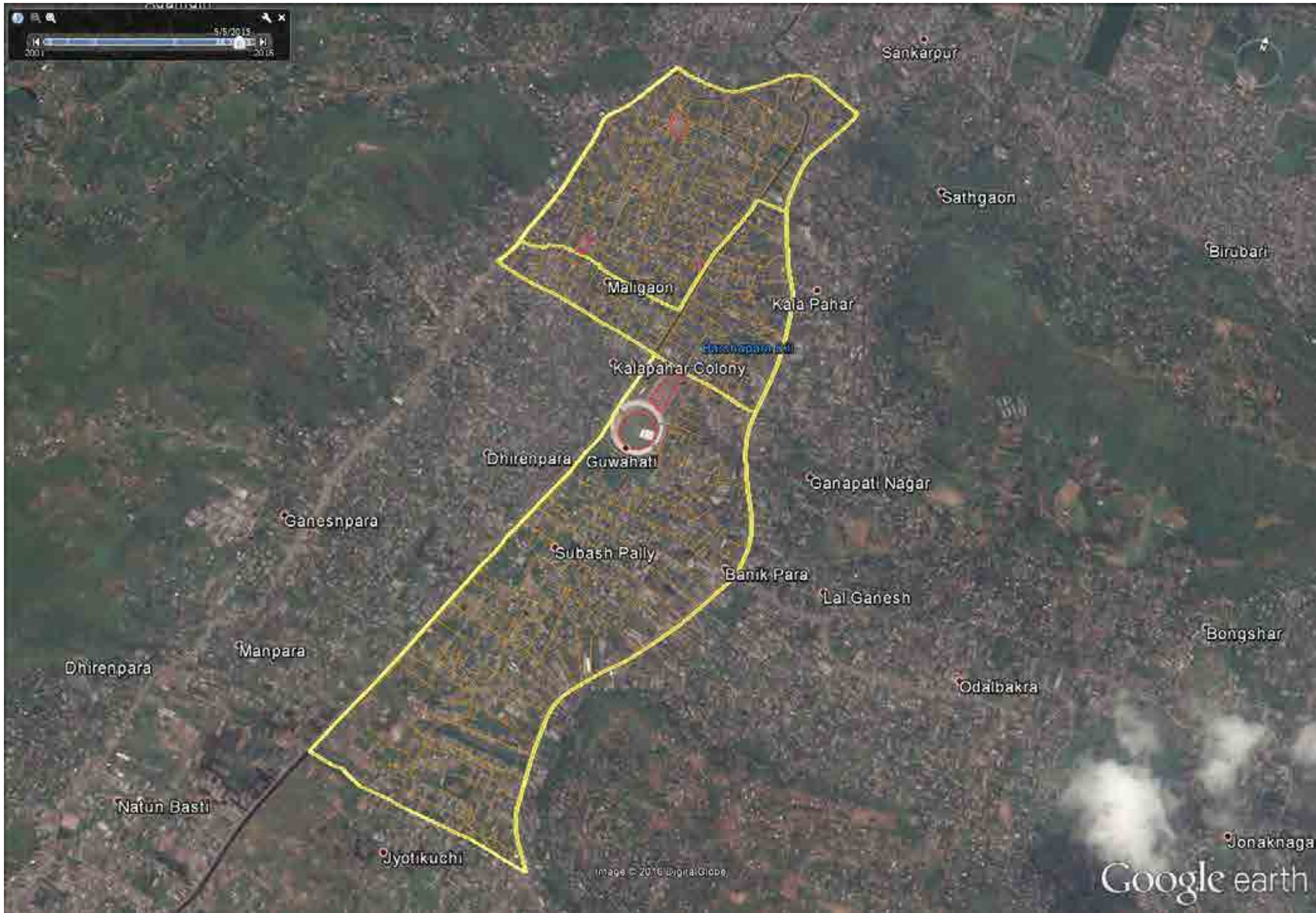


	Name	Area (sq.m)
1	West Guwahati soccer training center	4885.69
2	Pragati Sangha, Lokhra	738.66
3	Eidgah field	2843.00
4	Barsapara Cricket stadium	9552.94
5	Dr. Bhupen Hazarika cricket stadium	17028.10
Total		35048.40

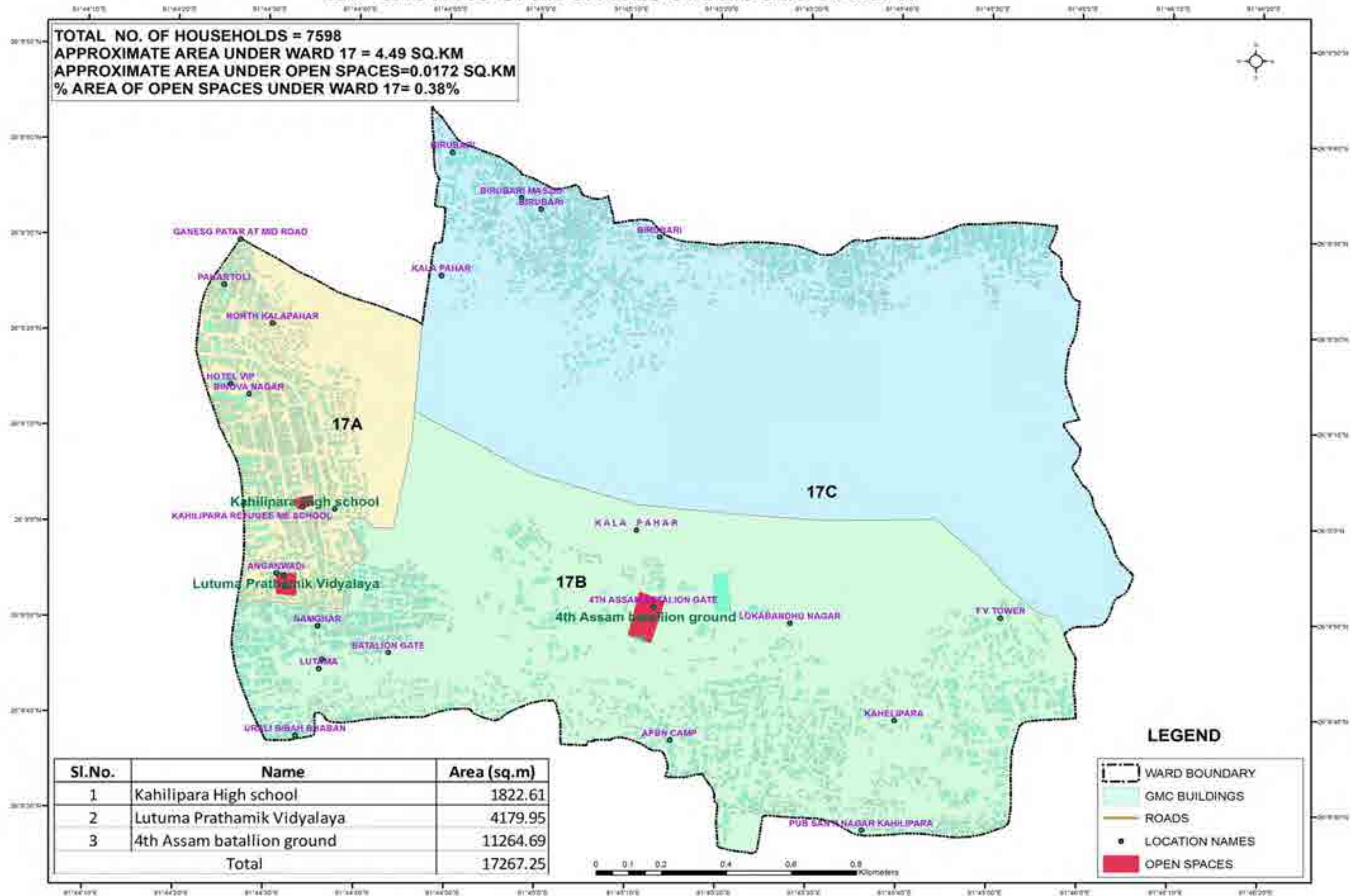
LEGEND

- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES





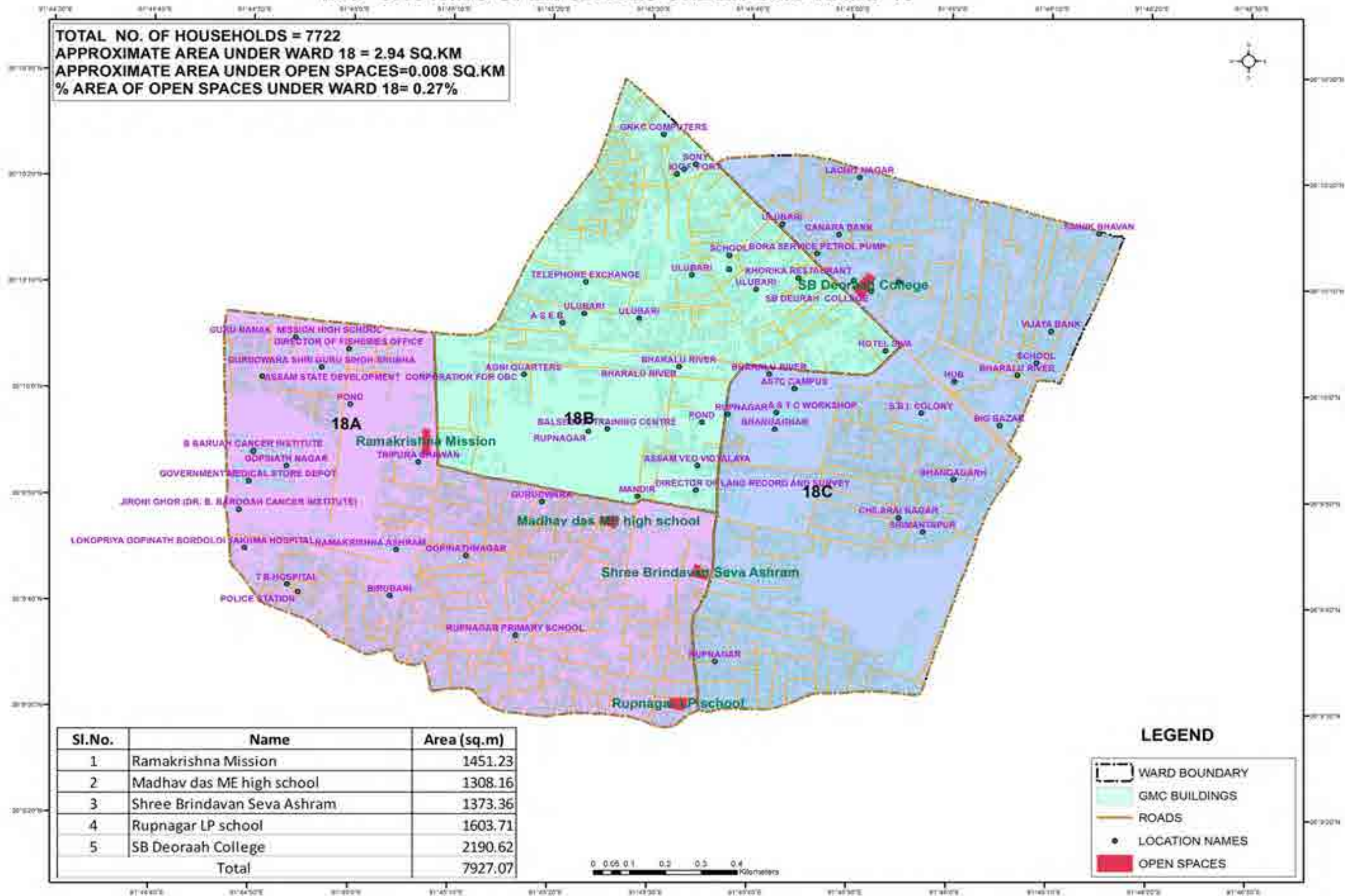
MAP SHOWING OPEN SPACES UNDER GMC WARD-17





MAP SHOWING OPEN SPACES UNDER GMC WARD-18

TOTAL NO. OF HOUSEHOLDS = 7722
 APPROXIMATE AREA UNDER WARD 18 = 2.94 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.008 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 18= 0.27%



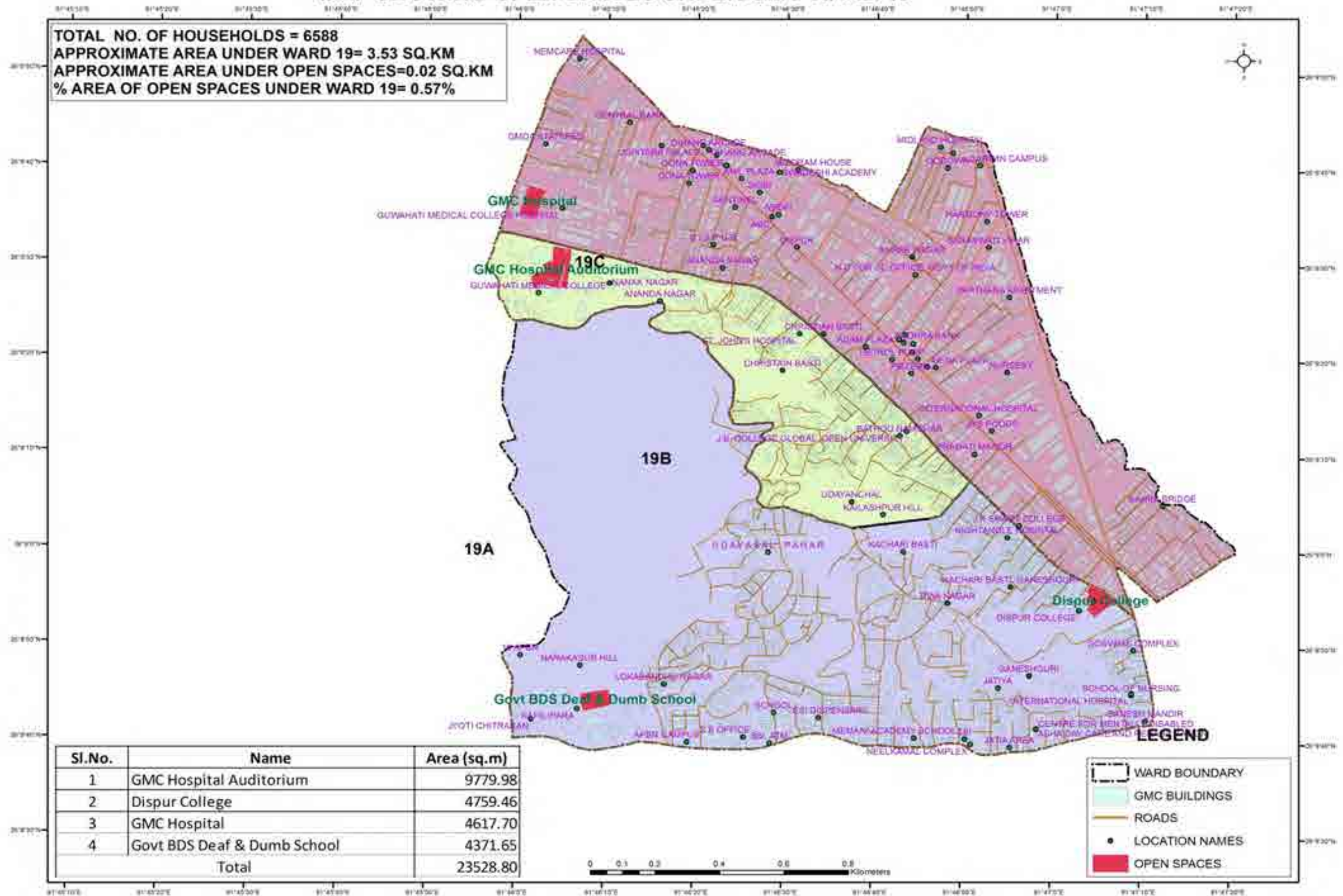
Sl.No.	Name	Area (sq.m)
1	Ramakrishna Mission	1451.23
2	Madhav das ME high school	1308.16
3	Shree Brindavan Seva Ashram	1373.36
4	Rupnagar LP school	1603.71
5	SB Deoraah College	2190.62
	Total	7927.07

LEGEND

- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES



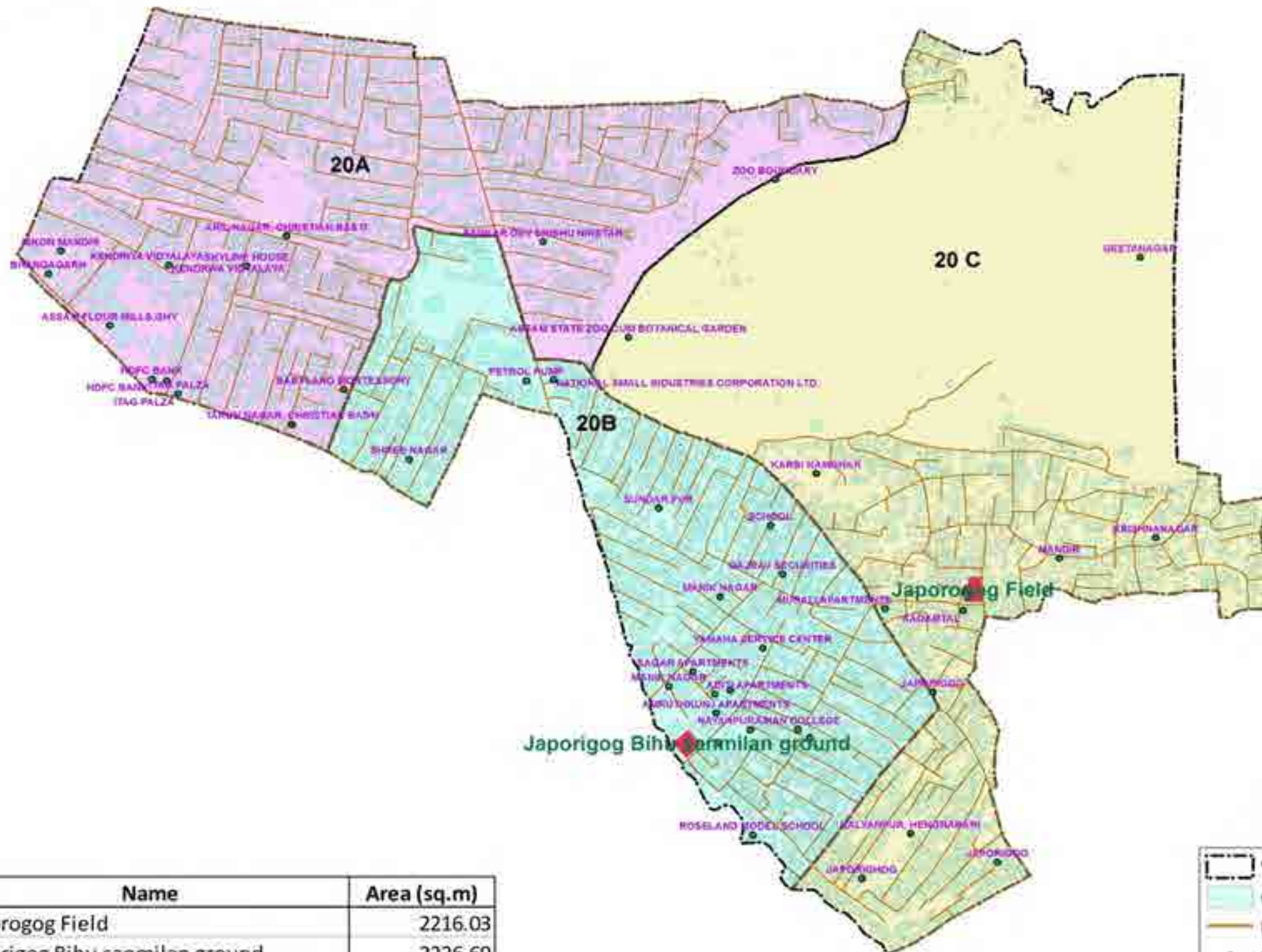
MAP SHOWING OPEN SPACES UNDER GMC WARD-19





MAP SHOWING OPEN SPACES UNDER GMC WARD-20

TOTAL NO. OF HOUSEHOLDS = 8075
 APPROXIMATE AREA UNDER WARD 20 = 3.46 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.004 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 20= 0.12%



Sl.No.	Name	Area (sq.m)
1	Japorogog Field	2216.03
2	Japorigog Bihu sanmilian ground	2226.69
Total		4442.72

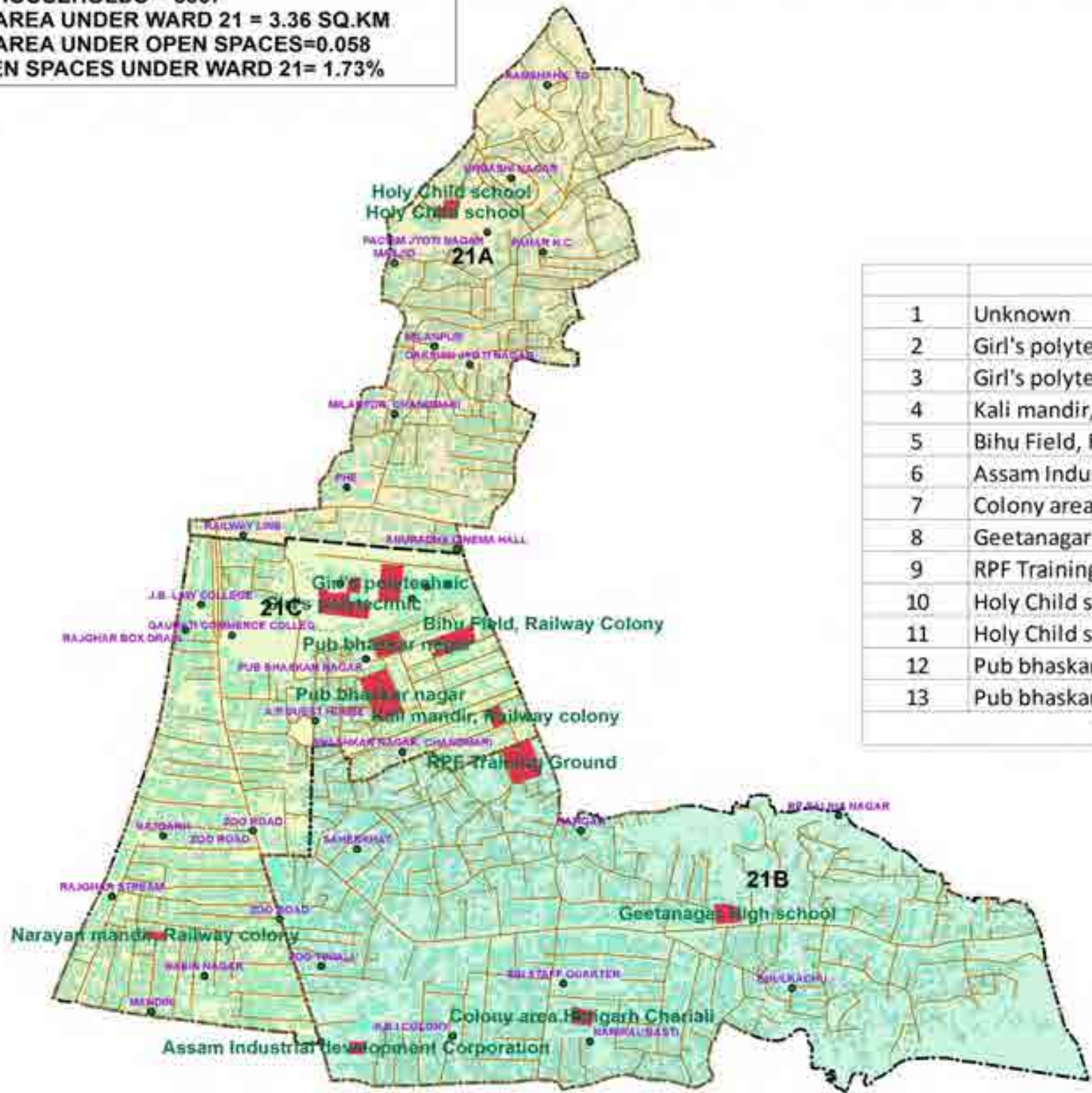
LEGEND

- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES



MAP SHOWING OPEN SPACES UNDER GMC WARD-21

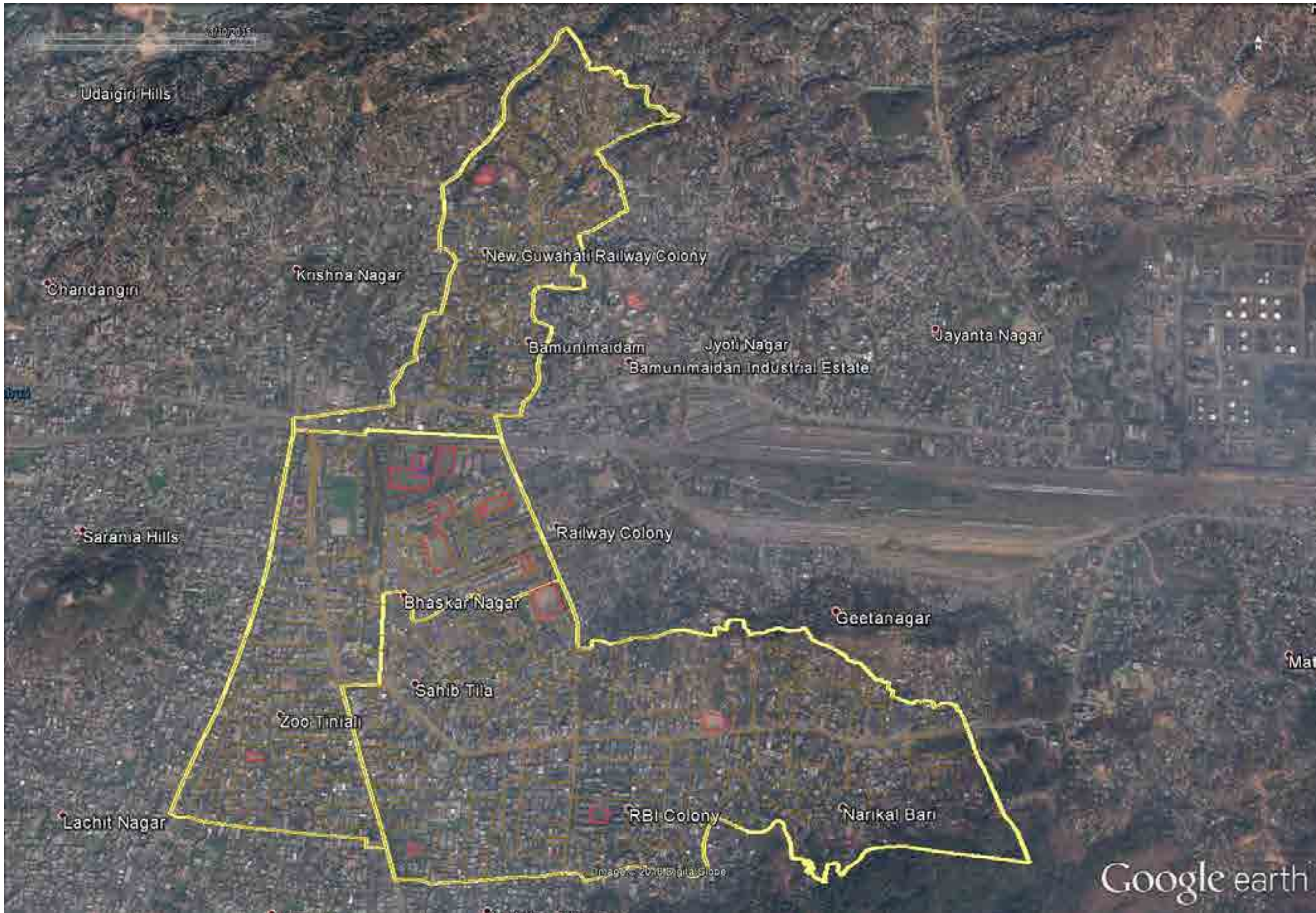
TOTAL NO. OF HOUSEHOLDS = 8307
 APPROXIMATE AREA UNDER WARD 21 = 3.36 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.058
 % AREA OF OPEN SPACES UNDER WARD 21= 1.73%



	Name	Area (sq.m)
1	Unknown	1277.29
2	Girl's polytechnic	9669.64
3	Girl's polytechnic	6247.83
4	Kali mandir, Railway colony	1859.05
5	Bihu Field, Railway Colony	5195.00
6	Assam Industrial development Corporati	1435.16
7	Colony area,Hatigarh Chariali	2797.82
8	Geetanagar High school	3642.50
9	RPF Training Ground	8633.46
10	Holy Child school	1810.90
11	Holy Child school	968.20
12	Pub bhaskar nagar	10481.33
13	Pub bhaskar nagar	4533.05
	Total	58551.21

LEGEND

- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES

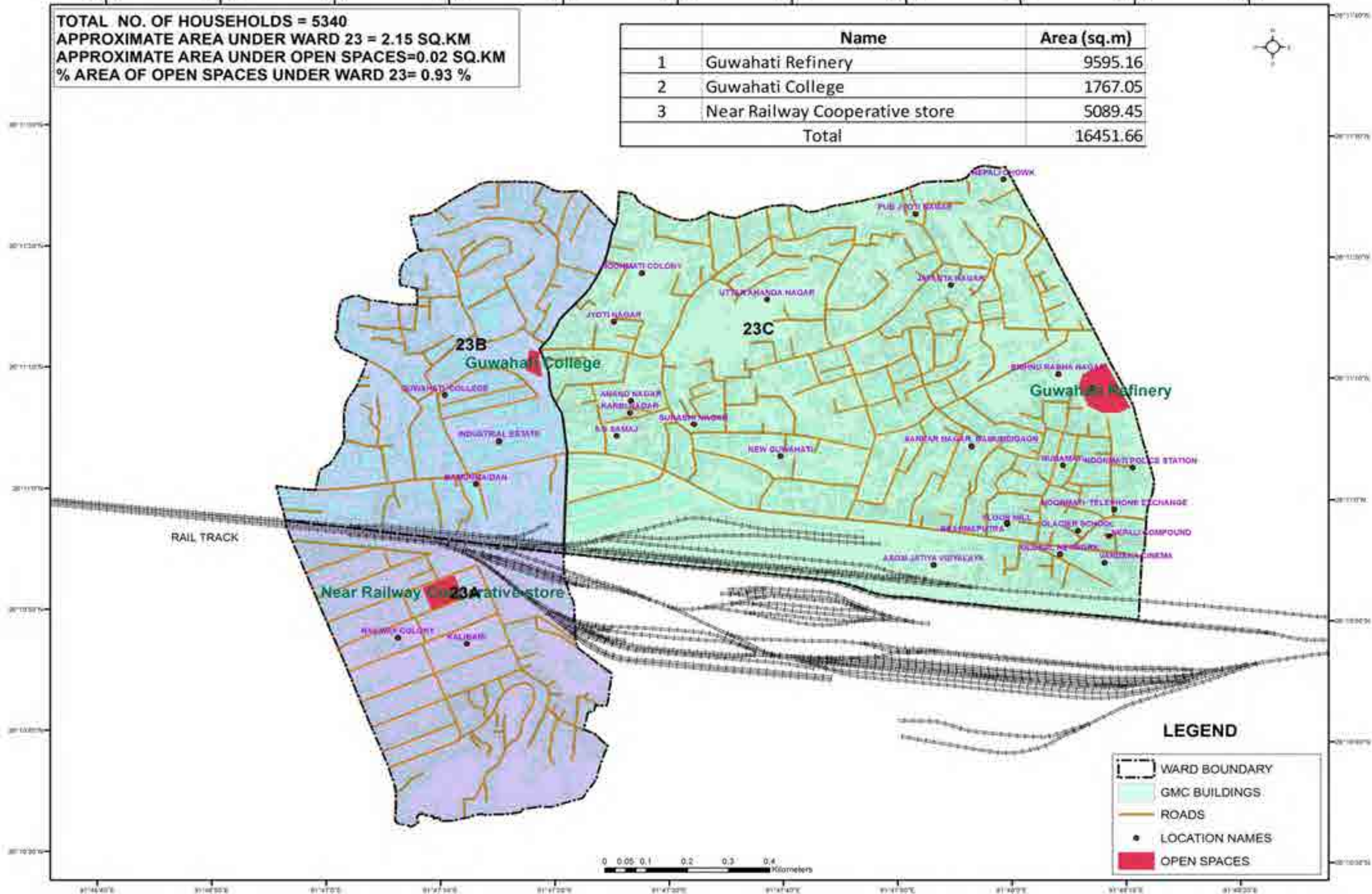




MAP SHOWING OPEN SPACES UNDER GMC WARD-23

TOTAL NO. OF HOUSEHOLDS = 5340
 APPROXIMATE AREA UNDER WARD 23 = 2.15 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.02 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 23= 0.93 %

	Name	Area (sq.m)
1	Guwahati Refinery	9595.16
2	Guwahati College	1767.05
3	Near Railway Cooperative store	5089.45
Total		16451.66



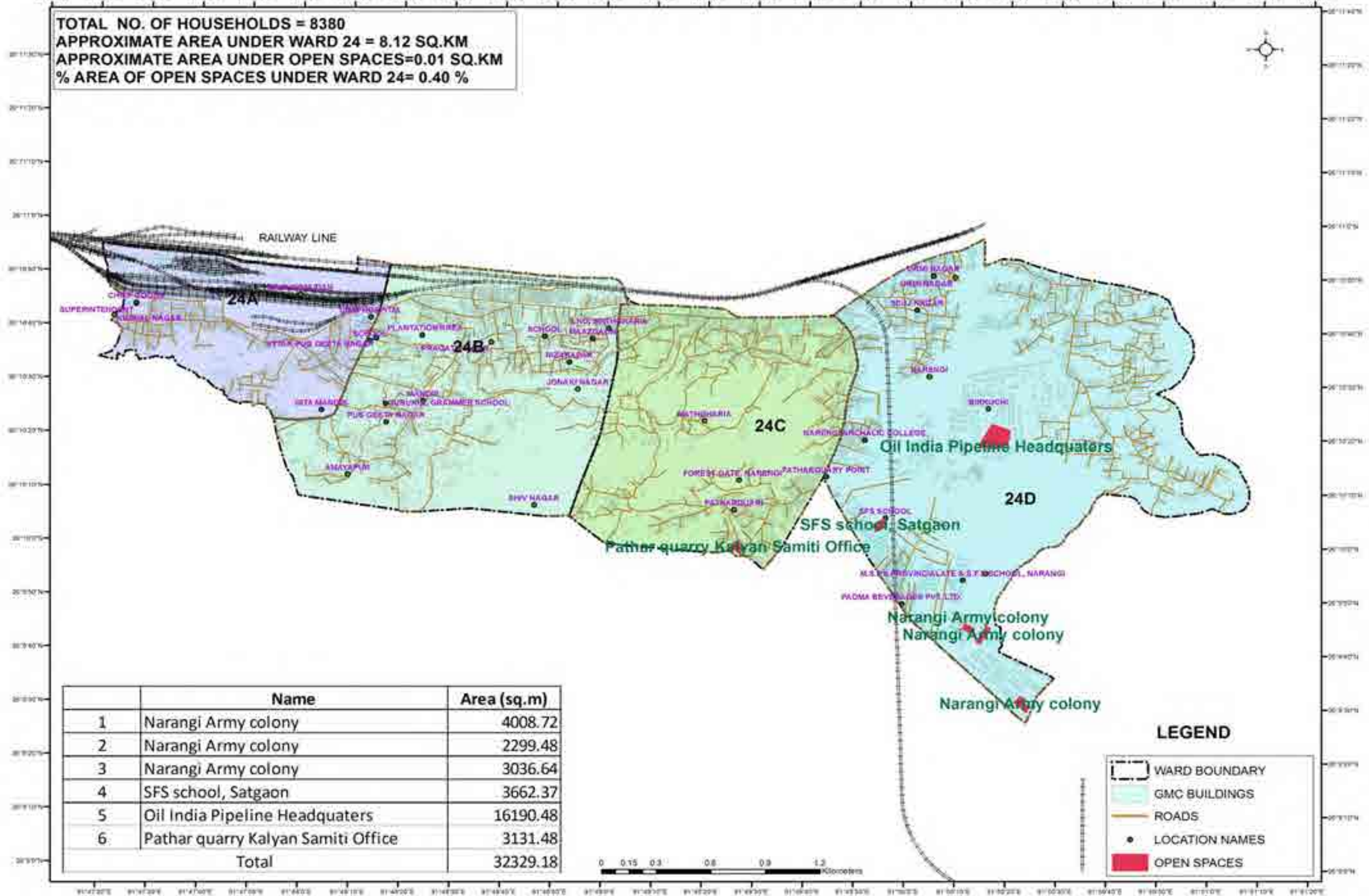
LEGEND

- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES



MAP SHOWING OPEN SPACES UNDER GMC WARD-24

TOTAL NO. OF HOUSEHOLDS = 8380
 APPROXIMATE AREA UNDER WARD 24 = 8.12 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.01 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 24= 0.40 %

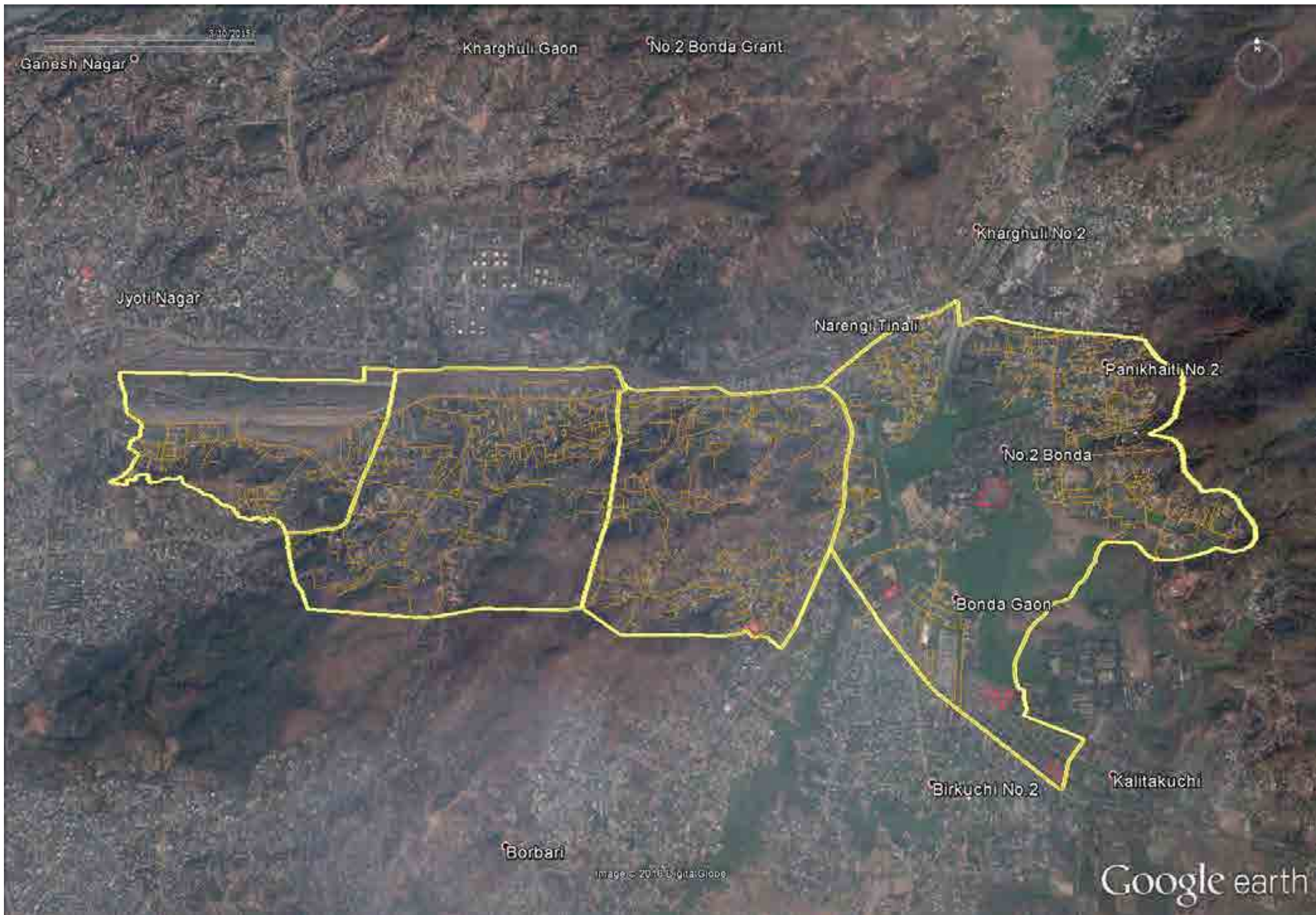


	Name	Area (sq.m)
1	Narangi Army colony	4008.72
2	Narangi Army colony	2299.48
3	Narangi Army colony	3036.64
4	SFS school, Satgaon	3662.37
5	Oil India Pipeline Headquarters	16190.48
6	Pathar quarry Kalyan Samiti Office	3131.48
Total		32329.18

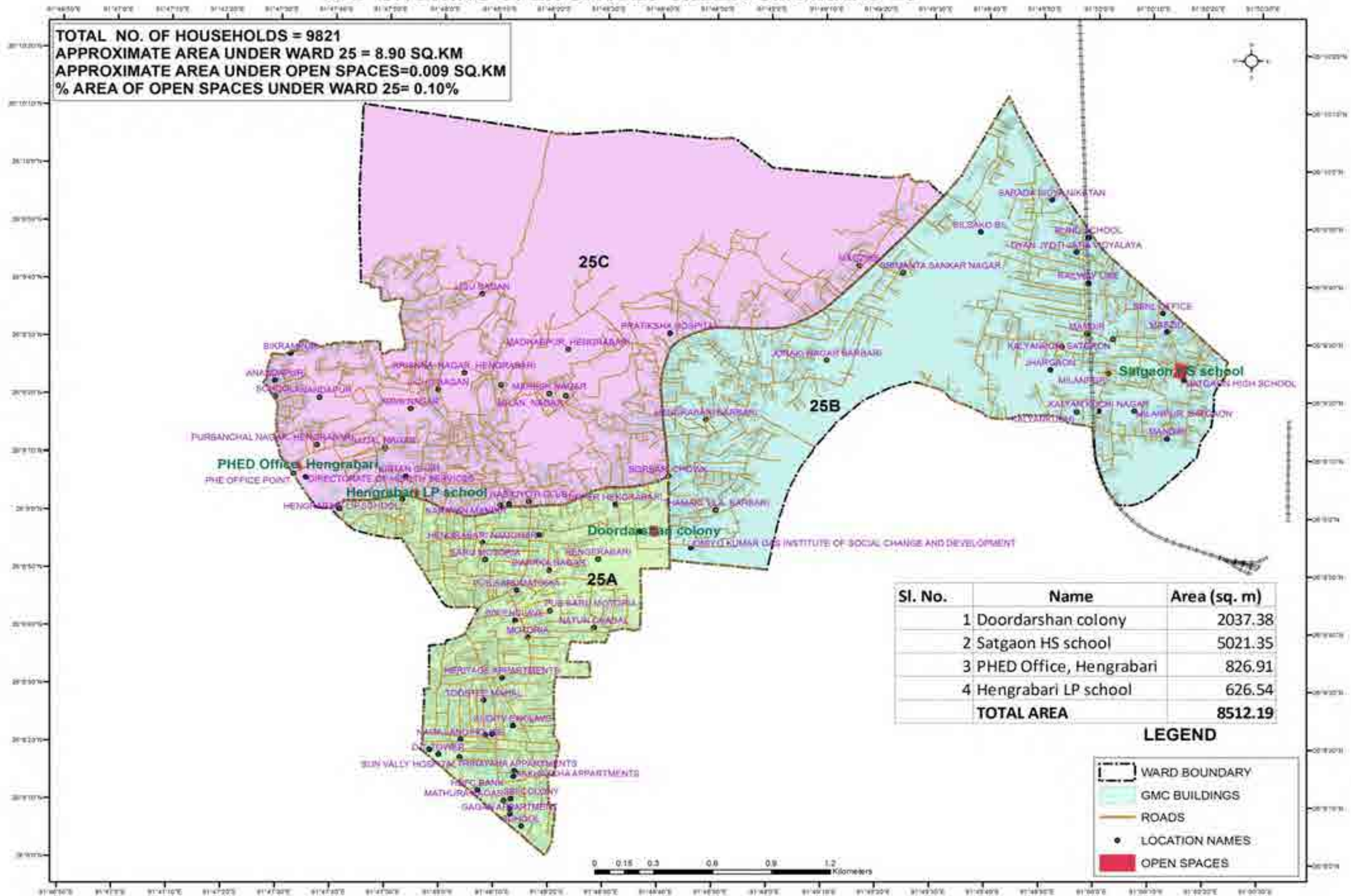
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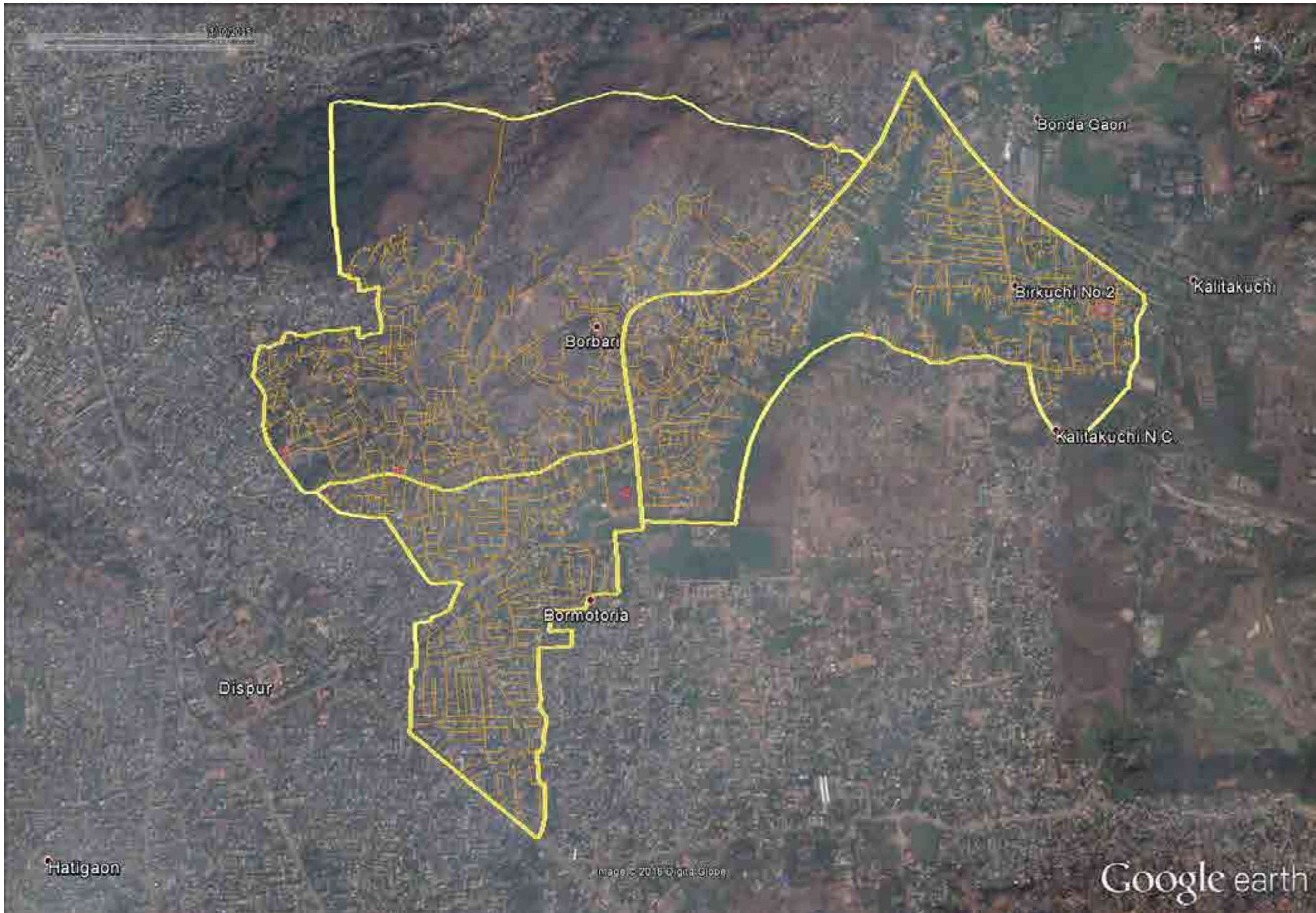
- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES



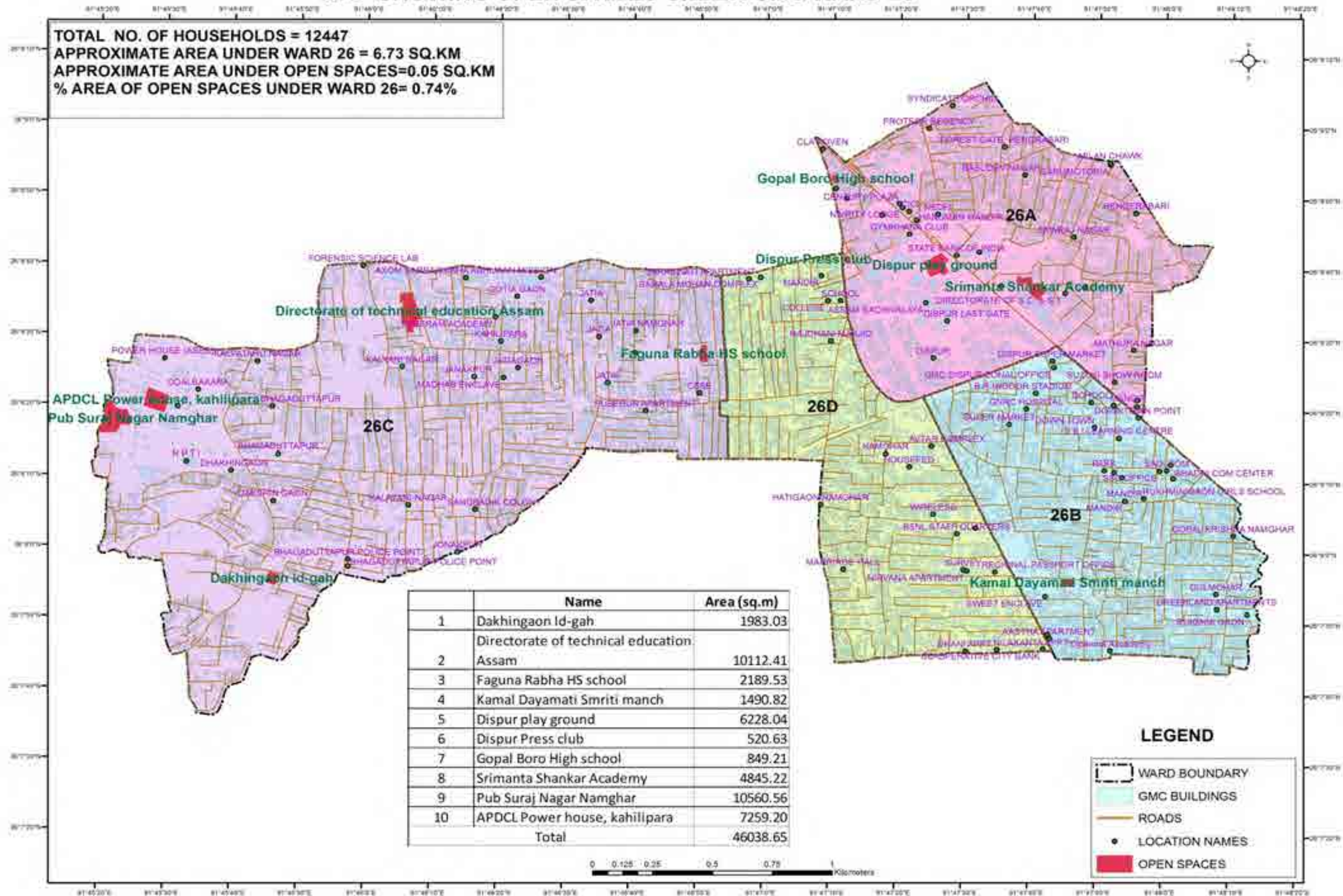


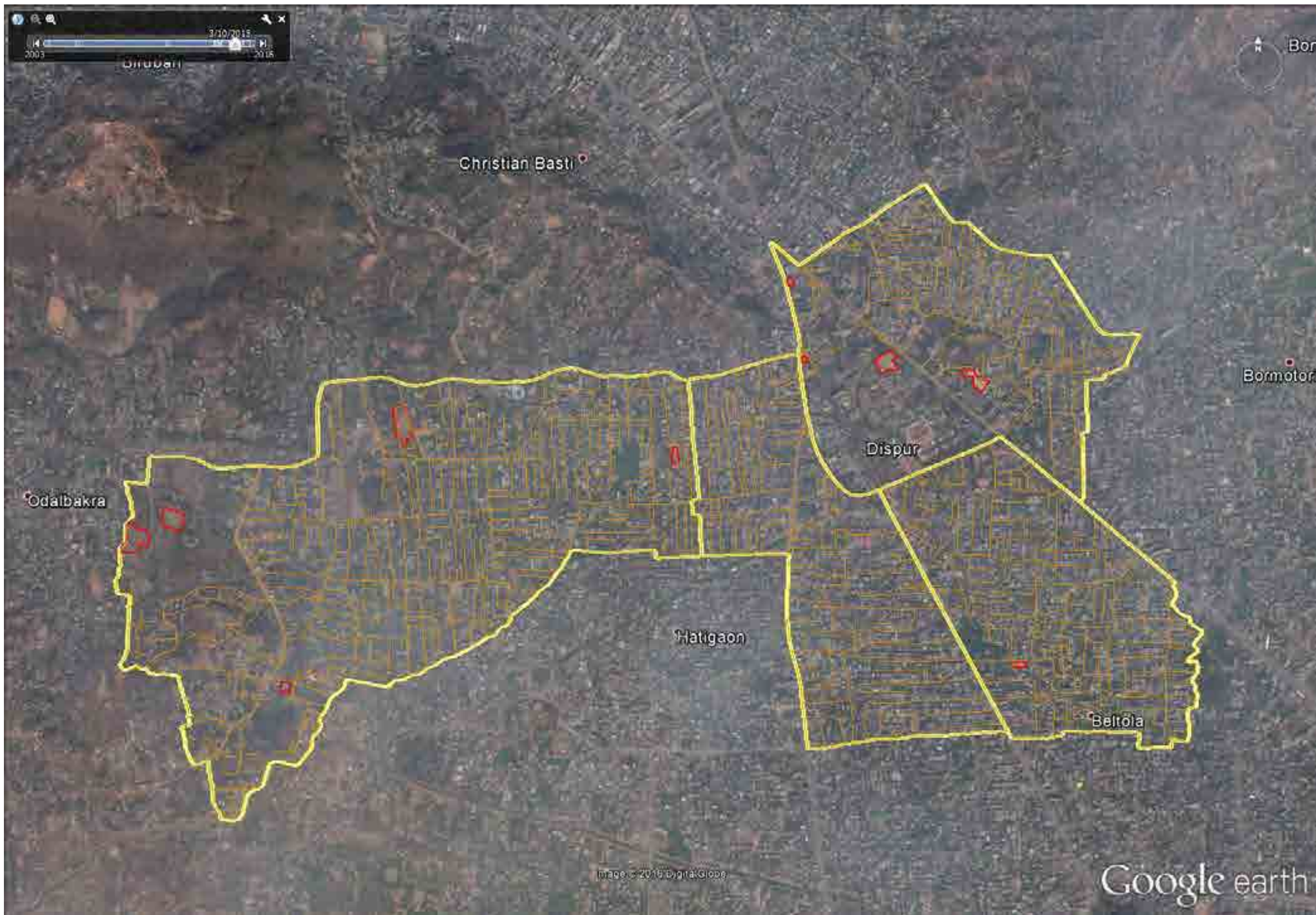
MAP SHOWING OPEN SPACES UNDER GMC WARD-25





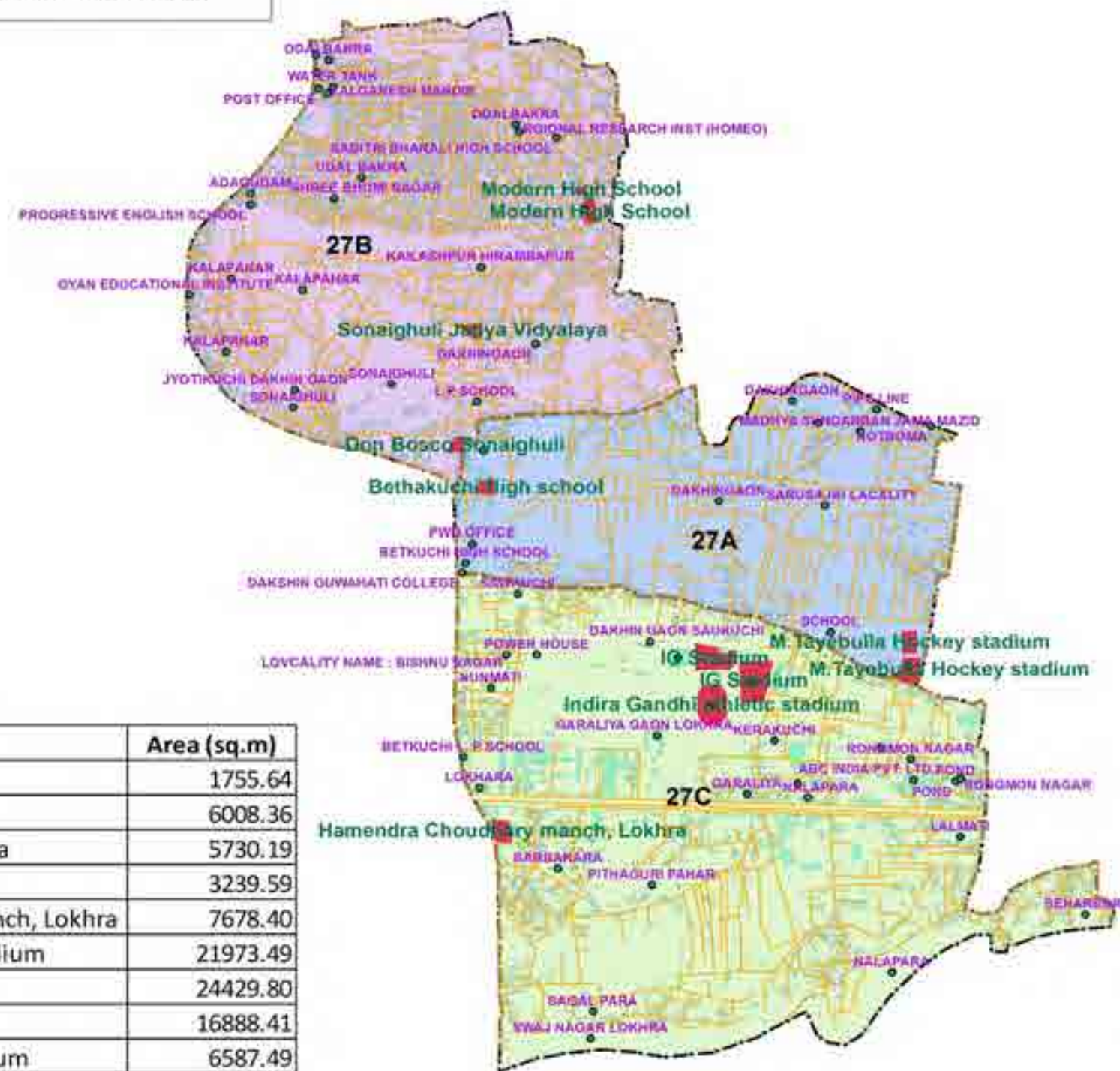
MAP SHOWING OPEN SPACES UNDER GMC WARD-26





MAP SHOWING OPEN SPACES UNDER GMC WARD-27

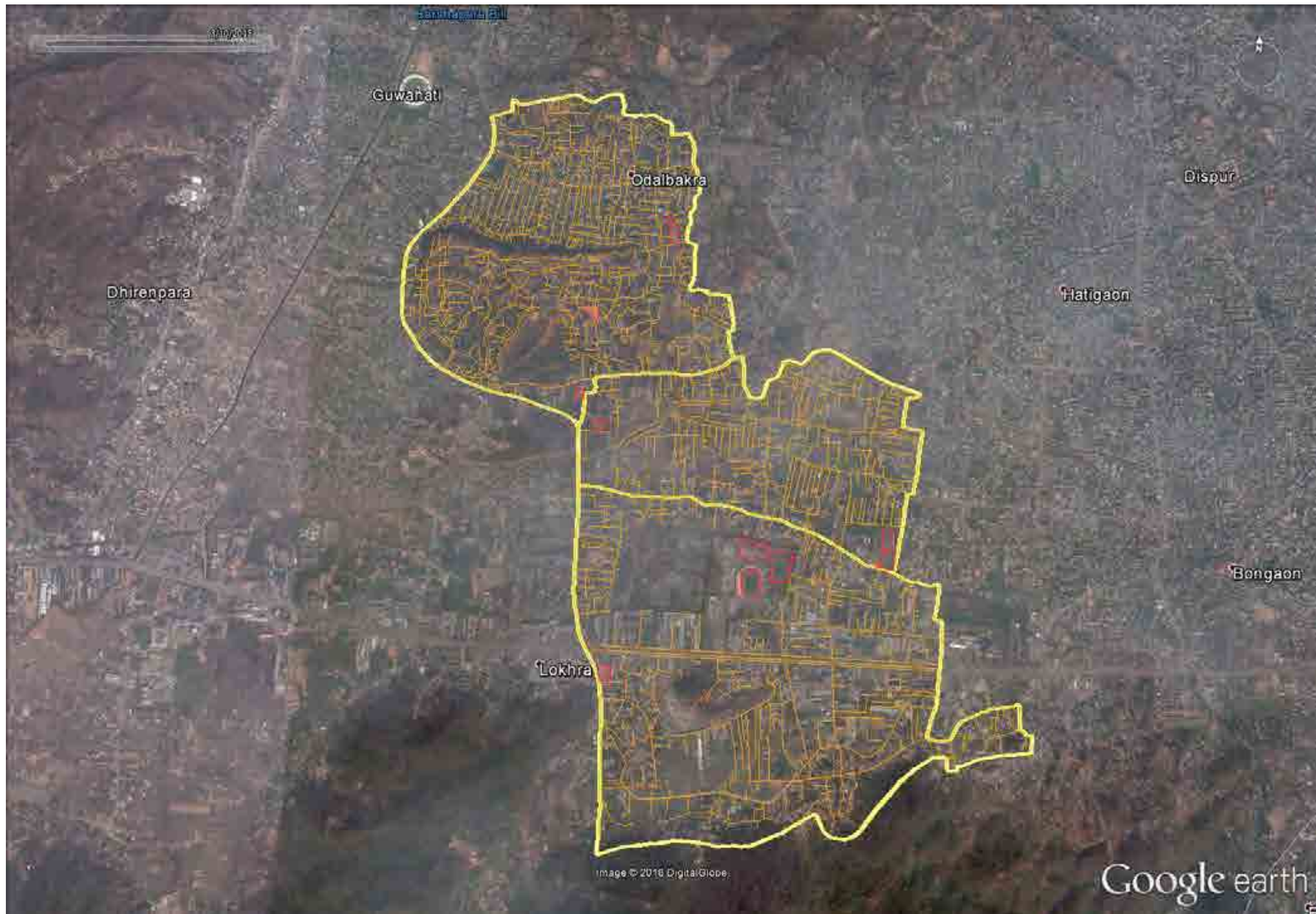
TOTAL NO. OF HOUSEHOLDS = 7566
 APPROXIMATE AREA UNDER WARD 27 = 9.89 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.11 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 27= 1.11%



	Name	Area (sq.m)
1	Modern High School	1755.64
2	Modern High School	6008.36
3	Sonaighuli Jatiya Vidyalaya	5730.19
4	Don Bosco Sonaighuli	3239.59
5	Hamendra Choudhary manch, Lokhra	7678.40
6	Indira Gandhi athletic stadium	21973.49
7	IG Stadium	24429.80
8	IG Stadium	16888.41
9	M.Tayebulla Hockey stadium	6587.49
10	M.Tayebulla Hockey stadium	9357.65
11	Bethakuchi High school	4360.55
	Total	108009.56

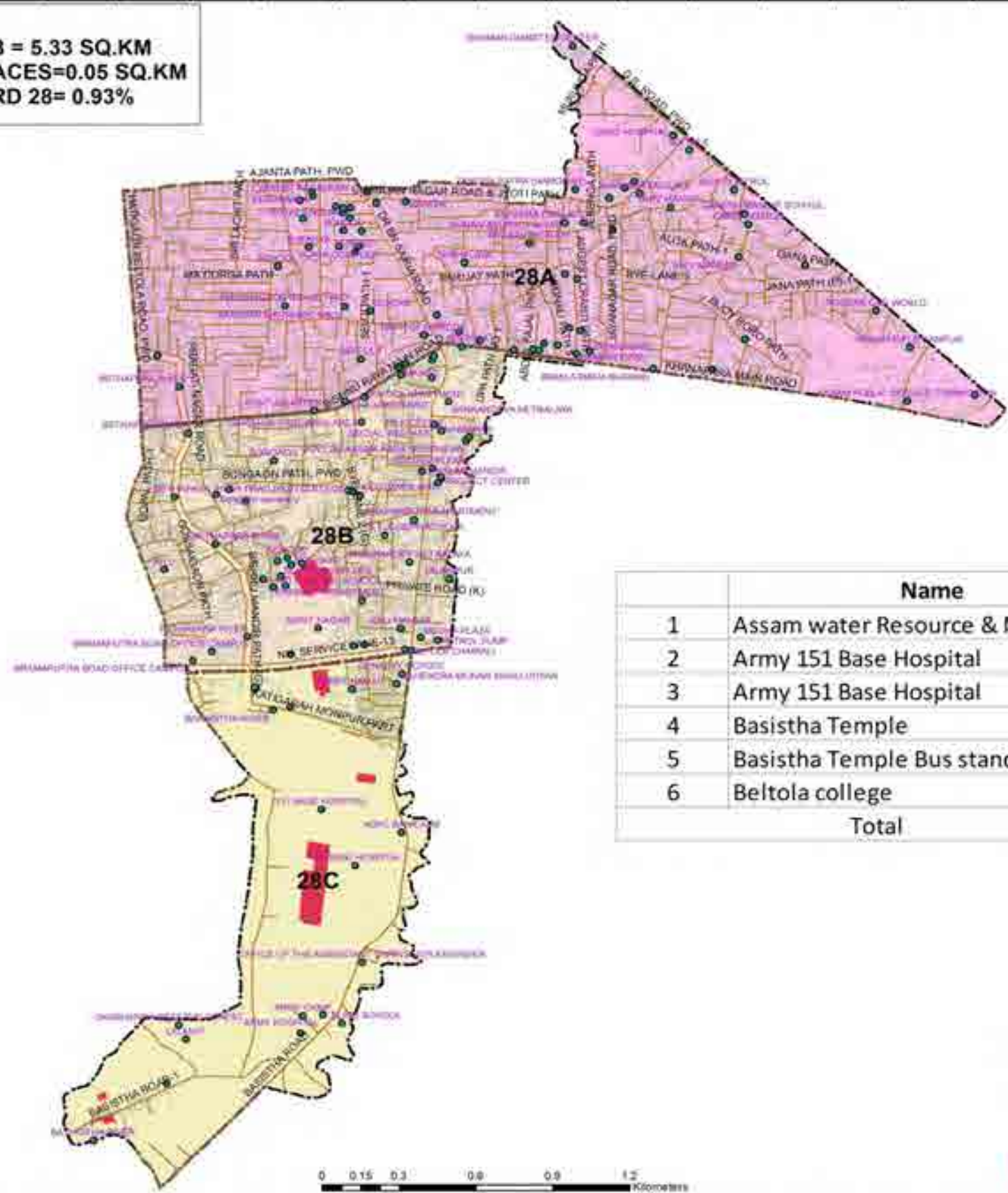
LEGEND

- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES



MAP SHOWING OPEN SPACES UNDER GMC WARD-28

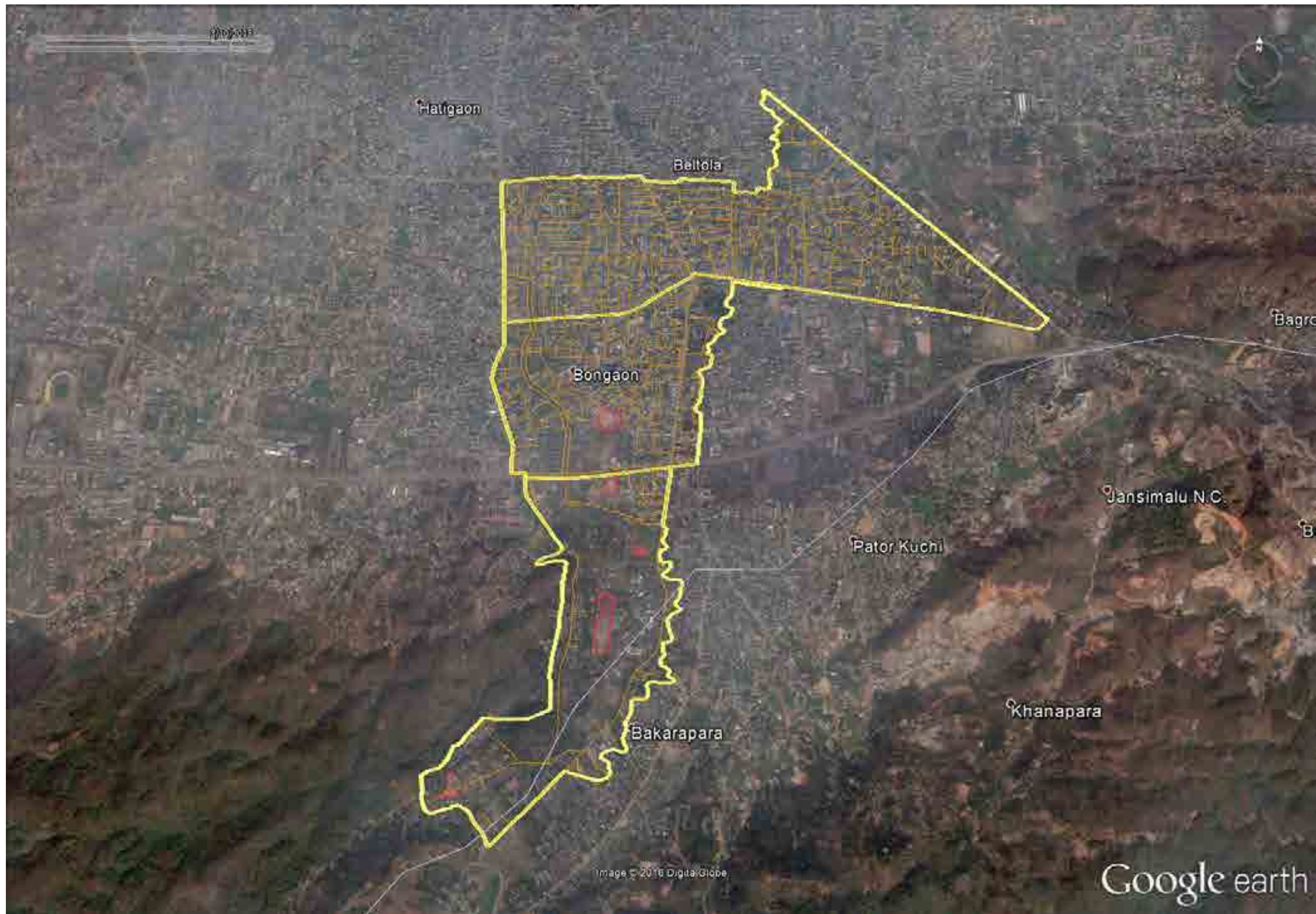
TOTAL NO. OF HOUSEHOLDS = 10079
 APPROXIMATE AREA UNDER WARD 28 = 5.33 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.05 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 28= 0.93%



	Name	Area (sq.m)
1	Assam water Resource & Managemen	5242.47
2	Army 151 Base Hospital	2221.56
3	Army 151 Base Hospital	26498.73
4	Basistha Temple	807.81
5	Basistha Temple Bus stand	2060.01
6	Beltola college	13552.34
	Total	50382.92

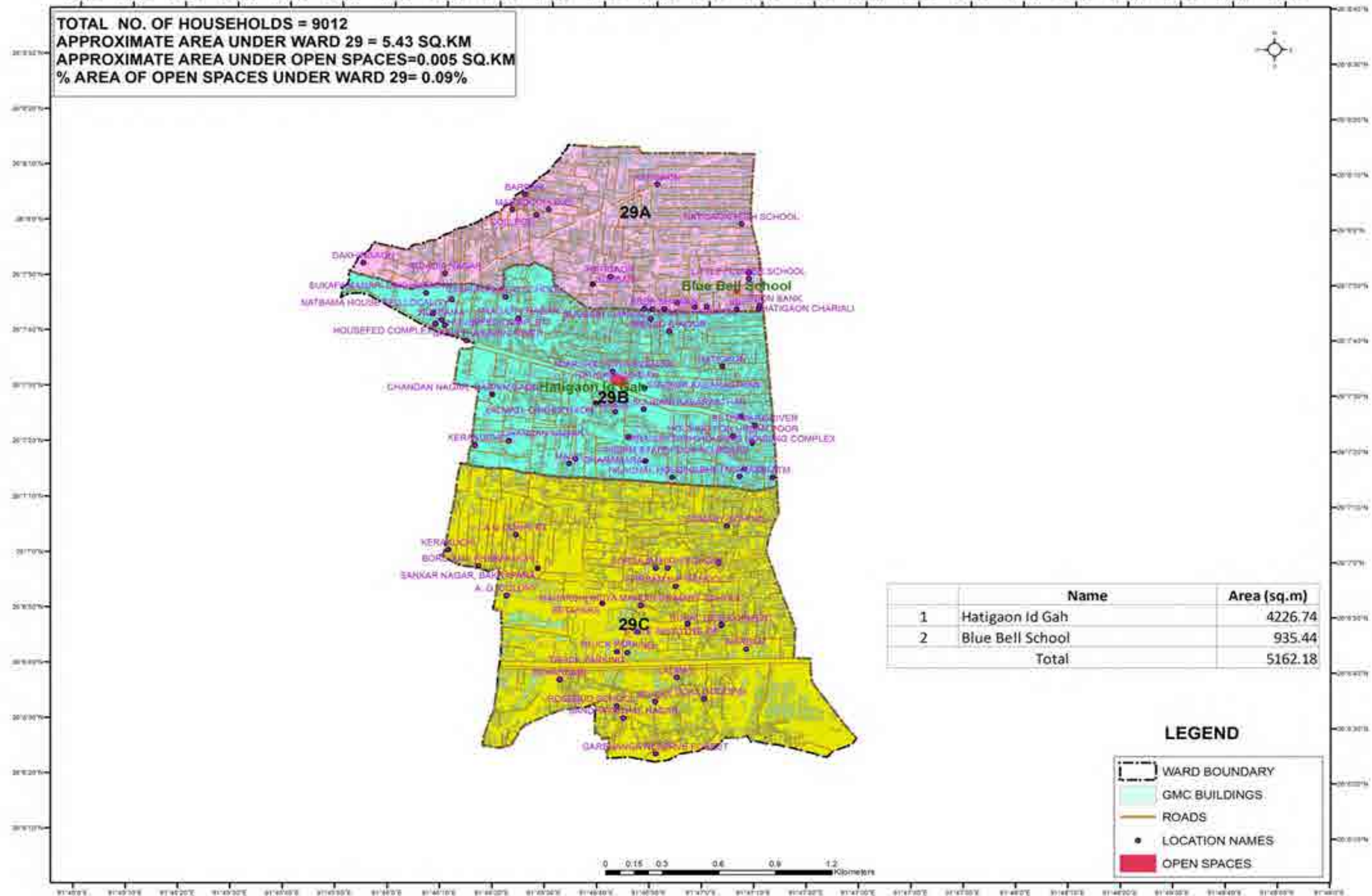
LEGEND

- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES



MAP SHOWING OPEN SPACES UNDER GMC WARD-29

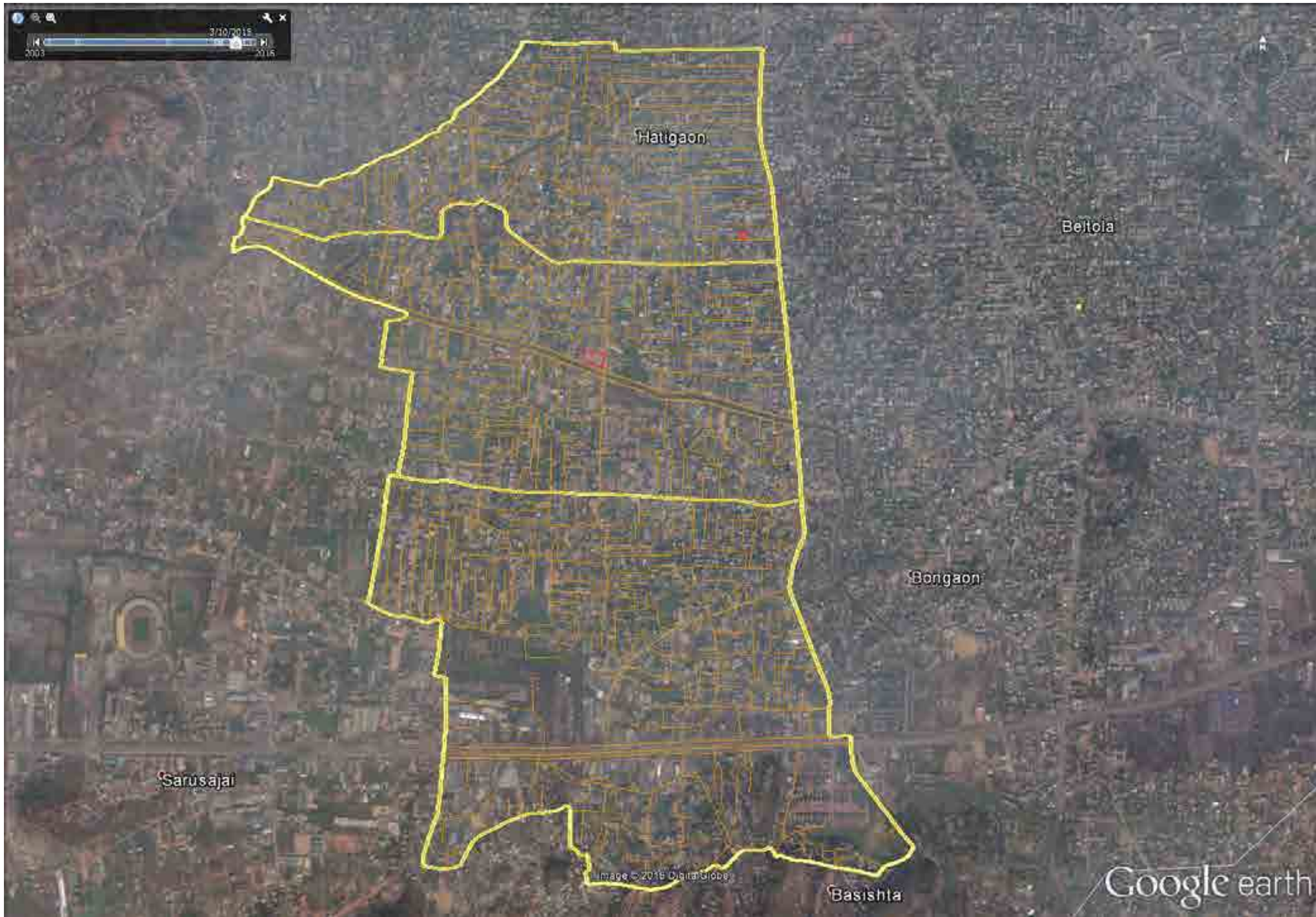
TOTAL NO. OF HOUSEHOLDS = 9012
 APPROXIMATE AREA UNDER WARD 29 = 5.43 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.005 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 29= 0.09%



	Name	Area (sq.m)
1	Hatigaon Id Gah	4226.74
2	Blue Bell School	935.44
	Total	5162.18

LEGEND

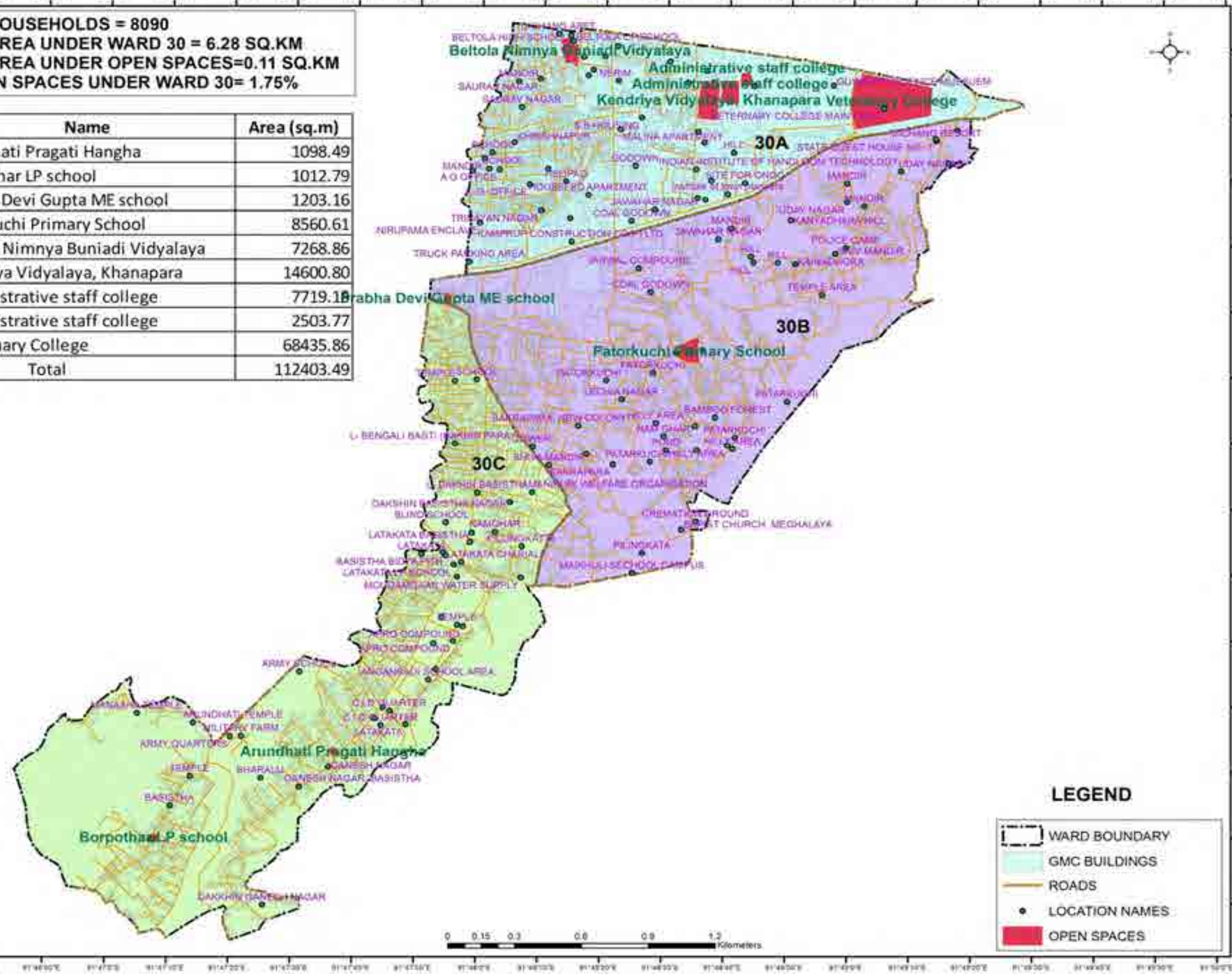
- WARD BOUNDARY
- GMC BUILDINGS
- ROADS
- LOCATION NAMES
- OPEN SPACES

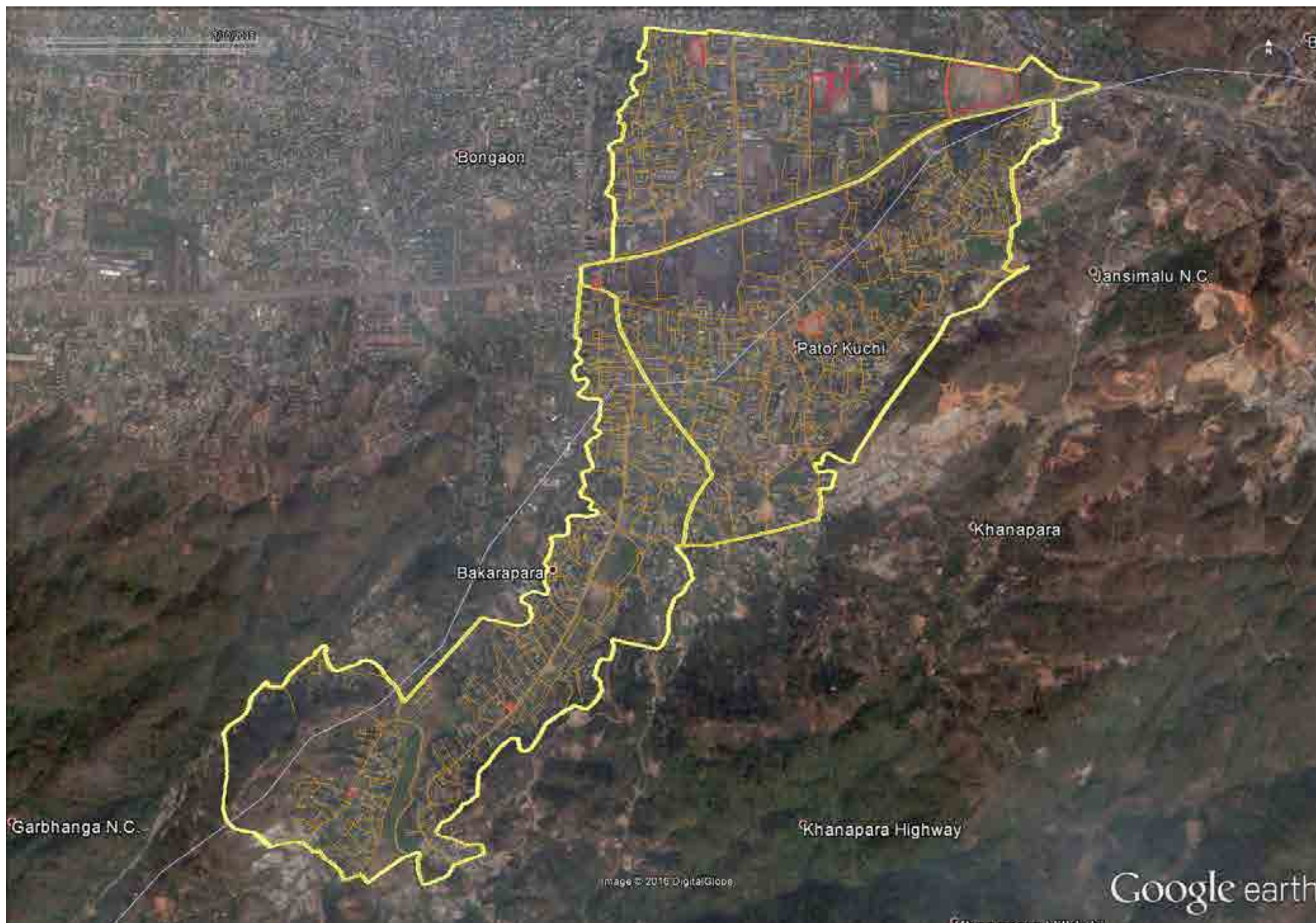


MAP SHOWING OPEN SPACES UNDER GMC WARD-30

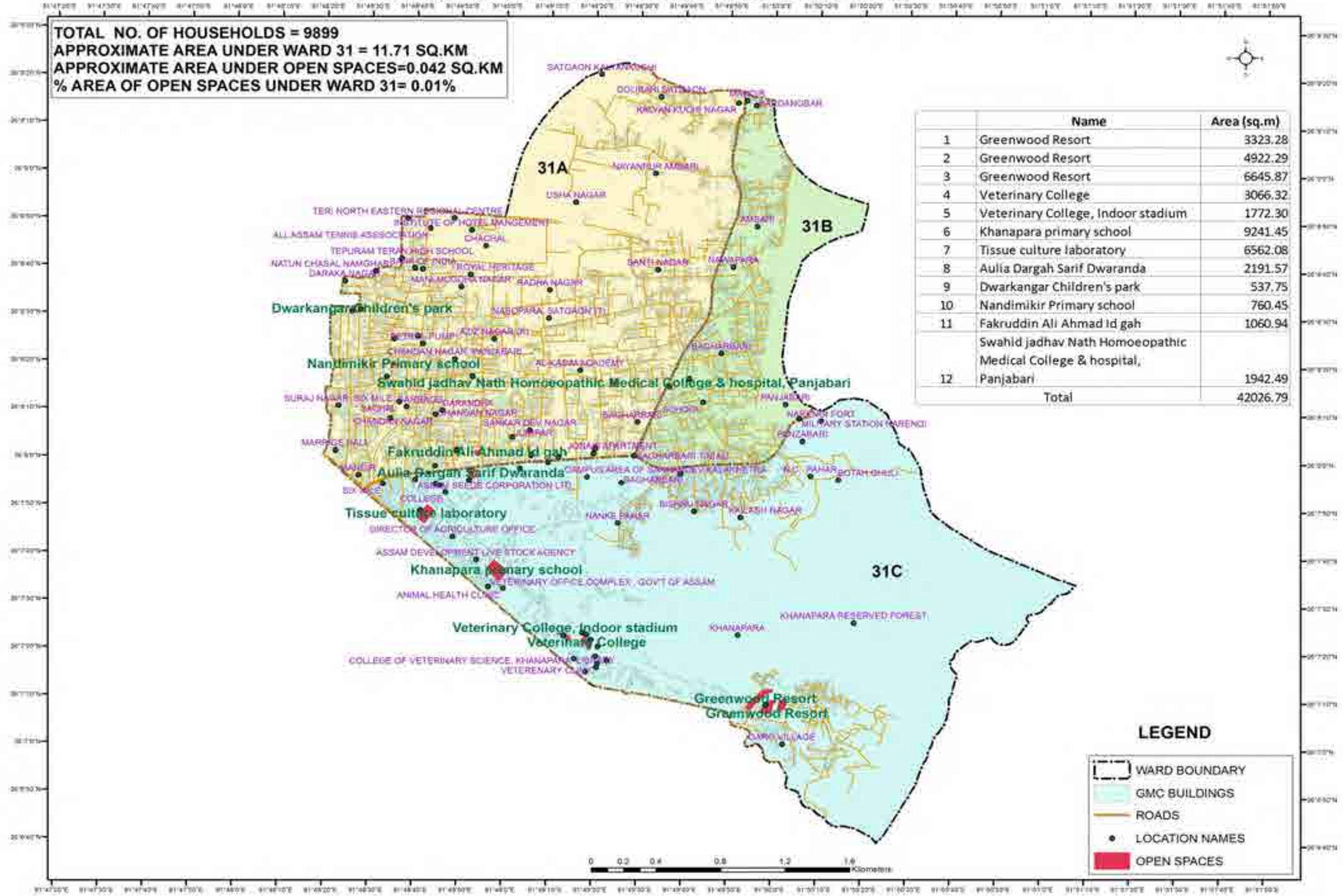
TOTAL NO. OF HOUSEHOLDS = 8090
 APPROXIMATE AREA UNDER WARD 30 = 6.28 SQ.KM
 APPROXIMATE AREA UNDER OPEN SPACES=0.11 SQ.KM
 % AREA OF OPEN SPACES UNDER WARD 30= 1.75%

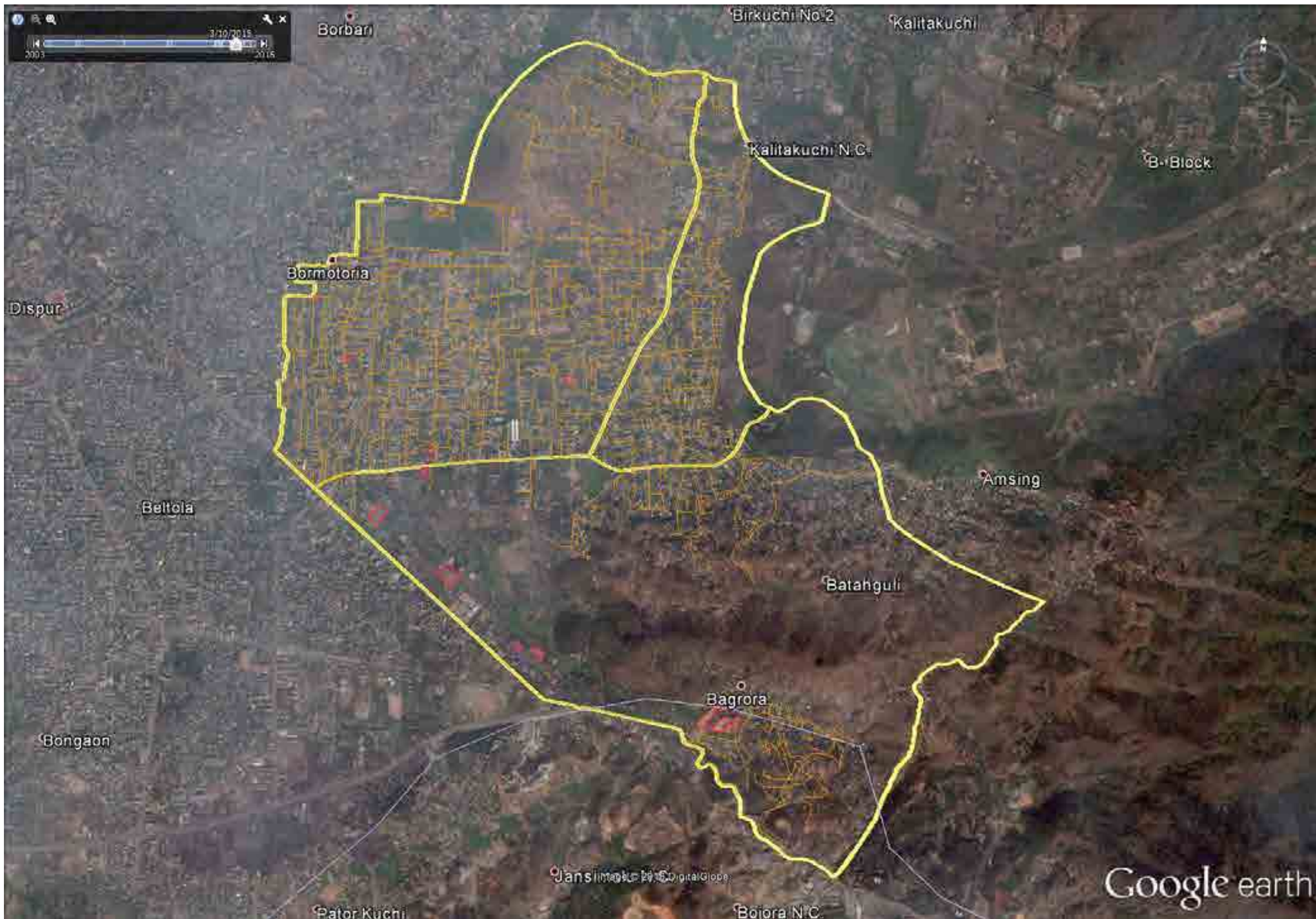
	Name	Area (sq.m)
1	Arundhati Pragati Hangha	1098.49
2	Borpothar LP school	1012.79
3	Prabha Devi Gupta ME school	1203.16
4	Patorkuchi Primary School	8560.61
5	Beltola Nimnya Buniadi Vidyalaya	7268.86
6	Kendriya Vidyalaya, Khanapara	14600.80
7	Administrative staff college	7719.18
8	Administrative staff college	2503.77
9	Veterinary College	68435.86
	Total	112403.49





MAP SHOWING OPEN SPACES UNDER GMC WARD-31







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