

Model Terms of Reference:

Preparation of GIS maps and carry out a household and establishment survey in

Location..... India

Issued on: Date....

TECHNICAL SUPPORT UNIT:

iihsTM

INDIAN INSTITUTE FOR
HUMAN SETTLEMENTS

IN ASSOCIATION WITH:



Keystone

CD Consortium for
DEWATS
Dissemination
Society


SECTION A: INVITATION TO SUBMIT PROPOSALS

Date:

Dear Sir/Madam,

Re: Terms of Reference (ToR)- Preparation of GIS maps and carry out a household and establishment survey in....., India

1. Proposals are hereby invited by ;:
2. The Terms of Reference (ToR) documents consist of Invitation to Submit Proposals, Guidelines for Submissions, Scope of Work, Evaluation Criteria, with supplementary information in Annexes.
3. Agencies will submit their technical and financial proposals following the attached INSTRUCTION AND DEADLINES FOR RESPONDING, to be received no later than **[INSERT TIME AND DATE]**.
4. No consideration will be given to the Proposals received after the stipulated time and no extension of time will be allowed for submission of the proposals. The Client is not responsible for any technical transmission problems/delays in mailing of proposals.
5. The agency will submit the proposal after carefully examining the whole of the ToR documents and the conditions of ToR. The agency will have to quote for all the sections following the Outlines for Technical and Financial Proposals herein. No section should be left blank. Incomplete proposals are liable to be rejected at the sole and exclusive discretion of the Client.
6. Canvassing in connection with the technical and financial proposals is strictly prohibited and the proposals submitted by the agency who resort to canvassing, are liable to be rejected at the sole and exclusive discretion of the Client at any time during the process including up to the contract award.
7. Proposal not fulfilling any or all of the conditions prescribed or which are incomplete shall be rejected at the sole and exclusive discretion of the Client.
8. The Client at its sole and exclusive discretion, reserves the right to accept or reject any proposal either in whole or in part without assigning any reason for doing so, and the Client is not bound to accept the lowest-cost bid.
9. The Client reserves the right to divide and distribute the work. In such case/s, the decision will be solely at the discretion of the Client, including that of assignment of works.
10. The successful agency shall furnish a list of relatives, if any, working with the Client or Client's associates or partners, along with their designations and addresses.

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11. Validity period of Offer: The proposals shall remain valid 90 days from the date of submission.
 12. The Client requires agencies under this Project to observe the highest standard of ethics during procurement and execution of such contracts.

Yours Sincerely

SECTION B: INSTRUCTION FOR PREPARATION OF PROPOSAL

1. [INSERT NAME OF ULB] contact:

For all questions about this ToR, please send an email to [CONTACT PERSON DETAILS]

2. Confirmation of interest:

Please send a statement acknowledging receipt of this ToR and your intent to respond or not respond no later than [INSERT TIME AND DATE]. Send the confirmation to the contact listed above.

3. Fact-finding questions:

Questions on this ToR will be accepted via email to the contact listed above through [INSERT TIME AND DATE]. Answers to all questions will be provided to all participants who confirmed interest per Section B.2 by [INSERT TIME AND DATE]. Inquiries after this date cannot be accommodated.

4. Proposal due [INSERT TIME AND DATE]:

Completed proposals should be submitted by email to: [CONTACT PERSON DETAILS]. The subject line of the email should read: **GIS and Household and Establishment Survey Research Proposal**. Interested agencies have to submit a separate technical and financial proposal document.

a. Technical proposal

The Technical Proposal should be submitted following the Outline for Submission of Technical Proposal provided below.

I. Company Profile (See Annexure I Form A for format) 1 page
II. List of similar projects undertaken in last 5 years (See Annexure I Form B for format) 1 page
III. Description of the approach, methodology and work plan – 15 to 18 pages
<ol style="list-style-type: none"> 1. Understanding of the objectives of the assignment as outlined in the Terms of Reference (TOR) (up to 1 page) 2. Approach, and the methodology for implementing the tasks to deliver the expected output(s) including highlight of processes that assure quality of the offering (up to 10 pages) 3. Structure and composition of the team (At a minimum following Form C) 4. Plan for the implementation of the main activities/tasks of the assignment (1-2 pages) 5. Milestones including details of outputs and tentative delivery dates of the reports (1-2 pages) 6. List of deliverables: Final documents (including reports) to be delivered as final output(s) (1 page)
IV. CVs of proposed team members – 1 CV per page

b. Financial proposal

Please provide an itemized budget which outlines all project costs (see Annexure I Form D). Agencies will be evaluated on cost competitiveness. Please provide explanations for itemized costs based on the scope of work outlined in Section C of this ToR.

We advise that you send files in commonly recognized Microsoft formats. Hard copy of the technical and financial proposal should not be sent. The proposal should only include information specific to accomplishing the scope of work. Elaborate materials, artwork, or other information not directly related to the scope of work are not suggested.

5. Evaluation criteria:

The following is a list of significant criteria against which technical and financial proposals will be assessed separately.

Technical proposal:

A. Experience in similar projects	
The extent and depth of experience of the agency in the same or similar type of projects (GIS and Household/Establishment surveys). The criteria should spell out clearly the project characteristics applicable.	10
B. Approach and Methodology	
i. Understanding the objectives: General understanding of the objectives and the different components covered within the study	10
ii. Quality of methodology: The degree of which the presented written methodology/approach addresses the requirements of the TOR	20
iii. Implementation and Work Plan: Quality of proposed implementation and work plan, i.e. how the agency will undertake each component	15
iv. Personnel: Assessment of each team member based on his/her experience including skills and capacity to deliver the expected research outputs	15
TOTAL TECHNICAL SCORE = 70	

Only technical proposals which receive a minimum of 55 points will be considered further.

Financial proposal:

A. Reasonableness of cost	30
TOTAL FINANCIAL SCORE = 30	

Maximum number of points will be allocated to the lowest financial proposal that is opened and compared among those agencies whose technical proposal has qualified based on the evaluation of the technical proposal.



6. Selection of shortlist:

[INSERT NAME OF ULB] reserves the right to select a shortlist from the proposals received and has the option to interview and discuss specific details with those candidates who are on the shortlist.

7. Conclusion of process:

Applicants will be notified of [INSERT NAME OF ULB] decision by [INSERT DATE]. Final award is subject to the terms and conditions included in this solicitation, as well as successful final negotiations of all applicable terms and conditions affecting this work.

SECTION C: SCOPE OF WORK

1. BACKGROUND

[ADD RELEVANT DETAILS]

2. OBJECTIVES

The key objectives of this assignment are:

- 1) Prepare digital base maps for [ADD LOCATION/S].
- 2) Collect and compile data from properties through door-to-door establishment and household survey.
- 3) Prepare GIS outputs linking survey database with the base maps

3. THE CONTEXT

[ADD RELEVANT DETAILS]


4. SCOPE OF WORK

The agency will carry out mapping of properties and build up a data base of social, economic and watsan features through a survey of all the properties and civic infrastructure¹ within the jurisdiction of [ADD LOCATION/S], to capture geographically explicit details of the properties and their water and sanitation arrangements. A database compiled from information collected through the survey is to be linked to the base maps and provided to [INSERT NAME OF ORGANISATION/ULB] in GIS format. The database and the maps should be accessible and usable by [INSERT NAME OF ULB] for further analytics using open source applications such as QGIS and spreadsheet software such as MS-Excel or Google Sheets.

The Scope of Work will include:

- 1. Development of the methodology for Survey, Mapping and compilation of geographically explicit data:** This will include clear statement of methodology for mapping, quality assurance and error corrections, with the database structure providing for interim fields that provide scope for checks and feedback by 3rd party before finalisation of the base map.
- 2. Creation and population of property database:** This will include definition of the database structure, appropriate indexing and optimisation to enable overlay of different map layers and linking these layers with appropriate databases.

¹ Civic infrastructure includes the physical spaces, buildings, and assets

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- 3. Collection and compilation of data through survey of Households and Establishments (including educational/health institutions):** This will include development of appropriate survey instruments with standard codes for responses, drafting of survey methodology including quality assurance (protocols for back-checks, closed properties, etc.), collection of data, verification, error-correction, data entry, vetting and compilation in database. The data to be collected through the survey is detailed in Annexure II.
 - 4. Develop codes for open-ended responses:** The agency has to post code all open-ended responses and develop codes for responses. The same has to be shared with [INSERT NAME OF ULB] for approval
 - 5. Creation of interlinked databases in an agreed format, with appropriate data structure(s):** The GIS database and the data collected through the household and establishment survey to be integrated and should take into account specificity issues that are listed in Annexure III.
 - 6. Preparation of Final set of Maps:** The agency shall prepare a final set of map as agreed with [INSERT NAME OF ULB], incorporating the map layers digitized and corrected of errors. Different thematic maps as agreed with [INSERT NAME OF ULB], with property data variables as attributes linked to the different map layers will be produced, as would a digital dataset of map layers and linked databases. The details of the various layers (indicative not exhaustive) to be part of the final map are given in Annexure IV:


Based on the above scope of work, the proposed assignment broadly includes the following five components:

- I. Preparation of GIS thematic map layers;
- II. Conduct of door-to-door household and establishment survey;
- III. Compilation of property database (vacant plots, households and establishments) after error corrections;
- IV. Production of GIS maps linking database with map layers
- V. Production of final thematic and composite maps

The above components are to be taken up as separate or phase-wise activities as completion of one component is contingent upon the preceding component.

4.1 Preparation of GIS maps

Base map includes administrative boundaries of town, water features, physiographic features, parks, landmarks, transportation (highway, roads, railway line, and airport) and buildings etc. The agency is to prepare GIS base maps with thematic layers including creation of base maps using latest high resolution satellite imagery available in open source or to be purchased from the National Remote Sensing Centre (NRSA) and survey all physical features of the town, and augment spatial and attribute data



through field data collection. The agency will collect all relevant information as given in Annexure V.

The agency will create a unique identification number for all establishments and households. In case of apartments or multi-storied residential complexes, each flat will be given a unique number. This is critical for proper representation of geographical data and location of each structure and will be used as a master list of all households and establishments for the second component.

4.2 Household and Establishment survey

A 100% door to door survey of properties (including households and establishments) is required to be carried out on a range of primary data pertaining to current water and sanitation arrangements. Data collection is to be carried out using GPS-enabled tablets and each property surveyed needs to be geo-coded. The agency shall also document the surveyed property through digital photographs - front elevation from the road, photograph of the toilet containment structure location and the visible portion of on-site sanitation system – so that all establishments and households surveyed are linked with a visual database. A list of all relevant information to be collected from the survey is listed in Annexure I.

The household and establishment survey team will adopt a unique identification system that will map on to the mapping team's identification system and thus match it. A system for sharing information between the mapping and data collection teams, supervisors and removal of discrepancies at periodic intervals needs to be devised and adopted.

4.3 Compilation of Database and finalisation

The data collected from the households and establishment survey will be entered into the different databases created as per the envisaged structure and linked for optimal performance. This will then be searched and retrieved using normal query rules for a final round of data verification and error corrections, including unit conversions where felt needed.

4.4 Production of GIS Maps with survey data

The agency should link both the GIS-base map including the layers and the survey data. Periodic sharing of datasets and maps with **[INSERT NAME OF ULB]** for quality assessments can be mentioned in the methodology.

Regular (preferable at weekly intervals) updates on work progress to be provided **[INSERT NAME OF ULB]**.

5. QUALITY ASSURANCE AND REPORTING

A. Preparation of GIS base maps

During the mapping process and the synchronisation of the survey data with mapping data, the agency will need to devise and state appropriate protocols for ensuring quality of the output and one-to-one mapping of data and spatial unit. The layer-wise data to be collected and mapped is detailed in Annexure I.

For instance, after the mapping team finishes a street, they should produce a ready-to-use map of the Street with ID of properties and the P-Tax ID provided by the TP. The survey team should use this, follow a start-to-end point L-R protocol and using the building id provided devise HH/Establishment sub-id. This needs to be verified by the supervisors at the end of the day and reconciled with the mapping team.

B. Household and Establishment survey

The field work plan should be presented to [INSERT NAME OF ULB] prior to commencing field work, as part of the Inception report.

- 1) The agency must then implement the survey, adhering as closely to the plan as conditions allow. If field conditions dictate significant changes to these plans, the agency is obliged to inform [INSERT NAME OF ULB], and take mutually agreed corrections.
- 2) The Agency will prepare a survey questionnaire based on a draft provided by [INSERT NAME OF ULB]. The Agency will make all efforts to address the ToR and the draft provided by [INSERT NAME OF ULB] is only suggestive and to indicate some of the field conditions. The survey questionnaire finalised in discussion with [INSERT NAME OF ULB] will be translated to Tamil by the Agency and vetted by [INSERT NAME OF ULB]. The final questionnaire will be bi-lingual and the agency will be responsible for writing the syntax and uploading the form in GPS-enabled tablet. The data collected from the tablets should be updated on identified servers on a daily basis and made available to [INSERT NAME OF ULB] for quality checks at a frequency of [MENTION NUMBER OF DAYS].
- 3) The agency should organise a training for all investigators and supervisors, as necessary. [INSERT NAME OF ULB] will provide support in terms of resource persons where mutually agreed.
- 4) The agency should develop strict field protocols for handling refusals and for locked households. In case of door locked, the agency should make a minimum of three visits.

- 5) The agency should maintain a list of households and establishments not covered due to refusals/door locked
- 6) Back checks: The agency is required to conduct **[INSERT PERCENTAGE]** back checks
- 7) Weekly reporting: The agency shall submit a weekly progress report in excel and GIS shape file on the field work status including:
 - a. No. of households/ establishments covered
 - b. No. of refusals or door locked
 - c. Any other notable occurrences

6. KEY QUALIFICATIONS AND EXPERIENCE

[INSERT NAME OF ULB] would feel that the qualifications, experience and competencies suggested in the Table below are required for the satisfactory delivery of this assignment. The Agency is free to consider this and suggest a team of better and suitable competencies to carry out this assignment.

Position/Role/Feature Qualifications	Description
Key position	Team Leader
Envisaged Role in Team	Overall coordination of teams, liaison with client on weekly basis, Available entire duration of project period
Area of specific expertise desired	Experience of project management and leading multi-disciplinary teams, tasked with preparation of GIS Base Maps, quantitative social and technical household/establishment surveys
Minimum qualifications and professional experience desired	Post-graduation in Urban Planning / Geo-informatics or relevant discipline with 7 years' experience or Graduate in relevant engineering discipline or geoinformatics or Remote Sensing or GIS (or a combination of any two) with minimum of 10 years' experience in contributing and managing components of surveying/mapping assignments with at least two similar tasks (to this RFP) as Team Leader.
Estimated man weeks required after commencement of work	At least 50% of elapsed 12 person-weeks with presence during key milestones and processes
Key position	GIS Specialist
Envisaged Role in Team	Position for up to 2 persons (with experience of Remote Sensing interpretation or Database Administration) to manage the GIS integration at planning and production

Position/Role/Feature Qualifications	Description
Area of specific expertise desired	Experience in interpreting high resolution satellite images for creation of base maps. Good knowledge of databases and GIS to design and optimise database of survey data and link with GIS base map layers. Experience in developing and maintaining Remote sensing and GIS data for city planning and urban management purposes will be an additional qualification.
Minimum qualifications and professional experience desired	Post-graduation in Geo Informatics or Geography or Geology or Earth Sciences or Engineering or other relevant discipline with minimum of 5 years' experience in the planning, production and integration of GIS products. Specialisations in database design and administration or Remote Sensing Interpretation could be added qualifications.
Estimated man weeks required after commencement of work	At least 40% of elapsed 12 person-weeks
Property Mapping Survey Manager	
Key position	Property Mapping Survey Manager
Envisaged Role in Team	Managing the survey component for mapping and digitisation
Area of specific expertise desired	Experience in GPS-based surveys, knowledge of establishing ground control points, experience with data storage and transfer protocols, error corrections and quality assurance processes, for digital base map creation and validating Property Tax database.
Minimum qualifications and professional experience desired	Graduation in Engineering or Surveying or relevant discipline with minimum 4 years' experience in managing mapping components of similar projects; OR Diploma in relevant discipline with at least 7 years' experience in managing mapping components of similar projects. Certification for proficiency in use of GPS-based devices or related software could be added qualification.
Estimated man weeks required after commencement of work	Estimated about 50% of elapsed 12 person weeks
Social Research Manager	
Key position	Social Research Manager
Envisaged Role in Team	Managing the household and establishment survey component and coordination with mapping team

Position/Role/Feature Qualifications	Description
Area of specific expertise desired	Experience in planning, designing and management of questionnaire-based household surveys. Knowledge and experience with quality assurance protocols for household survey, experience of recruitment, training and management of large teams, experience with management of error-free data entry, verification and population of pre-designed databases as required for this assignment.
Minimum qualifications and professional experience desired	Post graduate in social sciences or relevant discipline with at least 7 years of related work experience; demonstrated capability of managing large scale household/establishment surveys or technical surveys collecting quantitative data
Estimated man weeks required after commencement of work	Estimated about 50% of elapsed 12 person weeks

7. DURATION OF THE WORK

The agency will start with the data collection within one week after receiving written notification from [INSERT NAME OF ORGANISATION/ULB] for starting with the assignment. After receiving this written notification, the agency should deliver the final maps and datasets within [MENTION NUMBER OF WEEKS] from the starting date given in the written notification.

8. MILESTONE AND PAYMENT TERMS

Tasks	Milestone	Payment terms
Task A	Inception Report including: <ul style="list-style-type: none"> • Introduction • Methodology • Work Plan • Logistics and support 	[SPECIFY PERCENTAGE] on submission and approval of the inception report
Task B	Interim Report with Work Plan with bi-lingual instruments ported to devices, data model with database structure and map layers	[SPECIFY PERCENTAGE] on submission and approval of the interim report
Task C	For ULB-level maps: <ul style="list-style-type: none"> • Geo-referenced base map as described in the scope of work shall be produced both in digital and hard copy form after necessary quality check. Hard copy base maps are to be prepared at 1:2000 scale ward wise, and also combined map at town level. • Geo-referenced thematic maps at town level with various layers as per scope of work • Final GIS files such as shape file, KML, Image, project file with layout • All the raw data collected and created during the project including spatial and non-spatial data should be provided to the [INSERT NAME OF ULB]. 	[SPECIFY PERCENTAGE] on completion of GIS mapping and submission of draft map outputs in digital and printed form (2 copies)
Task D	For Household and Establishment survey: <ul style="list-style-type: none"> • Weekly status reports • Findings presentation in PowerPoint format • Findings report in Word format • Final data sets in excel and SPSS 	[SPECIFY PERCENTAGE] on completion of Household and Establishment survey and

	<ul style="list-style-type: none"> • Digital photographs of on-site sanitation systems with household/ establishment UID • List including the detailed locations of household/ establishments not covered due to refusals/ door locked 	submission final finding presentation in ppt format, final findings report in word format, final cleaned data sets in excel and SPSS format
Task E	Draft digital GIS Maps with databases linked – ULB 1 and 2	
Task F	Final output Printed and Digital	[SPECIFY PERCENTAGE] on submission of all deliverables as per the contract



ANNEXURES

ANNEXURE I – TECHNICAL PROPOSAL FORMS

FORM A: Outline for Submitting Agency Profile

Name of the Firm/Company (Lead agency):	
Registration details:	
Mailing address of the Firm/Company with contact number, mobile, Fax No.:	
Name and contact details of the consortium partners, if any:	
Lead Agency Contact Person: Contact Mobile: Contact Landline: Email ID:	
PAN No.:	
GST No.:	
Any other relevant Registration details:	

FORM B: List of similar projects undertaken in last 5 years

S. No	Key project title and description	Year	Name of the key client/s	Project value (Lakh INR)
1				
2				
3				
4				
5				

Form C: STAFFING AND TEAM COMPOSITION (To be filled in separately for GIS survey and HH/Establishment survey)

Name of the team member	Experience and Area of expertise	Task assigned in proposal	Number of days allocated

Form D: FINANCIAL PROPOSAL FORMAT

a. SUMMARY BUDGET FORMAT

BUDGET CATEGORY	RUPEES
I. FEE TOTAL	
II. TRAVEL	
III. OTHER EXPENSES	
TOTAL COST	
GRAND TOTAL INCLUDING TAX (with details)	

b. DETAILED BUDGET FORMAT - Detailed cost for GIS and HH and establishment survey should be presented separately, this includes data collection cost, training cost, office expenses and miscellaneous cost

A. Fees						
Sl. No.	Team Member	Role	Fee Rate *	Units	Number of Units Committed	Total
1.						
2.						
3.						
4.						
5.						
6.						
7.						

* Fee is to be mentioned as amount per day/week/month as defined in the next column; The Fee component can be detailed to include internal training and data entry costs. Please provide details

B. Travel					
Sl. No.	Travel Budget	No. of Trips	Mode of Travel (Air/Rail/Road)	Cost/Trip	Total
1.	Out-station Travel				
2.	Local travel				
3.	Travel for Client meetings				

Out-station is for agency location to Coimbatore; local is for travel within the two TPs and Coimbatore, client meetings if any are expected to be in Chennai and Coimbatore

C. Other expenses				
Sl. No.	Particulars	No. of Days	Rate/day	Total
1.	Stay and Food			
2.	Communication	Lump Sum		
3.	Stationery and material	Lump Sum		
4.	Others	<i>Item and cost assumptions to be specified</i>		

ANNEXURE II – HOUSEHOLD AND ESTABLISHMENT SURVEY

[PROVIDE DETAILS OF THE STUDY LOCATION/S]

At the household and establishment level, data pertaining to drinking water and sanitation arrangements will be collected.

a) Basic demographic information of resident households

b) Access to potable water and toilet

- Source of potable water in households/establishments
- No. of households/establishments that have access to individual toilets
- No. of households that have access to CT
- No. of households that share their toilets with other households
- No. of households practicing open defecation

c) Access to safe containment

- Percentage of households/establishments with on-site sanitation arrangements
- Type of on-site sanitation system
- Type of containment structure
- Materials used to build the wall, base and top layer of the containment
- Dimension of the containment

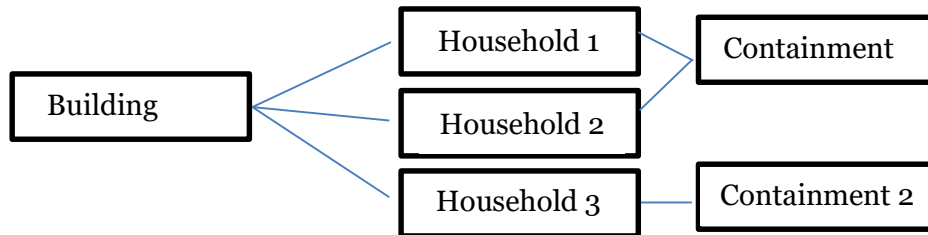
d) Disposal

- Percentage of households/establishments who have ever de-sludged
- Frequency of desludging
- Who cleans the containment

ANNEXURE III - LINKING BASE MAP WITH HOUSEHOLD AND ESTABLISHMENT SURVEY DATA

The household and Establishment surveyed data should be linked through the unique ID of the building (Parent UID). A building may have more than one household and more than one septic tank, these households and containment information's has to be grouped and added within the same building unique ID.

Eg:-



ANNEXURE IV

The Agency will need to devise a physical basis (suggest this is sketch-based, alternative can be suggested) for the verification of mapping data. It is envisaged this will be recorded for every node-to-node section of the map and will incorporate the following data for each of the properties surveyed with node X to node Y.

S. No	Details
1	Latitude and Longitude of property
2	HH/Building Unique ID provided by Agency
3	Ward no.
4	Road name (to be marked on the sketch)
5	Start point (Node X)
6	End point (Node Y)
7	Direction of marking 1 above w.r.t node X to node Y - Left/Right

ANNEXURE V

Sr. No	Layer Name	Vector Representation	Data Source	Attributes
1	ULB Boundary	Polygon	ULB	Area
2	Ward Boundary	Polygon	ULB	Ward. No and Area
3	Slum Boundary	Polygon	ULB	Category – Notified, Non Notified
4	Plots	Polygon	Imagery / Field Survey	Fenced, Not Fenced
5	Buildings	Polygon / Point	Imagery / Field Survey	Occupancy status (Used/vacant/ under construction or development) Total number of floors excluding ground floor Type of Roof Type (residential/ institutions/ commercial/Industrial, Socio cultural, Public and Semi-public, Mixed use (Residential and Commercial or Industrial or Semi-public), etc , Please refer 5a. to 5f.
a.	Residential	Polygons / Points	ULB, Imagery and Field Survey	Slum housing, Plotted Housing, Group Housing, Guest Housing (Lodging & Boarding House), Dharmashala
b.	Commercial	Polygons / Points	ULB, Imagery and Field Survey	Convenience shop, shopping center, service market (retail and Wholesale), Bakery, Hotel only food, Hotel fooding and lodging, commercial Godowns, Spare Parts Shops, Booking Agencies, Warehouse.
c.	Socio Cultural Facility	Polygons / Points	ULB, Imagery and Field Survey	Community Hall, Recreational Club, auditorium, music, dance & drama, centre / meditation, spiritual centre, Old Age Home / Care Centre for Physically /

Sr. No	Layer Name	Vector Representation	Data Source	Attributes
				Mentally challenged / Working women / men hostel / Adult Education Centre / Orphanage / Children's Centre / Night Shelter, Cinema Hall, Marriage Hall, Sports Center.
d.	Industrial	Polygons / Points	ULB, Imagery and Field Survey	Food grains Hardware and Building material Iron and Steel Timber Machinery Auto Parts Textile Chemicals and fertilisers
e.	Public – Semi Public	Polygons / Points	ULB, Imagery and Field Survey	Office Complex, Govt. Office, Private Office, Post Office, Park with toilet facility, Hospital, Veterinary Dispensary, Nursing or Paramedical institute, Medical College, Fire office, Post office, Police Station, Bus Shelters, Railway Station, Bank, ATM, Petrol Bunk, Electric Sub Station ,etc
f.	Mixed Use	Polygons / Points	ULB, Imagery and Field Survey	Residential with Commercial or Industrial or Socio culture or Public & Semi-public
6	Containment	Point	Field Survey	Type of containment structure <hr/> Containment dimensions (partly reported, Partly observed and measured (LxBxD in meter)) <hr/> Location of the containment structure (with identifier to link to different user units (Households, buildings, etc.) <hr/> Access to Containment Structure

Sr. No	Layer Name	Vector Representation	Data Source	Attributes
				(exclusive, shared with others)
7	Over Head Tanks for Water Supply	Point	ULB, Imagery and Field Survey	Source of water, Water Used for
8	Tube/Borewells for Public Water Supply	Point	ULB, Field Survey	In Use (Y/N), Water Used for
9	Pumping Stations for Public Water Supply	Point	ULB, Field Survey	Capacity, Wards covered
10	Public/Common Piped Water Supply Access Points (stand posts, Tanks with taps, Open Well, Hand Pump Protected Wells, and Underground Sump etc.)	Point	ULB, Field Survey	In Use (Y/N), Water Used for
11	Built-up Storm Water Network	Line	ULB, Imagery and Field Survey	Line, Unlined, Closed, Open, Semi - Open
12	Natural Storm Water Network	Polygon / Line	ULB, Imagery and Field Survey	Type, Name, Water Used for, Lined, Unlined.
13	Railway Network	Line	ULB, Imagery and Field Survey	Type of track
14	Road Network	Line	ULB, Imagery and Field Survey	Type of road, Width of the road, Name of the Road, Condition of the road
15	Bio-methanation Plant	Point	ULB, Imagery and Field Survey	
16	Resource Recovery Park for SWM	Polygons	ULB, Imagery and Field Survey	
17	Fecal Sludge Treatment Plant Site	Polygons	ULB, Imagery and Field Survey	
18	Cell Tower/ Telephone Tower	Point	ULB, Imagery	

Sr. No	Layer Name	Vector Representation	Data Source	Attributes
			and Field Survey	
19	Landmarks	Point	ULB, Imagery and Field Survey	
20	SWM Waste Collection/Transfer Bins	Point	ULB, Imagery and Field Survey	
21	SWM Segregation Site	Polygon	ULB, Imagery and Field Survey	
22	SWM Composting Site	Polygon	ULB, Imagery and Field Survey	