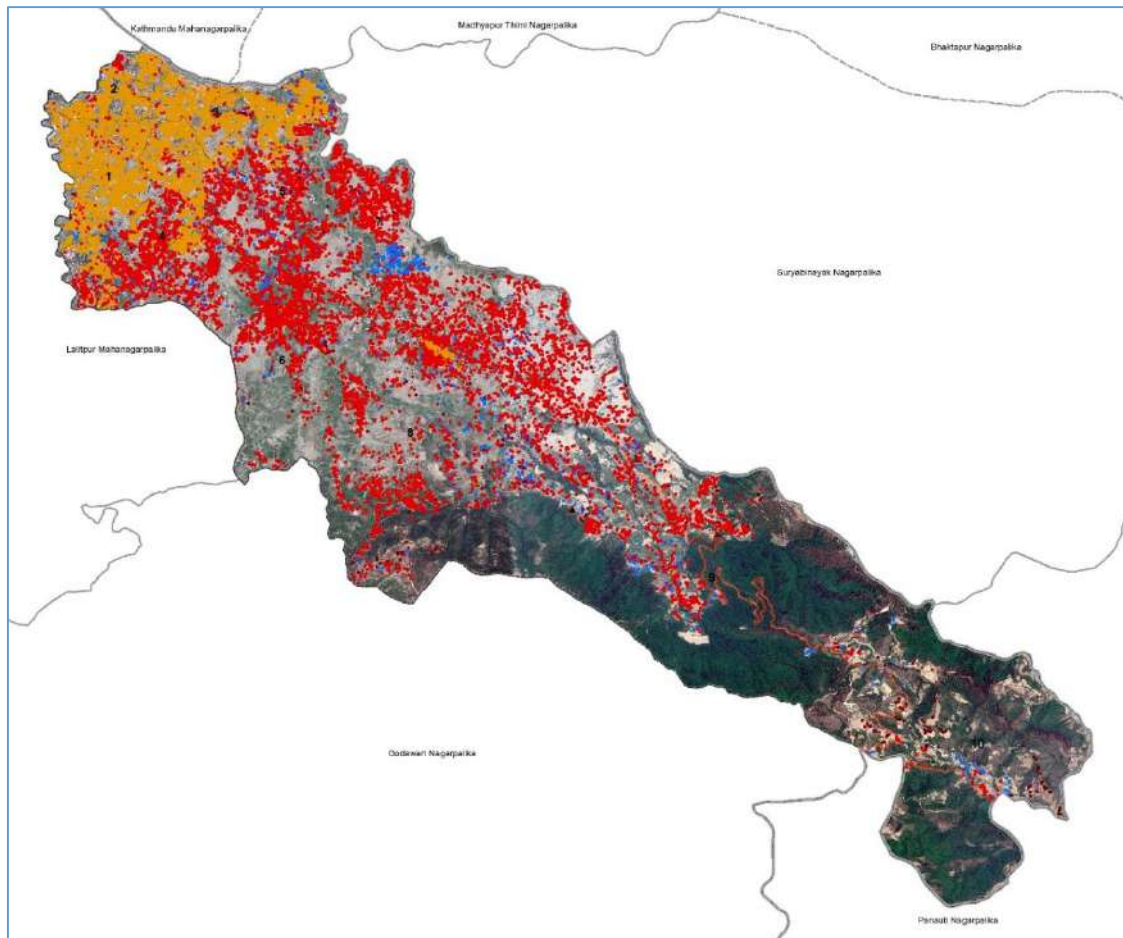


Situational Assessment of Faecal Sludge Management in Mahalaxmi Municipality



Submitted to



Mahalaxmi Municipality

Submitted by



Environment and Public Health Organization

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1 Background

Environment and Public Health Organization (ENPHO) is a service-oriented scientific NGO working in the field of environment, WASH and public health since 1990. The vision of ENPHO is to create eco-societies and to achieve its strategic objectives, ENPHO has been collaborating with various agencies including government agencies to implement several projects and initiatives.

ENPHO has made agreement with The Bill & Melinda Gates Foundation (BMGF) to implement Pilot Implementation of FSM standard in Nepal – Mahalaxmi Municipality as the pilot municipality. This grant will be used to adopt the newly established ISO 24521 FSM service standards in Nepal based on a technical validation first at Mahalaxmi Municipality, Lalitpur and, based on the piloting, later in the two additional municipalities.

Innovative Solution is a consulting company providing state of art technology solutions for development management. Innovative has experience of undertaking multidiscipline projects including studies, survey methodologies design and conducting survey, creating processing and analyzing spatial and non-spatial data and information; developing various IT-enable solutions for strengthening Local Governance in efficient service delivery and revenue enhancement. Some of the major tasks that exhibits the Innovative' s capability of developing new or improving or upgrading existing Information System are the Electronic Building Permit System (e-BPS); GIS-based Municipal Information System (GMIS) that is capable of integrating GIS based urban information system, socio-economic database management system, taxation system, etc. for urban service delivery and municipality's revenue enhancement; and Telecommunication Infrastructure Management Information System for Nepal Telecom Authority. Further, the company has developed the GIS based Integrated Municipal Information System for FSM for SNV Bangladesh funded by BMGF.

Appropriate and well accepted data is essential for the local government authorities to measure the scale of the problem to take initiative for effective and efficient solution. There is still a gap in integrating data. So, it is necessary to establish and institutionalise GIS-based Information System for FSM in Mahalaxmi Municipality to strengthen the role of the municipality in contributing to ensure human health and safety as GIS can provide more support for decision making and planning processes than simple visualization or mapping.

The Integrated Municipal Information System (IMIS) is a Web GIS-based application which composes of GIS server and the client is the web browser or desktop application or mobile. IMIS can be implemented in municipality's day to day workflow in the process of managing municipal faecal sludge. Anyone with general computer skills will be able to use the system. IMIS will able to integrate some of the other municipal functions such as building permit, taxation, sewerage services, water supply services for integrating data sources and optimal benefit of the system for city's urban and revenue management.

2 Objective

The main objective of this assessment is to support the piloting and validation of the ISO 24521- FSM service standard at Mahalaxmi Municipality by performing detailed situational assessment of the municipality, in order to understand the existing environmental sanitation status, thereby supporting to develop a sustainable Faecal Sludge Management (FSM) service delivery model, through coordination and consultations with the municipality, local committees, stakeholders and beneficiaries.

The specific objectives of the consultancy service are as follows:

- Conduct household survey on sanitation situation of Mahalaxmi Municipality
- Analysis of existing sanitation situation across the sanitation value chain;
- Analysis of demand and supply gaps for sanitation services;
- Establishment of GIS-based information system for the municipality

About the Project:

ENPHO is supporting pilot implementation of the ISO 24521 guidelines for the management of basic on-site domestic wastewater services in Mahalaxmi Municipality. To achieve this objective, ENPHO is collaborating with the Municipality, Kathmandu Valley Water Supply Management Board (KVWSMB), Nepal Bureau of Standards and Metrology (NBSM) and other relevant stakeholders. The project, which is supported by the Bill and Melinda Gates Foundation (BMGF) under grant assistance, is the first of its kind in Nepal and globally.

The key objectives of the Project are:

- to test the application of ISO 24521 guidelines for the management of basic on-site domestic wastewater services and thereby help improve environmental sanitation conditions in Mahalaxmi Municipality, and
- to draw lessons from this piloting experience and evidence to recommend adoption of the ISO 24521 guidelines at the national level through policy and practice changes.

Result: A fully functioning FSM service delivery model addressing the entire sanitation service chain – containment, transportation, treatment and reuse.

The Project has three interrelated outputs.

- Output 1:** National adoption of ISO 24521 guidelines by National Bureau of Standards and Metrology;
- Output 2:** Implementation of ISO 24521 guidelines in Mahalaxmi Municipality as a pilot initiative and, based on lessons learnt, replicate in an additional Municipalities; and
- Output 3:** Documentation of impact of implementation of ISO 24521 FSM guidelines and influence policy and practices on domestic wastewater management

3 Methodology

In order to develop an appropriate and well accepted database for the local government authorities, to measure the scale of the problem to take initiative for effective and efficient solution, the survey methodology has been designed at five stages as follows:

Stage 1 - Requirement analysis

Stage 2 - Creation of GIS database

Stage 3 – Census Survey for rapid sanitation situation assessment

Stage 4 – Sample Survey for detail sanitation situation assessment

Stage 5 – Sampling of containment for technical assessment

3.1 Requirement analysis

Several documents related to implementation of FSM standard in Nepal have been collected from concerned organizations. Some of them reviewed in detail are following:

- ISO 24510 – 2007
- ISO 24511 – 2007
- ISO 24521 – 2016
- Feasibility Study on FSM at Madhuban Municipality – 2018

Upon review of above mentioned documents, requirement analysis has been done with massive interaction with key personals of municipality, experts of quality control, TA team members. After several meetings, One-day workshop was conducted to finalize the data and information required for existing sanitation situational assessment of Mahalaxmi Municipality. On the basis of this analysis, checklist for census survey and questionnaire for sample survey of households were developed (Annex-1 and Annex-2).

3.2 Creation of GIS database

First of all, images of Mahalaxmi Municipality were downloaded from Google, and all buildings and road network were digitized to prepare a base map of the municipality (Annex-3). During digitization, all visible structures such as temple, temporary hut, etc are digitized. Each of the structures was assigned with a Building Identification Number (BIN). Then, the whole area of municipality was divided into 90 grids of scale 1:1000 with size of 790m x 530m. Then, 90 map sheets in A1 size with colour were printed for field verification (Annex-4).

The surveyors were oriented about map reading and identifying location as per map sheet in the field. They visited the particular area of map sheet and visited each and every structure as shown in the map sheet and noted if that structure is building or monument such as temple, church, or something else. Any building not mentioned in the map was also noted and marked in the map. In case of road too, they verified each and every road seen in the map and in the field. If there were any road observed in the field and not mentioned in the map, they noted it and marked in the map. After updating all buildings and road networks, an updated base map

of the municipality was prepared and GIS database was created with BIN and basic feature such as type of building.

3.3 Census survey of rapid sanitation situation assessment

The main objective of this task is to assess quickly the existing sanitation situation of the municipality including all houses including residential, commercial and both, buildings with offices, institutions, industry, schools/colleges. A checklist for such assessment was prepared with brief information on sanitation situation with type of building, number of households and population, type of toilet, connection of toilet to sewerage or containment, etc. A mobile app was developed and checklist was uploaded for use.

The updated base map of the municipality was printed in 85 sheets in A1 size with colour for census survey. The surveyors were oriented for census survey on rapid sanitation situational assessment. They were provided one Tablet with App and map sheets of updated base map of the municipality. After data collection in the field, the surveyors uploaded data from Tablet to the Server, which were easily assessed by the supervisor and data analyst. Thus, the data were uploaded in the server each day by surveyors and the data analyst checked data quality each day.

The data were downloaded each day and checked for consistency and missing. After cleaning and processing, the data were analysed and generated required tables presenting sanitation situation of the municipality.

3.4 Sample survey for detail containment assessment

The sample survey was designed for existing sanitation situational assessment in detail based on census survey data.

Sampling frame

The list of building with containment was used as a sampling frame for the sample survey. The census survey has enumerated about 11542 buildings with containment. Most of them are located in ward 5 to 10. The sampling unit is a building with containment.

Sample size

A sample size of 400 buildings with 5% margin of error at 95% confidence level was determined with consultation of TA team members. The sample size consists of 3.46% of total buildings with containment.

Sampling method

A multi-stage sampling method was used for sample survey. First of all, the municipality was divided into 90 grids of size 790m x 530m. The number of buildings with containment was listed for each grid. In case of a grid with less than 35 buildings with containment was merged with neighbor grid since sample size is 3.46%. The sample was allocated to each grid using

probability proportional to size (i.e., building with containment). A number of buildings for sample from each grid was determined and a list of all buildings with containment was prepared for each grid. Then a sample of buildings was selected using systematic sampling technique from each grid separately.

Data collection

A group of 15 surveyors were oriented for data collection using mobile app for sample survey. The questionnaire was explained discussed in detail. The surveyors were provided the map sheet of with marked sample building for survey so that they can easily identify the sample building in the field. After data collection, the surveyors uploaded data from Tablet to the Server each day, which were easily assessed by the supervisor and data analyst.

Data analysis

The data were downloaded each day and checked for consistency and missing. After cleaning and processing, the data were analysed and generated required tables presenting sanitation situation of the municipality.

3.5 Sampling of containment for technical assessment

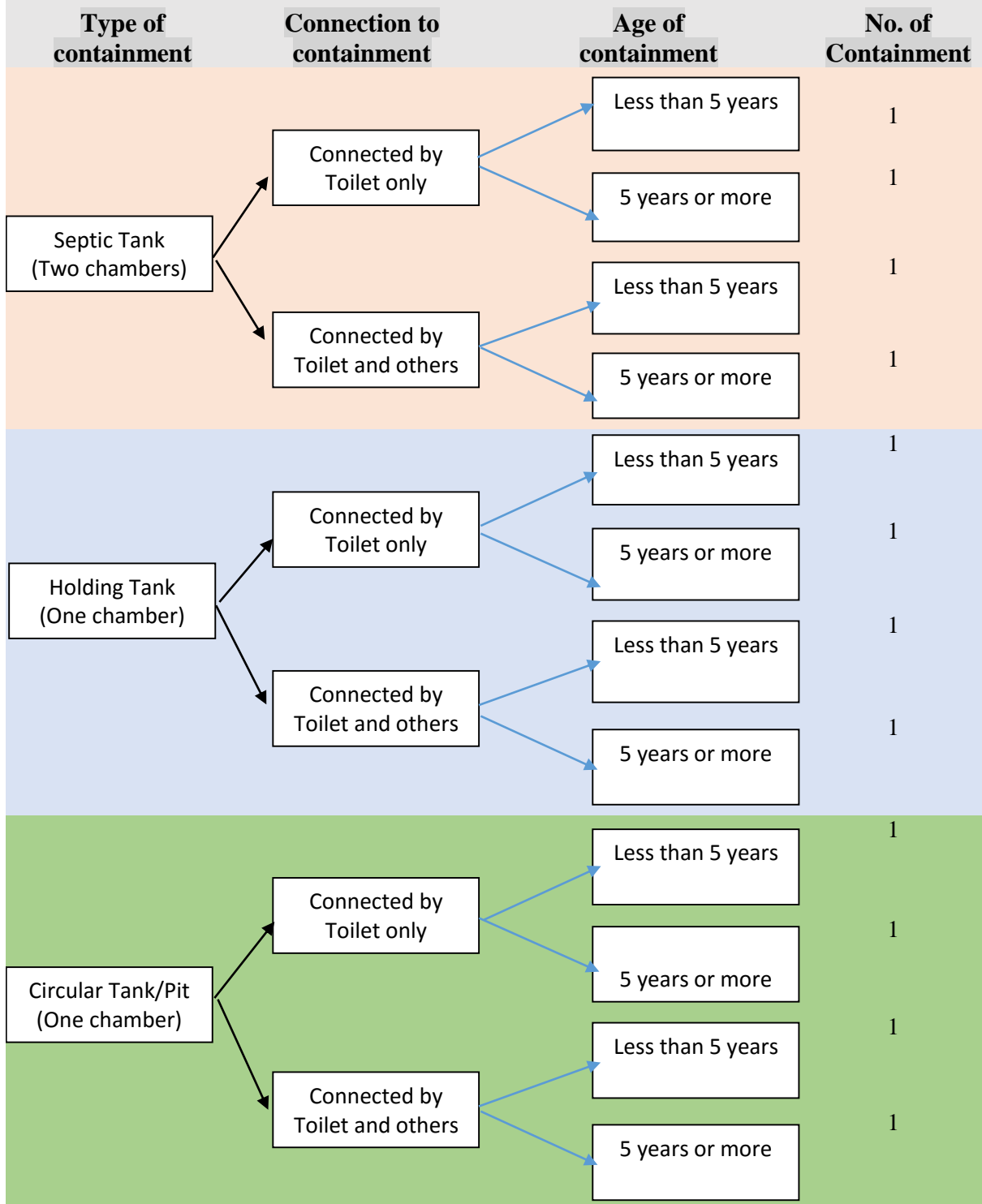
The main objective of technical assessment of containment is to assess the volume and quality of faecal sludge of containment, to examine the design of containment, size of containment and other detail engineering and technical aspect of containment. Based on the budget availability, about 12 containments will be selected for the detail investigation of containment. The basic criteria for such selection are set as follows:

- Type of containment – Septic tank/ holding tank/ pit
- Connection to containment – from toilet only/ toilet and other waste water
- Age of containment- less than 5 years/ 5 years or more

Distribution of 12 containments for technical examination

Characteristics of containment	No. of containment
Type of containment	
• Septic Tank (two chambers)	4
• Holding tank (one chamber)	4
• Circular tank/Pit (one chamber)	4
Connection to containment	
• Only toilet	6
• Toilet and other	6
Age of containment	
• Less than 5 years	6
• 5 years or more	6

Selection of Containment for Technical Examination



Summary of Methods of Survey on Sanitation Situation Assessment

Stage 1- Requirement Analysis	<ul style="list-style-type: none"> • Review of related documents • Prepare checklist for census survey on quick sanitation situation assessment • Prepare checklist for detail household survey on existing sanitation situation • Develop Mobile/Tablet App for collecting data for census survey on quick sanitation situation assessment • Develop Mobile/Tablet App to collect data from household survey
Stage 2- Creation of GIS database	<ul style="list-style-type: none"> • Preparation of Images of Mahalaxmi Municipality thru Satellite Images • Digitization of building, visible structure, and road network • Preparation of maps of municipality at scale • Provide orientation to Surveyors for field verification • Field verification of buildings and road networks using map • Update of new buildings and road networks in the map • Assign a building number to all buildings in the map • Preparation of Base map of municipality • Preparation of GIS database of all buildings and road networks of the municipality
Stage 3– Census Survey	<ul style="list-style-type: none"> • Printing of Base map of Mahalaxmi with assigned building number • Provide orientation to surveyors on using App and checklist for census survey • Mobilize surveyors at the field for census survey • Download data on quick sanitation situation assessment • Process and analyze data on quick sanitation situation assessment • Prepare appropriate tables presenting quick sanitation situation of the municipality
Stage 4 – Sample Survey	<ul style="list-style-type: none"> • Design sampling method to conduct household survey • Prepare sampling frame • Provide orientation to surveyors for household survey • Mobilize surveyors for household survey at the field • Download data on household survey • Process and analyze data on existing sanitation situation of the municipality • Prepare appropriate tables presenting existing sanitation situation of the municipality • Analysis of existing sanitation situation across the sanitation value chain • Analysis of demand and supply gaps for sanitation services

4 GIS Database

Several documents related to implementation of FSM standard in Nepal have been collected from concerned organizations. Some of them reviewed in detail are following:

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First of all, images of Mahalaxmi Municipality were downloaded from Google, and all buildings and road network were digitized to prepare a base map of the municipality (Annex-3). During digitization, all visible structures such as temple, temporary hut, etc are digitized. Each of the structures was assigned with a Building Identification Number (BIN). Then, the whole area of municipality, which is 26.51 sqkm was divided into 90 grids of scale 1:1000 with size of 790m x 530m. And further, 90 map sheets in A1 size with colour were printed for field verification (Annex-4).

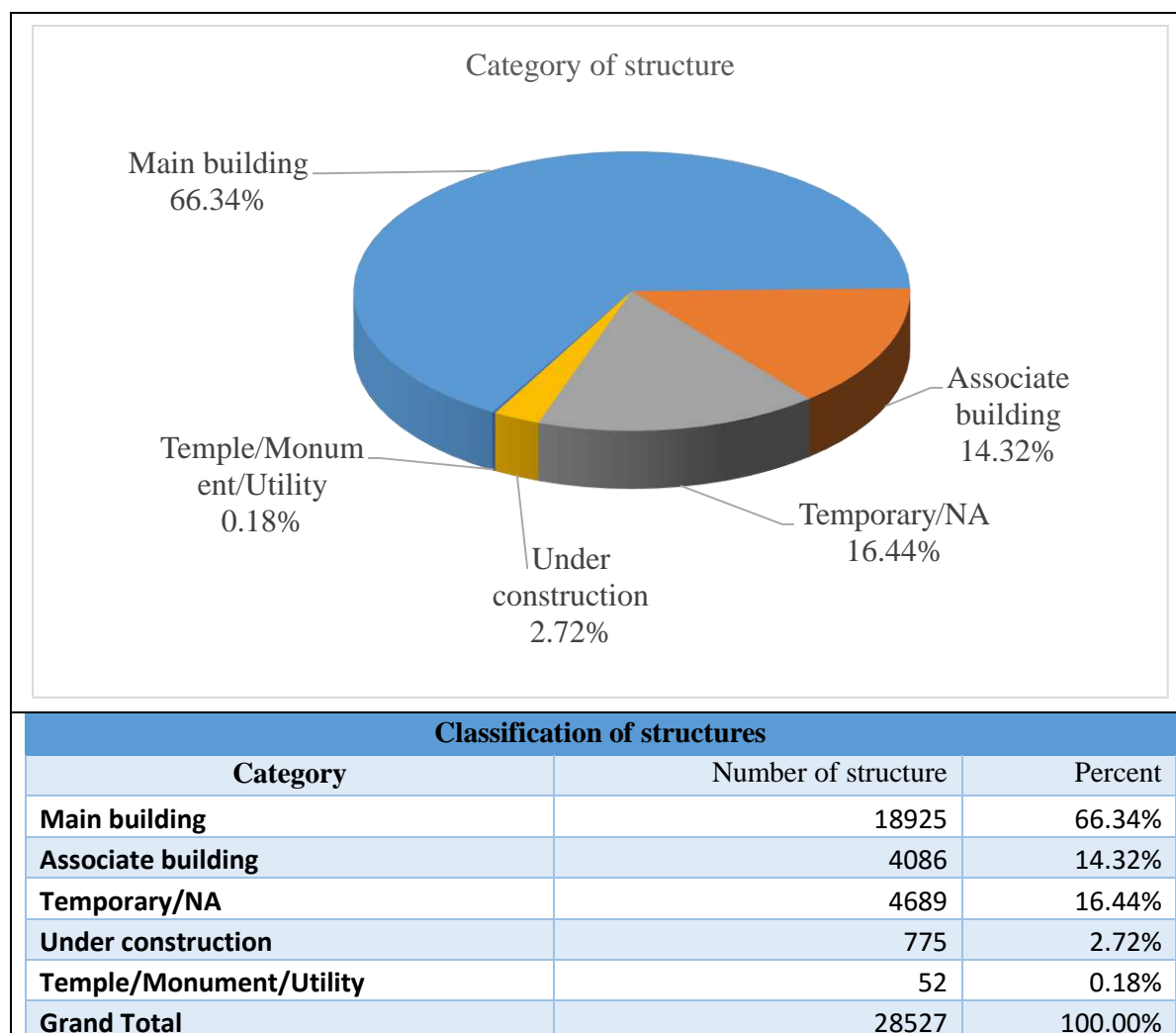
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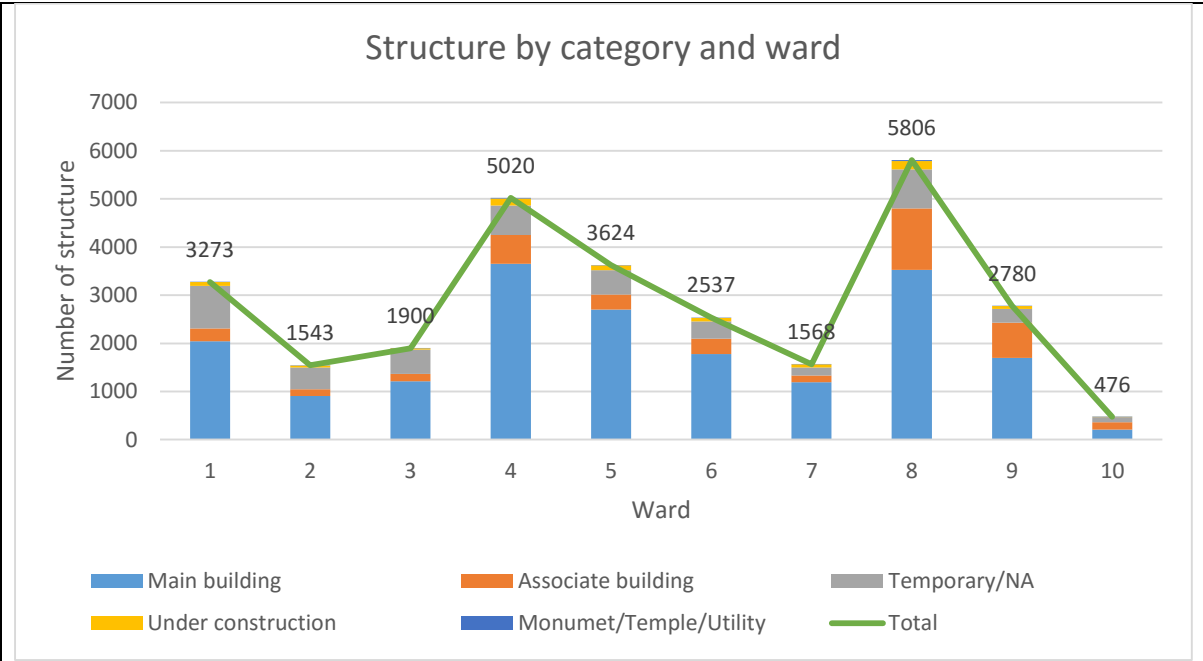
The GIS database includes 28527 structures identified and visited in the field. The structures were classified into five major categories as follows:

- **Main building** - Main building are permanent structures where people are living during daytime, nighttime or both and where people have toilet.
- **Associate building**- Associated building is the building, which is the associated with main building and owned by the owner of the respective main building. The data of associate buildings are included in the data of the respective main building

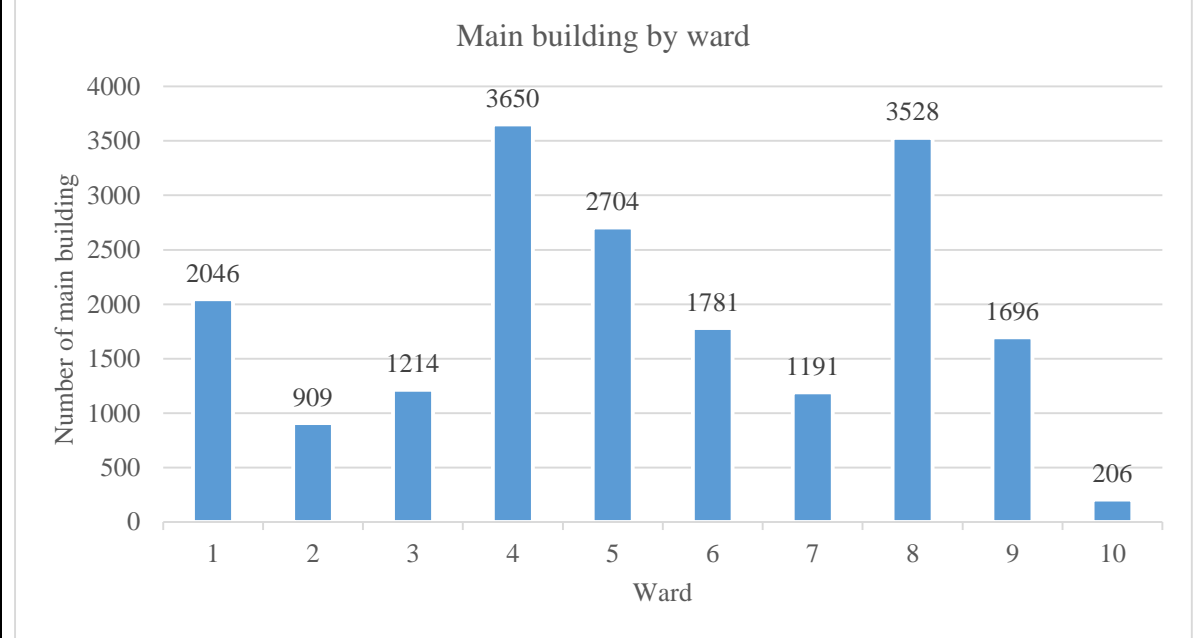
- **Temporary/NA**- Temporary building are temporary structures, usually made of CGI sheet, where people are not living during the nighttime and where people do not have toilet or use shared toilet
- **Under construction** - The building which are in the phase of construction during the time of survey
- **Temple/monument/utility** – Temple, landmark, and public toilet

According to above mentioned classification, there are 18925 main buildings with 4086 associate buildings. The distribution of all structures by ward is shown below in table and chart.





Structure by category and ward											
Category of structure	Number of structures by ward										
	1	2	3	4	5	6	7	8	9	10	Total
Main building	2046	909	1214	3650	2704	1781	1191	3528	1696	206	18925
Associate building	265	135	151	604	309	316	142	1275	734	155	4086
Temporary/NA	881	454	503	606	510	360	168	812	287	108	4689
Under construction	80	43	30	152	97	74	66	173	56	4	775
Monument/Temple/Utility	1	2	2	8	4	6	1	18	7	3	52
Total	3273	1543	1900	5020	3624	2537	1568	5806	2780	476	28527



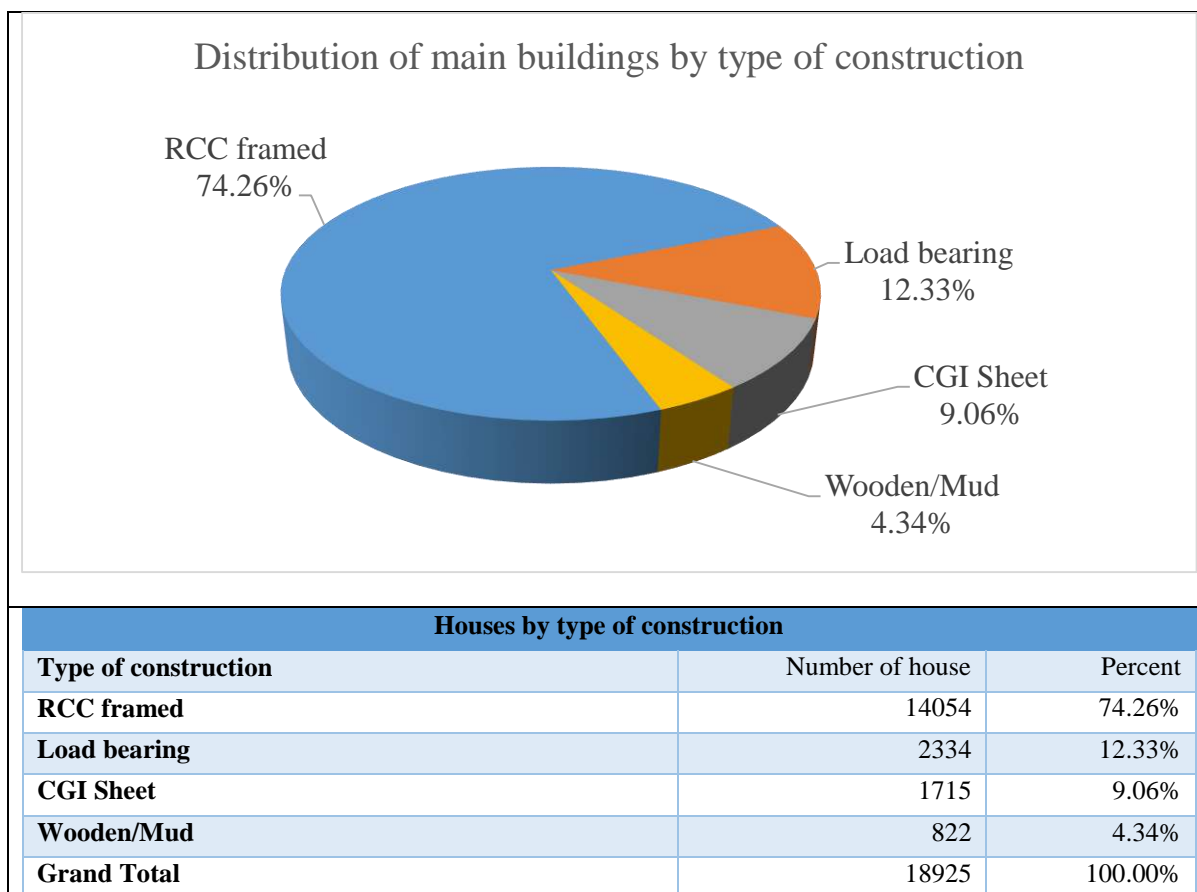
5 Sanitation situation assessment based on census survey

The census survey has covered only main building which includes information of associate building also. The census survey has collected information on rapid sanitation situation of as follows:

List of information covered in census survey	
Location information	<ul style="list-style-type: none"> ⇒ Building identity number (BIN) ⇒ GPS of building ⇒ Name of location ⇒ Ward number ⇒ Grid number
Owner information	<ul style="list-style-type: none"> ⇒ Name of owner ⇒ Gender of owner ⇒ Respondent (Y/N) ⇒ Name of respondent ⇒ Gender of respondent
Building information	<ul style="list-style-type: none"> ⇒ Construction type ⇒ Number of floor ⇒ Purpose of use ⇒ Number of family ⇒ Number of people
Sanitation system	<ul style="list-style-type: none"> ⇒ Toilet in premises ⇒ Open defecation practice ⇒ Number of toilets ⇒ Location of toilet ⇒ Connection of toilet
Containment information	<ul style="list-style-type: none"> ⇒ Type of containment ⇒ Age of containment ⇒ Location of containment ⇒ Emptied or not
Drinking water	<ul style="list-style-type: none"> ⇒ Main source of drinking water ⇒ Satisfaction with quality of drinking water ⇒ Well in premises

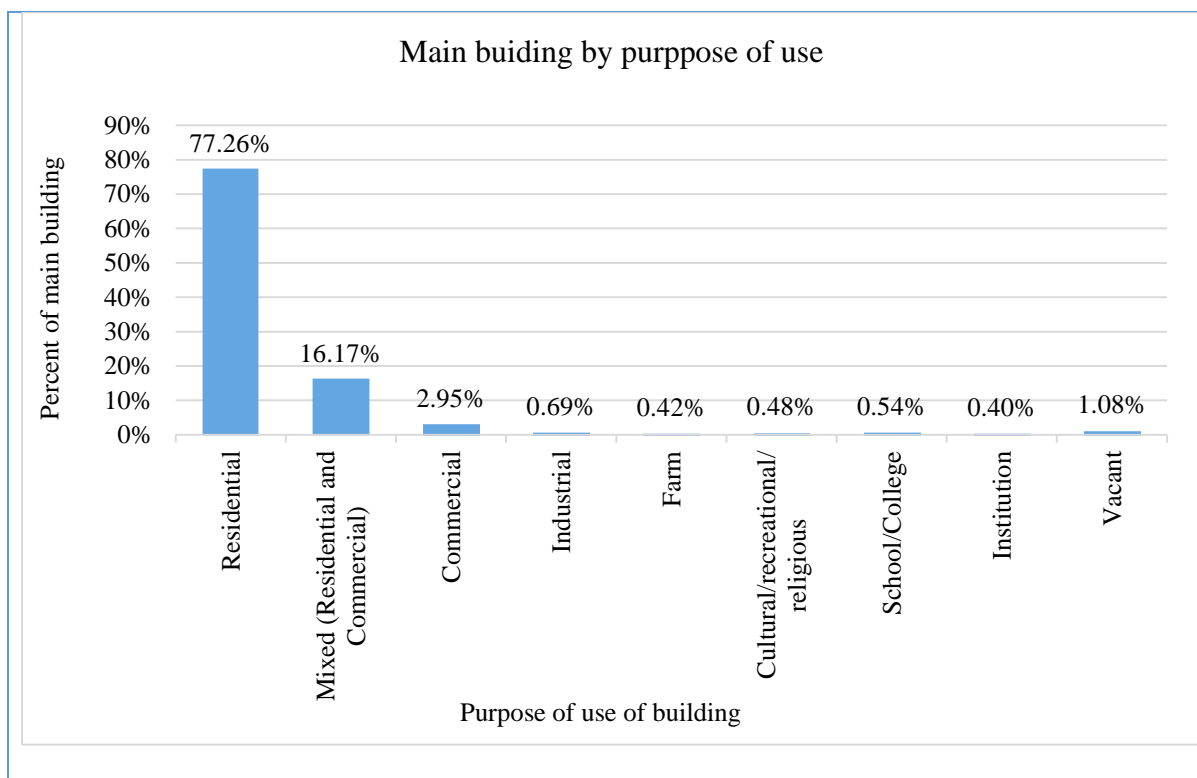
5.1 Building information

The census survey has enumerated 18925 main buildings, of which 74.26% are RCC framed, 12.33% of load bearing, 13.40% are CGI sheet and wooden/mud. About 77% of the buildings were used for residential purposes, 16% for both residential and business purpose. About 3.7% buildings were used for commercial and industrial purpose. The spatial distribution of buildings is shown in GIS map.



The buildings were mostly used for residential purpose. About 93.43% buildings were using for residential purpose including some 16.17% building using for both commercial and residential purposes. Very few buildings (2.95%) were used for pure commercial purposes and 0.69% buildings were occupied by industries. The other purposes are shown in the table and chart.

The census survey has noted that population of Mahalaxmi Municipality increased by 2.32 times that of 2011. As per the population census 2011, the population of the municipality was 62172 only which increased up to 144820 till the survey time.



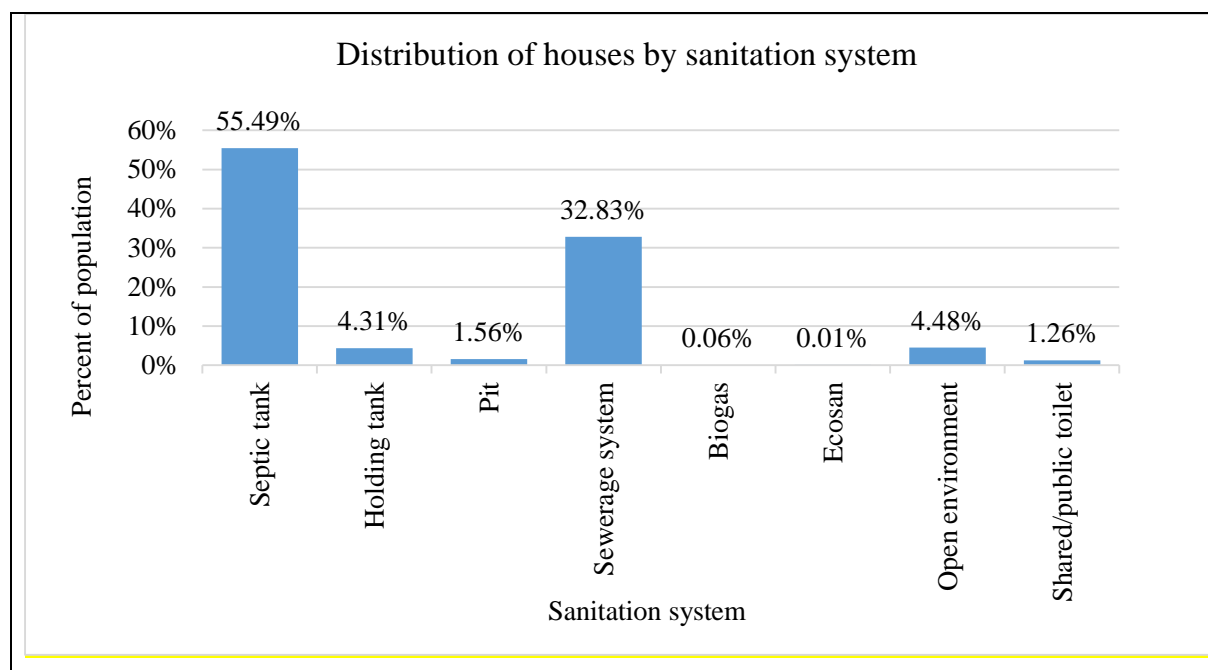
Main building, household and population by purpose of use						
Purpose of use	Number			Percent		
	Main building	Household	Population	Main building	Household	Population
Residential	14621	20734	82365	77.26%	70.98%	56.87%
Mixed (Residential and Commercial)	3060	7067	26762	16.17%	24.19%	18.48%
Commercial	559	1015	3207	2.95%	3.47%	2.21%
Industrial	131	121	845	0.69%	0.41%	0.58%
Farm	79	73	268	0.42%	0.25%	0.19%
Cultural/recreational/religious	91	28	92	0.48%	0.10%	0.06%
School/College	103	103	30723	0.54%	0.35%	21.21%
Institution	76	72	558	0.40%	0.25%	0.39%
Vacant	205			1.08%		
Total	18925	29213	144820	100.00%	100.00%	100.00%

Census year	1991	2001	2011	2019
Population	29626	35902	62172	144820
Number of HHs	5532	7262	14930	29213
Household size (per/hh)	5.36	4.93	4.16	4.96
Density (per/ha)	11.18	13.51	23.45	54.93

House, Household and population by ward			
Ward	Number of main building	Number of household	Population
1	2046	3677	17839
2	909	2313	9695
3	1214	2636	9461
4	3650	5484	31880
5	2704	4608	21312
6	1781	2301	13455
7	1191	1783	7476
8	3528	4306	22445
9	1696	1904	10469
10	206	201	788
Total	18925	29213	144820

5.2 Sanitation system

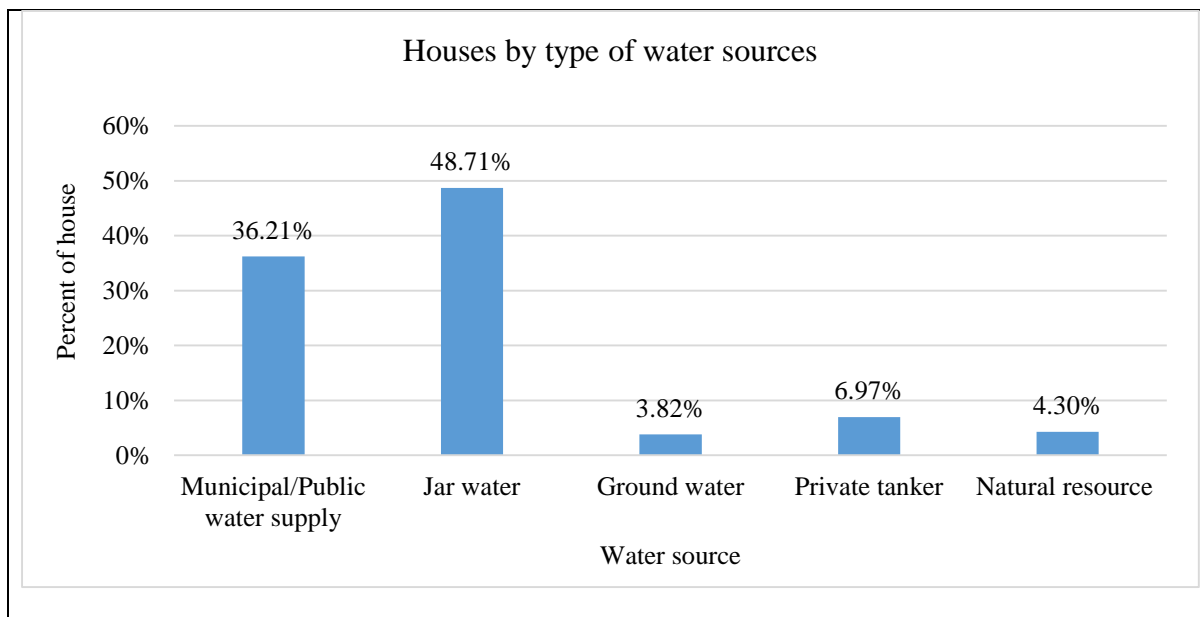
In Mahalaxmi, majority of the houses have toilets connected to containment and one third houses were connected to sewerage system. Here, containment represents for septic tank, holding tank and pit. About 61.36% houses have containment, of which 55.49% septic tank, 4.31% holding tank, and 1.56% pit. About 1.26% houses have no toilet and share with neighbouring toilet or use public toilet. The spatial distribution of buildings with sanitation system is shown in GIS map. Further, road network, landuse, soil class, geology type, and satellite image have been overlaid with the sanitation systems of buildings in GIS maps.



Houses with sanitation systems												
Type of Sanitation system	Ward										Total	Percent
	1	2	3	4	5	6	7	8	9	10		
Septic tank	95	100	104	1769	1553	1613	1009	2798	1405	55	10501	55.49%
Holding tank	10	0	0	77	127	78	152	196	134	42	816	4.31%
Pit	5	1	9	15	18	27	9	69	61	82	296	1.56%
Sewerage system	1881	783	1013	1455	858	26	0	197	1	0	6214	32.83%
Biogas	0	0	0	2	0	1	0	6	3	0	12	0.06%
Ecosan	0	0	0	0	0	1	0	0	0	0	1	0.01%
Open environment	47	9	78	298	110	11	6	215	66	7	847	4.48%
Shared/public toilet	8	16	10	34	38	24	15	47	26	20	238	1.26%
Total	2046	909	1214	3650	2704	1781	1191	3528	1696	206	18925	100.00%

5.3 Drinking water

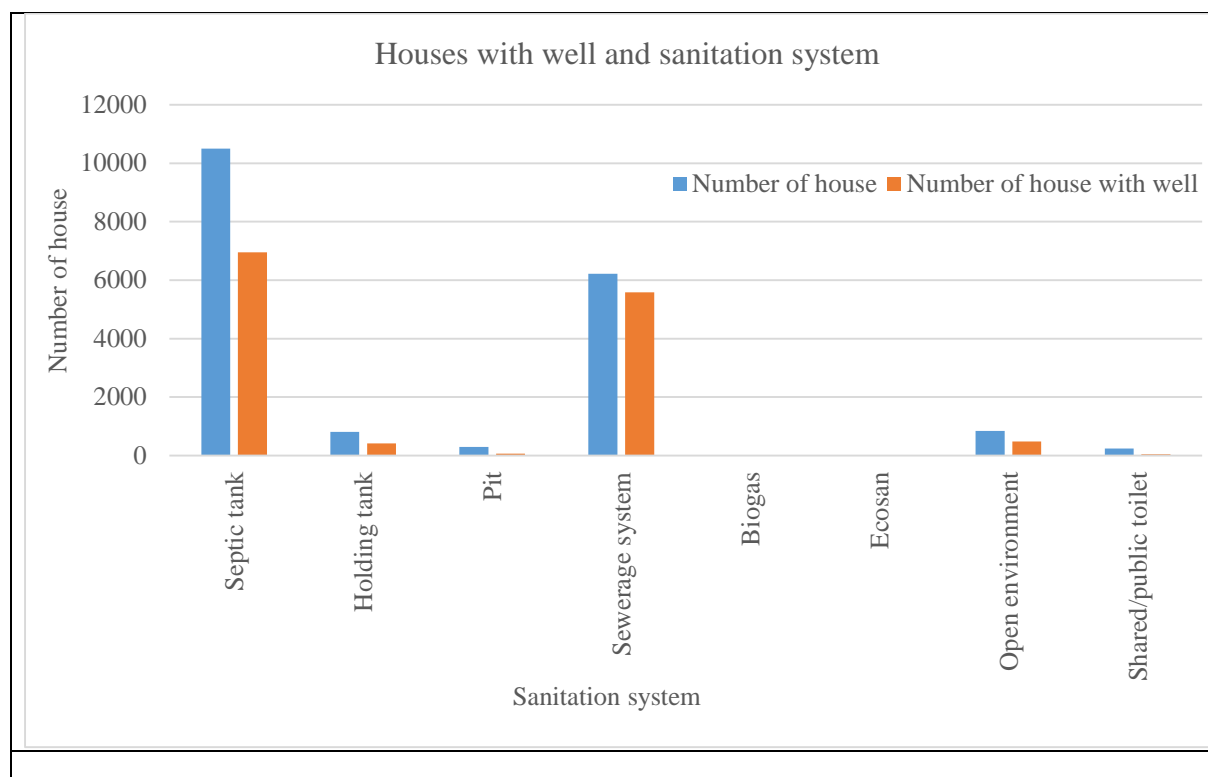
Almost half of the houses use jar water for drinking. About 36.21% houses use municipal or public water for drinking and nearly 7% houses use private tanker for drinking purpose. About 3.82% houses use ground water such as well, dug well, tube well, and deep boring. Some 4.3% houses were found using natural resources such as spring/can/river, rainwater and others.



Distribution of houses by source of water		
Source of water	Number of house	Percent of house
Municipal/Public water supply	6852	36.21%
Jar water	9218	48.71%
Ground water	722	3.82%
Private tanker	1319	6.97%
Natural resource	814	4.30%
Total	18925	100.00%

5.4 Well in premise

In Mahalaxmi, about 71.7% houses have well in their premises. Considering, the sanitation systems, about 66.22% houses with septic tank have well also in their premise. Similarly, about 51.59% houses with holding tank have well, and in case of houses with pit, about 23.99% houses have well. The spatial distribution of houses with containment and well is shown in the GIS map.



Type of Sanitation system	Number of house	House with well	
		Number	Percent
Septic tank	10501	6954	66.22%
Holding tank	816	421	51.59%
Pit	296	71	23.99%
Sewerage system	6214	5582	89.83%
Biogas	12	4	33.33%
Ecosan	1	1	100.00%
Open environment	847	488	57.62%
Shared/public toilet	238	48	20.17%
Total	18925	13569	71.70%

6 Containment assessment based on sample survey

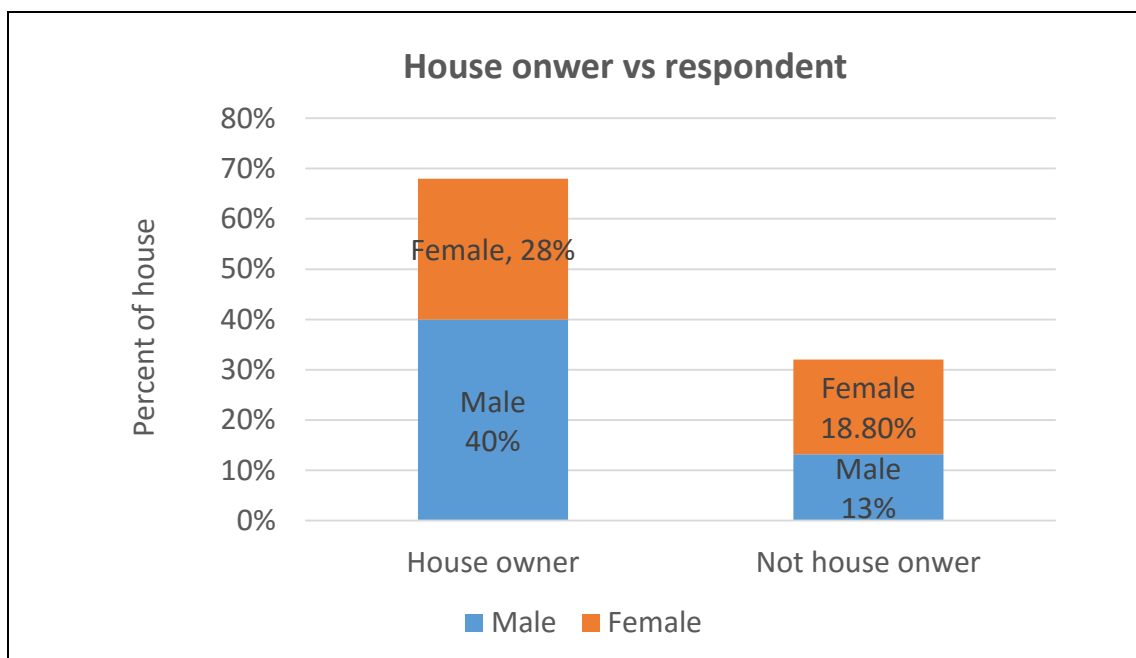
The sample survey of 400 houses were undertaken to access existing situation of containment of Mahalaxmi Municipality. Most of the sampled houses were selected from ward 5 to 10 as the houses with containment were mostly located in these wards since most of houses of remaining wards connected to sewerage system. The selected houses were mostly residential and mixed with commercial too.

In the survey, the detail information of toilet and containment were collected. The major information included are followings:

- Owner information
- Household characteristics
- Toilet characteristics
- Containment characteristics – construction type, emptying frequency, emptying practices and willingness to pay for emptying, distance between containment and nearby well, accessibility of containment to road
- Water use
- Characteristics of service provider
- Knowledge of users on fecal sludge management

6.1 Owner's information

Among 400 sample houses, about 68% respondents were owner of the house, of which 28% female and 40% male. Altogether, about 62.25% houses were owned by male and 37.75% houses were owned by female. Among the respondents, 53.25% were male and 46.75% were female.



Gender disaggregation of House Owner and respondent									
Percent of house					Number of house				
Type of Respondent	Gender of Respondent	Gender of House Owner			Type of Respondent	Gender of Respondent	Gender of House Owner		
		Female	Male	Total			Female	Male	Total
House Owner	Female	28.00%		28.00%	House Owner	Female	112	-	112
	Male		40.00%	40.00%		Male	-	160	160
	Total	28.00%	40.00%	68.00%		Total	112	160	272
Not House Owner	Female	6.00%	12.75%	18.75%	Not House Owner	Female	24	51	75
	Male	3.75%	9.50%	13.25%		Male	15	38	53
	Total	9.75%	22.25%	32.00%		Total	39	89	128
All Respondent	Female	34.00%	12.75%	46.75%	All Respondent	Female	136	51	187
	Male	3.75%	49.50%	53.25%		Male	15	198	213
	Total	37.75%	62.25%	100.00%		Total	151	249	400

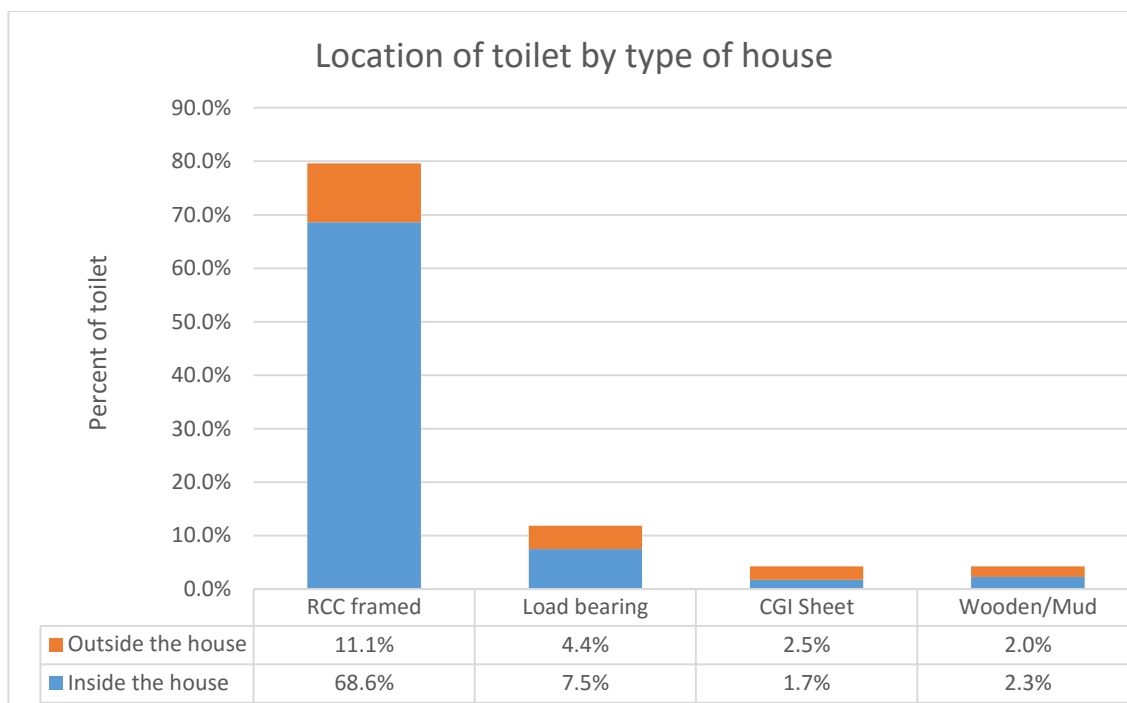
6.2 Household characteristics

The sample survey of 400 houses covered 535 houses and 2046 residents with average number of people in a house is 5.1 and average number of people in a household is 3.8. About 80% houses were single family owned and 20% houses have more than one family/household. About 42.1% households were rented. In terms of gender of residents, 48% consists of male and 52% consists of female in adult as well as in children. The adult population is 86% whereas children is 14%. The sampled houses were mostly RCC framed (73.8%) followed by load bearing (13.8%), CGI sheet and mud/wooden of 12.6%.

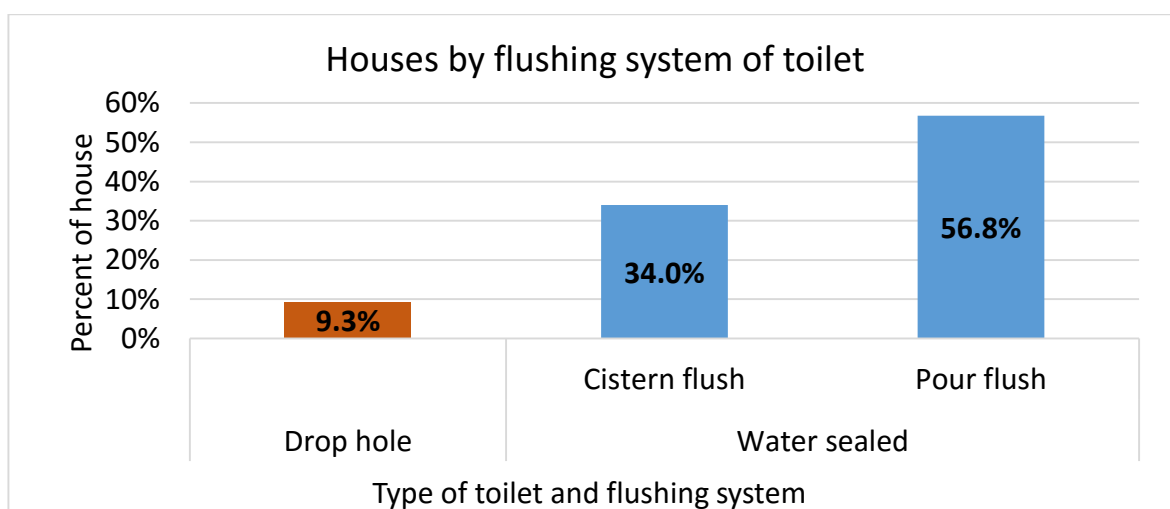
6.3 Toilet characteristics

The survey has enumerated 751 toilets from selected houses. Every 100 houses have 188 toilets of which 20% toilets were located outside the house and 80% were inside. The number of toilets vary according to construction type of house. The RCC framed houses have 80% toilets, load bearing houses have 12% and remaining 8% toilets are in houses of CGI sheet and mud/wooden type. Regarding flushing system of toilet, most of the houses have water sealed toilet (91%) with flushing system (34%) and pour flush (57%). About 34% houses have just drop hole type toilet. However, most of the respondents (93.5%) were satisfied with their toilet as good condition.

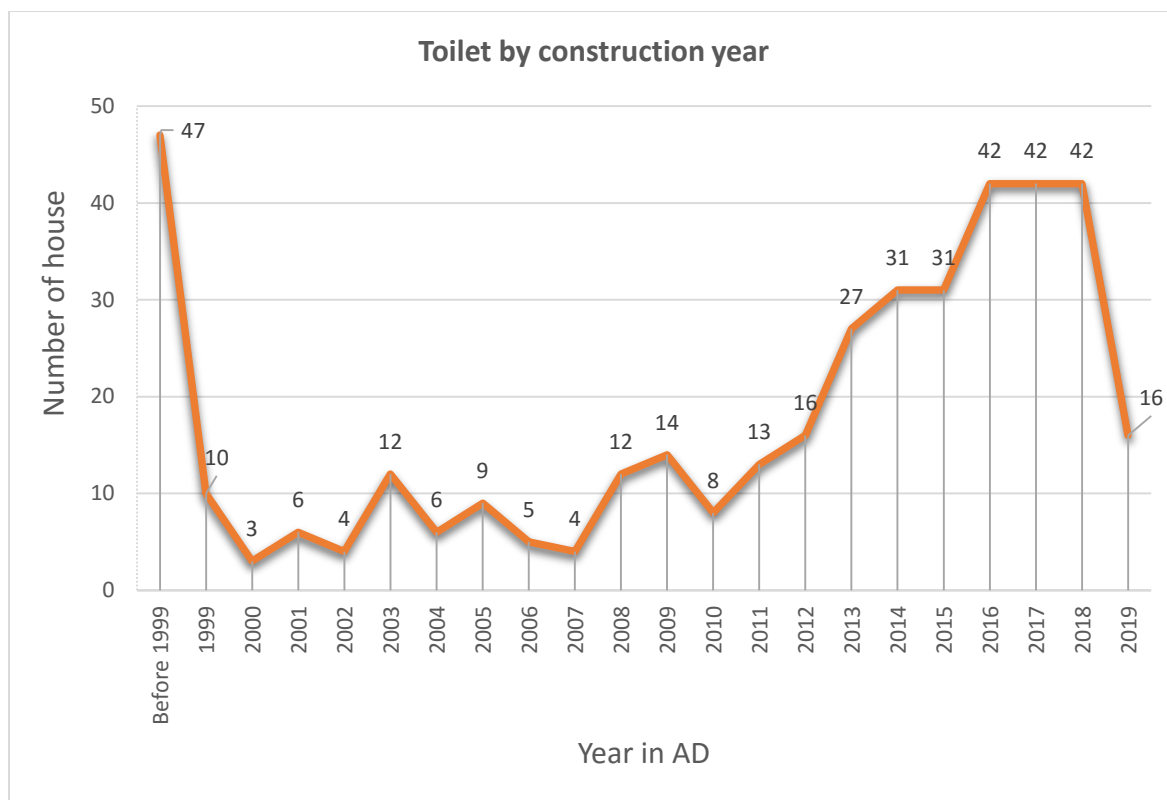
Regarding age of toilet, one fourth (25%) of the houses had constructed toilet within last two years and about 51% houses had constructed their toilets within last five years.



Number and percent of toilets by type of house and location of toilet						
Type of house	Percent of toilet			Total number of toilet		
	Total	Inside the house	Outside the house	Total	Inside the house	Outside the house
RCC framed	79.6%	68.6%	11.1%	598	515	83
Load bearing	11.9%	7.5%	4.4%	89	56	33
CGI Sheet	4.3%	1.7%	2.5%	32	13	19
Wooden/Mud	4.3%	2.3%	2.0%	32	17	15
Total	100.0%	80.0%	20.0%	751	601	150



Houses by type of flushing system of toilet			
Flushing system		Percent of house	Number of house
Water sealed	Drop hole	9.3%	37
	Cistern flush	34.0%	136
	Pour flush	56.8%	227
Total		100.0%	400



Percent and number of toilet by age group		
Age of toilet	Percent	Number
0 to 2 years ago	25%	100
3 to 5 years ago	26%	104
6 to 10 years ago	20%	78
11 to 15 years ago	9%	36
16 to 20 years ago	9%	35
More than 20 years ago	12%	47
Total	100%	400

6.4 Containment characteristics

6.4.1 Physical structure

The sample survey has considered 400 houses with containment consisting of 362 houses with septic tank, 31 houses with holding tank and 7 houses with pit. It has been already mentioned in previous chapter that the type of containment was enumerated through interview with respondent in census survey.

In order to verify the type of containment noted in census survey with sample survey, the surveyor observed the containment physically and noted the shape of containment in sample survey. In addition to this, the surveyor asked respondents about number of chambers inside the containment for holding tank and septic tank, number of ring for pit, sealed or unsealed inside, location of outlet. For the measurement, they measured length, width of tank, diameter of pit and asked about depth to the respondent.

The number of containment defined by respondents during census survey and their characteristic collected during sample survey is shown in the following table.

Number of containment by type and its characteristics

Features of containment		Type of containment as of census			
		Septic tank	Holding tank	Pit	Total
Shape of containment	Rectangular	271	26	5	302
	Circular	91	5	2	98
	Total	362	31	7	400
Number of chambers	One chamber	189	29		218
	Two chambers	147	1		148
	Don't know	26	1	7	34
	Total	362	31	7	400
Sealed or unsealed	Sealed	106	5		111
	Unsealed	94	13	6	113
	Wall sealed but base not sealed	131	13	1	145
	Don't know	31			31
	Total	362	31	7	400
Location of outlet	Bottom part of the side of tank	1			1
	Mid part of the side of tank	3			3
	Top part of the side of tank	60	5		65
	Don't know	298	26		324
	Total	362	31	7	400

It was interestingly noted that many respondents were unaware of the type of containment even in shape. Some of them do not know about the structure of the containment such as number of chambers, whether sealed inside or not, and location of outlet. However, majority of the respondents have answered the questions regarding characteristics of the containment. But, those responds were not consistent with the type of containment that they had mentioned earlier.

Some of major inconsistencies observed during sample survey compared to census survey regarding septic tank, holding tank and pit are followings:

- Out of 362 houses with septic tank according to respondent in census survey,
 - 271 houses' septic tanks were rectangular and **91 were circular in shape**
 - 142 houses' septic tank had two chambers, **189 had one chamber, 26 houses' respondents were not clear about number of chamber**
 - 106 houses' septic tanks were sealed, **225 were partially or completely unsealed**
 - 60 houses' septic tanks had outlet at the top of the tank, **298 houses were unknown about it, and 4 had either on the bottom or mid of the tank**
- Out of 31 houses with holding tank according to responded in census survey,
 - 26 houses' holding tanks were rectangular and **5 were circular in shape**
- Out of 7 houses with pit according to census survey,
 - 2 houses' pits were circular and **5 were unknown in shape**

6.4.2 Criteria of a septic tank

The criteria used in the survey to define a containment as a septic tank are followings:

1. Rectangular in shape
2. Two chambers inside
3. Sealed all four walls and base
4. Outlet at the top of the tank

A septic tank should have all above four features. If the containment is rectangular in shape but does not have all other three features, then it is considered as a holding tank. If the containment is circular in shape, then it is considered as a pit.

Further, analyzing in detail, the percent of respondents who had mentioned a containment as a septic tank correctly, only 43 respondents' out of 362, were correct, which is 12%. In other words, among the sampled houses with septic tank, only 12% houses had really septic tank, whereas, 63% houses had holding tank and 29% houses had either pit or unknown instead of septic tank. That means, if a respondent mentioned that he/she had a septic tank, then the probability that he would have really a septic tank would be only 12%.

In case of houses with holding tank, more respondents (84%) mentioned correctly as having holding tank, and 16% houses had pit instead of holding tank. Thus, if a respondent mentioned that he/she had a holding tank, then there would be about 84% chances of having really a holding tank satisfying its criteria. In case of pit, few respondents were not clear about shape, so for they were assumed as pit.

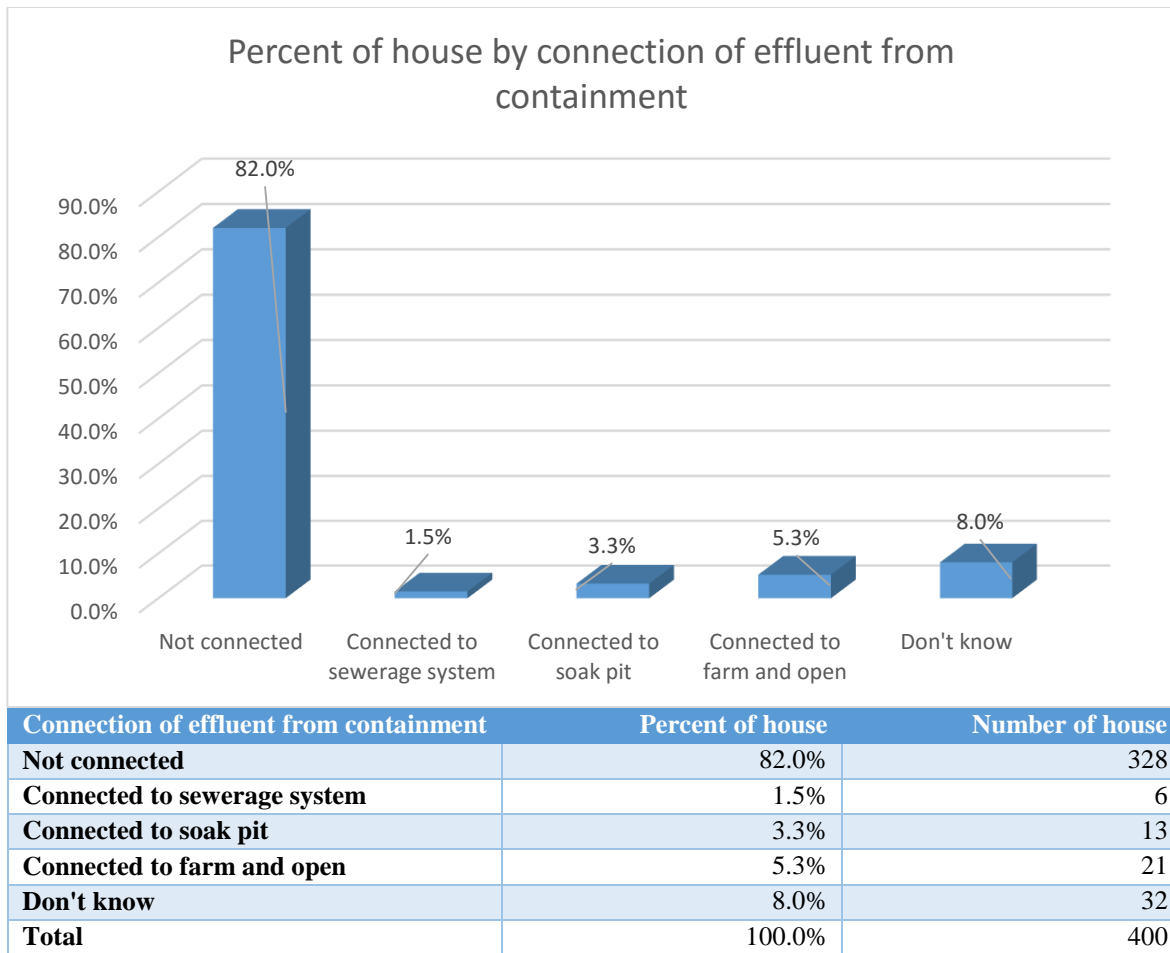
The analysis shows that the respondents mentioned having holding tank were more consistent about containment type than those mentioned having pit or septic tank. Hereafter, the septic tank refers to actual septic tank satisfying above mentioned four criteria used in the sample survey. For estimation of number of septic tank, holding tank and pit, following probabilities are used with 5% marginal error and 95% confidence level.

Probability of respondent identifying the containment type correctly (%)					
		Containment type observed & measured by enumerator			Total
		Septic tank	Holding tank	Pit	
Containment type mentioned by respondent	Septic tank	12%	63%	25%	100%
	Holding tank		84%	16%	100%
	Pit			100%	100%

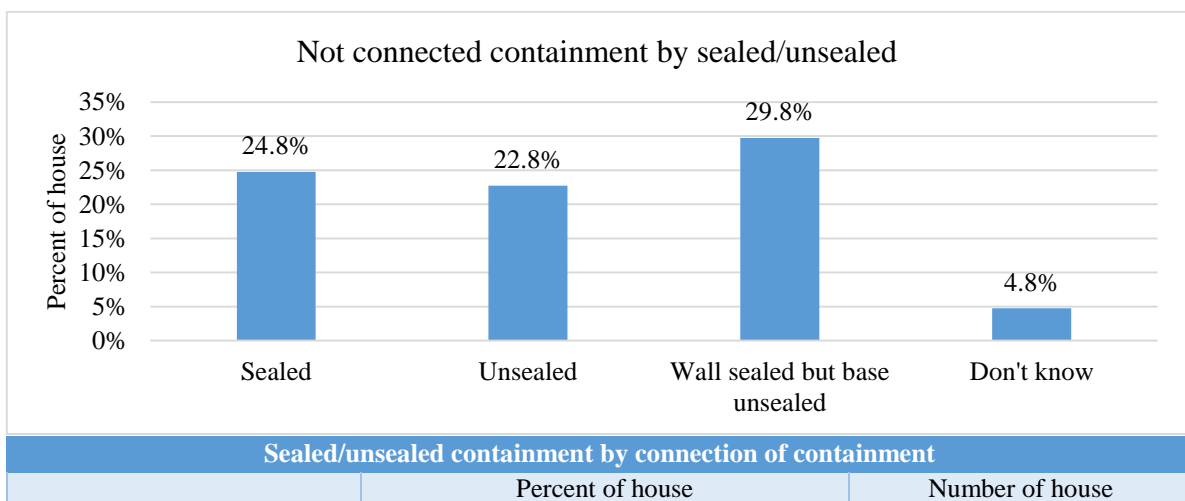
With this estimation the number of correctly identified septic tank is estimated to be 1260, holding tank of 7301, and pit of 3052.

6.4.3 Effluent from containment

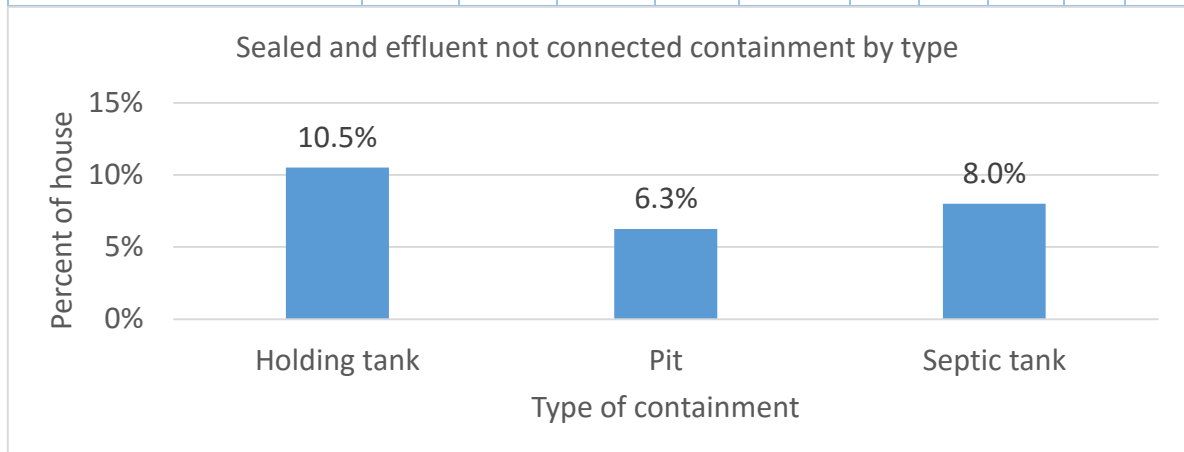
Regarding connection of effluent or overflow from containment, 82% houses responded that their containments were not connected anywhere, and only 18% houses responded they have connected to sewerage system (1.5%), soak pit and open to environment (8.6%), and some 8% were not aware of connection.



Further, analyzing the sealed and unsealed condition of the containment which were not connected to anywhere, only 24% were sealed, and among them, only 8% were actually houses with septic tanks. Thus, although 82% houses' containments were not connected to anywhere for effluent or overflow, only 8% were septic tank among them.



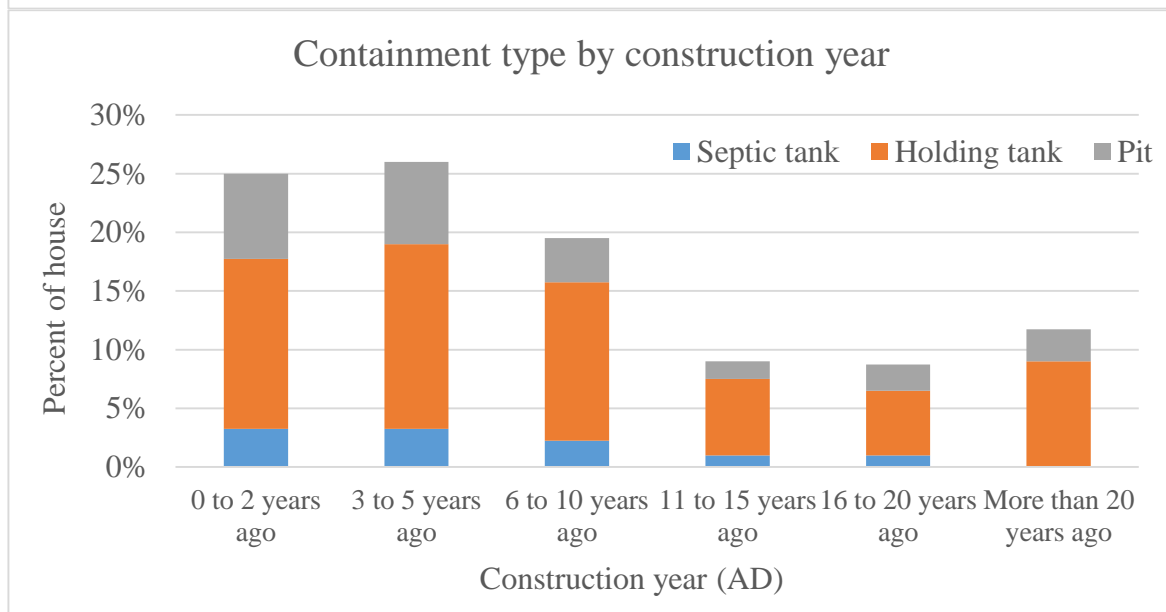
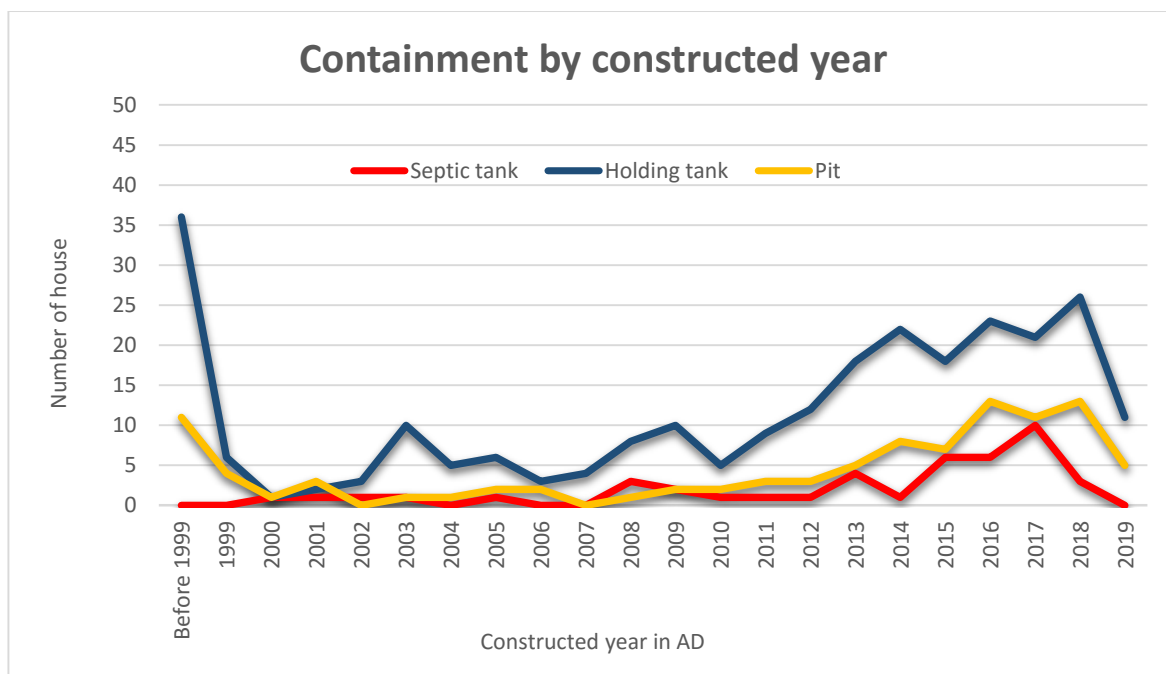
Connection of effluent from containment					Total					Total
	Sealed	Unsealed	Wall sealed, but base unsealed	Don't know		Sealed	Unsealed	Wall sealed, but base unsealed	Don't know	
Not connected	24.8%	22.8%	29.8%	4.8%	82.0%	99	91	119	19	328
Connected to sewerage system	0.3%		1.0%	0.3%	1.5%	1		4	1	6
Connected to soak pit	1.3%	0.5%	1.3%	0.3%	3.3%	5	2	5	1	13
Connected to farm and open	0.8%	2.3%	2.0%	0.3%	5.3%	3	9	8	1	21
Don't know	0.8%	2.8%	2.3%	2.3%	8.0%	3	11	9	9	32
Total	27.8%	28.3%	36.3%	7.8%	100.0%	111	113	145	31	400



Sealed and effluent not connected containment by type		
Containment type	Percent of house	Number of house
Holding tank	10.5%	42
Pit	6.3%	25
Septic tank	8.0%	32
Total	24.8%	99

6.4.4 Year of construction

About 70% of the houses have constructed containment within last 10 years, of which majority were holding tank (43.75%) followed by pit (18%) and septic tank (8.75%).

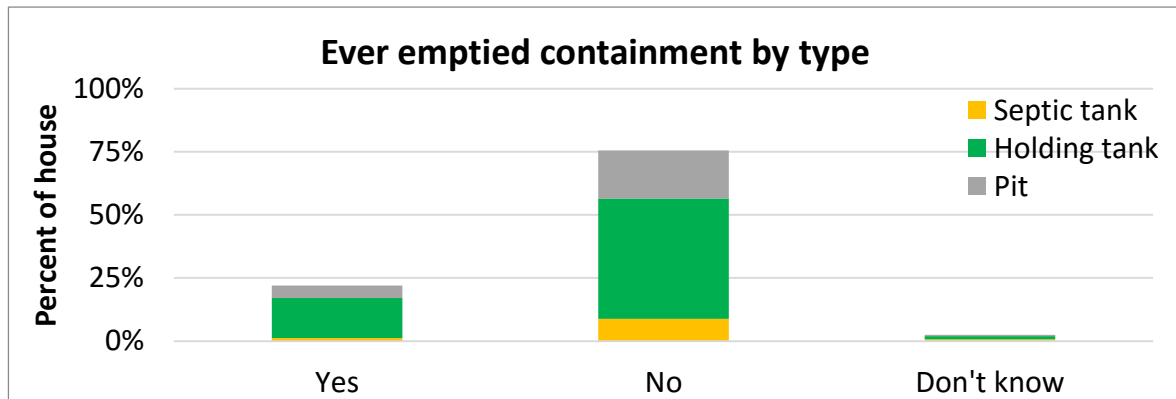


Age group	Percent of house				Number of house			
	Septic tank	Holding tank	Pit	Total	Septic tank	Holding tank	Pit	Total
0 to 2 years ago	3.25%	14.50%	7.25%	25.00%	13	58	29	100
3 to 5 years ago	3.25%	15.75%	7.00%	26.00%	13	63	28	104
6 to 10 years ago	2.25%	13.50%	3.75%	19.50%	9	54	15	78
11 to 15 years ago	1.00%	6.50%	1.50%	9.00%	4	26	6	36
16 to 20 years ago	1.00%	5.50%	2.25%	8.75%	4	22	9	35
More than 20 years ago		9.00%	2.75%	11.75%		36	11	47
Total	10.75%	64.75%	24.50%	100.00%	43	259	98	400

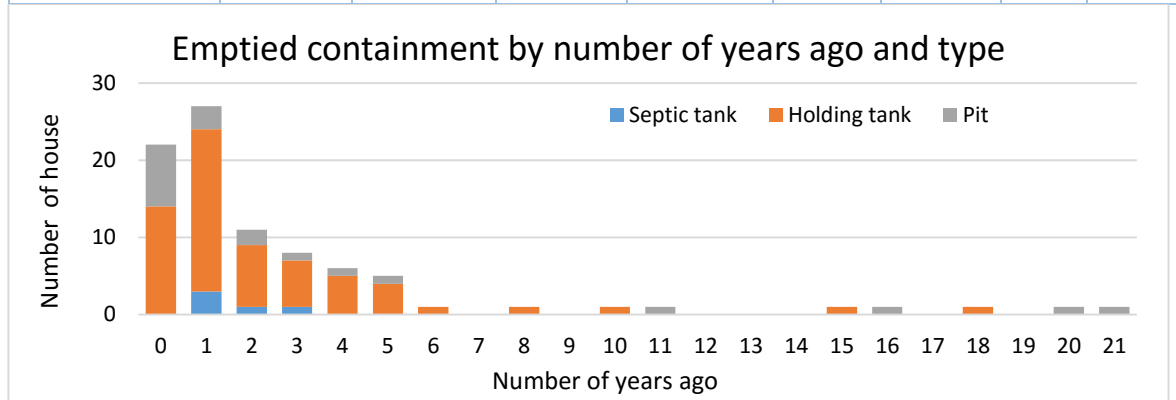
6.4.5 Emptying practices

About 22% houses have emptied containment, of which majority were holding tank (15.75%) followed by pit (5%) and septic tank (1.25%). Regarding last emptied year, about

15% containment were emptied within last two years. In case of septic tank, among 43 septic tanks noted in the survey, only 5 septic tanks (i.e., 1.25%) were emptied since last three years. The practice of emptying holding tanks observed from 18 years ago and pit from 21 years ago.



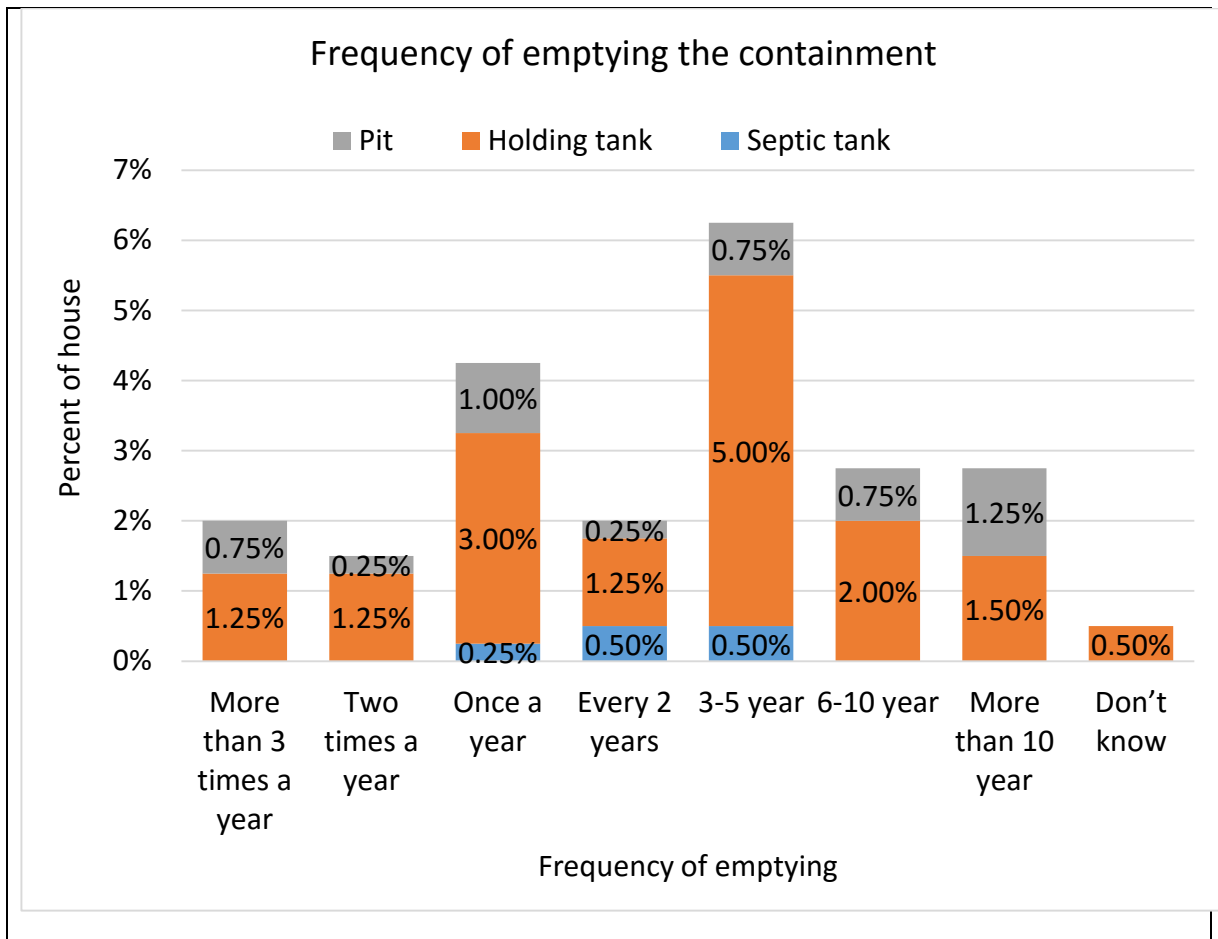
Year emptied	Percent of house				Number of house			
	Septic tank	Holding tank	Pit	Total	Septic tank	Holding tank	Pit	Total
Yes	1.25%	15.75%	5.00%	22.00%	5	63	20	88
No	8.75%	47.75%	19.00%	75.50%	35	191	76	302
Don't know	0.75%	1.25%	0.50%	2.50%	3	5	2	10
Total	10.75%	64.75%	24.50%	100.00%	43	259	98	400



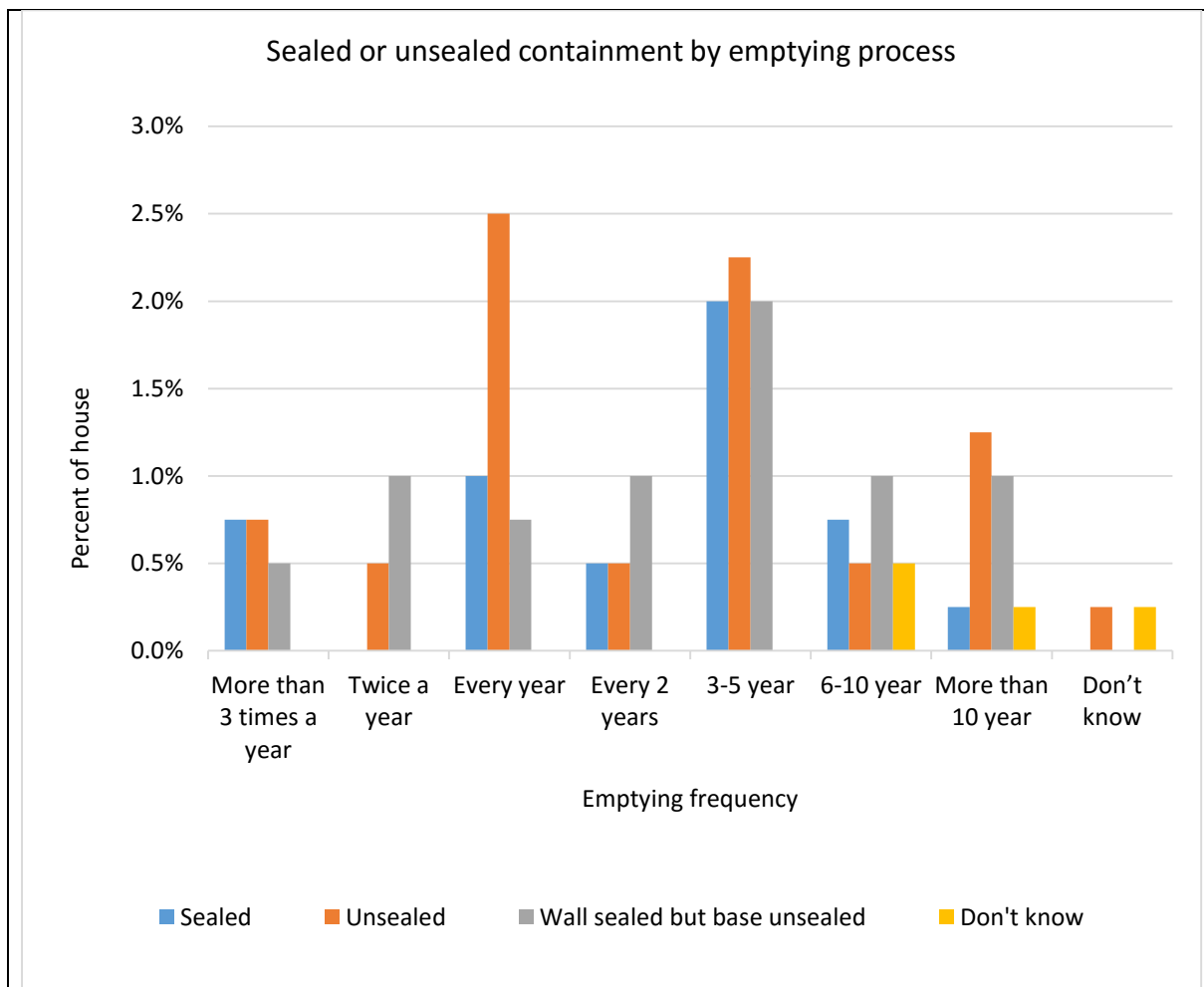
Last emptied year	Percent of house				Number of house			
	Septic tank	Holding tank	Pit	Total	Septic tank	Holding tank	Pit	Total
This year (2019 AD)		3.50%	2.00%	5.50%		14	8	22
1 year ago	0.75%	5.25%	0.75%	6.75%	3	21	3	27
2 years ago	0.25%	2.00%	0.50%	2.75%	1	8	2	11
3 years ago	0.25%	1.50%	0.25%	2.00%	1	6	1	8
4 years ago		1.25%	0.25%	1.50%		5	1	6
5 years ago		1.00%	0.25%	1.25%		4	1	5
6 to 10 years ago		0.75%		0.75%		3		3
more than 10 years ago		0.50%	1.00%	1.50%		2	4	6
Total	1.25%	15.75%	5.00%	22.00%	5	63	20	88

6.4.5.1 Frequency of emptying containment

About 22% houses had emptied the containment due to overflow, bad smell and as a routine cleaning. Regarding the frequency of emptying the containment, out of 22%, about 8% houses were emptying the containment at least once a year.



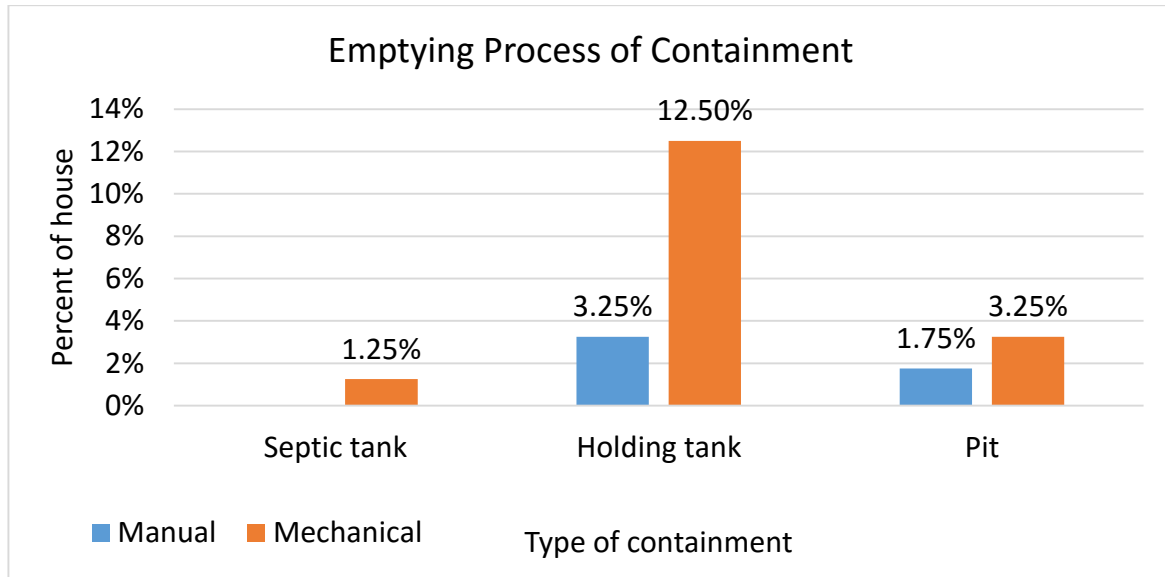
Frequency of emptying by type of containment								
Interval of emptying containment	Percent of house				Number of house			
	Septic tank	Holding tank	Pit	Total	Septic tank	Holding tank	Pit	Total
More than 3 times a year		1.25%	0.75%	2.00%		5	3	8
Two times a year		1.25%	0.25%	1.50%		5	1	6
Once a year	0.25%	3.00%	1.00%	4.25%	1	12	4	17
Every 2 years	0.50%	1.25%	0.25%	2.00%	2	5	1	8
3 - 5 year	0.50%	5.00%	0.75%	6.25%	2	20	3	25
6 - 10 year		2.00%	0.75%	2.75%		8	3	11
More than 10 year		1.50%	1.25%	2.75%		6	5	11
Don't know		0.50%		0.50%		2		2
Total	1.25%	15.75%	5.00%	22.00%	5	63	20	88



Containment by sealed/unsealed and frequency of emptying										
Emptying frequency	Percent of house					Number of house				
	Sealed	Unsealed	Wall sealed but base unsealed	Don't know	Total	Sealed	Unsealed	Wall sealed but base unsealed	Don't know	Total
More than 3 times a year	0.75%	0.75%	0.50%		2.00%	3	3	2		8
Twice a year		0.50%	1.00%		1.50%		2	4		6
Every year	1.00%	2.50%	0.75%		4.25%	4	10	3		17
Every 2 years	0.50%	0.50%	1.00%		2.00%	2	2	4		8
3-5 year	2.00%	2.25%	2.00%		6.25%	8	9	8		25
6-10 year	0.75%	0.50%	1.00%	0.50%	2.75%	3	2	4	2	11
More than 10 year	0.25%	1.25%	1.00%	0.25%	2.75%	1	5	4	1	11
Don't know		0.25%		0.25%	0.50%		1		1	2
Total	5.25%	8.50%	7.25%	1.00%	22.00%	21	34	29	4	88

6.4.5.2 Emptying process

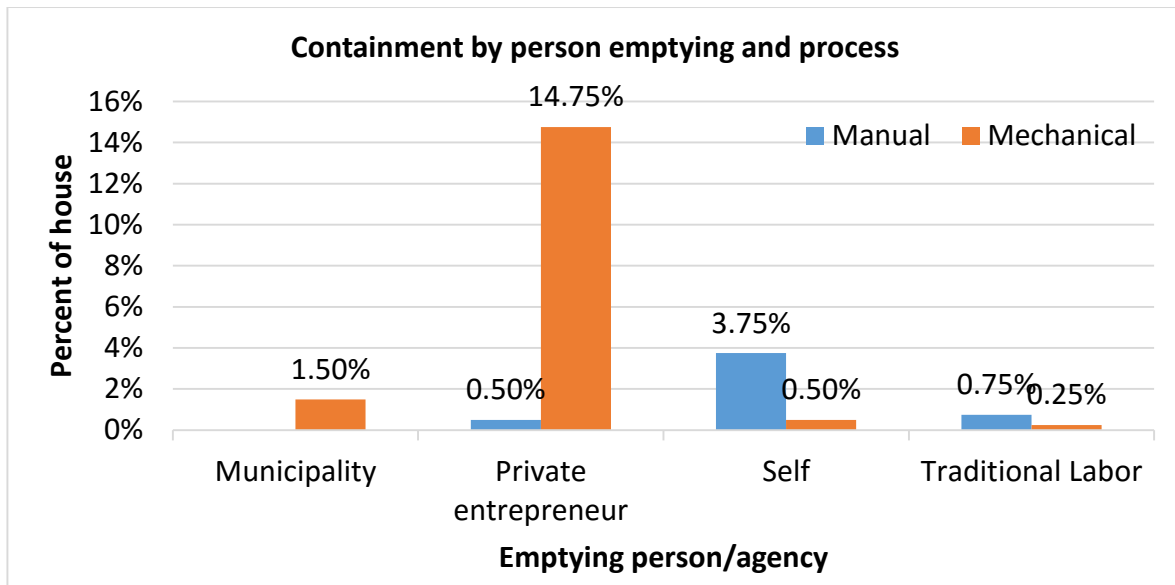
Regarding emptying process of the containment, about 5% houses were emptying the containment manually, and remaining 17% were emptying mechanically. It should be noted that 88% houses never emptied their containment. Manual emptying practices were noted for holding tank and pit only, septic tanks were emptied with mechanical process.



Process of emptying containment								
Emptying process	Percent of house				Number of house			
	Septic tank	Holding tank	Pit	Total	Septic tank	Holding tank	Pit	Total
Manual		3.25%	1.75%	5.00%		13	7	20
Mechanical	1.25%	12.50%	3.25%	17.00%	5	50	13	68
Total	1.25%	15.75%	5.00%	22.00%	5	63	20	88

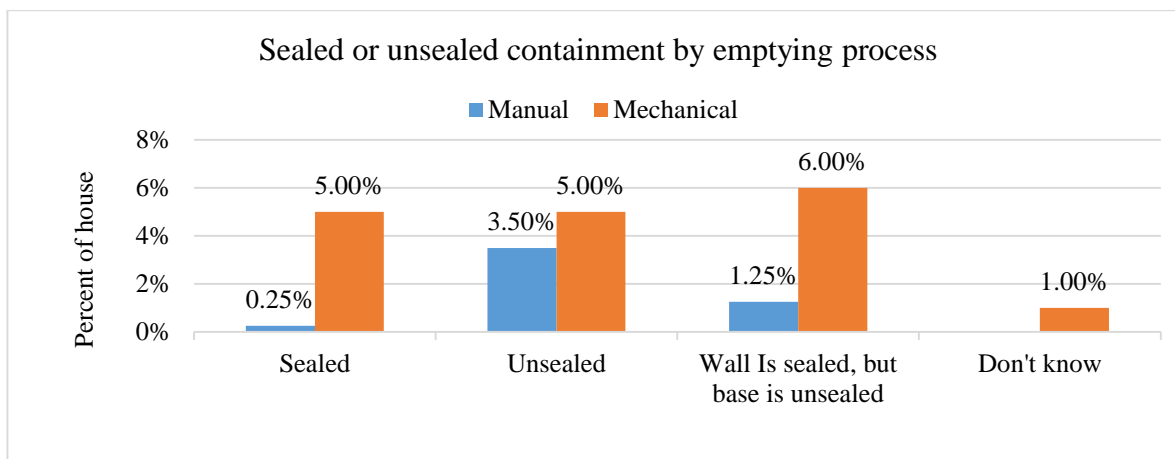
The emptying of containment was usually done by municipality, private entrepreneur, traditional labor and owner himself. It was noted that most of houses (15.25%) had emptied the containment by private entrepreneurs. Few private entrepreneurs used manual process (0.5%) also, but mostly mechanical (14.8%). About 1.5% houses have emptied through Municipality mechanically. The manual emptying was done by mostly traditional labor and self. The main reason for manual emptying was to use the sludge from containment in the farm. So, they just dispose the sludge in their farm. However, few houses mentioned septic was not easily accessible for mechanical process.

Agency/person emptying containment								
Emptying agency/ person	Percent of house				Number of house			
	Septic tank	Holding tank	Pit	Total	Septic tank	Holding tank	Pit	Total
Municipality		1.50%		1.50%		6		6
Private entrepreneur	1.00%	11.00%	3.25%	15.25%	4	44	13	61
Self		2.50%	1.75%	4.25%		10	7	17
Traditional Labor	0.25%	0.75%		1.00%	1	3		4
Total	1.25%	15.75%	5.00%	22.00%	5	63	20	88

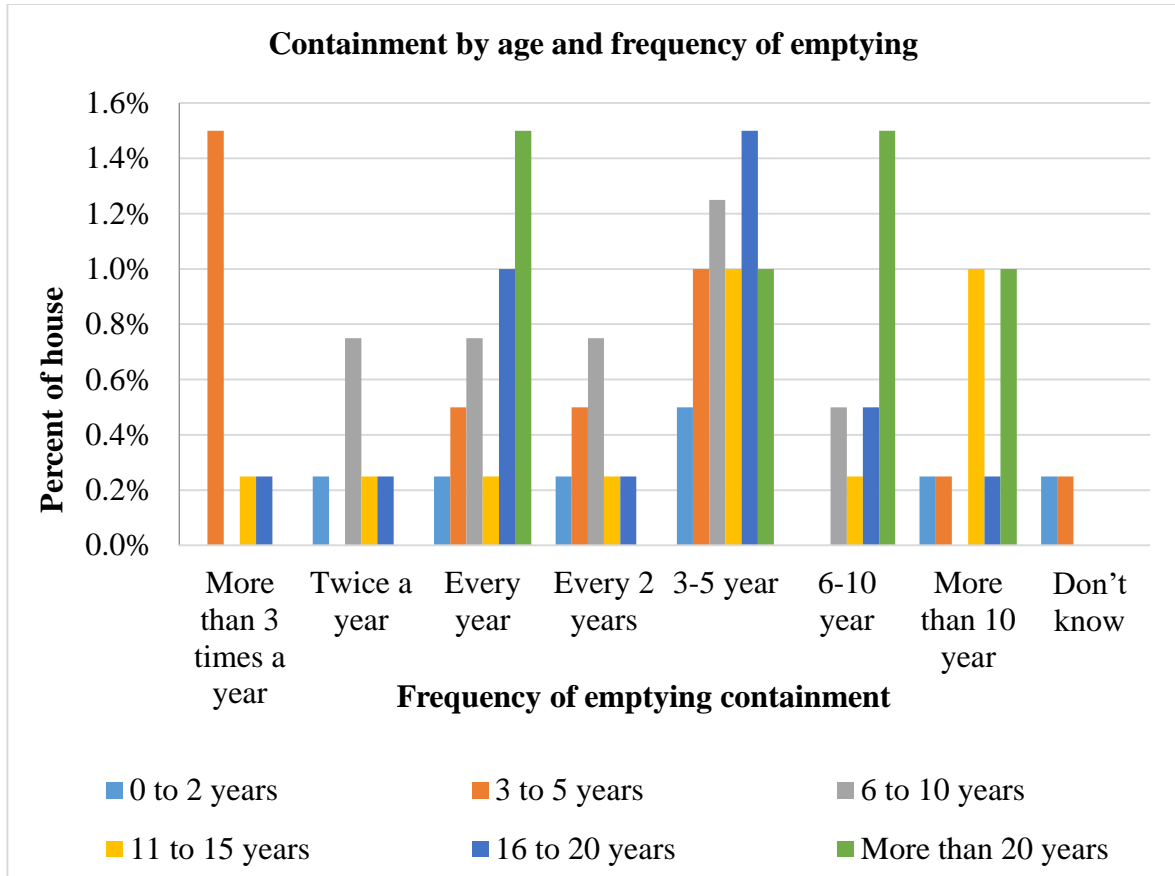


Containment emptying process and person/agency						
Emptying person/agency	Percent of house			Number of house		
	Manual	Mechanical	Total	Manual	Mechanical	Total
Municipality		1.50%	1.50%		6	6
Private entrepreneur	0.50%	14.75%	15.25%	2	59	61
Self	3.75%	0.50%	4.25%	15	2	17
Traditional Labor	0.75%	0.25%	1.00%	3	1	4
Total	5.00%	17.00%	22.00%	20	68	88

While cross analyzing sealed or unsealed containment with emptying process, sealed containments were mostly emptied with mechanical process only and partially or completely unsealed containments were found emptied with manual or mechanical process.



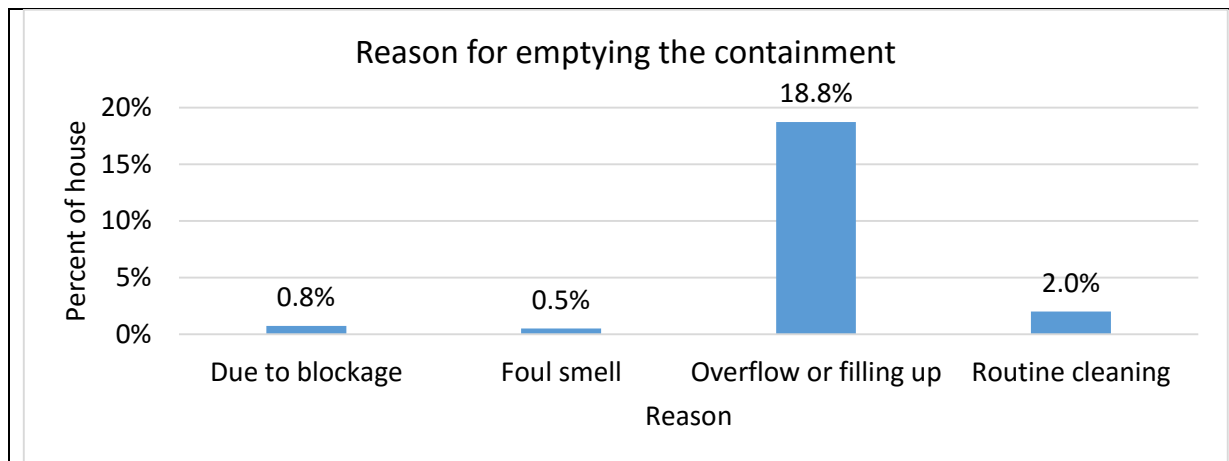
Sealed or unsealed containment by emptying process						
Sealed/unsealed	Percent of house			Number of house		
	Manual	Mechanical	Total	Manual	Mechanical	Total
Sealed	0.25%	5.00%	5.25%	1	20	21
Unsealed	3.50%	5.00%	8.50%	14	20	34
Wall sealed but base unsealed	1.25%	6.00%	7.25%	5	24	29
Don't know		1.00%	1.00%		4	4
Total	5.00%	17.00%	22.00%	20	68	88



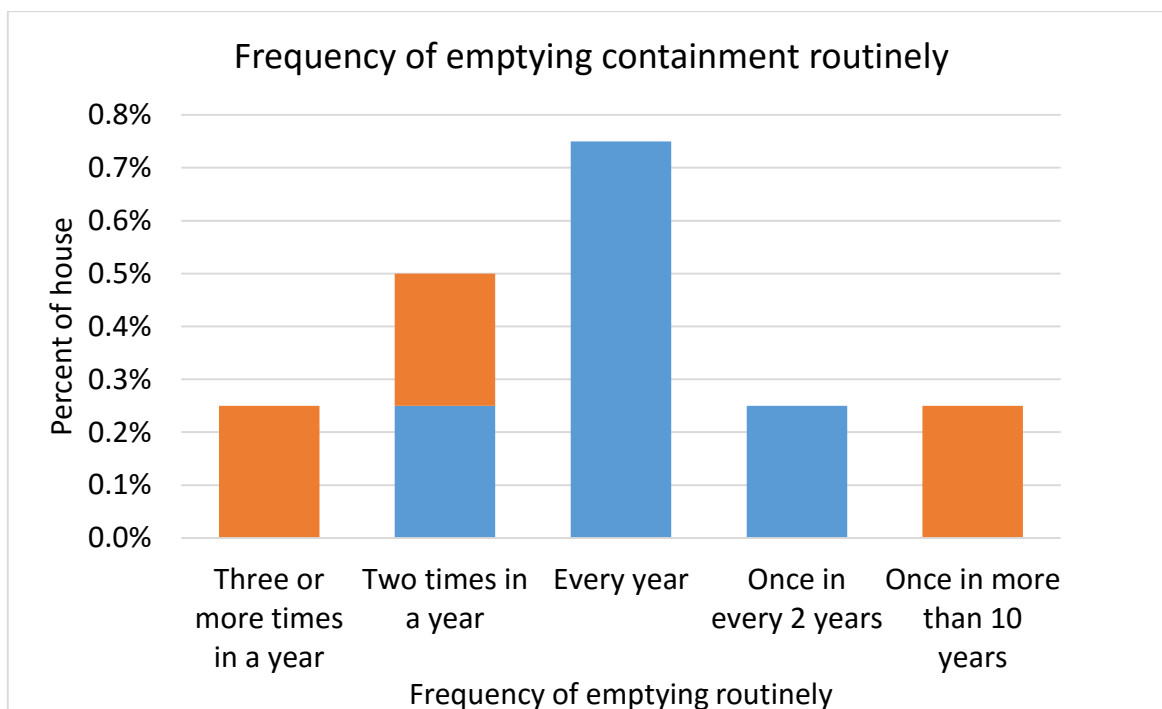
Containment by emptying frequency and age														
Frequency of emptying containment	Percent of house							Number of house						
	0 to 2 years	3 to 5 years	6 to 10 years	11 to 15 years	16 to 20 years	More than 20 years	Total	0 to 2 years	3 to 5 years	6 to 10 years	11 to 15 years	16 to 20 years	More than 20 years	Total
More than 3 times a year		1.50%		0.25%	0.25%		2.00%		6		1	1		8
Twice a year	0.25%		0.75%	0.25%	0.25%	0	1.50%	1		3	1	1		6
Every year	0.25%	0.50%	0.75%	0.25%	1.00%	1.50%	4.25%	1	2	3	1	4	6	17
Every 2 years	0.25%	0.50%	0.75%	0.25%	0.25%		2.00%	1	2	3	1	1		8
3-5 year	0.50%	1.00%	1.25%	1.00%	1.50%	1.00%	6.25%	2	4	5	4	6	4	25
6-10 year			0.50%	0.25%	0.50%	1.50%	2.75%			2	1	2	6	11
More than 10 year	0.25%	0.25%		1.00%	0.25%	1.00%	2.75%	1	1		4	1	4	11
Don't know	0.25%	0.25%					0.50%	1	1					2
Total	1.75%	4.00%	4.00%	3.25%	4.00%	5.00%	22.00%	7	16	16	13	16	20	88

6.4.5.3 Reason of Emptying

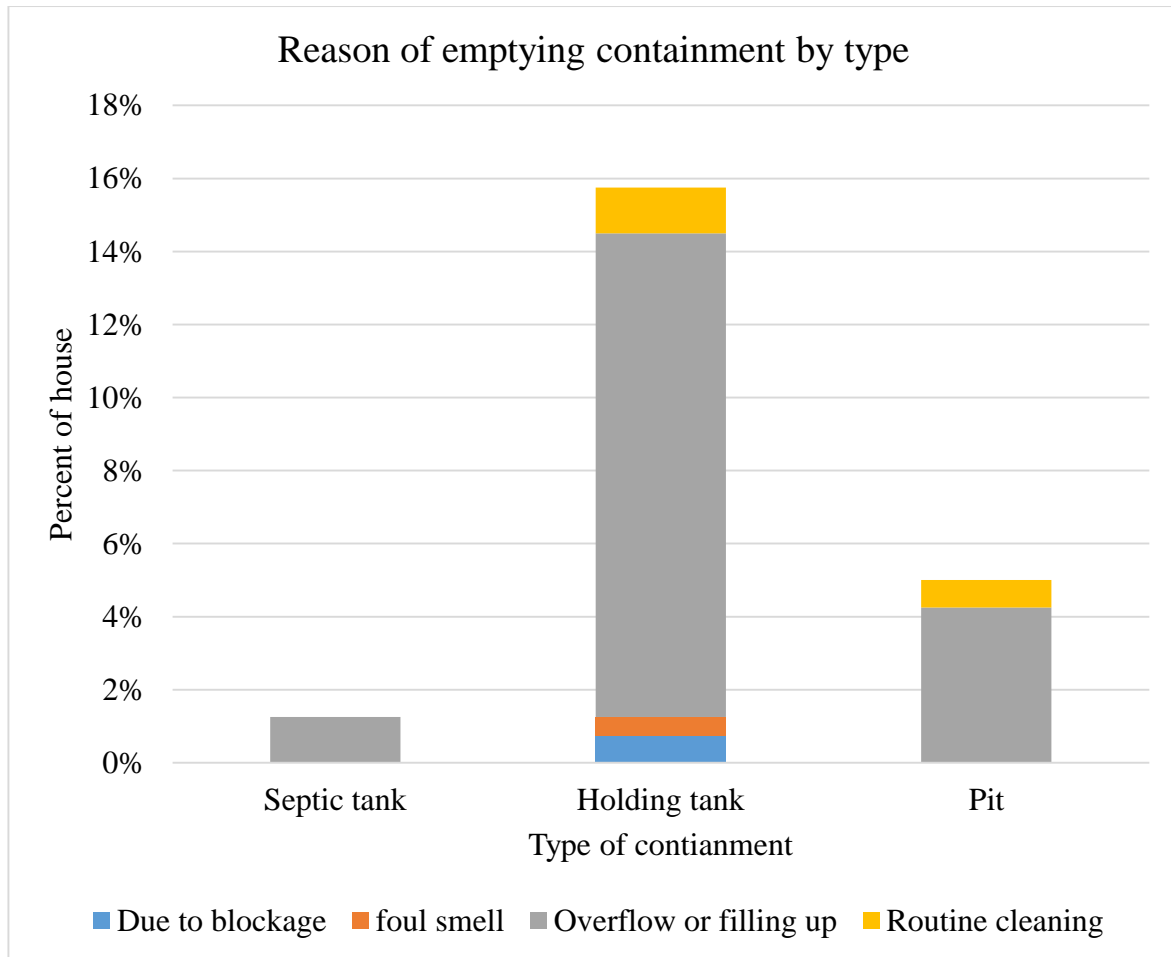
One of the main reasons of emptying containment was overflow or filling up. About 18.75% houses have emptied their containment because of overflow. However, some 2% houses emptied the containment as of routine cleaning, which were holding tank and pit. Septic tank was emptied mainly due to overflow. In case of manual emptying, the main reason was to use the sludge in the farm.



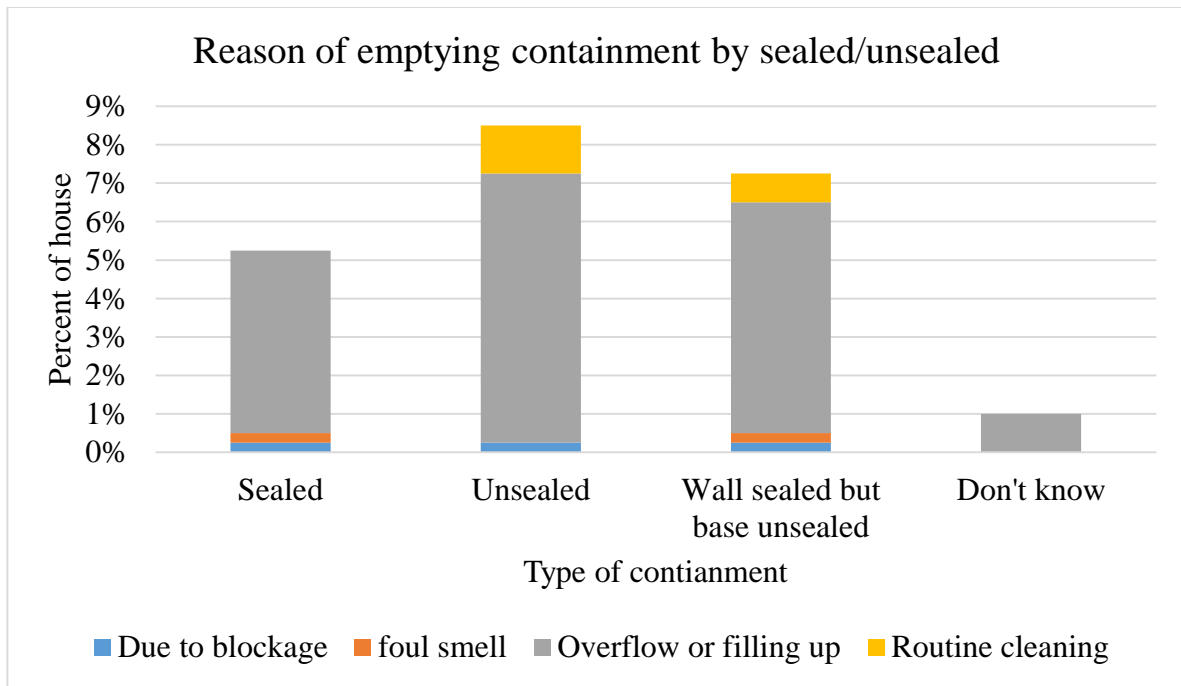
Reason for emptying containment								
Reason	Percent of house				Number of house			
	Septic tank	Holding tank	Pit	Total	Septic tank	Holding tank	Pit	Total
Due to blockage		0.75%		0.75%		3		3
Foul smell		0.50%		0.50%		2		2
Overflow / filling up	1.25%	13.25%	4.25%	18.75%	5	53	17	75
Routine cleaning		1.25%	0.75%	2.00%		5	3	8
Total	1.25%	15.75%	5.00%	22.00%	5	63	20	88



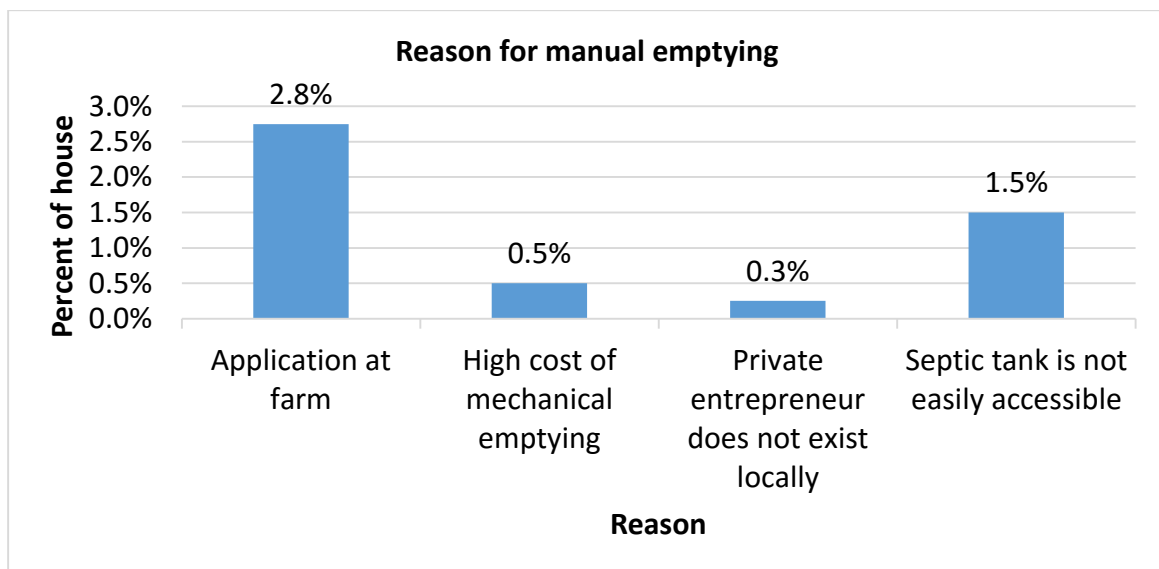
Frequency of emptying containment as of routine cleaning						
Frequency of emptying	Percent of house			Number of house		
	Holding Tank	Pit	Total	Holding Tank	Pit	Total
Three or more times in a year		0.25%	0.25%		1	1
Two times in a year	0.25%	0.25%	0.50%	1	1	2
Every year	0.75%		0.75%	3		3
Once in every 2 years	0.25%		0.25%	1		1
Once in more than 10 years		0.25%	0.25%		1	1
Grand Total	1.25%	0.75%	2.00%	5	3	8



Reason of emptying containment by type								
Reason	Percent of house				Number of house			
	Septic tank	Holding tank	Pit	Total	Septic tank	Holding tank	Pit	Total
Due to blockage		0.75%		0.75%		3		3
foul smell		0.50%		0.50%		2		2
Overflow or filling up	1.25%	13.25%	4.25%	18.75%	5	53	17	75
Routine cleaning		1.25%	0.75%	2.00%		5	3	8
Total	1.25%	15.75%	5.00%	22.00%	5	63	20	88



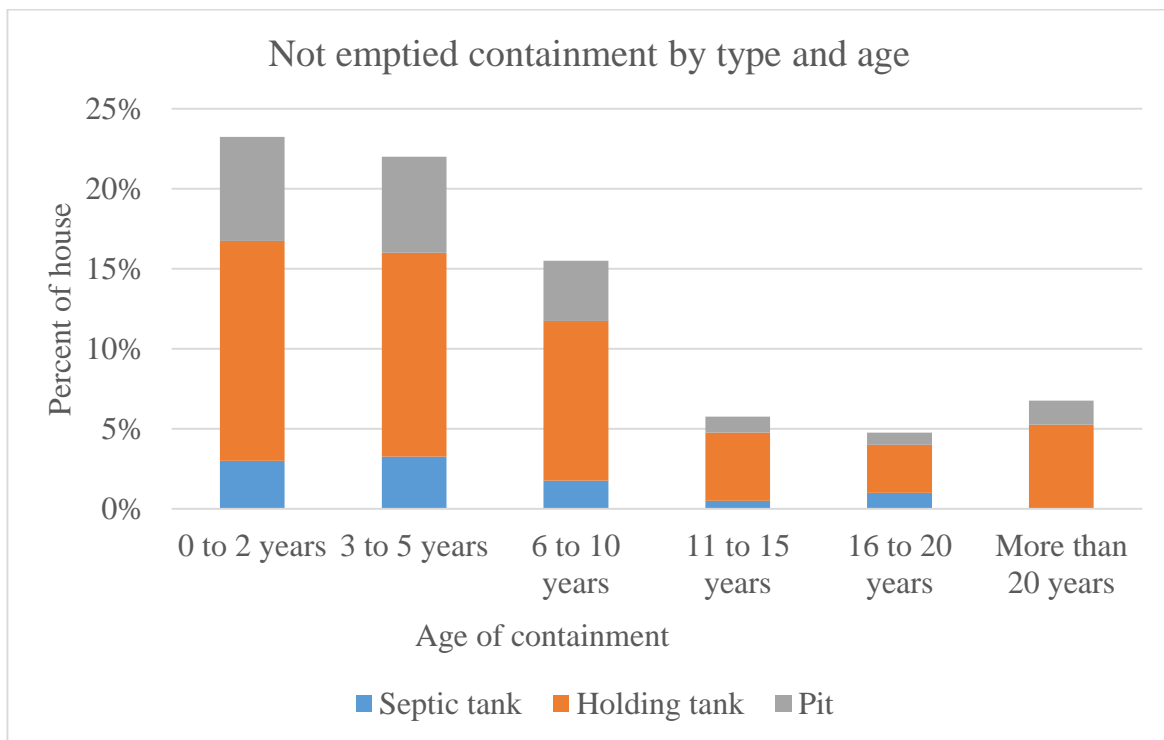
Reason of emptying containment by sealed/unsealed										
Reason	Percent of house				Total	Number of house				
	Sealed	Unsealed	Wall sealed but base unsealed	Don't know		Sealed	Unsealed	Wall sealed but base unsealed	Don't know	Total
Due to blockage	0.25%	0.25%	0.25%		3	1	1	1		3
Foul smell	0.25%		0.25%		2	1		1		2
Overflow or filling up	4.75%	7.00%	6.00%	1.00%	75	19	28	24	4	75
Routine cleaning		1.25%	0.75%		8		5	3		8
Total	5.25%	8.50%	7.25%	1.00%	88	21	34	29	4	88



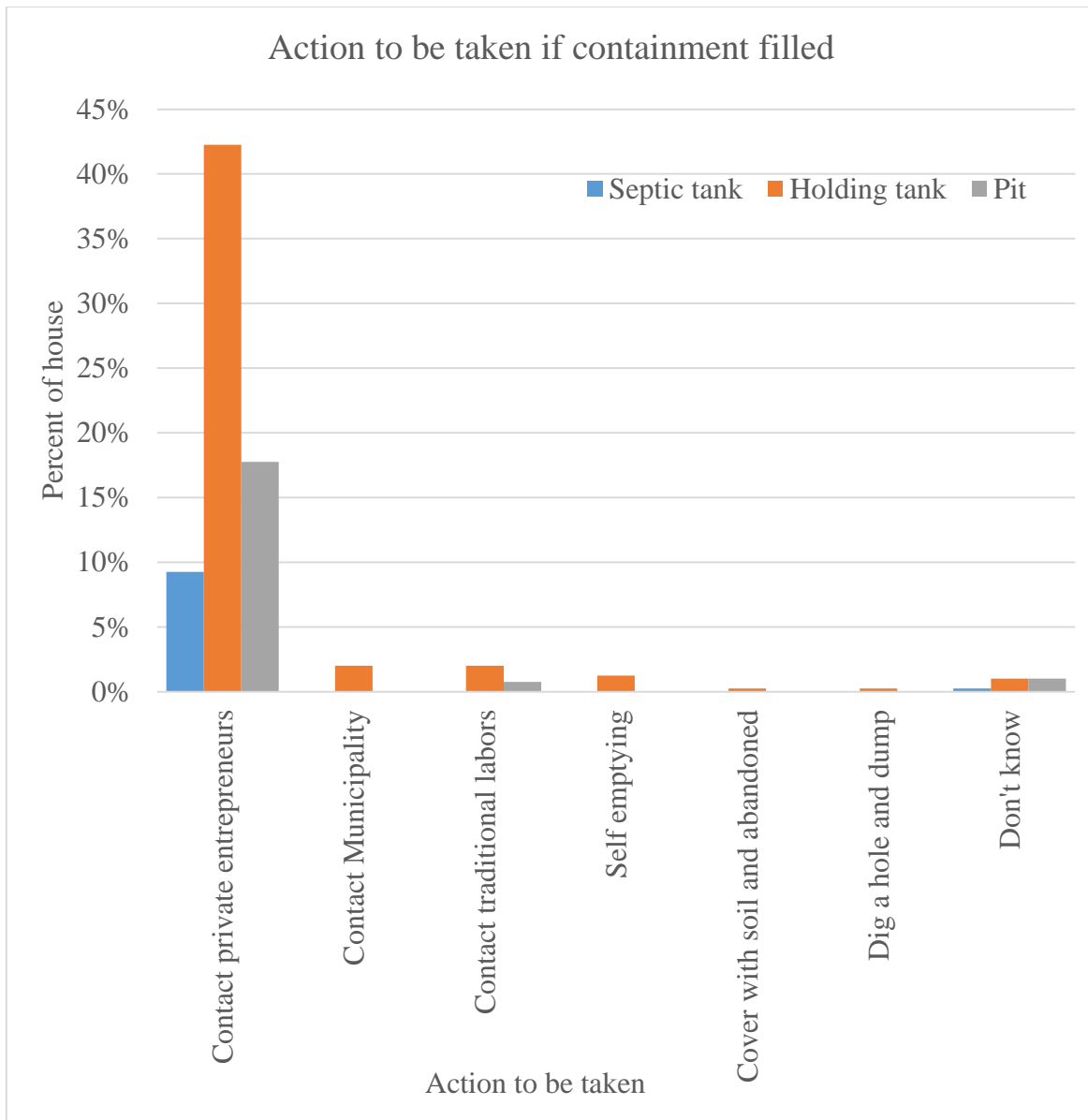
Reason for manual emptying		
Reason	Percent of house	Number of house
Application at farm	2.8%	11
High cost of mechanical emptying	0.5%	2
Private entrepreneur does not exist locally	0.3%	1
Septic tank is not easily accessible	1.5%	6
Total	5.0%	20

6.4.5.4 Reason of not emptying

About 75.5% houses responded that they have not emptied their containment as it had not been filled up yet and 2.5% houses were not sure about it. Considering the age of containment of all those houses who have either never emptied containment or not sure, about 32.8% houses have containments constructed 6 years ago and most of them were holding tank and pit. Further, they were asked about the action to be taken when the containment filled, majority of them (68.25%) were ready to contact private entrepreneurs to empty the containment. Most of them ready to pay as per rate.



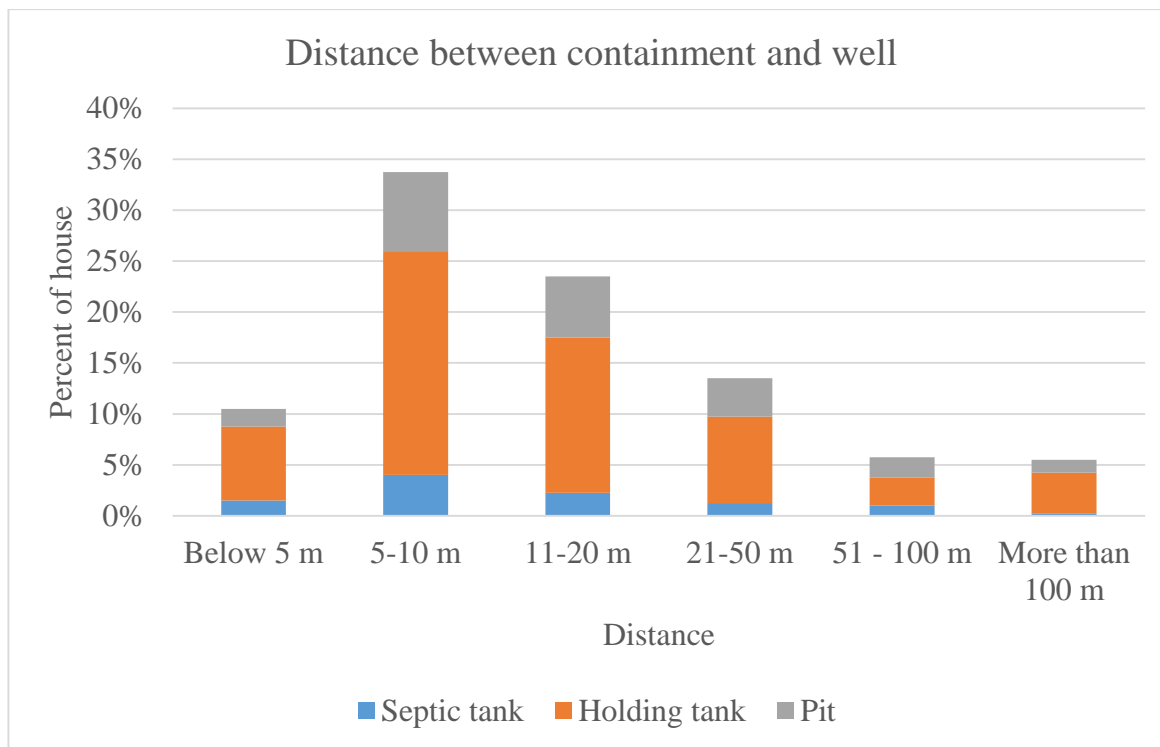
Not emptied containment by type and age group								
Age of containment	Percent of house				Number of house			
	Septic tank	Holding tank	Pit	Total	Septic tank	Holding tank	Pit	Total
0 to 2 years	3.00%	13.75%	6.50%	23.25%	12	55	26	93
3 to 5 years	3.25%	12.75%	6.00%	22.00%	13	51	24	88
6 to 10 years	1.75%	10.00%	3.75%	15.50%	7	40	15	62
11 to 15 years	0.50%	4.25%	1.00%	5.75%	2	17	4	23
16 to 20 years	1.00%	3.00%	0.75%	4.75%	4	12	3	19
More than 20 years		5.25%	1.50%	6.75%		21	6	27
Total	9.50%	49.00%	19.50%	78.00%	38	196	78	312



Action to be taken if containment filled								
Action to be taken	Percent of house				Number of house			
	Septic tank	Holding tank	Pit	Total	Septic tank	Holding tank	Pit	Total
Contact private entrepreneurs	9.25%	42.25%	17.75%	69.25%	37	169	71	277
Contact Municipality		2.00%		2.00%		8		8
Contact traditional labors		2.00%	0.75%	2.75%		8	3	11
Self-emptying		1.25%		1.25%		5		5
Cover with soil and abandoned		0.25%		0.25%		1		1
Dig a hole and dump		0.25%		0.25%		1		1
Don't know	0.25%	1.00%	1.00%	2.25%	1	4	4	9
Total	9.50%	49.00%	19.50%	78.00%	38	196	78	312

6.5 Distance of well from containment

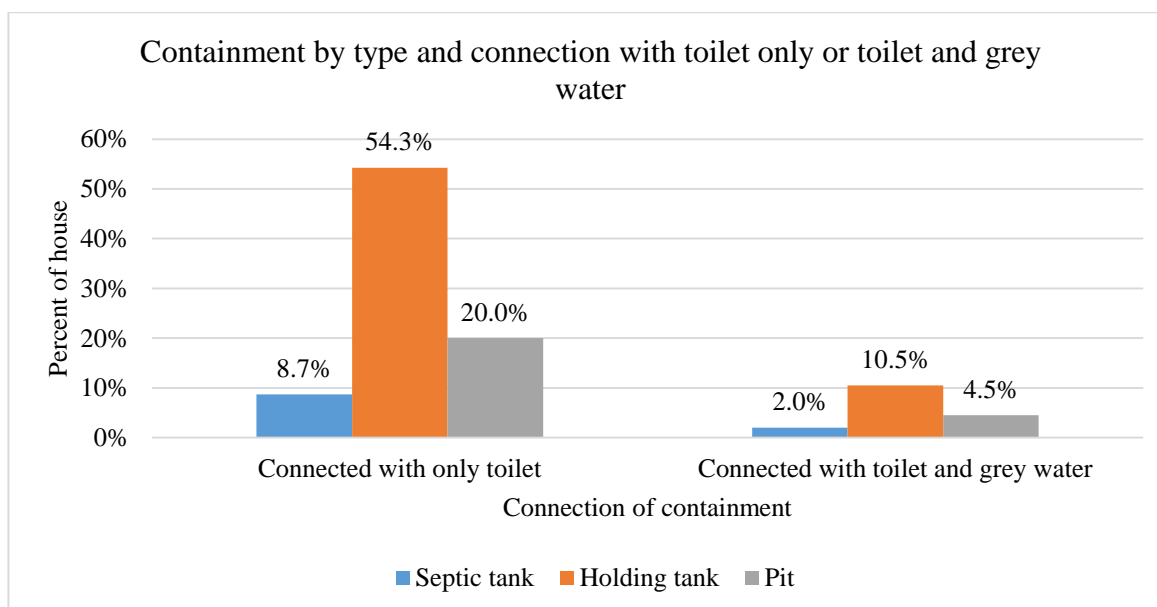
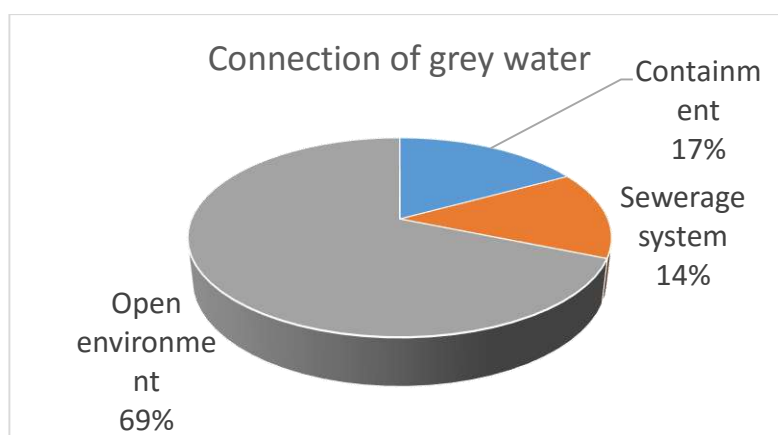
About 92.5% houses have well and containment both in their premises, of which 67.75% wells were within 20m distance from containment mostly holding and pit, and 24.75% wells were 20m far from the containment.



Distance between well and containment														
Containment type	Percent of house						Number of house						Total	
	Below 5 m	5-10 m	11-20 m	21-50 m	51 - 100 m	more than 100 m	Total	Below 5 m	5-10 m	11-20 m	21-50 m	51 - 100 m		more than 100 m
Septic tank	1.50%	4.00%	2.25%	1.25%	1.00%	0.25%	10.25%	6	16	9	5	4	1	41
Holding tank	7.25%	22.00%	15.25%	8.50%	2.75%	4.00%	59.75%	29	88	61	34	11	16	239
Pit	1.75%	7.75%	6.00%	3.75%	2.00%	1.25%	22.50%	7	31	24	15	8	5	90
Total	10.50%	33.75%	23.50%	13.50%	5.75%	5.50%	92.50%	42	135	94	54	23	22	370

6.6 Connection of grey water

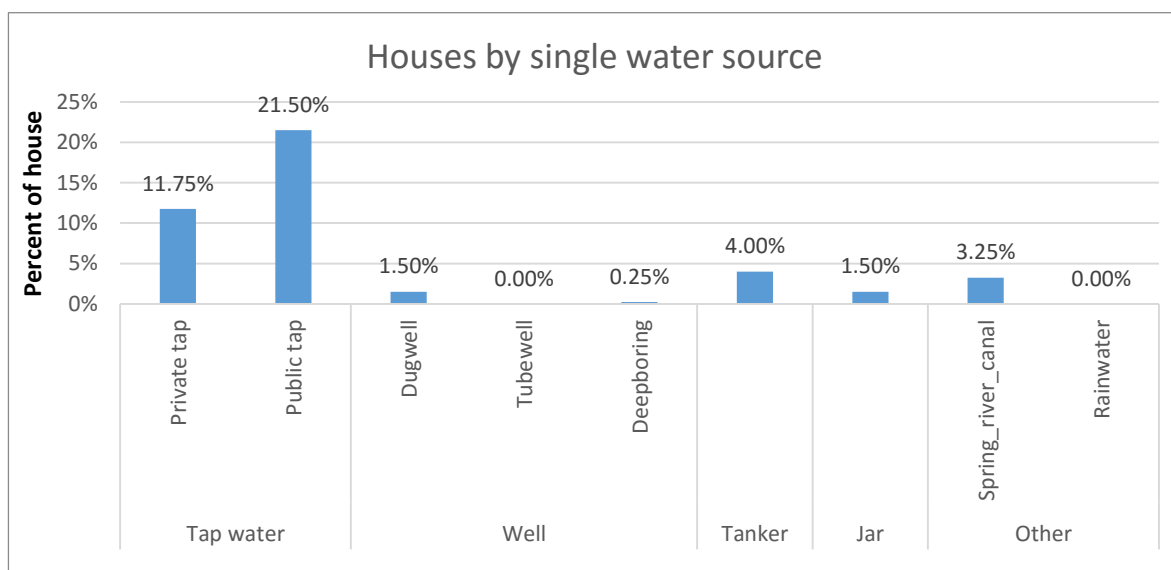
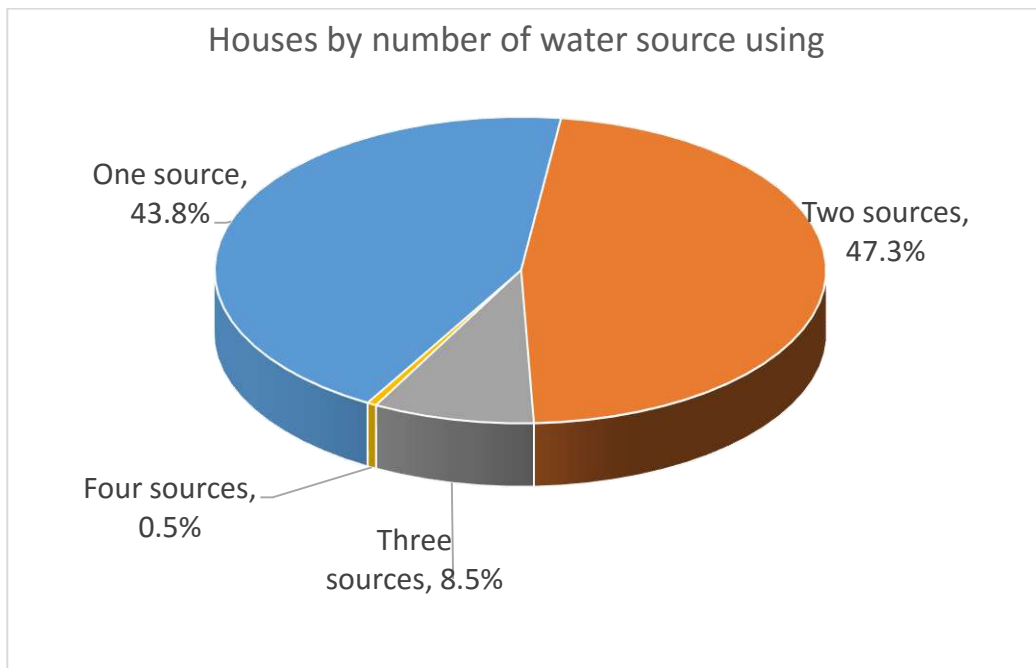
About 69% houses were drained their household grey water to open environment such as storm drain, soak pit, water bodies, and farm. About 14% household mentioned that their grey water was connected to sewerage system, but the survey area has no sewerage system actually, that was ultimately open to land. However, 17% households were connected grey water to their containment. About 83% houses have connected only toilet to the containment, of which 8.7% were septic tank, 54.3 % holding tank and 20% pit.

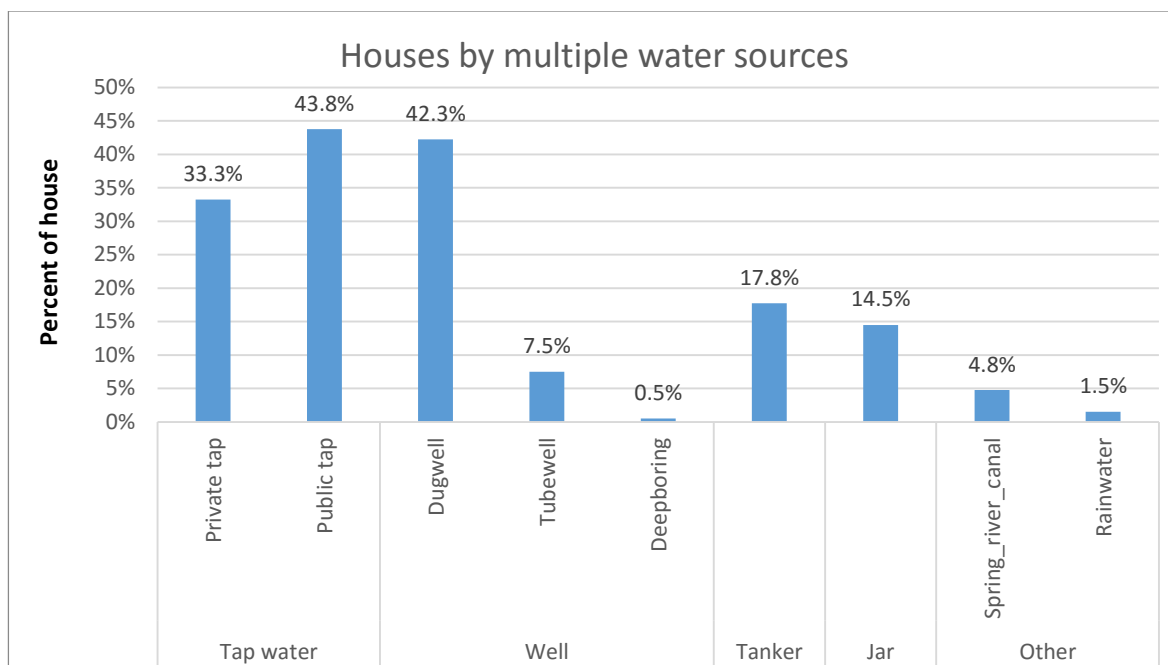


Containment by connection with toilet and grey water								
Connection of containment	Percent of house				Number of house			
	Septic tank	Holding tank	Pit	Total	Septic tank	Holding tank	Pit	Total
Connected with only toilet	8.7%	54.3%	20.0%	83.0%	35	217	80	332
Connected with toilet and grey water	2.0%	10.5%	4.5%	17.0%	8	42	18	68
Total	10.8%	64.8%	24.5%	100.0%	43	259	98	400

6.7 Water use

Majority of the houses (56%) were using more than one source of water for domestic use. About 33.3% houses used only tap water such as private municipal water and public tap water, 1.8% houses used well water such as dug well, tube well, deep boring. The present of houses using various water sources as single or multiple is shown in following table and graphs. Similarly, about 80% of houses have well in their premises.





Houses by source of water use										
	Percent of house									
	Tap water		Well			Tanker	Jar	Other		Total
Number of source	Private	Public	Dugwell	Tubewell	Deepboring			Spring/river/canal	Rainwater	
One source	11.75%	21.50%	1.50%	0.00%	0.25%	4.00%	1.50%	3.25%	0.00%	43.75%
Two sources	16.75%	19.25%	35.25%	4.25%	0.25%	10.50%	7.25%	0.75%	0.25%	47.25%
Three sources	4.25%	3.00%	5.00%	3.00%	0.00%	3.00%	5.25%	0.75%	1.25%	8.50%
Four sources	0.50%	0.00%	0.50%	0.25%	0.00%	0.25%	0.50%	0.00%	0.00%	0.50%
Total	33.25%	43.75%	42.25%	7.50%	0.50%	17.75%	14.50%	4.75%	1.50%	100.00%
	Number of house									
One source	47	86	6	0	1	16	6	13	0	175
Two sources	67	77	141	17	1	42	29	3	1	189
Three sources	17	12	20	12	0	12	21	3	5	34
Four sources	2		2	1	0	1	2	0	0	2
Total	133	175	169	30	2	71	58	19	6	400

7 GIS Maps

Map1. Location map of Mahalaxmi Municipality

Map2. Spatial distribution of Building in Mahalaxmi Municipality

Map3. FSM system and Road

Map4. FSM system and Satellite image

Map5. FSM system and Geology of Mahalaxmi Municipality

Map6. FSM system and Landuse of Mahalaxmi Municipality

Map7. FSM system and Soil of Mahalaxmi Municipality

Map8. Major sources of water for drinking in Mahalaxmi Municipality

Map9. Sewerage network of Mahalaxmi Municipality

Map10. Distribution of Building with Well in Mahalaxmi Municipality

Map11. Service Coverage from PWWTP Site at the interval of 2km road distance

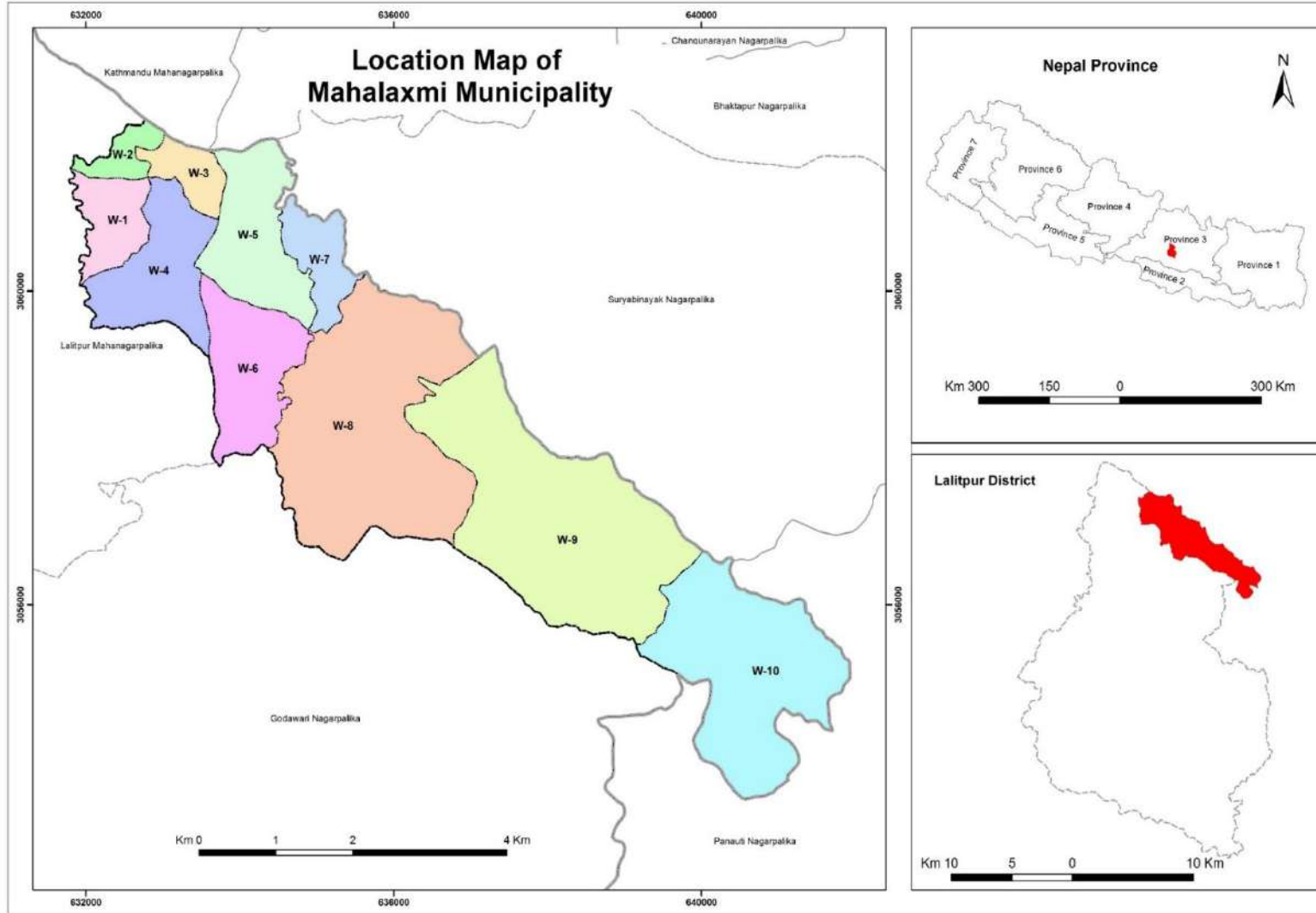
Map12. Route and Distance from PWWTP Site to Service Coverage Area

Map13. Population density per hectare

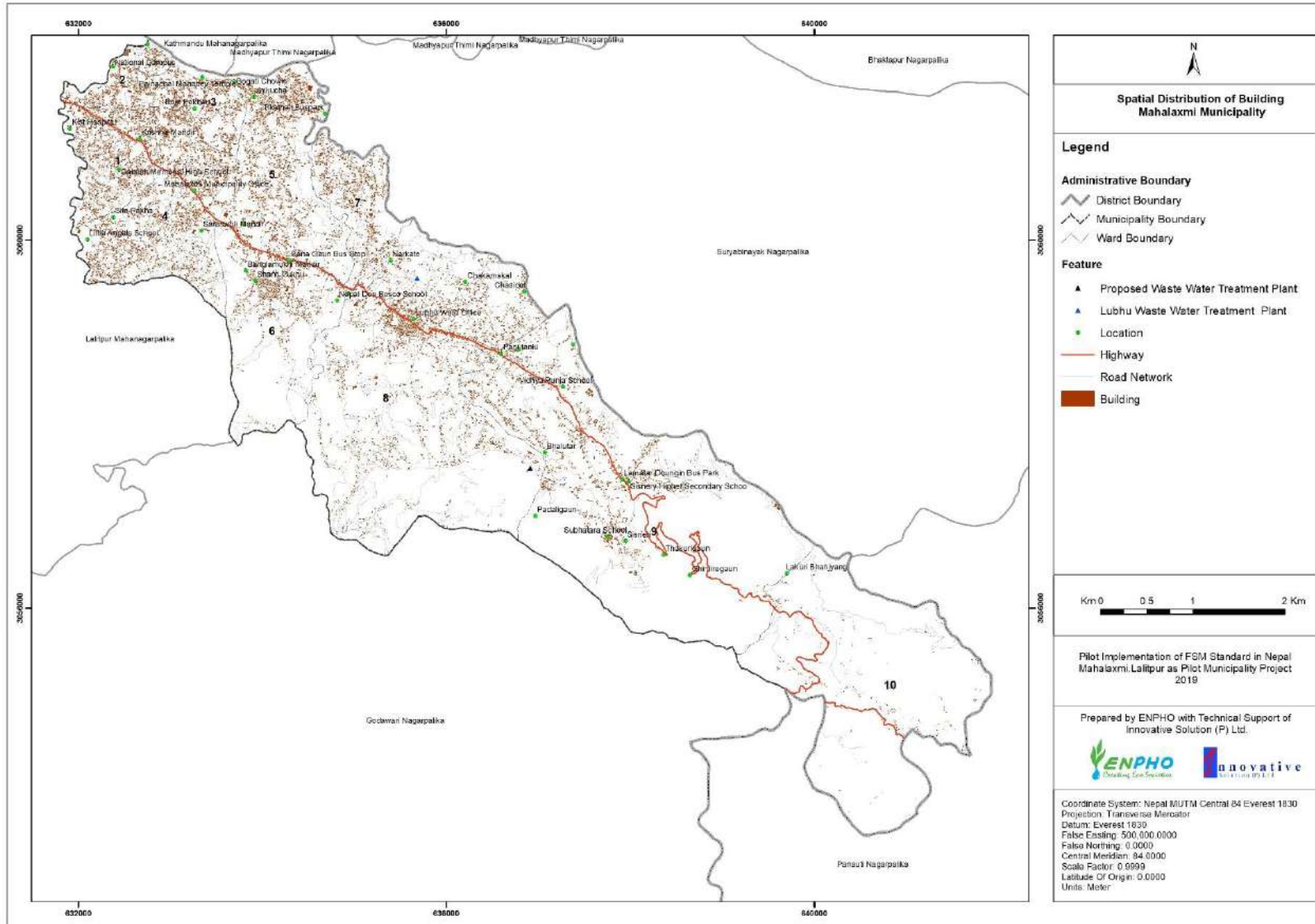
Map 14. Containment density per hectare

Map 15. Area vulnerable to well contamination

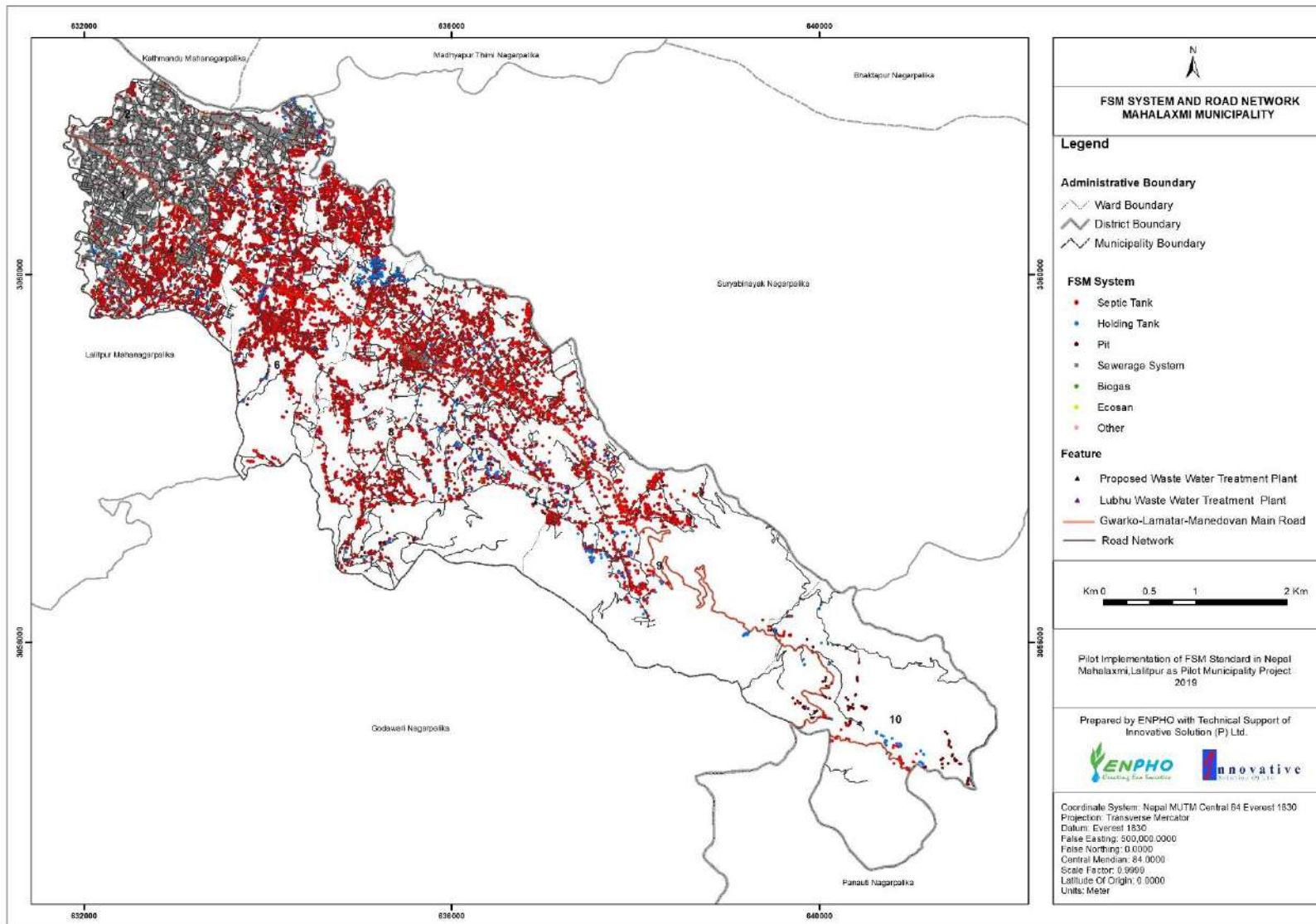
Map1. Location map of Mahalaxmi Municipality



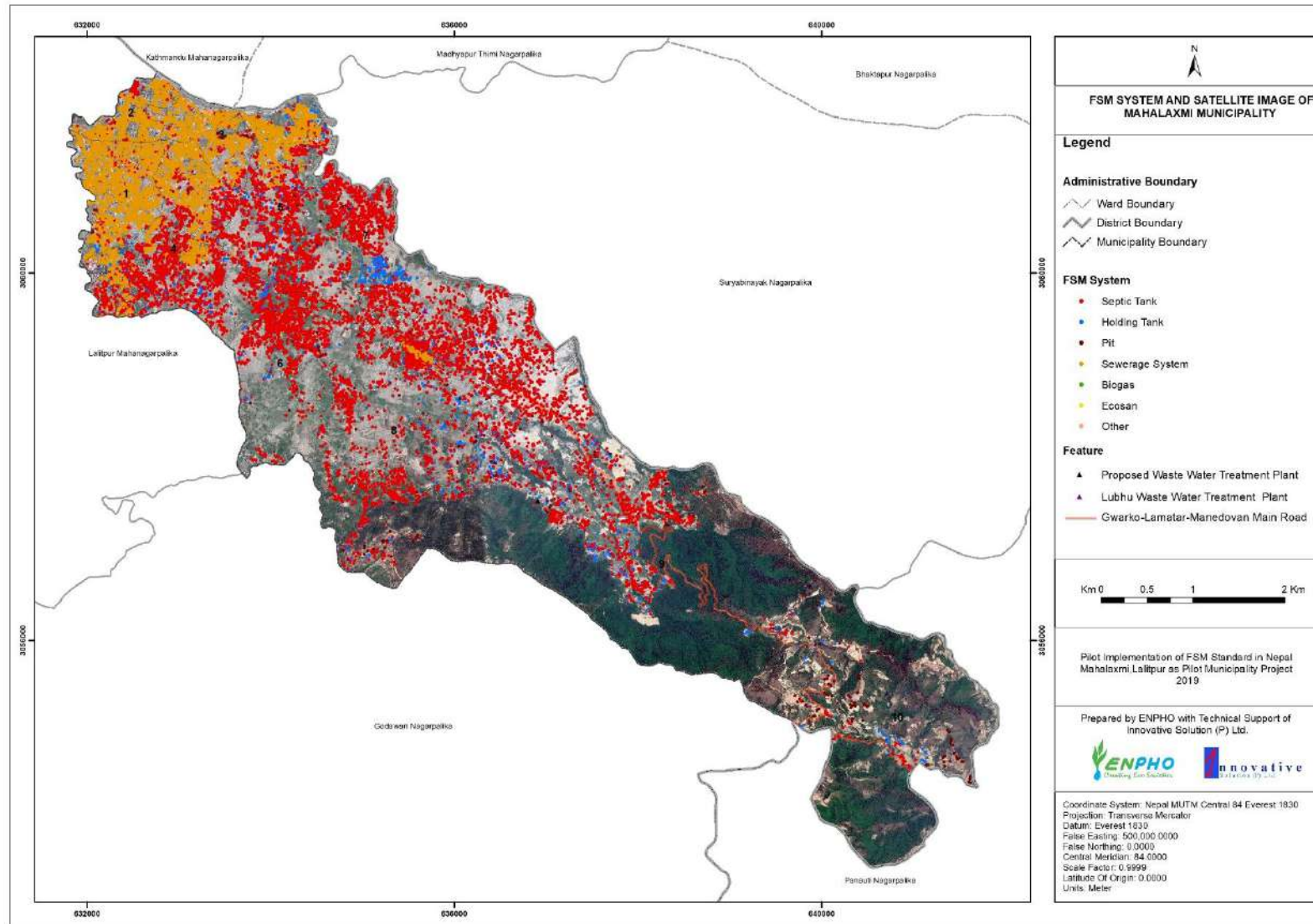
Map2. Spatial distribution of buildings in Mahalaxmi Municipality



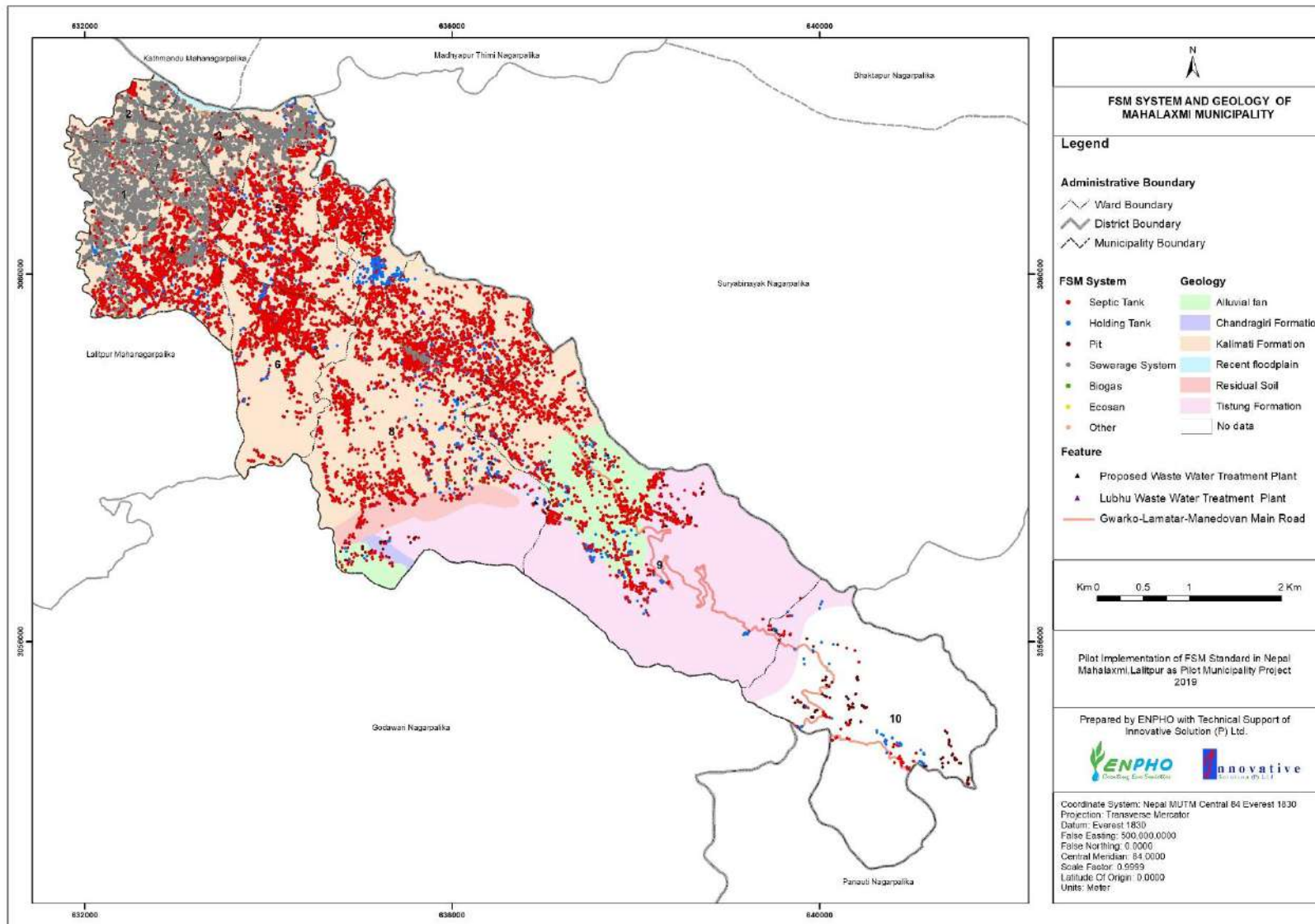
Map3. FSM system and Road



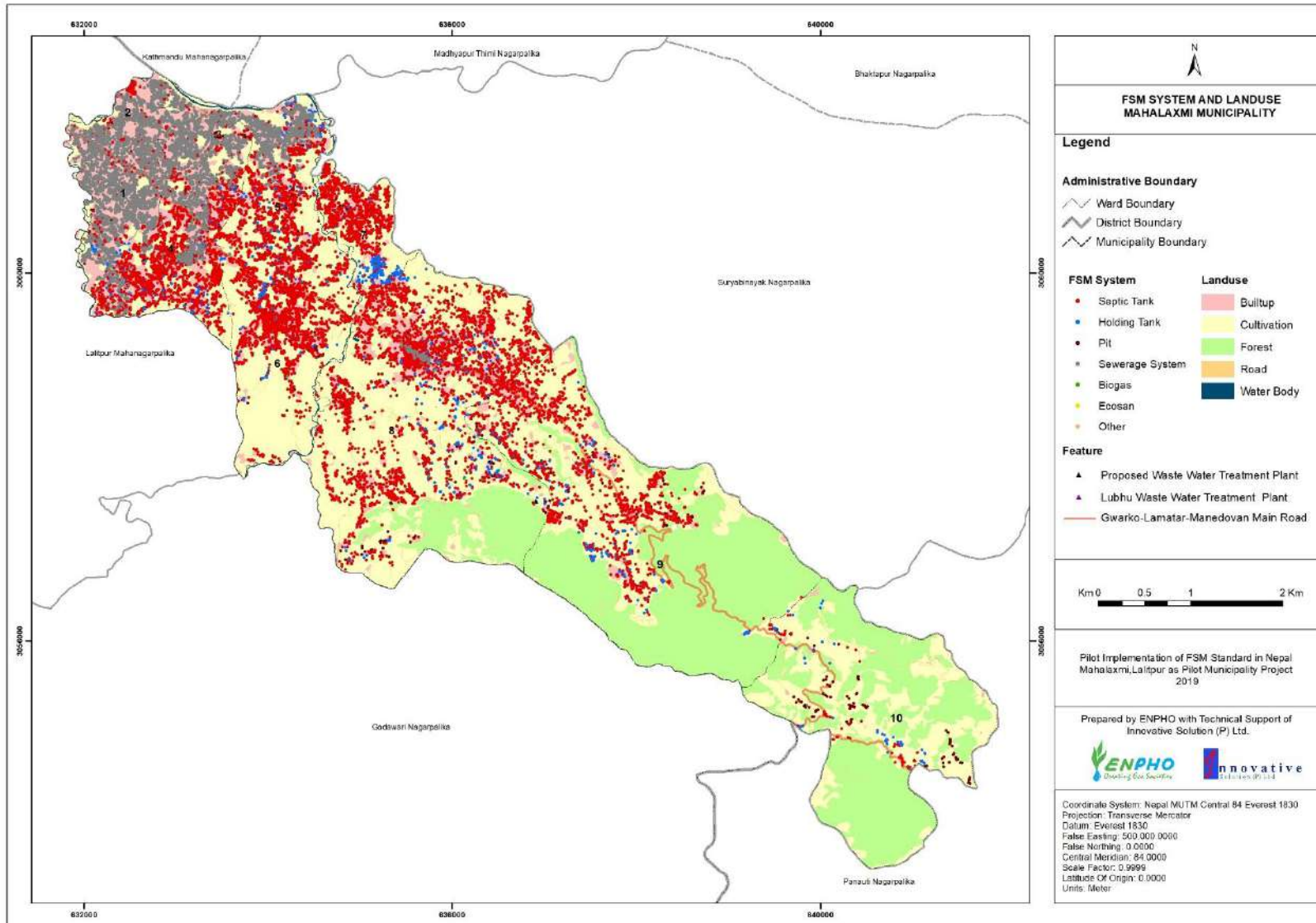
Map4. FSM system and Satellite Image



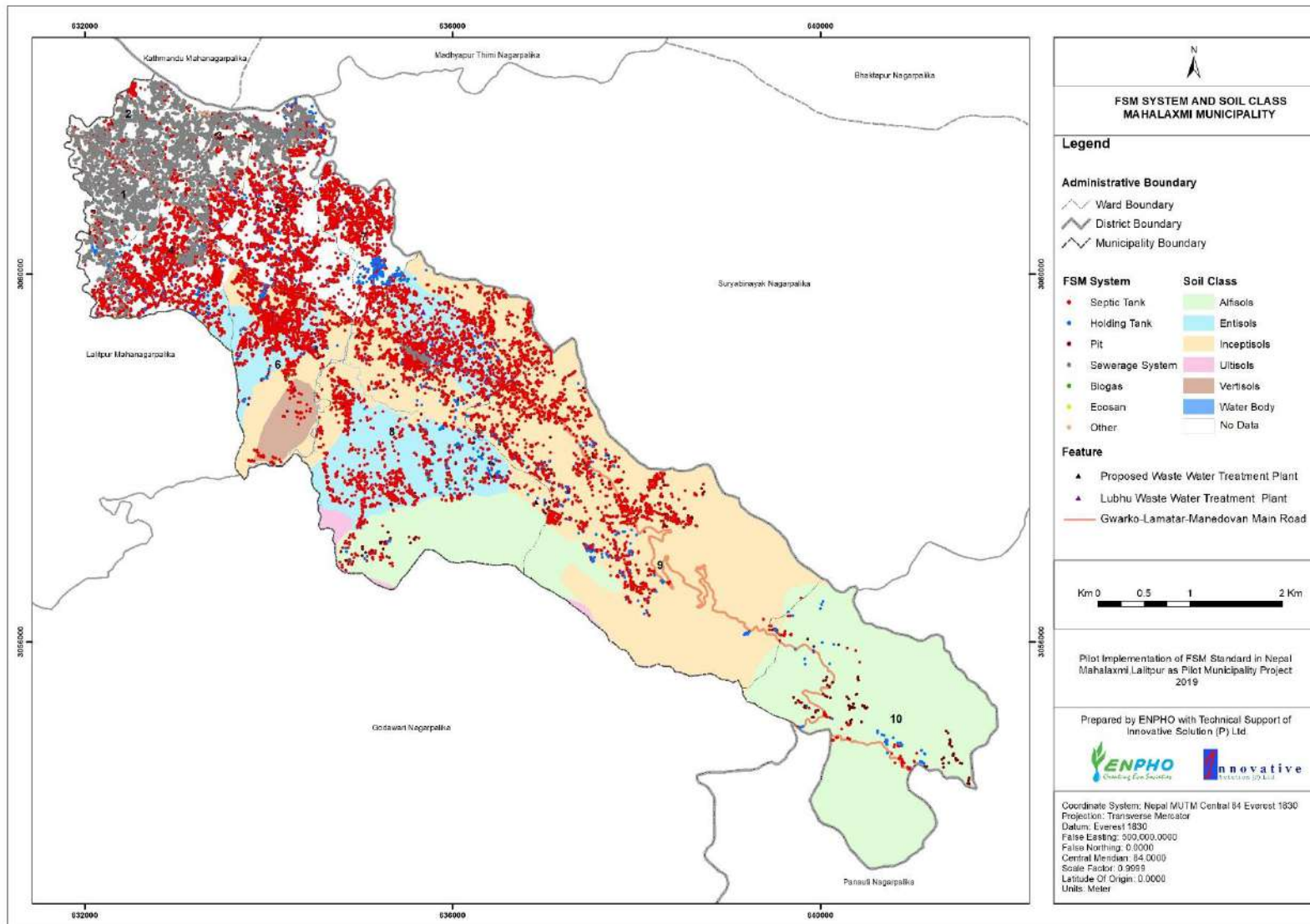
Map5. FSM system and Geology of Mahalaxmi Municipality



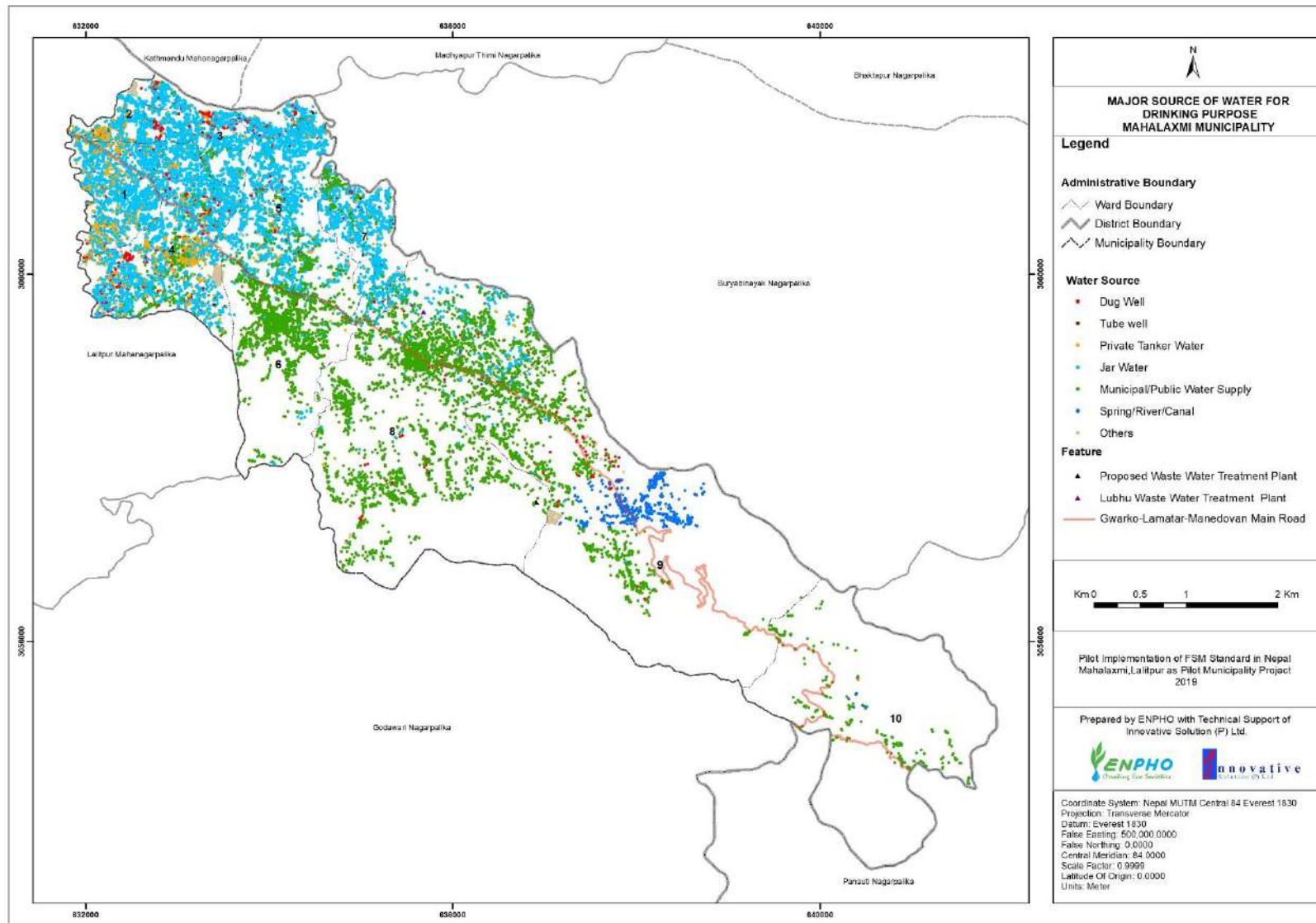
Map6. FSM system and Landuse of Mahalaxmi Municipality



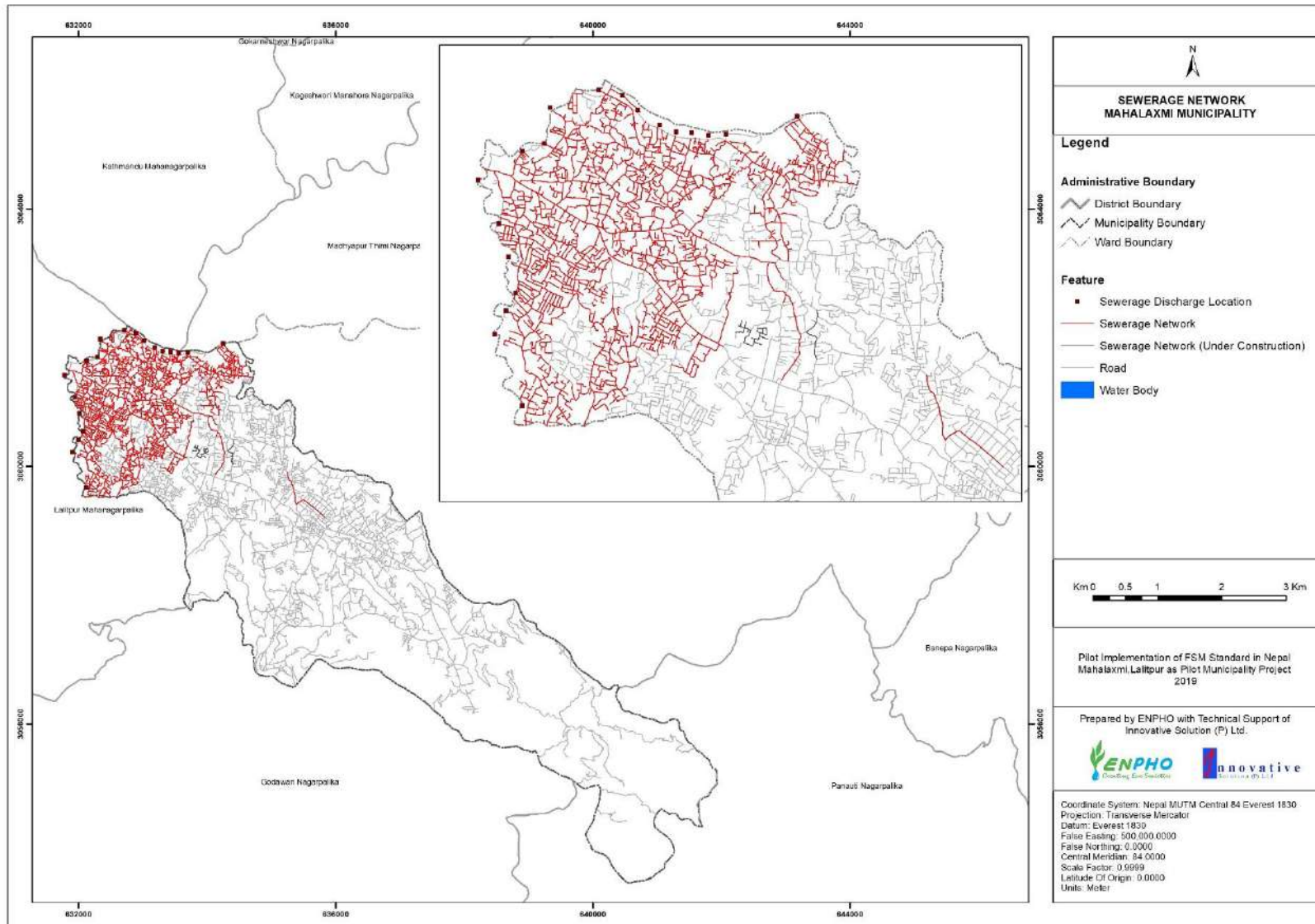
Map7. FSM system and Soil Class of Mahalaxmi Municipality



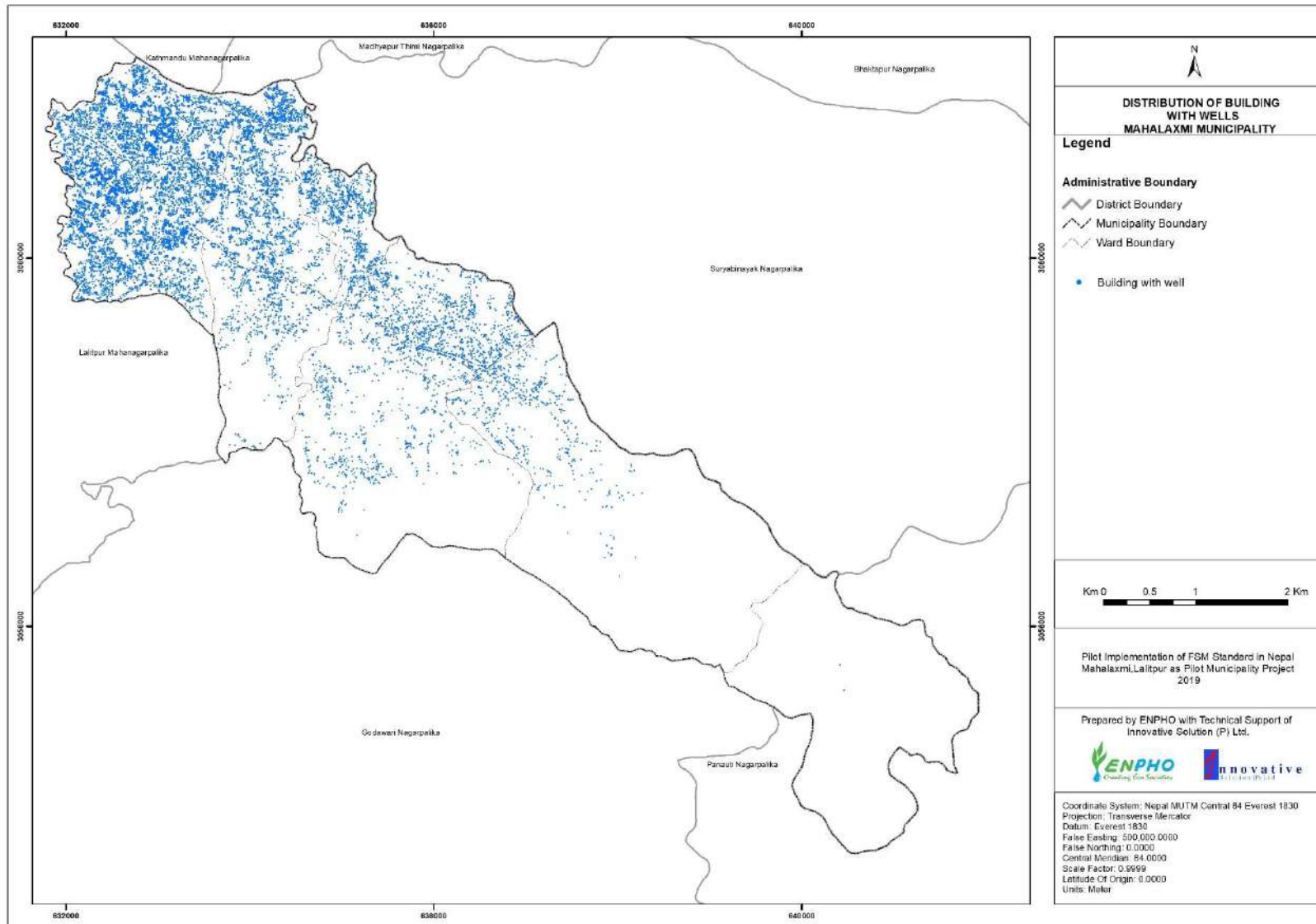
Map8. Major sources of water for drinking in Mahalaxmi Municipality



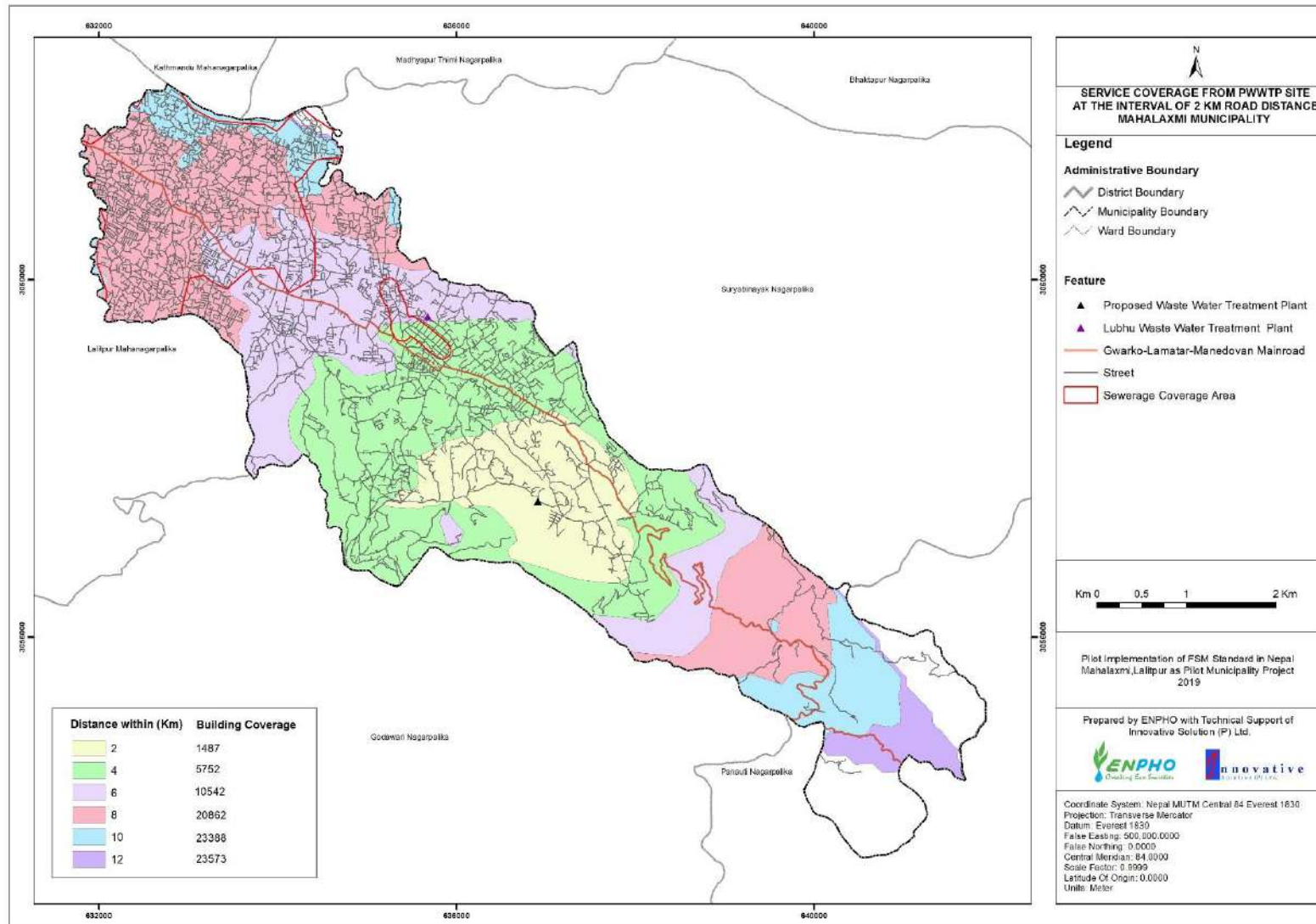
Map9. Sewerage network of Mahalaxmi Municipality



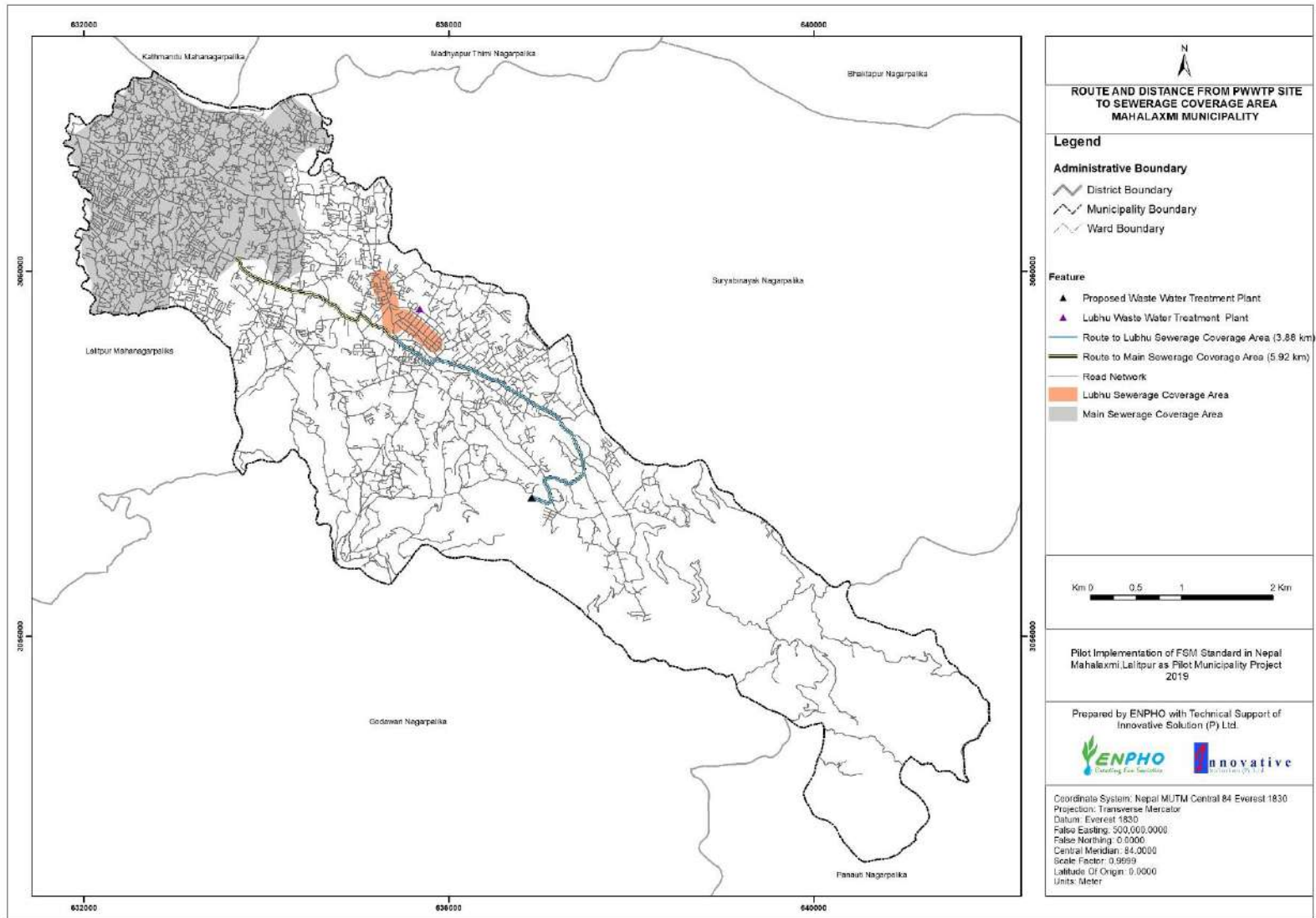
Map10. Distribution of Building with Well in Mahalaxmi Municipality



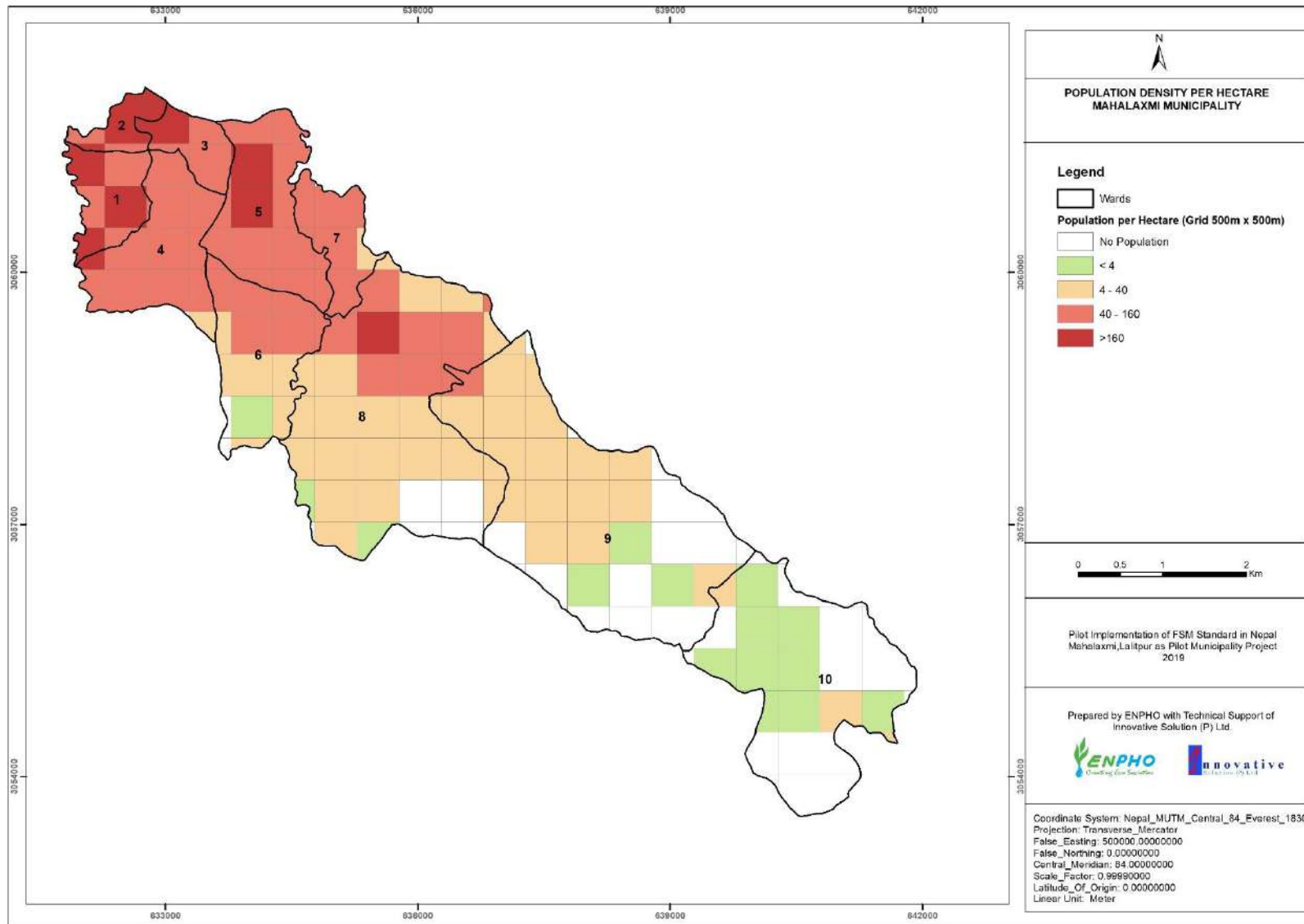
Map11. Service Coverage from PWWTP Site at the interval of 2km road distance



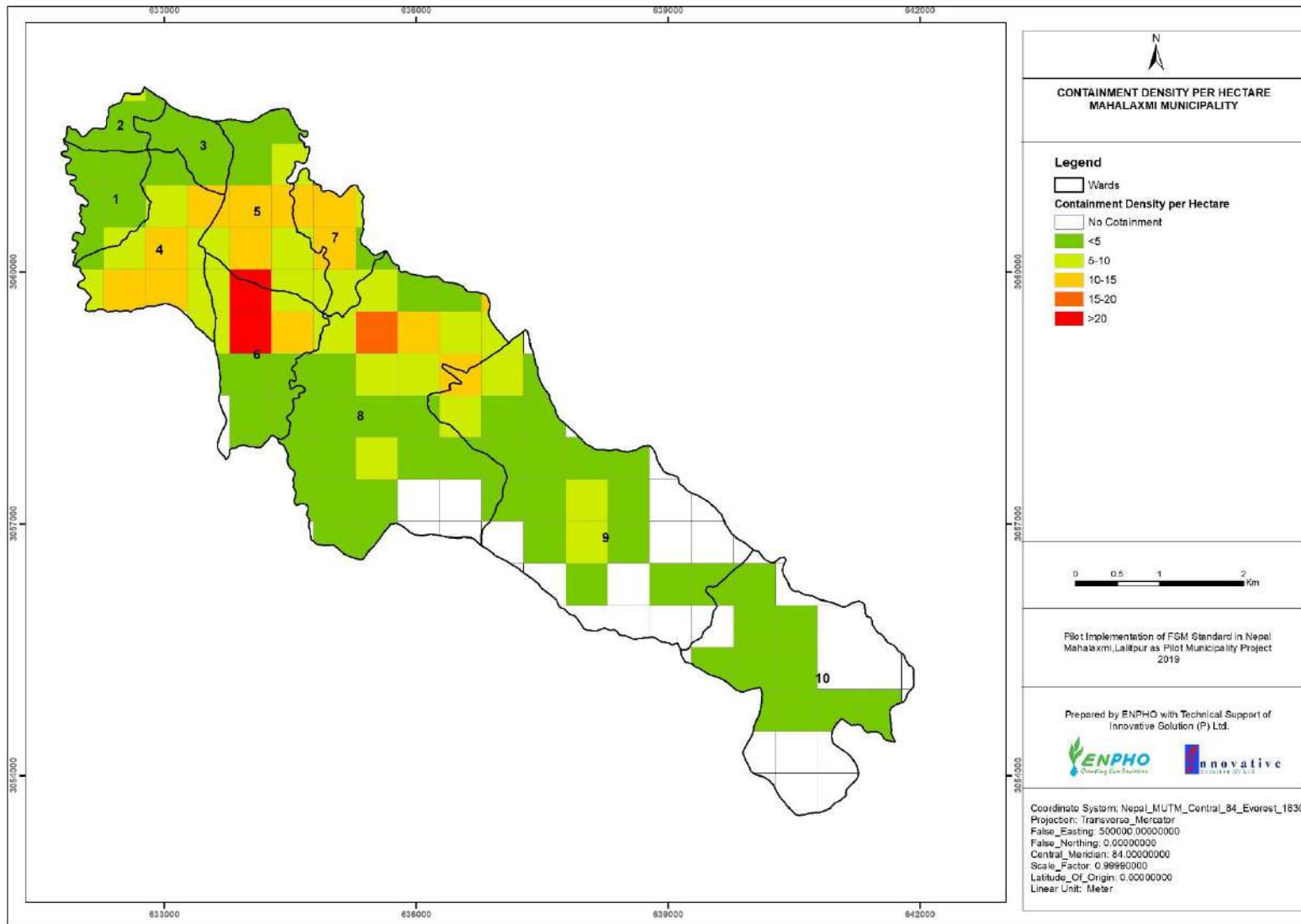
Map12. Route and Distance from PWWTP Site to Service Coverage Area



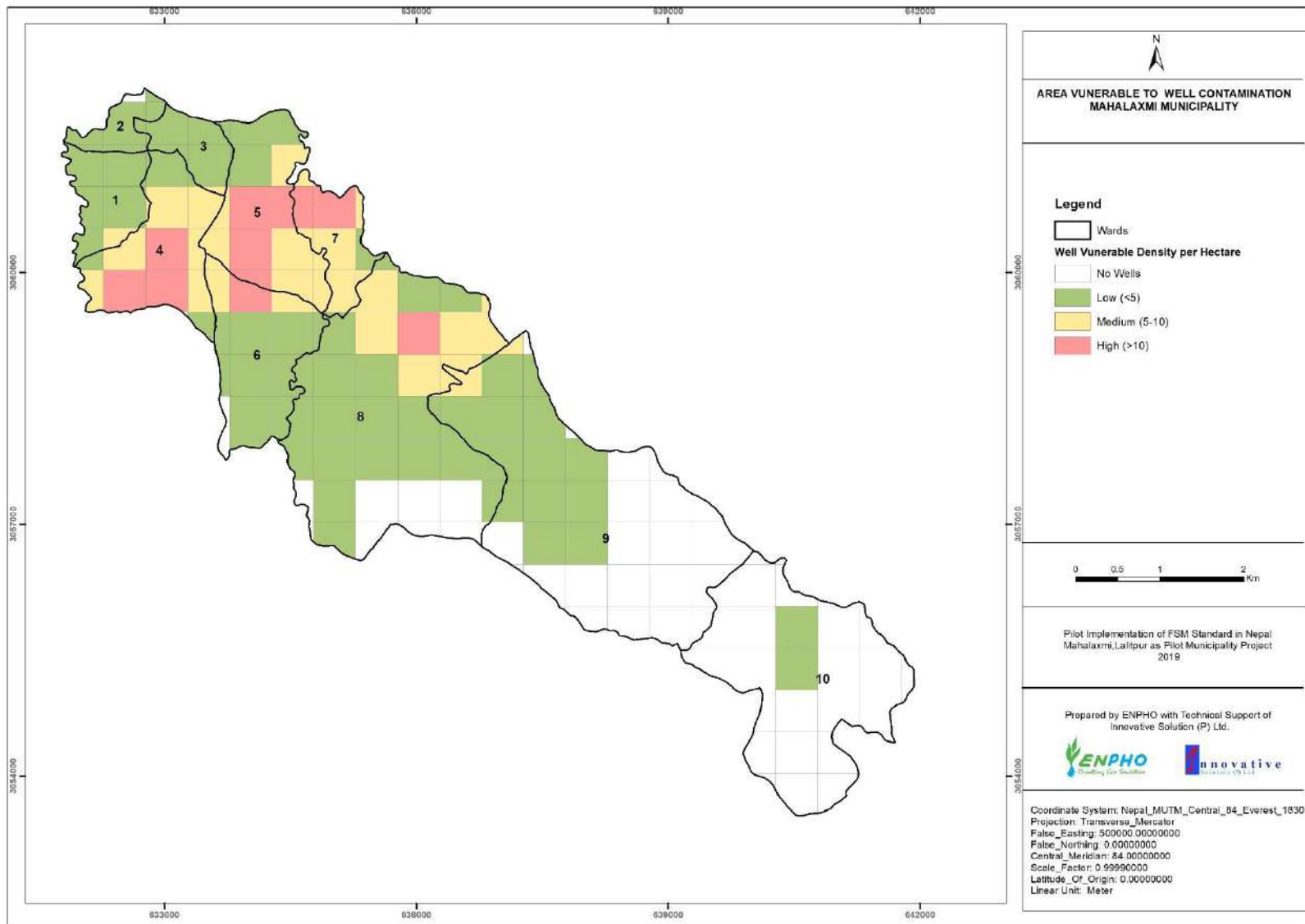
Map13. Population density per hectre



Map14. Containment density per hectre



Map15. Area vulnerable to well contamination



8 GIS based Integrated Municipal Information System

The GIS Integrated Municipal Information System (IMIS) for Mahalaxmi Municipality is being developed which comprises of all data and information collected from survey of all three stages. The system has been designed to keep sludge containment in the centre, so any plan, financing and business models developed can have sufficient basic data and information for FSM services. The GIS-database developed so far is mainly based on the existing situation of the containments, habitants of the city and other infrastructure.

Annex

- Annex-1** Checklist for Census Survey on rapid sanitation situation assessment
- Annex-2** Questionnaire for Sample Survey on sanitation situation assessment
- Annex-3** An image of Mahalaxmi Municipality
- Annex-4** A base map of Mahalaxmi Municipality
- Annex-5** A map sheet of a grid no. 86 used for field verification of Mahalaxmi Municipality (sample)
- Annex-6** A portion of map sheet 86 updated during field verification of Mahalaxmi Municipality (sample)
- Annex-7** An updated map sheet of grid 86 of Mahalaxmi Municipality (sample)
- Annex-8** Layout of Tablet used for census survey

Annex-1

Checklist for Census Survey on rapid sanitation situation assessment

Census Survey on Sanitation Situation in Mahalaxmi Municipality

1. Map Sheet No.
2. Name of Surveyor:
3. Name of Location (Tole):
4. Ward no.
5. BIN:
6. Name of Respondent
7. Gender of Respondent
8. Is Respondent owner of the building?
 - a. Yes (*if yes, go to Q11*)
 - b. No
9. If no, name of Respondent
10. Gender of Respondent

Building Information

11. What is type of construction of this building? (Observation)
 - a. RCC framed
 - b. Load bearing
 - c. Wooden/Mud
 - d. CGI Sheet
 - e. Other (Specify):
12. Number of floor (including ground floor) (Observation)
13. Purpose of use of this building?
 - a. Residential
 - b. Commercial
 - c. Mixed (Residential and Commercial)
 - d. Offices
 - e. School/college
 - f. Industrial
 - g. Institution
 - h. Other(Specify):
14. How many families/households are living in this building?
15. How many people are living in this building including all families?

Toilet Characteristics

16. Do you have toilet on your premises? (Observation)
 - a. Yes (*if yes, go to Q18*)
 - b. No
17. If No, where do your family go for defecation?
 - a. Use a shared toilet
 - b. Use a public toilet
 - c. Open defecation at water bodies
 - d. Open defecation at open ground
 - e. Others (Specify):
18. If Yes, how many toilets do you have? (Number)
19. Where is your toilet located? (Observation)
 - a. Inside the house
 - b. Outside the house
 - c. Inside and outside the house
20. Where does your toilet connection go? (Observation)

- a. Septic Tank
- b. Holding tank
- c. Pit (*go to Q22*)
- d. EcoSAN (*go to Q25*)
- e. Biogas (*go to Q25*)
- f. Directly to sewerage system (*go to Q25*)
- g. Directly to storm water drain (*go to Q25*)
- h. Directly to water bodies (*go to Q25*)
- i. Directly to open environment (*go to Q25*)
- j. Others (Specify):
- k. Don't know

Septic Tank Characteristics

21. If Septic/holding tank, does it have at least 2 chambers, outlet at top, sealed/lined base and walls (कम्तिमा २ खण्ड, माथि निकास, चारै गाह्रो र भुईँ प्लास्टर गरेको)?
- a. Yes
 - b. No
 - c. Don't Know
22. When was the septic/holding tank/pit constructed? (year B.S)
23. If you have septic/holding tank/pit, where is it located?
- a. Inside the main building
 - b. Outside the building footprint
 - c. Inside an out-building (बाहिर को घर मुनि)
 - d. Outside the property boundary
 - e. Don't know
24. Have you ever emptied your septic/holding tank/ pit?
- a. Yes
 - b. No
 - c. Don't know

Water Use

25. What is main source of water for drinking?
- a. Municipal/Public water supply
 - b. Dug well
 - c. Tube well
 - d. Spring/River/Canal/Stone spout
 - e. Rainwater
 - f. Private Tanker water
 - g. Jar water
 - h. Others
26. Are you satisfied with the quality of drinking water?
- a. Yes
 - b. No
27. Do you have well on your premises?
- a. Yes

Annex-2

Questionnaire for Sample Survey on sanitation situation assessment

1. Name of the Enumerator
2. Date
3. Demographic Information
4. वडा (Ward)
5. टोल (Tole)
Household Characteristics
6. घर नम्बर (House NumberBIN)
7. Grid Number
Respondent Information
8. उत्तर दिने व्यक्तिको नाम (Name of respondent)
9. उत्तर दिने व्यक्तिको लिङ्ग (Gender of Respondent) <ul style="list-style-type: none"> • पुरुष (Male) • महिला (Female) • अन्य (Other)
10. के हजुर घरमूली हुनुहुन्छ ? (Is the respondent House Owner?) <ul style="list-style-type: none"> • हो (Yes) • होइन (No)
House owner Information
11. घरमूलीको नाम उल्लेख गर्नुहोस् (Name of House Owner)
12. घरमूलीको लिङ्ग (Gender of House Owner) <ul style="list-style-type: none"> • पुरुष (Male) • महिला (Female) • अन्य (Other)
13. यो घरमा, कति परिवार संख्या हुनुहुन्छ / बस्नुहुन्छ ? (How many families are there in this building?) ?) 1) ?) भन्दा बढी) More than 1)
Member of House
14. परिवार संख्या उल्लेख गर्नुहोस् (How many families are there?)(Total)
15. कति जना व्यक्तिहरु बस्नुहुन्छ ? (How many people are there?)(Total)
पुरुष) Male)
महिला) Female)
16. Adult population (Adult (>=18 year))
Male
Female
17. बालबालिका संख्या (६ वर्ष भन्दा मुनि) (Children (less than 6 year))
Boy
Girl
Tenant Information
18. के यो घरमा भाडामा बस्ने कोही हुनुहुन्छ? (Is there a tenant living in this house?) छ) Yes.) छैन) No.)
19. यदि हुनुहुन्छ भने, कति जना उल्लेख गर्नुहोस् (If yes, how many tenants (in total) are there?)
Toilet Characteristics
Number of Toilets

20. हजुरको घरमा कतिवटा चर्पीहरु (प्यान/ कमोद) छन् ? (How many toilets (pans/commodos) are there in this house?) Total
Inside the house
Outside the house
Note: यदि चर्पी संख्या एकभन्दा बढी छ भने, सबैभन्दा बढी प्रयोग हुने चर्पीको बारेमा लेख्नुहोस् ।) If there are more than 1 toilet, then provide answers for characteristics (like, type, system, etc...) for the toilet which is used most.)
21. कस्तो प्रकारको चर्पी प्रयोग गर्नुहुन्छ ? (What type of toilet do you use?) <ul style="list-style-type: none"> • वाटर सिल (Water sealed) • दिसा झर्ने प्वाल मात्र भएको चर्पी (Drop hole) • थाहा छैन (Don't know)
22. हजुरको चर्पीमा कस्तो खालको फ्लसिङ्ग प्रणाली छ ? (What is the flushing system in the toilet ?) <ul style="list-style-type: none"> • पानी खन्याएर फ्लस गर्ने प्रणाली (Pour Flush) • यान्त्रिक फ्लस प्रणाली (Cistern Flush)
23. In which year was the toilet constructed?
24. हजुरको चर्पी कहिले बनाइएको हो ? (When was the toilet constructed?) <ul style="list-style-type: none"> • 0-२ वर्ष अघि (0-2 years ago) • ३-५ वर्ष अघि (3-5 years ago) • ६-१० वर्ष अघि (6-10 years ago) • ११-१५ वर्ष अघि (11-15 years ago) • १६-२० वर्ष अघि (16-20 years ago) • २० वर्ष भन्दा अगाडि (more than 20 years ago) • थाहा छैन (Don't know)
25. चर्पीको अवस्था कस्तो छ ? (What is the current physical status of toilet?) <ul style="list-style-type: none"> • राम्रो अवस्थामा छ (Good Condition) • नराम्रो अवस्थामा छ (तैपनि प्रयोग गर्न मिल्ने) (Poor Condition (still usable)) • प्रयोग गर्न नमिल्ने: जाम भएर दिसा-पिसाबले भरिएको (Unusable (flooded)) • प्रयोग गर्न नमिल्ने: भौतिक क्षति भएको (Physically damaged and unusable) • थाहा छैन (Don't know)
Sanitation System
26. हजुरको चर्पीको दिसा -पिसाब कहाँ जान्छ ? (Where does your toilet connection go ?) <ul style="list-style-type: none"> • सेप्टिक ट्याङ्की (Septic Tank) • संकलन ट्याङ्की (Holding tank) • खाल्डे चर्पी (Pit) • मलचर्पी (EcoSAN) • गोबरग्याँस (Biogas) • आकाशेपानी जाने नालीमा (Directly to storm water drain) • खोला -नालामा (Directly to water bodies) • खुला वातावरणमा (Directly to open environment) • ढलमा (Directly to sewerage system) • सोक पिटमा (Directly to soak pit) • अन्य (Others) • थाहा छैन (Don't know)
उल्लेख गर्नुहोस् (Specify (Other) Where does your toilet connection go ?)
27. हजुरको भान्साघरको , लुगा धोएको र नुहाएको फोहोरपानी कहाँ जान्छ? (Where does the wastewater from the kitchen, bathing and laundry go?) <ul style="list-style-type: none"> • सेप्टिक ट्याङ्की (Septic Tank) • संकलन ट्याङ्की (Holding tank) • खाल्डे चर्पी (Pit) • गोबरग्याँस (Biogas) • आकाशेपानी जाने नालीमा (Directly to storm water drain) • खोला -नालामा (Directly to water bodies) • खुला वातावरणमा (Directly to open environment) • ढलमा (Directly to sewerage system)

<ul style="list-style-type: none"> • सोक पिटमा (Directly to soak pit) • अन्य (Others) • थाहा छैन (Don't know)
उल्लेख गर्नुहोस् (Specify (Other) Where does the wastewater from the kitchen, bathing and laundry go?)
<p>28. ट्याङ्कीबाट निस्कने बाही (फोहोरपानी) कहाँ जान्छ ? (Where does the effluent or overflow from the tank go?)</p> <ul style="list-style-type: none"> • सोक पिटमा (Soak pit) • ढलमा (Sewerage system) • आकाशेपानी नालीमा (Storm water Drain) • खेतबारीमा (Farms) • खुला वातावरणमा (Open environment) • अन्य (Other) • कतैपनि जोडिएको छैन (Not connected) • थाहा छैन (Don't know)
उल्लेख गर्नुहोस् (Specify (Other) where does overflow/effluent from septic tank go?)
<p>29. कस्तो खालको ढल छ ? (What is the type of sewerage system?)</p> <ul style="list-style-type: none"> • केन्द्रित मिश्रित ढल प्रणाली (Centralized Combined) • केन्द्रित फरक ढल प्रणाली (Centralized Separate) • विकेन्द्रित मिश्रित ढल प्रणाली (Decentralized Combined) • विकेन्द्रित फरक ढल प्रणाली (Decentralized Separate) • थाहा छैन (Don't Know)
Survey
Water use
पानीका प्रयोग सम्बन्धि (Water Use)
<p>30. पानीका स्रोत के-के छन् ? (What are the sources of water?)</p> <ul style="list-style-type: none"> • व्यक्तिगत नगर धारा (Private-Municipal water supply) • सार्वजनिक धारा (Public Water Supply) • इनार (Dug well) • नल्का (Tube well) • दीप बोरिंग (Deep Boring) • मूल / खोलानाला (Spring/River/Canal) • आकाशे पानी (Rainwater) • निजी पानीको ट्याङ्कर (Private Tanker water) • अन्य (others)
उल्लेख गर्नुहोस् (Specify (Other) What are the sources of water?)
<p>31. दैनिक प्रयोगका लागि पानी कहाँ सङ्कलन गर्नुहुन्छ ? (Where do you store water for regular use?)</p> <ul style="list-style-type: none"> • कौशी माथिको ट्याङ्कीमा (Overhead/ Rooftop water storage tank) • गाग्रीमा (Gagris) • जारमा (Jars) • जर्कीन्मा (Jerry can) • बाल्टिनमा (Buckets) • ड्रम / ट्याङ्कीमा (Drum/Tank) • अन्य (others)
उल्लेख गर्नुहोस् (Specify (Other) Where do you store water?)
<p>32. सङ्कलन गर्ने कौशीको ट्याङ्कीको आयतन उल्लेख गर्नुहोस् । (लिटरमा) (What is the capacity (liters) of overhead/ rooftop water storage tank ?)</p>
<p>33. सङ्कलन गर्ने सबै गाग्रीको आयतन उल्लेख गर्नुहोस् । (लिटरमा) (What is the capacity (liters) of all gagris ?)</p>
<p>34. सङ्कलन गर्ने सबै जारको आयतन उल्लेख गर्नुहोस् । (लिटरमा) (What is the capacity (liters) of all jars ?)</p>
<p>35. सङ्कलन गर्ने सबै जर्कीनको आयतन उल्लेख गर्नुहोस् । (लिटरमा) (What is the capacity (liters) of all jerry cans ?)</p>
<p>36. सङ्कलन गर्ने सबै बाल्टिनको आयतन उल्लेख गर्नुहोस् । (लिटरमा) (What is the capacity (liters) of all buckets ?)</p>
<p>37. सङ्कलन गर्ने सबै ड्रम / ट्याङ्कीको आयतन उल्लेख गर्नुहोस् । (लिटरमा) (What is the capacity (liters) of all drums/ tanks ?)</p>
<p>38. अन्यमा उल्लेख गर्नुभएको भाडाको आयतन कति हो ? (What is the capacity (liters) of $\{A2\}$?)</p>

39. हजुरको घर नजिकै रहेको इनारको पानी जमिनबाट कति गहिराइमा छ (फीट मा) ? (How deep is the water level from the ground in the well nearby?)
40. वर्षा याममा, त्यस इनारमा पानीको लेवल कहाँ सम्म पुग्छ ? (What will be the maximum water level in the well during rainy season?)
नोट :माथिका प्रश्नहरूले नजोगतेका केही नयाँ जानकारी छन भने कृपया यहाँ उल्लेख गर्नुहोस्) Note (If you want to add any detail/data, which was not covered in above questionnaire, then please write it here))
41. कतिवटा सेप्टिक ट्याङ्की /होल्डिंग ट्याङ्की/ खाल्डो छन् ? (How many septic tank/holding tank/pit are there in this property?)
सेप्टिक ट्याङ्की/ होल्डिंग ट्याङ्की/ खाल्डो (Septic tank/Holding tank/Pit)
42. कस्तो प्रकारको खाल्डो चर्पी छ? (What type of pit do you have?)
<ul style="list-style-type: none"> • एक खाल्डो अफसेट चर्पी (Single offset pit) • दुई खाल्डो अफसेट चर्पी (Double offset pit) • खाल्डो चर्पी (Direct pit) • अन्य (Others)
उल्लेख गर्नुहोस् (Specify (other) type of pit.)
43. सेप्टिक ट्याङ्की / होल्डिंग ट्याङ्की/खाल्डोमा कहाँ- कहाँको फोहोरपानी जान्छ ? (From where wastewater goes in septic tank/holding tank/pit?)
<ul style="list-style-type: none"> • चर्पीको (Toilet) • बाथरूमको (Bathroom) • धुने ठाउँको (Washing Area) • बेसिनको (Wash basins) • भान्सा-कोठाको (Kitchen) • आकाश पानी (Rainwater) • अन्य (Others)
44. सेप्टिक ट्याङ्की /होल्डिंग ट्याङ्की/ खाल्डोमा कहाँ- कहाँको फोहोरपानी जान्छ ? (Specify other/From where wastewater goes in septic tank/holding tank/pit?)
45. सेप्टिक ट्याङ्की / होल्डिंग ट्याङ्की/खाल्डो कहाँ छ ? (Where is the tank/pit located?)
<ul style="list-style-type: none"> • मुख्य घर मुनि (Inside the main building) • बाहिरको घर मुनि (Inside an out-building) • घर बाहिर (Outside the building footprint) • घर जग्गा बाहिर (Outside the property boundary) • कता छ कता (The tank/pit cannot be located)
46. सेप्टिक ट्याङ्की / होल्डिंग ट्याङ्की/खाल्डोको आकार कस्तो छ ? (What is the shape of septic tank/holding tank/pit?)
<ul style="list-style-type: none"> • चार-कुने (Rectangular) • गोलो (Circular) • थाहा छैन (Don't Know)
नाप (Dimension)
47. नाप (मिटरमा) (Dimensions of septic tank) (Observation+Measurement)
लम्बाइ मिटरमा (Length (in meters))
चौडाइ मिटरमा (Width (in meters))
व्यास मिटरमा (Diameter (in meters))
गहिराई मिटरमा (Depth (in meters))
रिङ्ग संख्या (Number of rings)
48. माथि उल्लेख गरिएको नाप (Dimension noted on previous questions are)
<ul style="list-style-type: none"> • स्वयम्सेवकले नापेको (Measured by enumerator) • प्रतिक्रिया दिने व्यक्तिले दिएको (Given by respondent) • नक्साबाट लिइएको (Copied from septic tank design showed by respondent) • Other
Specify other (माथि उल्लेख गरिएको नाप (Dimension noted on previous questions are))
49. सेप्टिक ट्याङ्कीमा कति खण्ड छन् ? (Number of chambers in the septic/holding tank)
<ul style="list-style-type: none"> • एक खण्ड (One chamber) • दुई खण्ड (Two chamber) • तीन खण्ड (Three chamber) • थाहा छैन (Don't know)

<p>50. के हजुरको ट्याङ्की / खाल्डोमा सजिलै खोल्ल-बन्द गर्न मिल्ने ढकनी छ ? (Is there a proper man hole or access port for each tank/pit?)</p> <ul style="list-style-type: none"> • छ (Yes) • छैन (No) • थाहा छैन (Don't Know)
<p>51. Is there outlet in the tank?</p> <ul style="list-style-type: none"> • छ (Yes) • छैन (No) • थाहा छैन (Don't Know)
<p>52. Where is the outlet of the tank?</p> <ul style="list-style-type: none"> • Top part of the side of tank • Mid part of the side of tank • Bottom part of the side of tank • Don't know
<p>53. सेप्टिक ट्याङ्की/होल्डिंग ट्याङ्की/ खाल्डो माथीको भुइ कस्तो छ ? (What is the type of flooring above septic tank/holding tank/ pit?)</p> <ul style="list-style-type: none"> • प्लास्टर गरिएको(Concrete plaster) • ढलाई मात्र गरिएको (Unfinished concrete) • टाइल लगाइएको (Tile) • माटोले पुरिएको (Soil) • अन्य (Other)
<p>उल्लेख गर्नुहोस् (Specify (Other) type of flooring)</p>
<p>54. ट्याङ्की भरिएपछि, के हजुर दिसाजन्य लेदो खाली गर्न भुइ फुटाल्न इच्छुक हुनुहुन्छ (Are you willing to break the floor for emptying?)</p> <ul style="list-style-type: none"> • छु (Yes) • छैन (No) • हुन्छु होला, तर जानकारी चाहिन्छ (Maybe, need more information)
<p>55. हजुरको सेप्टिक ट्याङ्की/ होल्डिंग ट्याङ्की/खाल्डे चर्पी नजिकैको ईनार/नल्काबाट कति टाढा छ ? (How far is septic tank/holding tank/pit from the nearby well/tubewell?)</p> <ul style="list-style-type: none"> • ५ मि. भन्दा कम (Below 5 m) • ५- १० मि. (5-10 m) • ११- २० मि. (11-20 m) • २१- ५० मि. (21-50 m) • ५१- १०० मि. (51 - 100 m) • १०० मि. भन्दा बढी (more than 100 m) • कुनै पनि होइन (None)
<p>56. के हजुरको सेप्टिक ट्याङ्की/ होल्डिंग ट्याङ्की/खाल्डो प्लास्टर गरिएको छ ? (Is your septic tank/holding tank/pit sealed?)</p> <ul style="list-style-type: none"> • भुइँ-भित्ता सबै प्लास्टर गरिएको छ (Sealed) • प्लास्टर नगरिएको (Unsealed) • भित्ता प्लास्टर गरिएको तर भुइँ नगरिएको (Wall Is sealed, but base is unsealed) • अन्य (Others) • थाहा छैन (Don't know)
<p>उल्लेख गर्नुहोस् (Specify (Other) Is your septic tank/होल्डिंग ट्याङ्की/pit sealed?)</p>
<p>57. हजुरको सेप्टिक ट्याङ्की/होल्डिंग ट्याङ्की/ खाल्डोको अवस्था कस्तो छ ? (What is the current physical status of septic tank/holding tank/pit?)</p> <ul style="list-style-type: none"> • राम्रो छ (Good Condition) • ठिकै छ (Fair Condition) • बिग्रिएको छ (Damaged) • भताभुङ्ग भएको / नराम्रो सँग बिग्रिएको छ (Collapsed) • दिसाजन्य लेदो ट्याङ्की /खाल्डोबाट बाहिर निस्किएको (Flooded) • थाहा छैन (Don't know)
<p>नोट :माथिका प्रश्नहरूले नजोगटेका केही नयाँ जानकारी छन् भने कृपया यहाँ उल्लेख गर्नुहोस्) Note (If you want to add any detail/data, which was not covered in above questionnaire, then please write it here)</p>
<p>58. के तपाईंले अहिलेसम्म सेप्टिक ट्याङ्की /होल्डिंग ट्याङ्की/ खाल्डो खाली गर्नुभएको छ ? (Have you ever emptied your septic tank/holding tank/ pit?)</p>

<ul style="list-style-type: none"> • छ (Yes) • छैन (No) • थाहा छैन (Don't Know)
यदि छैन भने) Never Emptied)
<p>59. हजुरले अहिलेसम्म सेप्टिक ट्याङ्की / होल्डिंग ट्याङ्की/खाल्डो किन खाली नगर्नु भएको ? (Why haven't you emptied your septic tank/holding tank/?)</p> <ul style="list-style-type: none"> • भरिएको छैन (Not filled) • थाहा भएन (Lack of knowledge) • सेवा प्रदायक (सेवा दिने निकाय/व्यक्ति) छैन (No service provider available) • अन्य (others)
उल्लेख गर्नुहोस् (Specify (Other) Why haven't you emptied your septic tank/holding tank/?)
<p>60. सेप्टिक ट्याङ्की/होल्डिंग ट्याङ्की/ खाल्डो भरिएपछि के गर्नुहुन्छ ? (What will you do after the tank/pit get filled?)</p> <ul style="list-style-type: none"> • आफै खाली गर्छु (Self emptying) • सेवा दिने निकायलाई सम्पर्क गर्छु (Contact Private Entrepreneurs) • पहिले देखि सेप्टिक ट्याङ्की/ खाल्डो खाली गर्ने व्यक्तिलाई सम्पर्क गर्छु (Contact Traditional Labors) • नगरपालिकालाई सम्पर्क गर्छु (Contact Municipality) • माटोले छोपेर छोडिदिन्छु (Cover with soil and abandoned.) • यतिकै छोडिदिन्छु (abandoned only) • खाल्डो खनेर पुरिदिन्छु (Dig a hole and dump) • थाहा छैन (Don't know) • बर्षातमा पिढको पाइप् खोलिदिने (open emptying) • अन्य (Others)
उल्लेख गर्नुहोस् (Specify (Other) What will you do after the tank/pit get filled?)
<p>61. हजुरको सेप्टिक ट्याङ्की / होल्डिंग ट्याङ्की/खाल्डो खाली गर्ने निकायलाई कति शुल्क तिर्न इच्छुक हुनुहुन्छ ? (How much are you willing to pay for emptying the septic tank/holding tank/pit latrine)</p> <ul style="list-style-type: none"> • रु.५०० भन्दा मुनि (below 500) • रु.५०१-१००० (501 - 1000) • रु.१००१-२००० (1001 - 2000) • रु.२००१-३००० (2001 -3000) • रु.३००१-५००० (3001 - 5000) • रु.५००० भन्दा बढी (more than 5000) • जति भन्छ त्यति (As per their rate) • सित्तैमा (Free of cost)
यदि खाली गरिएको छ भने (Emptied)
<p>62. In which year was the septic tank/ holding tank/ pit last emptied?</p>
<p>63. हजुरको सेप्टिक ट्याङ्की/ होल्डिंग ट्याङ्की/ खाल्डो कहिले खाली गर्नुभएको थियो ? (When was the septic tank/holding tank/pit last emptied?)</p> <ul style="list-style-type: none"> • ०-६ महिना भयो (0-6 month) • ६-महिना - २ वर्ष भयो (6 month - 2 years) • २-५ वर्ष भयो (2 - 5 years) • ५-१० वर्ष भयो (5-10 years ago) • १० वर्ष भन्दा बढी भयो (more than 10 years ago)
<p>64. कति अन्तरालमा ट्याङ्की खाली गर्नुहुन्छ/भरिन्छ ? (At what time interval is the septic tank/holding tank/pit emptied?)</p> <ul style="list-style-type: none"> • वर्षको ३ चोटी भन्दा बढी (more than 3 times a year) • वर्षको २ चोटी (Twice a year) • हरेक वर्ष (every year) • २ वर्षको एकचोटी (Every 2 years) • ३-५ वर्षमा (3-5 year) • ६-१० वर्षमा (6-10 year) • १० वर्षभन्दा बढी (more than 10 year) • थाहा छैन (I don't know)
<p>65. सेप्टिक ट्याङ्की / खाल्डो खाली गर्नुको कारण के थियो ? (What was the reason for emptying ?)</p> <ul style="list-style-type: none"> • नियमित रूपमा खाली गर्छु (Routine cleaning)

<ul style="list-style-type: none"> • जाम भएर (Due to blockage) • भरिएर (Overflow or filling up) • गनाएर (foul smell) • अन्य (Others)
उल्लेख गर्नुहोस् (Specify (Other) What was the reason for emptying ?)
<p>66. सेवा दिने निकायको थिए ? (Who empties the septic tank/holding tank/pit?)</p> <ul style="list-style-type: none"> • नगरपालिका (Municipality) • निजी व्यवसायी (Private entrepreneur) • परम्परागत सफा गर्ने व्यक्ति (Traditional Labor) • आफैँ (Self) • अन्य (Other)
उल्लेख गर्नुहोस् (Specify (Other) Who empties the septic tank/pit?)
<p>67. सेवा दिने निकायले (वा आफैँले) कसरी खाली गर्छन् ? (How they emptied tank/pit ?)</p> <ul style="list-style-type: none"> • हातले वा बिना मेसिनको प्रयोग गरी (Manual) • मेसिनको प्रयोग गरेर (Mechanical) • दुवै तरिकाले (Both manual and mechanical) • वर्षातमा पिढको पाइप खोलीदिने (open emptying)
<p>68. यदि हातले गर्नुहुन्छ भने, मेसिनको प्रयोग नगरी हातले किन खाली गर्नुहुन्छ ? (Why do you practice manual emptying service?)</p> <ul style="list-style-type: none"> • मेसिनको प्रयोग गर्दा महङ्गो भएकोले (High cost of mechanical emptying) • सेप्टिक ट्याङ्की बाटोको पहुँचमा नभएकोले (Septic tank is not easily accessible) • सेवा दिने निकायलाई सम्पर्क गर्ने तरिका लामो भएकोले (Lengthy process to contact emptying trucks) • सेवा दिने निकायबारे जानकारी नभएकोले (No idea as to whom to contact and what is the process for contacting trucks) • खेतबारीमा लगाउन (Application at farm) • सेवा दिने निकाय नभएकोले (Private entrepreneur does not exist locally) • अन्य (Others)
उल्लेख गर्नुहोस् (Specify (Other) Why do you practice manual emptying service?)
About Emptying
<p>69. हातले खाली गरिसकेपछि दिसाजन्य लेदो कहाँ बिर्सजन/ फ्याल्नु हुन्छ ? (Where do you dispose your faecal sludge after manually emptying your pit or septic tank/holding tank?)</p> <ul style="list-style-type: none"> • सिधै खेतबारीमा प्रयोग गर्छु (Direct application to farm) • मल बनाउछु (Make compost out of it) • नालीमा/ ढलमा फाल्छु (Nearby storm water drain / sewage) • खाल्डो खनेर त्यसमा पुरिदिन्छु (Digging hole in land and dumping) • खोलानालामा (Water body (river/pond)) • अन्य (Others) • थाहा छैन (Don't know)
उल्लेख गर्नुहोस् (Specify (Other) Where do you dispose your faecal sludge after manually emptying your pit or septic tank/holding tank?)
<p>70. बिर्सजन गरिएपछि/ फ्यालिएपछि, त्यसको नराम्रो पक्ष के भोग्नुपर्छ ? (What are the ill-effects that you observe during / after manual disposal?)</p> <ul style="list-style-type: none"> • गन्याउँछ (Foul Smell) • झैँगा-लामखुटे आउँछ (Flies Problem) • छिमेकीबाट गुनासो/ उजुरी आउँछ (Complains from neighbourhood) • पानीका स्रोत दूषित भएका छन् (Contamination on water sources) • अन्य (Others) • केही पनि हुँदैन (None)
उल्लेख गर्नुहोस् (Specify (Other) what are the ill-effects that you observe during / after manual disposal?)
<p>71. मेसिनको प्रयोग नगरी खाली गर्ने क्रममा कति आयतनको बाल्टिन प्रयोग गरिएको थियो ? (What was the size of bucket used for manual emptying?)</p> <ul style="list-style-type: none"> • १० लि (10 litres) • २० लि (20 litres) • ३० लि (30 litres)

<ul style="list-style-type: none"> • ४० लि (40 litres) • ५० लि (50 litres)
<p>72. कति टिप गरिएको थियो ? (बाल्टिनको प्रयोग गर्दा) (How many trips did they make for manual emptying?)</p> <ul style="list-style-type: none"> • 0-१५ (0-15) • १६-३० (16-30) • ३१-५० (31-50) • ५० भन्दा बढी (more than 50)
<p>73. मेसिनले खाली गर्ने भाँडोको आयतन कति थियो ? (What was the size of container used for mechanical emptying?)</p> <ul style="list-style-type: none"> • ०-५०० लि (0-500 litres) • ५०१-१००० लि (501-1000 litres) • १०००-२००० लि (1001-2000 litres) • २००१-४००० लि (2001-4000 litres) • ४००१-६००० (4001-6000 litres) • ६००० लि भन्दा बढी (More than 6000 litres) • थाहा छैन (Don't know)
<p>74. कति टिप गरेका थिए (मेसिनले खाली गर्ने क्रममा) (How many trips did they make for mechanical emptying?)</p> <ul style="list-style-type: none"> • १ (1) • २ (2) • ३ (3) • ३ भन्दा बढी (more than 3)
<p>75. मेसिनको प्रयोगले खाली गर्ने क्रममा केही समस्या व्यहोर्न परेको थियो ? (Were there any problems during mechanical emptying of septic tank/holding tank/pit?)</p> <ul style="list-style-type: none"> • घरबाट गाडी राख्ने ठाँउको पहुँच टाढा थियो (Access or distance for suction truck to house) • टायल फुटाल्नु परेको थियो (Break floor tiles to access septic tank) • ढकनी बरिपरीको प्लास्टर फुटाल्नु पर्यो (Break concrete manhole to access septic tank) • सेप्टिक ट्याङ्की/ खाल्डो पत्ता लगाउन गाह्रो भएको थियो (Difficult to locate the septic tank) • दुर्गन्ध आएको थियो (Bad Smell) • फोहोर गरिदिएको थियो (Made a mess) • त्यस्तो केही समस्या आएको थिएन, (No problem found) • अन्य (Others) • थाहा छैन (Don't know)
<p>उल्लेख गर्नुहोस् (Specify (Other) problem during mechanical emptying)</p>
<p>76. सेप्टिक ट्याङ्की / होल्डिङ ट्याङ्की / खाल्डो खाली गर्ने क्रममा कति पानी प्रयोग भएको थियो ? (How much water was used during emptying the septic tank/holding tank/pit?)</p> <ul style="list-style-type: none"> • पानीको प्रयोग भएको थिएन (No use of water) • १०० लिटर भन्दा कम (less than 100 L) • १०१-२०० लि (101-200 L) • २०१-३०० लि (201 - 300 L) • ३०१-४०० लि. (301 - 400 L) • ४०१-५०० लि. (401 - 500 L) • ५०० लि. भन्दा बढी (more than 500 L) • थाहा छैन (Don't Know)
<p>77. के सेप्टिक ट्याङ्की / होल्डिङ ट्याङ्की / खाल्डो पुरै खाली गरिएको थियो? (Is the tank emptied completely?)</p> <ul style="list-style-type: none"> • थियो (Yes) • थिएन (No) • थाहा छैन (Don't know)
<p>78. यदि थिएन भने, कति बाँकी छोडिएको थियो ? (How much stays behind?)</p> <ul style="list-style-type: none"> • आधाभन्दा बढी (more than half) • आधा (half) • एक-तिहाइ (1/3 (one third)) • एक-तिहाइ भन्दा कम (less than 1/3 (one third))

<ul style="list-style-type: none"> • थाहा छैन (Don't know)
<p>सेवा निकायको विशेषता) Characteristics of Service Provider)</p>
<p>79. के हजुरको समाजमा सेप्टिक ट्याङ्की होल्डिंग ट्याङ्की// खाल्डो खाली गर्ने निकाय / व्यक्ति छन् ? (Do you have service provider or person for emptying your pit/septic tank/holding tank in the locality?)</p> <ul style="list-style-type: none"> • छ (Yes) • छैन (No) • थाहा छैन (Don't know)
<p>80. यदि छन् भने कति ? (How many service provider are there in this locality?)</p> <ul style="list-style-type: none"> • १ (1) • २ (2) • ३ (3) • ३ भन्दा बढी (more than 3) • थाहा छैन (Don't know)
<p>81. सेवा दिने निकायलाई कसरी सम्पर्क गर्नुभयो ? (How did you contact service provider?)</p> <ul style="list-style-type: none"> • छिमेकीद्वारा (Neighbour) • पत्र-पत्रिकाद्वारा (Newspaper) • साथीभाईद्वारा (Friends) • नातेदारद्वारा (Relatives) • विज्ञापनद्वारा (Advertisements) • दलाल वा मध्यस्थ व्यक्तिद्वारा (Broker) • नगरपालिकाद्वारा (Municipality) • अन्य (Others)
<p>उल्लेख गर्नुहोस् (Specify (other)how did you contact service provider?)</p>
<p>82. सम्पर्क गरेपछि कति समय पछि आउँछन् ? (How much time do service provider take to arrive?)</p> <ul style="list-style-type: none"> • 0-१ घण्टा (0-1 hour) • १-३ घण्टा (1-3 hour) • ३-६ घण्टा (3-6 hours) • ६-१२ घण्टा (6-12 hours) • १ दिन (One day) • २ दिन (Two days) • १ हप्ता भित्रमा (within a week)
<p>83. के हजुर उनीहरूको सेवाबाट सन्तुष्ट हुनुहुन्छ ? (Are you satisfied with the emptying services?)</p> <ul style="list-style-type: none"> • छु (Yes) • छैन (No) • थाहा छैन (Don't know)
<p>84. यदि हुनुहुन्छ भने, कुन पक्षमा सन्तुष्ट हुनुहुन्छ ? (What aspects of the service are you satisfied with?)</p> <ul style="list-style-type: none"> • छिटो आउँछन् (quick response) • राम्रोसँग सफा /खाली गर्छन् (efficient cleaning and maintenance) • कम शुल्क लिन्छन् (Low Charges) • विश्वासनीय छन् (Reliability) • छिटो काम गर्छन् (Quick service) • अन्य (others)
<p>उल्लेख गर्नुहोस् (Specify (Other) what aspects of the service are you satisfied with?)</p>
<p>85. यदि हुनुहुन्न भने, यस्तो सेवा सुधारन के गर्न सकिन्छ ? (What may be the ways of improving this service?)</p> <ul style="list-style-type: none"> • समयमा आउने (Timely arrival) • राम्रो-सँग खाली गर्ने (Better emptying facilities) • कम शुल्क लिने (Low charge) • छिटो सेवा/काम दिने (Quick service) • सबै आवश्यक सामग्री लिएर आउने (Well Equipped) • अन्य (Others)
<p>उल्लेख गर्नुहोस् (Specify (Other) What may be the ways of improving this service?)</p>
<p>86. सेप्टिक ट्याङ्की /होल्डिंग ट्याङ्की / खाल्डो खाली गर्ने क्रममा, सेवा दिने निकायले के-के सुरक्षाका सामग्री प्रयोग गर्छन् ? (Which safety measures do service provider used during emptying?)</p>

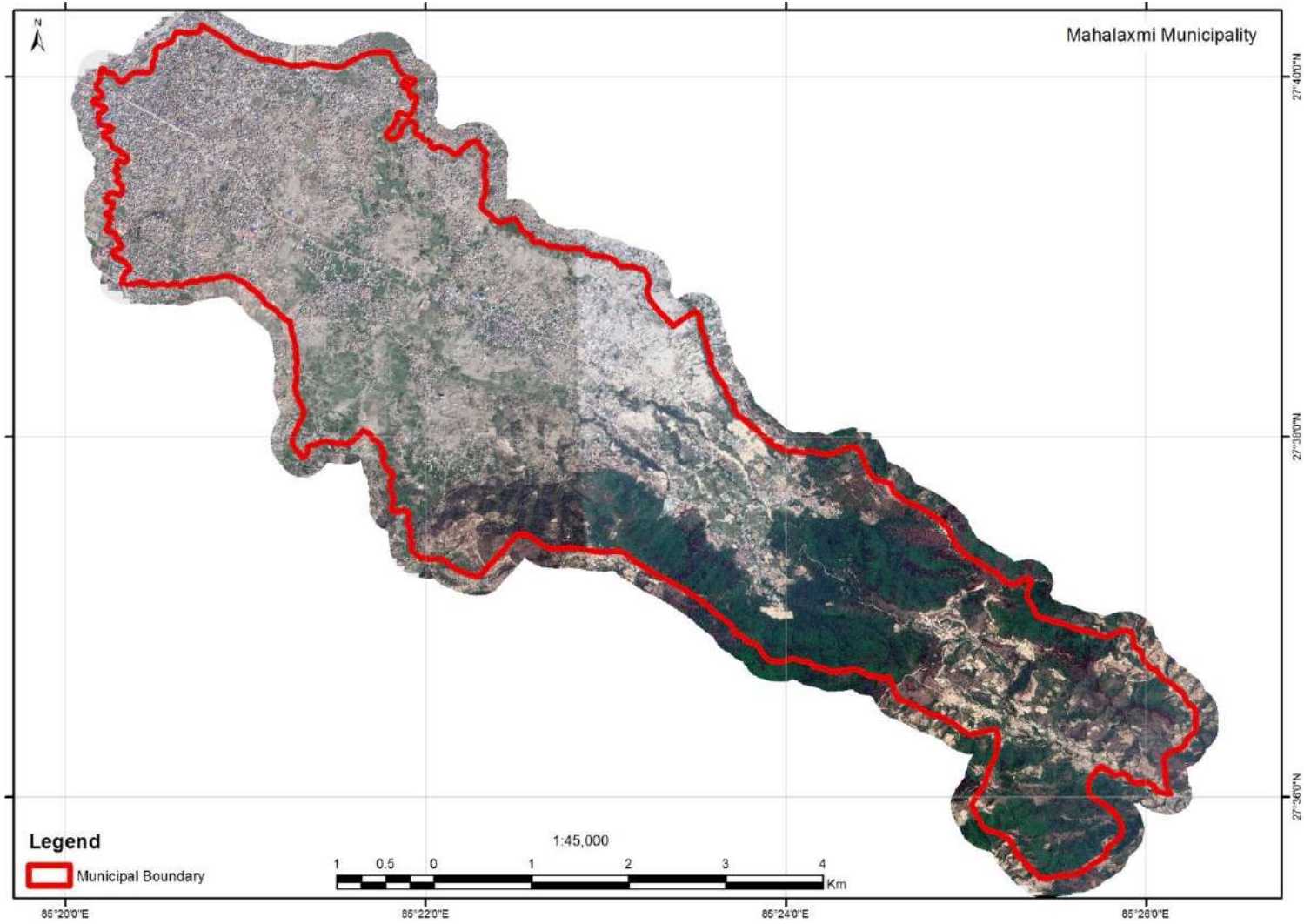
<ul style="list-style-type: none"> • माक्स (Mask) • पन्जा (Gloves) • बूट्स (Boots) • हेल्मेट (Helmet) • काम गर्न प्रयोग गरिने छुट्टै लुगा (Uniform) • अन्य (Others) • याद छैन (Don't remember) • सुरक्षाका सामग्री केही पनि प्रयोग गर्दैनन् (Nothing)
उल्लेख गर्नुहोस् (Specify (other) safety measure)
आर्थिक पक्ष) Financial)
<p>87. एक टिप गरेको शुल्क कति हो ? (What is the emptying charge per trip?)</p> <ul style="list-style-type: none"> • रु. १००० भन्दा मुनि (less than 1000) • रु १००१-१५०० (1001-1500) • रु १५०१-२००० (1501-2000) • रु २००१-२५०० (2001-2500) • रु २५०१-३००० (2501-3000) • रु ३००१-५००० (3001-5000) • रु ५००० भन्दा बढी (more than 5000) • थाहा छैन (Don't know)
<p>88. के हजुर त्यो सेवा शुल्कमा सन्तुष्ट हुनुहुन्छ ? (Are you satisfied with the emptying costs?)</p> <ul style="list-style-type: none"> • छु (Yes) • छैन (No)
<p>89. यदि सन्तुष्ट हुनुहुन्न भने, हजुरको बिचारमा सेवा शुल्क कति हुनुपर्छ ? (How much should be the cost?)</p> <ul style="list-style-type: none"> • १००० भन्दा कम (less than 1000) • १००१-१५०० (1001-1500) • १५०१-२००० (1501-2000) • २००१-२५०० (2001-2500) • २५०१ - ३००० (2501-3000) • ३००० भन्दा बढी (more than 3000) • सित्तैमा (Free of cost)
<p>90. के हजुर “improved quality emptying services” को लागी थप शुल्क तिर्न इच्छुक हुनुहुन्छ ? (Are you willing to pay more for improved quality emptying services?)</p> <ul style="list-style-type: none"> • छु (Yes) • छैन (No) • थाहा छैन (Don't know)
<p>91. यदि हुनुहुन्छ भने थप कति ? (How much additional charge are you willing to pay?)</p> <ul style="list-style-type: none"> • ५०० भन्दा कम (less than 500) • ५०१-१००० (501-1000) • १००१-१५०० (1001-1500) • १५०१- २००० (1501-2000) • २००१- २५०० (2001-2500) • २५०१-३००० (2501-3000) • ३००१- ५००० (3001-5000) • ५००० भन्दा बढी (more than 5000)
सेप्टिक ट्याङ्की/ होल्लिङ ट्याङ्की/ खाल्डो सम्मको पहुँच (बाटोको) (Accessibility to On-site Sanitation Systems)
<p>92. हजुरको घरबाट सबैभन्दा नजिकको बाटोमा कुन सवारीसाधन आउन सक्छ (४० मी. दुरी भित्र) ? (Which vehicle has access to nearby road (with in 40m from house) from this building?) (Observation +Interview)</p> <ul style="list-style-type: none"> • ट्रक (Truck) • जीप, कार जस्ता मध्यम सईजको सवारी साधन (Jeep, car (medium sized vehicles)) • त्राईसाईकल / मोटरसाईकल मात्र (Tricycle/motorcycle only.) • टयाक्टर मात्र (tractor only) • कुनै पनि सवारी साधन जान सक्दैन (No vehicles can access)

<p>93. ट्रक आउन सके बाटो घरबाट कति टाढा छ ? (How far is road from where truck can pass?)(Observation +Interview)</p> <ul style="list-style-type: none"> • ०-४० मि (0-40m) • ४१-१०० मि (41-100m) • १०१-३०० मि (101m - 300 m) • ३०१-५०० मि (301m - 500 m) • ५०० मि भन्दा बढी (More than 500m)
<p>यदि ५०० मीटर भन्दा बढी हो भने कति टाढा उल्लेख गर्नुहोस् (Specify, how far is road from where truck can pass?) (unit in meter)</p>
<p>94. नजिकैको बाटोमा यातायात आवगमन कस्तो छ ? (What is the traffic situation at the nearby road?)</p> <ul style="list-style-type: none"> • अफिस टाइममा धेरै यातायात आवगमन हुन्छ (Heavy traffic during peak hours.) • अफिस टाइममा अलि-अलि यातायात आवगमन हुन्छ (Mild traffic during peak hours.) • हरेक समयमा धेरै यातायात आवगमन हुन्छ (Heavy traffic all the time.) • यातायात आवगमन हुदैन (No traffic.)
<p>95. घरबाट (४० मि. भित्रको दूरीमा) नजिकै पार्किङ गर्न ठाँउ कहाँ छ ? (Is there parking available nearby (with in 40m from house?)) (Observation +Interview)</p> <ul style="list-style-type: none"> • बाटोको छेउमा छ । (Off street truck parking) • बाटोमा हो – यातायात आवगमन अवरुध हुदैन । (On-street parking - No traffic blockage) • बाटोमा हो – यातायात आवगमन अवरुध हुन्छ । (On-street parking - traffic blockage will occur) • पार्किङ गर्ने ठाँउ छैन (No place for parking)
<p>96. घरबाट नजिकै पार्किङ कति टाढा छ ? (How far is nearest parking from house?) (Observation +Interview)</p> <ul style="list-style-type: none"> • ०-४० मि (0-40 m) • ४१-१०० मि (41-100m) • १०१-३००मि (101m - 300 m) • ३०१-५०० मि (301m - 500 m) • ५०० मि भन्दा बढी (More than 500m)
<p>97. सेप्टिक ट्याङ्की / होल्डिङ ट्याङ्की /खाल्डो र पार्किङ गर्ने ठाँउ कति दूरीमा छन् ? (What is a distance of the tank or pit from the vehicle parking area?) (Observation +Interview)</p> <ul style="list-style-type: none"> • १-५ मि (1 – 5 meters) • ६-१० मि (6 – 10 meters) • ११-२० मि (11 – 20 meters) • २१-४० मि (21 – 40 meters) • ४१-६० मि (41 – 60 meters) • ६० मि भन्दा बढी (Greater than 60 meters.)
<p>98. पार्किङ गर्ने ठाँउ र सेप्टिक ट्याङ्की / खाल्डोको लेवल कस्तो छ ? (What is the level/elevation of parking area?) (Observation)</p> <ul style="list-style-type: none"> • एउटै लेवलमा (At the same level as the tank or pit) • पार्किङ गर्ने ठाँउ ट्याङ्की /खाल्डो भन्दा मुनि (At a lower level than the tank or pit) • पार्किङ गर्ने ठाँउ ट्याङ्की /खाल्डो भन्दा माथि (At a higher level than the tank or pit.)
<p>99. अनुमानित लेवल कति फरक छ ? (What is the estimated level difference ?)(Observation)</p> <ul style="list-style-type: none"> • 0-२ मि (0 – 2 meters) • ३-४ मि (3- 4 meters) • ५-६ मि (5– 6 meters) • ६ मि भन्दा धेरै (Greater than 6 meters)
<p>नोट :माथिका प्रश्नहरूले नजिकैका केही नयाँ जानकारी छन् भने कृपया यहाँ उल्लेख गर्नुहोस्) Note (If you want to add any detail/data, which was not covered in above questionnaire, then please write it here))</p>
<p>प्रतिक्रिया दिने व्यक्तिको ज्ञान र इच्छा (Knowledge and Willingness of Respondent)</p>
<p>100. दिसाजनय लेदो खाली गरिएपछि कहाँ जान्छ, के हजुरलाई थाहा छ ? (Do you know where does faecal sludge go after it is emptied?)</p> <ul style="list-style-type: none"> • थाहा छ (Yes) • थाहा छैन (No)
<p>101. यदि थाहा छ भने, कहाँ जान्छ ? (Where does faecal sludge go after it is emptied?)</p> <ul style="list-style-type: none"> • नाली (Drain) • प्रशोधन केन्द्र (Treatment plant)

<ul style="list-style-type: none"> • खेतबारीमा (Farm) • खोलानालामा (Water bodies) • जङ्गलमा (Forest) • अन्य (Other)
उल्लेख गर्नुहोस् (Specify (other) where does faecal sludge go after it is emptied?)
<p>102. कुनै सेप्टिक ट्याङ्की जाँच बुझा गर्ने निकायले हजुरको सेप्टिक ट्याङ्की/ खाल्डो अझै सुधार गर्न सल्लाह दियो भने के सुधार गर्नु हुन्छ ? (Are you willing to upgrade your containment if recommended by the inspector?)</p> <ul style="list-style-type: none"> • अवश्य सुधार गर्छु (Yes, definitely) • सुधार गर्छु, तर थप जानकारी चाहिन्छ (Yes, but need more information) • सुधार दिँदैन (No)
<p>103. के हजुर जायाभावी दिसाजनय लेदो बिसर्जन गर्ने कुरामा चासो देखाउनुहुन्छ ? (Are you concerned about the improper discharge of sludge into the open environment?)</p> <ul style="list-style-type: none"> • देखाऊ छु (Yes) • देखाऊ दिँदैन (No)
<p>104. यदि देखाउनु हुन्छ भने, हजुरको विचारमा त्यस्ता काम कसरी कम गर्न सकिन्छ होला ? (In your opinion how improper dumping could be discouraged?)</p> <ul style="list-style-type: none"> • प्रशोधन केन्द्र बनाउनुपर्छ । (Construct treatment plant) • शुल्क तिराउनुपर्छ । (Penalize) • कडा नियम बनाउनुपर्छ (Strict law) • पूर्णप्रयोग गर्नुपर्छ (Reuse) • थाहा छैन (Don't know) • अन्य (Others)
उल्लेख गर्नुहोस् (Specify (other) opinion to discourage improper dumping)
<p>105. के हजुरको ठाँउमा गएको १० वर्षमा बाढी आएको थियो ? (Was the area flooded in last 10 years?)</p> <ul style="list-style-type: none"> • थियो (Yes.) • थिएन (No.) • थाहा छैन (Dont Know)
106. GPS
107. स्वयम्सेवकको सर्वेक्षण गरेको अनुभवमा कुनै प्रतिक्रिया (Feedback of Enumerator based on observation)

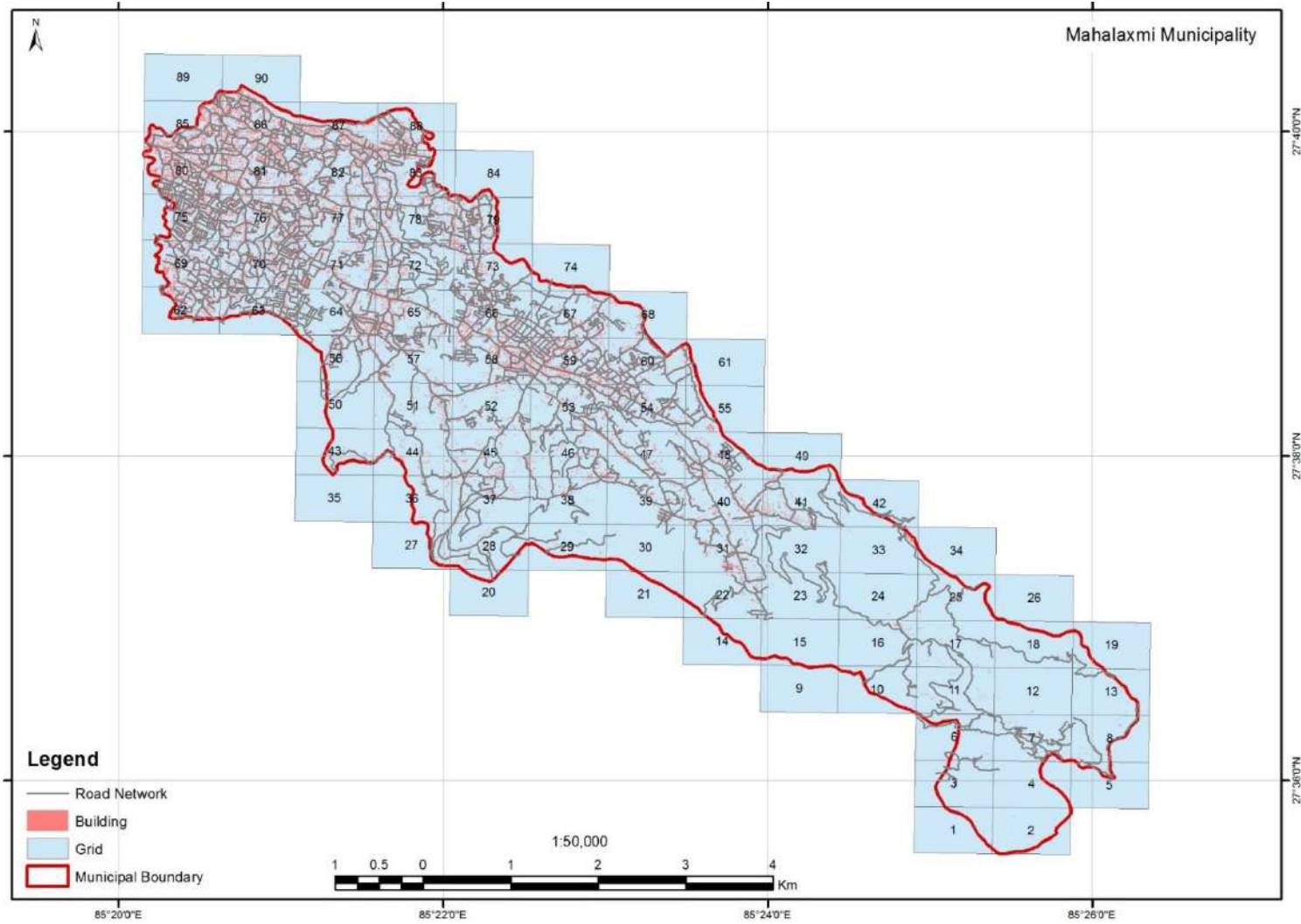
Annex-3

A Satellite Image of Mahalaxmi Municipality



Annex-4

A base map of Mahalaxmi Municipality



Annex-5

A map sheet of a grid no. 86 used for field verification of Mahalaxmi Municipality (sample)



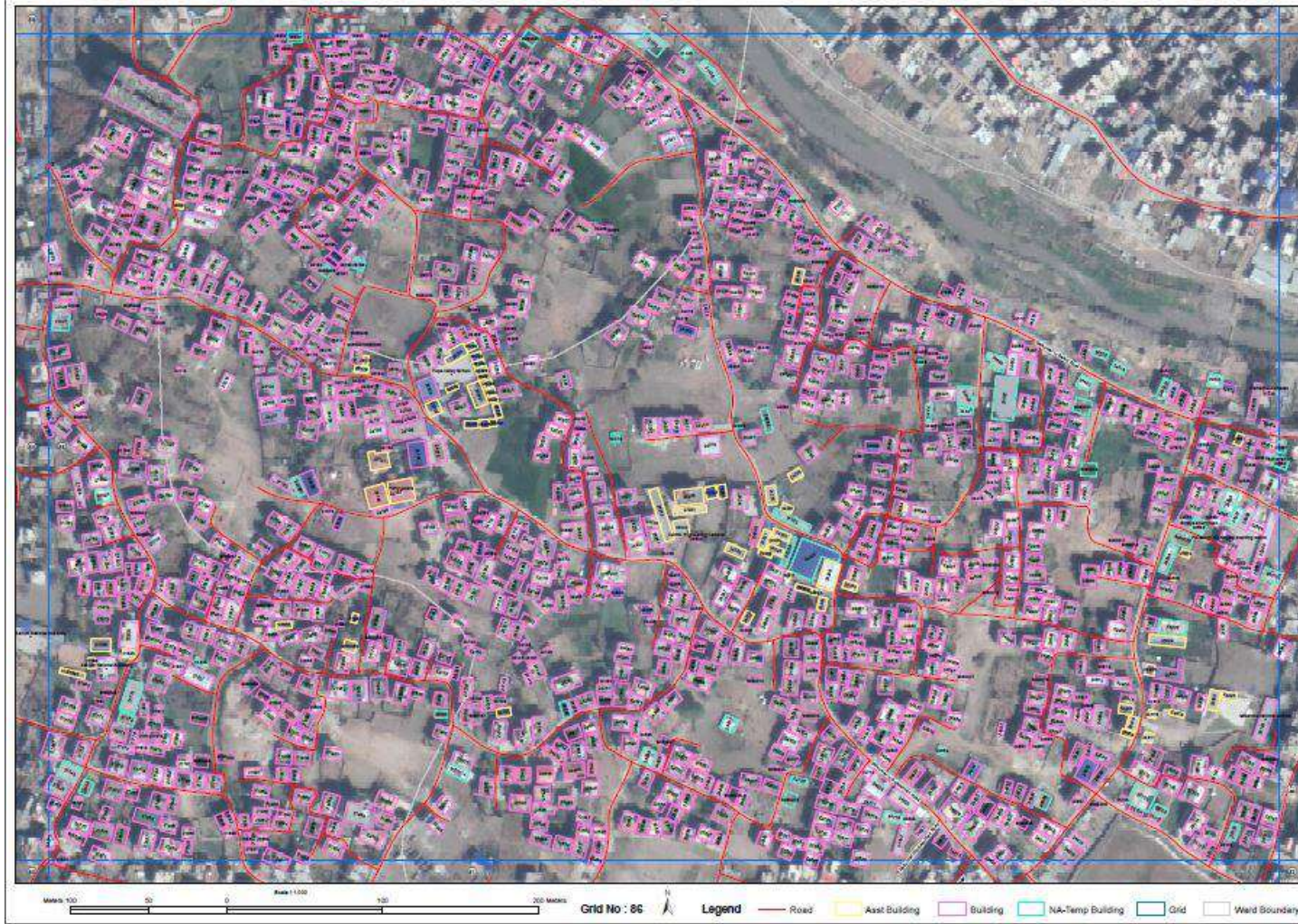
Annex-6

A portion of map sheet 86 updated during field verification of Mahalaxmi Municipality (sample)




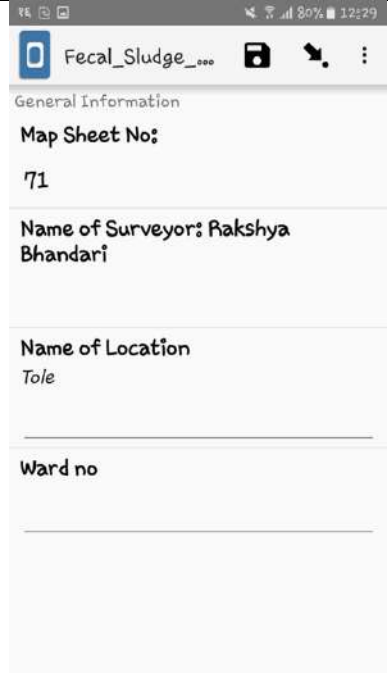
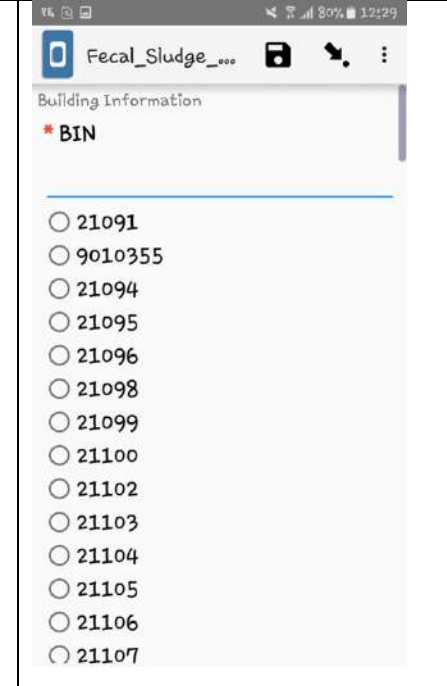
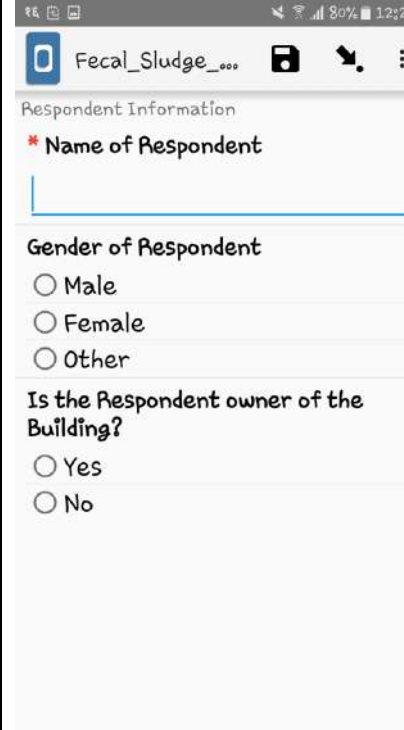
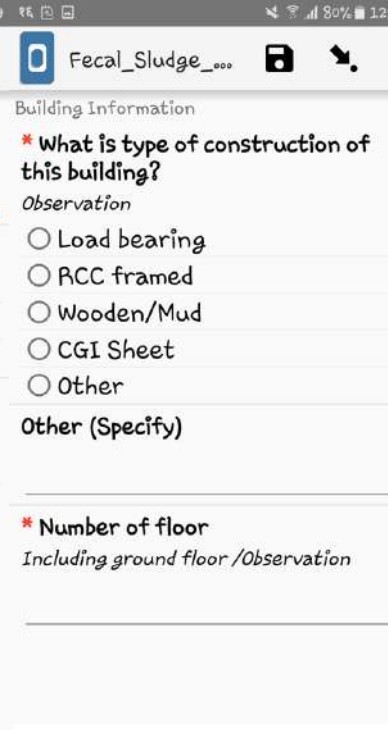
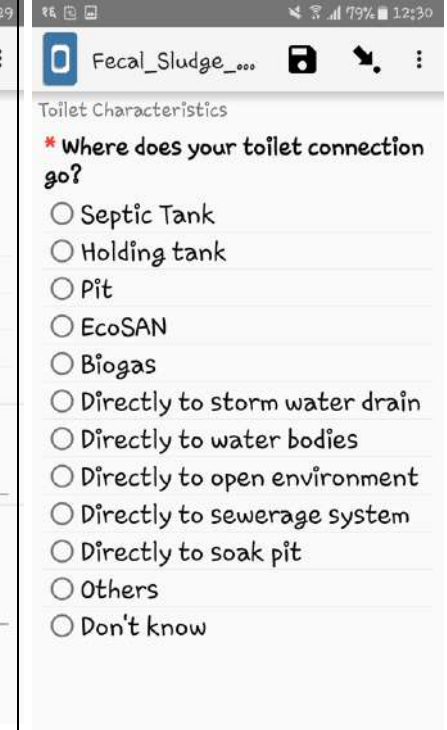
Annex-7

An updated map sheet of grid 86 of Mahalaxmi Municipality (sample)



Annex-8

Layout of Tablet used for census survey

 <p>KoBoCollect v1.14.0a Part of KoBoToolbox</p> <p>Fill Blank Form</p> <p>Edit Saved Form (1)</p> <p>Send Finalized Form (1)</p> <p>View Sent Form (13)</p> <p>Get Blank Form</p> <p>Delete Saved Form</p>	 <p>General Information</p> <p>Map Sheet No: 71</p> <p>Name of Surveyor: Rakshya Bhandari</p> <p>Name of Location <i>Tole</i></p> <p>Ward no</p>	 <p>Building Information</p> <p>* BIN</p> <p><input type="radio"/> 21091</p> <p><input type="radio"/> 9010355</p> <p><input type="radio"/> 21094</p> <p><input type="radio"/> 21095</p> <p><input type="radio"/> 21096</p> <p><input type="radio"/> 21098</p> <p><input type="radio"/> 21099</p> <p><input type="radio"/> 21100</p> <p><input type="radio"/> 21102</p> <p><input type="radio"/> 21103</p> <p><input type="radio"/> 21104</p> <p><input type="radio"/> 21105</p> <p><input type="radio"/> 21106</p> <p><input type="radio"/> 21107</p>
 <p>Respondent Information</p> <p>* Name of Respondent</p> <p>Gender of Respondent</p> <p><input type="radio"/> Male</p> <p><input type="radio"/> Female</p> <p><input type="radio"/> Other</p> <p>Is the Respondent owner of the Building?</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p>	 <p>Building Information</p> <p>* What is type of construction of this building?</p> <p><i>Observation</i></p> <p><input type="radio"/> Load bearing</p> <p><input type="radio"/> RCC framed</p> <p><input type="radio"/> Wooden/Mud</p> <p><input type="radio"/> CGI Sheet</p> <p><input type="radio"/> Other</p> <p>Other (Specify)</p> <p>* Number of floor</p> <p><i>Including ground floor /Observation</i></p>	 <p>Toilet Characteristics</p> <p>* Where does your toilet connection go?</p> <p><input type="radio"/> Septic Tank</p> <p><input type="radio"/> Holding tank</p> <p><input type="radio"/> Pit</p> <p><input type="radio"/> EcoSAN</p> <p><input type="radio"/> Biogas</p> <p><input type="radio"/> Directly to storm water drain</p> <p><input type="radio"/> Directly to water bodies</p> <p><input type="radio"/> Directly to open environment</p> <p><input type="radio"/> Directly to sewerage system</p> <p><input type="radio"/> Directly to soak pit</p> <p><input type="radio"/> Others</p> <p><input type="radio"/> Don't know</p>