



Assessment and Mapping of Open Defecation (OD) Risk in the selected ward of Surat Municipal Corporation

December 2018

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Project Team

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December 2018

Supported by:



Surat Municipal Corporation



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Abbreviations

FGD	Focused Group Discussions
GIDC	Gujarat Industrial Development Corporation
GVP	Garbage Vulnerable Points
ICDS	Integrated Child Development Services
IHHL	Individual House Hold Toilet
LPCD	Liters Per Capita per Day
OD	Open Defecation
OU	Open Urination
PT/CT	Public/Community Toilet
SBM	Swachh Bharat Mission
SLB	State Level Benchmark
SMC	Surat Municipal Corporation
SUH	Shelter for Urban Homeless
UHC	Urban Health Center

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1. Why OD Risk Management

1.1. What is Open Defecation?

Open defecation (OD) is the practice where people go out in open fields /spaces rather than using a toilet. It is a well-established traditional practice deeply ingrained from early childhood followed since generations to generations. It poses serious threats to human health, especially children. The practice of open defecation is the main reason for deaths due to diarrhea among children under five years of age. In India, every year, diarrhea kills around 1,17,285 children under five (Unicef India).

Diarrhea and worm infection are two major health conditions that affect school-age children impacting their learning abilities. OD also puts at risk the dignity of women in India. Women feel constrained to relieve themselves only under the cover of dark for reasons of privacy to protect their dignity.

In urban areas, OD is driven by various reasons:

- a) Inadequate space to construct toilets in high density settlements and
- b) Neither tenants willing to invest in toilets in rented houses, nor the house owner willing to provide the toilet facility to the tenants (especially in slums and slum like settlements).
- c) Behavioral tendencies of the urban poor

1.2. Current Statistics of urban India

Government of India, through the Swachh Bharat Mission – Urban aims to eliminate OD practice and to achieve 100% OD free status in all the Urban Local Bodies (ULBs) across the nation by 2nd October 2019. Around 58.3 lakh Individual House Hold Latrines (IHHLs) have been constructed against 66 lakh targeted, and 4.3 lakh seats of community/public toilets are constructed against a target of 5 lakh seats (Unicef India).

So far 18 states/UTs (Andhra Pradesh, Tamil Nadu, Andaman & Nicobar Islands, Chandigarh, Chhattisgarh, Dadra & Nagar Haveli, Daman and Diu, Gujarat, Haryana, Madhya Pradesh, Maharashtra, Mizoram, Manipur, Sikkim, Uttarakhand, Jharkhand, Rajasthan and Telangana), and 3240 cities have been self-declared as Open Defecation Free (ODF), and after third party verification, 2741 cities have been re-certified as ODF. Gujarat was the first state to be declared as ODF on 2nd October 2016. All 170 ULBs in the state were declared as ODF, making it one of the first states to achieve the coveted status in a short time (MoHUA, 2018).

Despite achieving the ODF status by ULBs of Gujarat, only 158 ULBs of Gujarat (93%) are re-certified by the third-party verification presently, and 12 cities have slipped off from the ODF status to Non-ODF and many other cities are facing this risk. It shows that achieving ODF status once, is not enough. The real challenge for the ULBs is to retain and sustain its status of being ODF.

Achieving ODF is the first step towards attaining improved and sustained sanitation. Government of India has launched new protocols for turning cities from ODF to ODF¹ and ODF⁺⁺².

The OD risk assessment tool will help the ULBs to understand the risks associated with the city

¹ All constructed IHHLs and CT/PTs are functional and well maintained, and the city should have 0% fgd (OU)

² Faecal sludge/septage and sewage is safely managed and treated, with no discharging and/or dumping of untreated faecal sludge/septage and sewage in drains, water bodies and open areas)

1.3. Case Study - The City of Surat

1.3.1. Why Surat

Surat, fondly known as the *diamond city* is the second largest city of Gujarat. It is located on the south west part of Gujarat and is located on the banks of River Tapi.

The city has been one of the fastest growing cities not only of India, but also across Asia. The city almost doubles in population size every decade. As per the Census 1991 data, the population of Surat was 15 lakh which increased to 28 lakh in 2001. The city recorded a population of 46 lakh in the last 2011 census. Currently, the city estimates housing a population of 56 lakh.

Owing to its location between Ahmedabad and Mumbai, Surat has grown as a major industrial hub of India. It has a major economic base of textile manufacturing, diamond cutting and polishing industries, *zari* work and houses India's leading petrochemical and natural gas industries such as ONGC, ESSAR, Reliance at the Hazira port.

It is said that every 9 out of 10 diamond in the world is polished in Surat and 40% of human-made fabric, and 28% of human-made fiber produced in India comes from a mill in Surat.

Such industrialization and rapid growth has brought in prosperity but has also brought serious challenges to the local government in the form of high infiltration of migrants. Consequently, it leads to proliferation of slums, expansion of serviceable area and lower recovery of costs.

The city is governed by the Surat Municipal Corporation (SMC) which over the last two decades has been at the forefront in addressing these challenges and forging leading practices in urban management.

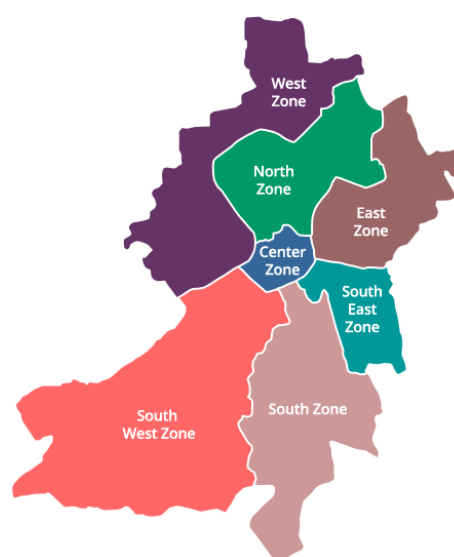
1.3.2. Demography of Surat

The city is spread across an area of 327 sqkm and is administratively divided into 7 zones and 29 election/administrative wards. The city has witnessed a high decadal growth rate of 55% between years 2001-2011. The census 2011 reports that around 11% of the city's population lived in slums and the city is home to about 40,000 homeless population. The slum population is majorly concentrated in the southern part of the city which is close to the industrial estates. The table below shows the demographic summary of SMC.

Table 1: Demographic summary of Surat, Website of SMC-Census 2011

Sr. No	Particulars	
1	Area	326.5 Sq. Km
2	Population, 2011	44.6 lakh
3	Decadal growth rate (2001-11)	55.29%
4	Population, 2018	60,78,457
5	Number of Slum Pockets, 2011	334
6	Slum Households, 2011	1.3 lakh
7	Slum Population, 2011	4.8 lakh (11% of total population)
8	Homeless population, 2011	39,274

Figure 1: Administrative zones of Surat



1.3.3. Performance of Surat in Sanitation

Surat has been one of the best performing cities in India. This is also reflected in the Swachh Survekshan results. At national level, it has ranked 6th, 4th and 14th in Survekshan 2016, 2017 and 2018 respectively. It was ranked as the 2nd cleanest city of Gujarat in 2018. Surat has been declared as an ODF city since October 2016, and since then, it has been recertified twice in June 2017, and March 2018. The table below provides an overview of the Service Level Benchmarks (SLBs) of Surat over the recent three years.

Table 2: Service Level Benchmark values

Sr No	Particulars	SLB Indicators			
		Benchmark	2014-15	2015-16	2016-17
1	Water Supply Service				
	Coverage of water supply connections (%)	100	95	95	96
	Per capita supply of water (lpcd)	135	150	148	146
	Continuity of water supply (hours)	24	3.3	4	4
2	Waste water management (Sewerage and sanitation)				
	Coverage of toilets (%)	100	98	97	98
	Coverage of sewage network services (%)	100	93	96	96
	Adequacy of sewage treatment capacity (%)	100	100	100	100
	Extent of reuse and recycling of sewage (%)	20	5.1	7	7
3	Solid waste management				
	Household level coverage of solid waste management services (%)	100	98.86	98	99
	Efficiency of collection of municipal solid waste (%)	100	93	93	96
	Extent of segregation of municipal solid waste (%)	100	11.8	10	17

High immigration has thrown numerous challenges to the corporation in its ability to meet the quality and quantity of the basic urban services. SMC has been persistent in its efforts to overcome these challenges.

Under the Swachh Bharat Mission, the city has constructed 101 public toilets, 46 community toilets and 6,332 individual household toilets. Although, the city has met its adequacy in numbers, the quality of these public and community facilities has space for further improvements.

Furthermore, migration of working class into the city, has led to encroachment on private and government lands. Lack of basic sanitation facilities on these lands, along with habitual practices of people have led to high vulnerability on adjoining open plots and land patches. They have eventually been converted to open spots prone to OD.

SMC has always tried hard to provide the urban poor with basic health and educational facilities. Municipal schools, Urban Health Centers and Shelter for Urban Homeless (SUH) have been constructed for them. Quality, and adequacy of WASH infrastructure in these public institutions, however, is an issue.

The major issues observed and identified in sanitation sector in the city of Surat, therefore, are:

- Inadequacy of toilets - The toilets are placed in sufficient number across the city, however, numerous cubicles are non-functional, ultimately leading to inadequacy of the facility.
- Maintenance of toilets – It has been observed that the toilets are often unclean, and unmaintained. The faucets are broken, washbasins are broken and there is presence of odor.
- Behavioral tendencies – Interactions with families of urban poor informed us that it is mostly the men, and the elderlies in the family who do not use public toilets. Men, because they're

unwilling to pay user charges of user charges, and elderly, because they feel uncomfortable in a closed toilet.

- Slum like settlements – Slum like settlements act as the first base for fresh migrants in the city. As the community develops gradually, and is also unofficial, it is difficult for the SMC to provide all the services. As for the migrant, sanitation issues are not their priority.

It is because of these reasons that the SMC requires support in OD risk mapping. The OD risk mapping exercise will help the corporation in sustaining the ODF status of the city. It will also help the corporation to understand whether the benefits of the public services are reaching the intended beneficiaries.

Thus, UMC is supporting SMC to:

- a) Prepare a benchmarking tool to quantitatively assess the OD risk and to formulate an action plan for improving WASH compliance for institutions and community facilities³
- b) Undertake ODF risk mapping for pilot ward in Surat (Focus on migrant & floating population),
- c) Prepare an action plan for improving access of urban poor to urban shelter

1.3.4. Selection of Pilot Ward in Surat

A team from UMC visited the city on 28th and 29th June to interact with SMC officials to discuss the thrust of the project as well as discussion on selection of a pilot ward. The meeting was held with Dr. Ashish Naik, Municipal Health Officer at SMC, along with his team. The discussion centered on the probable interventions by UMC in the ward selected.

UMC developed the following criteria for the selection of pilot ward and discussed the same with SMC.

1. Higher concentration of migrant population as well as industrial laborers
2. Higher concentration of slum and slum-like settlements
3. Higher number of public and community toilet
4. Higher number of government/municipal schools
5. At least one anganwadi
6. At least one-night shelter or SUH (Shelter for Urban Homeless)
7. At least one urban health center or primary health center

Based on the criteria, Dr. Naik suggested UMC to conduct a rapid assessment of the South Zone to finalize the ward. Dr. Sanjay Das Gupta, Deputy Health Officer, South Zone, SMC assessed wards 23, 27 and 29, each having an estimated population of 1.50 lakh. All three wards have similar characteristics such as high floating population, a large number of slum and slum like settlements and a high risk of OD.

Findings of the rapid assessment of the three shortlisted wards has been summarized in the following table:

³ Municipal schools, anganwadis and urban health centers

Table 3:Details of shortlisted wards

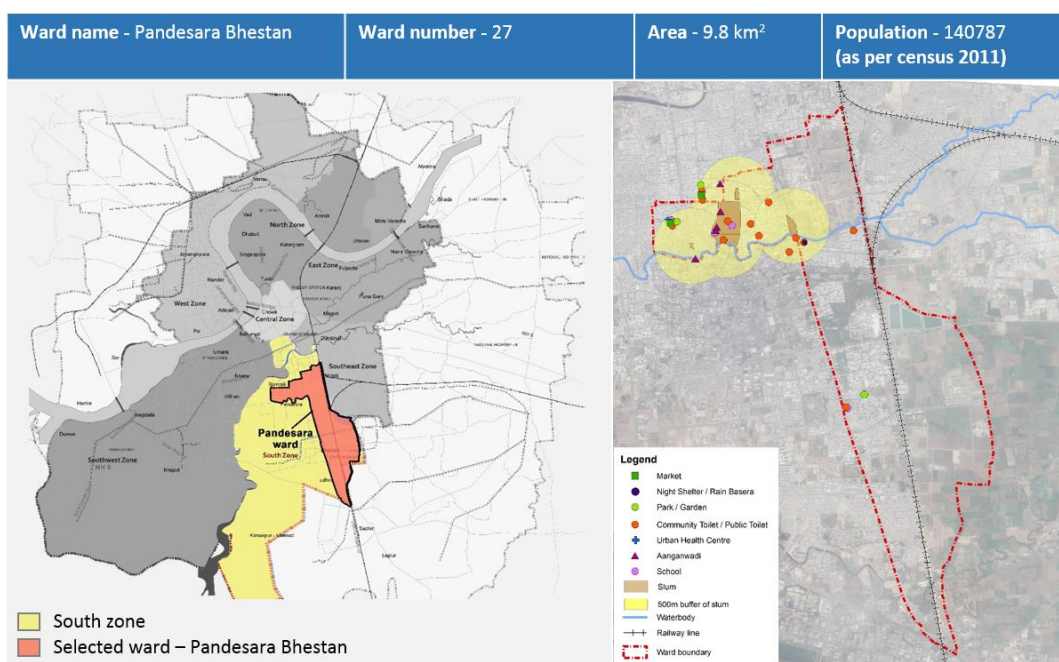
Sr. No.	Criteria	Ward 23	Ward 27	Ward 29
		Udhna (Daxin) - Udyognagar	Pandesara – Bhestan	Vadod - Jiav – Unn
1	Population	1,57,251	1,40,787	1,55,936
2	Slum and slum like settlements	28	13	12
3	Public toilet	5	7	5
4	Community toilet	3	5	-
5	Primary Schools	17	24	4
6	Suman Schools	1	3	-
7	Primary Health centers	1	3	1
8	Waste pickers involved	47	12	18

UMC and SMC mutually decided to select Ward No. 27 – Pandesara-Bhestan, as it has a good mix of migrant population from distinct parts of Gujarat, as well as from India.

1.3.5. Ward Profile

Pandesara Bhestan spans over an area of 9.8 km², having a population of 1,40,787 people (Census 2011). Location of the ward can be seen in Map 1: Pandesara, Bhestan Ward-South Zone, Surat City.

Map 1: Pandesara, Bhestan Ward-South Zone, Surat City



The ward is characterized by high migrant population because of the close proximity to Gujarat Industrial Development Corporation (GIDC) area. Most of the migrants in this ward are from Orissa and Maharashtra. Apart from them, there is also a small tribal population who work in the city on a daily wage basis.

The ward has five slum settlements with an estimated population of 22,250 (16% of the total population of ward). In addition to that there are two slum like settlements and a few schemes for Economically Weaker Sections (EWS).

The SMC has provided 13 Public/Community Toilets, 15 anganwadis, nine schools, two Urban Health Centers and one shelter for urban homeless to take care of this population.

A summary of the ward is attached as table below.

Table 4: Summary of ward profile

Components	Present	Surveyed	Components	Present	Surveyed
Public and Community Toilet	13	13	Slum like areas	2	2
Slums	5	5	Urban Health Centres	2	2
Schools	9	9	Parks/Gardens	3	3
Anganwadis	15	15	Markets	1	1
Night Shelter	1	1	Industries	NA	6

2. How to conduct OD Risk Mapping

OD risk can be mapped by identifying the places and people vulnerable to OD:

Places - Certain spaces and plots become defined as OD spots. These areas can be either be government plots, or private land. It is the location of such areas which define their use. Very often, it is observed that the space outside a PT/CT is used for OD. Vacant plots or land areas likewise become dump sites, and later OD sites.

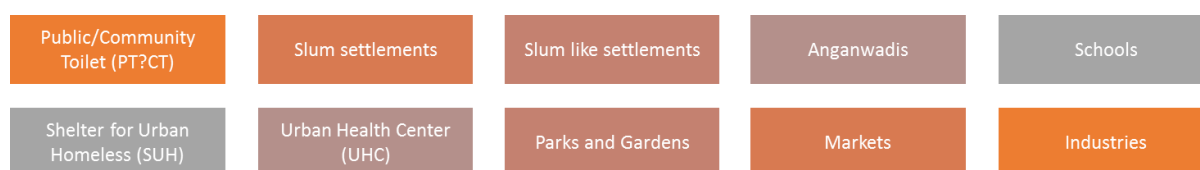
People – it has been observed that behavioral issue pose a challenge in sustaining ODF status. This can be seen in areas that cater to floating population or those that are home to temporary settlements of ODF city.

To conduct OD risk mapping, thus, it is important to identify the places vulnerable to OD and also the people who use these spaces. The reasons for such behavior also needs to be understood in order to prevent them for continuing such habits.

2.1. Framework for Mapping OD Risk

Figure 2 indicates the places identified as vulnerable places.

Figure 2: Types of Places Vulnerable to OD



Following the assessment of each component listed in the above figure, a tool kit was developed for further analysis.

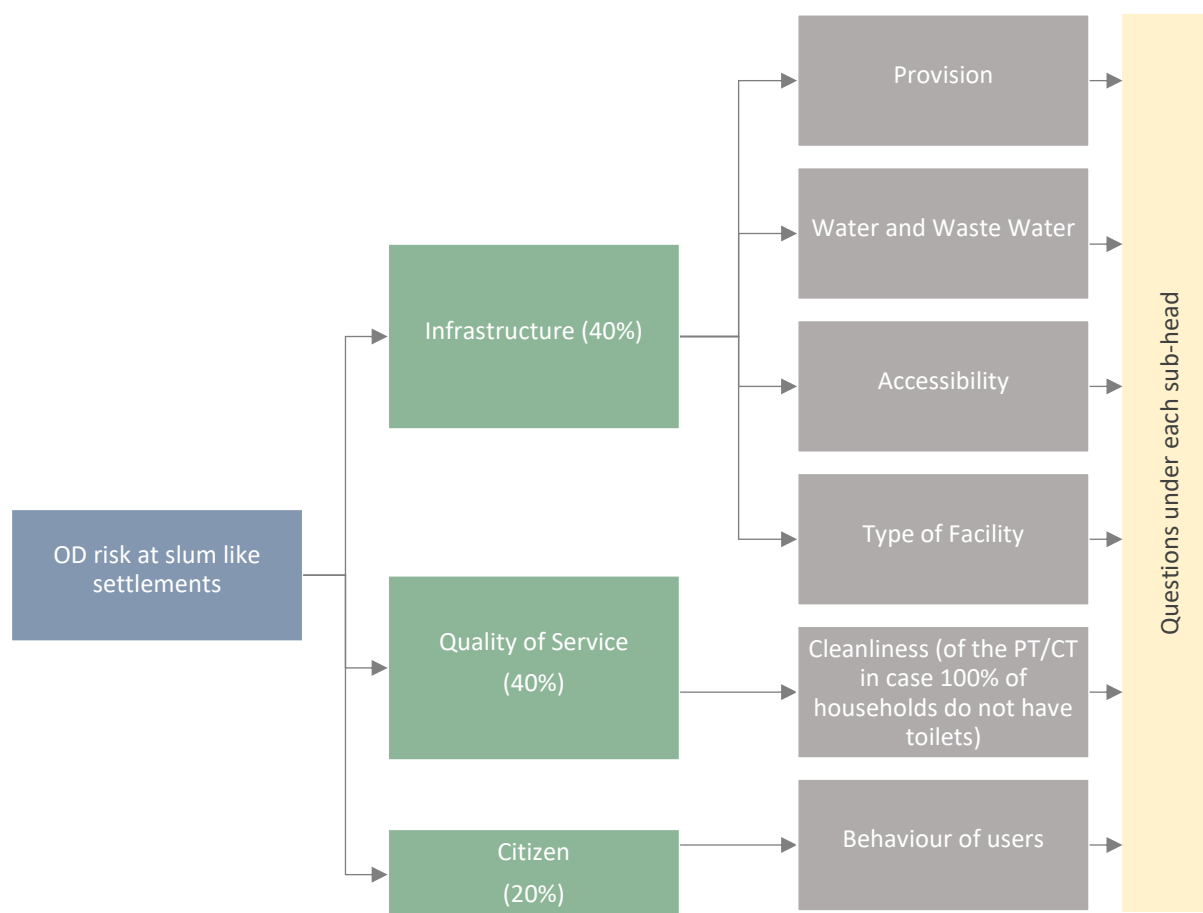
At the facilities listed in Figure 2, extensive site visits were carried and discussions held with ward authorities, citizens and users. The findings were captured through survey forms, interviews and group discussions. The data collected was then assessed to find out the risk associated with the site and potential OD spots.

The detailed frameworks for the assessment of the survey data for each site and facility have been prepared. The frameworks evaluate any site or facility in mainly three parameters:

- **Infrastructure** – which focuses primarily on the aspects of provision and adequacy of a facility/establishment.
- **Quality of service** – which tries to assess whether the establishment once constructed or provided is maintained and operated efficiently, apart from evaluating the support infrastructure available for the users.
- **Citizen behavior** – which assesses the level of awareness amongst the citizens and the community.

Each parameter has further been analyzed through questions categorized under particular sub-heads. Figure 3 represents the development of the framework.

Figure 3 Structure of the Framework



OD can be a result of any one of the above listed parameters, or it could be a combination of all.

Each facility is scored against 100 marks. The score band is divided amongst Infrastructure, Quality of Service and Citizen Behavior in the ratio of 40:40:20 respectively.

Each question carries marks in range of 1 to 3. Higher the score, better is the situation at the place analyzed. The highest scores that any place can achieve is represented through the column of 'Allotted Marks'. The scores achieved by each are in accordance with the data collected by the team.

An overall score of each identified place is then calculated. As the number of components vary for each place (like the pilot ward has only two UHCs, but 13 PT/CTs), the average score has been considered as the final score.

While the final score denotes the overall OD risk for the place, the individual scores help in identifying the areas needing immediate action. Scoring and detailed results for each component have been displayed in the following section.

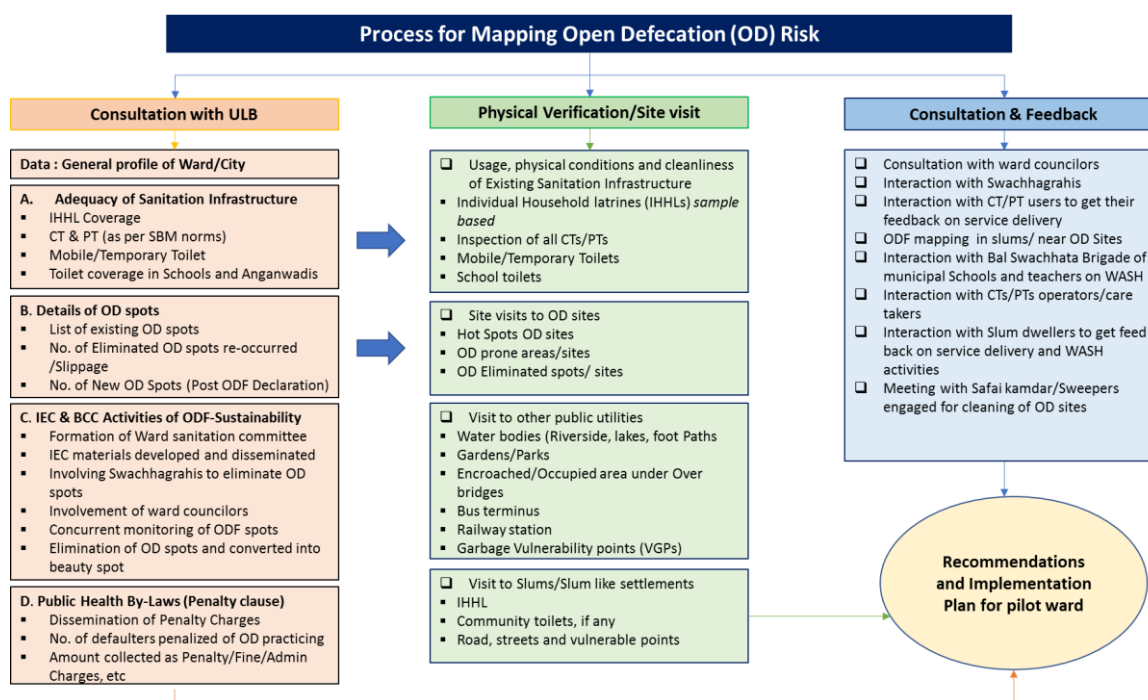
Subsequent to that, a comprehensive table for all the components is developed which help in recognizing the component carrying the highest risk of OD, and the results are displayed in Section 4.

2.2. Process of OD Risk Mapping

In order to attain the data required for the framework, the UMC team designed a process methodology. The three major components of the methodology are:

- a) Consultation with the ULB
- b) Site visits and physical verification of sanitation facilities and OD sites
- c) Consultation and feedback from various stakeholders

Figure 4: Process of OD risk mapping



Consultation with the ULB was undertaken at zonal level, as well as at ward level. The ward officials described the qualitative characteristic of the ward, and joined the team for the initial field visits. Survey tools for ground level assessment were developed in the next stage, and Focused Group Discussions (FGDs) conducted in slum and slum like settlements. The tools have been annexed as annexures.

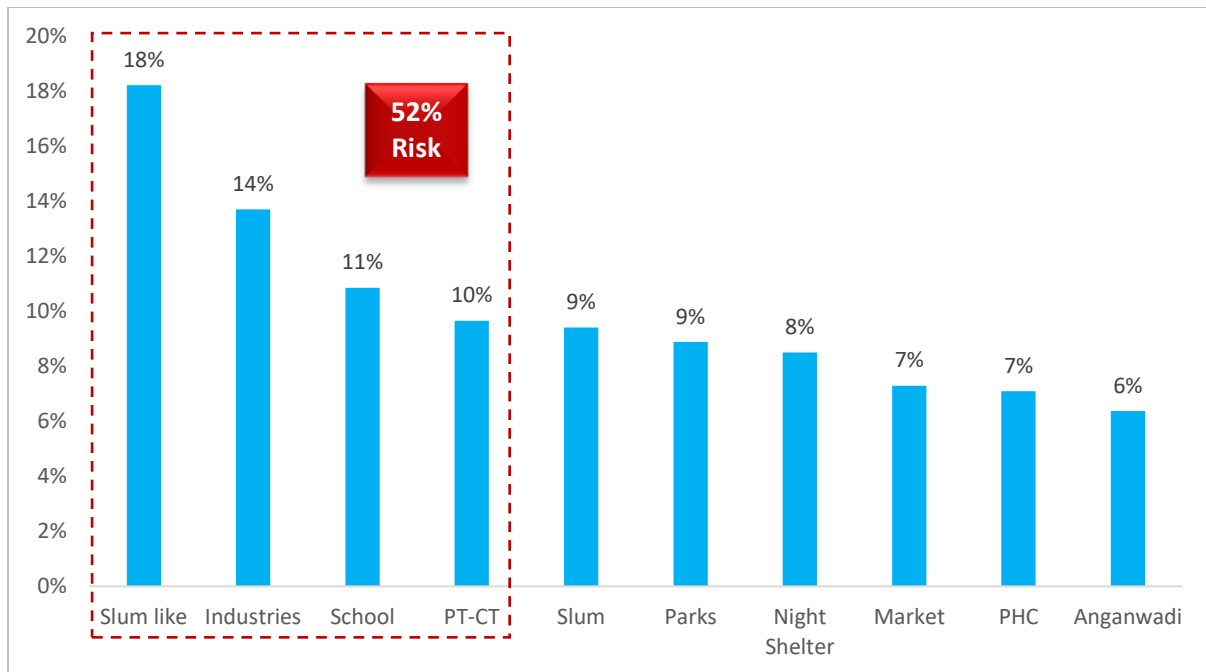
3. Ground level assessment

The team visited the selected places, and has engaged and interacted with the stakeholders to understand and assess the issues and challenges being faced by them. The data collected was then analyzed and it was found that the average risk of OD in the pilot ward is 44%.

Further analysis have shown that the highest probability of OD is at slum like settlements, followed by industrial areas. The lowest risk is associated with UHCs and Anganwadis.

The graph below shows the probability of risk of OD in the ward of Pandesara Bhestan.

Figure 5 : Probability of OD risk



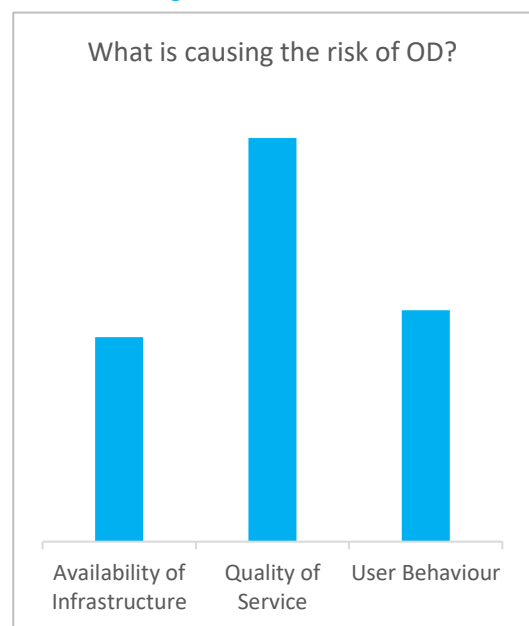
The graph indicates that improving on the first four vulnerable places can mitigate 50% risk of OD from the ward. An assessment of the cause of risk indicates that risk of OD in the ward is highest due to the lack of maintenance of the existing infrastructure, followed by behavior of the users.

The action plan developed for the ward caters to the infrastructural deficit in the ward and the maintenance regimes to be followed for ODF sustenance.

The ward would need to spend an estimated amount of 2.8 crores in the pilot ward to address the requirement of additional infrastructure, regular maintenance of the same and to improve the user behavior.

The next section helps in understanding a detailed analysis of the places identified and surveyed as vulnerable places.

Figure 6 : Cause of risk





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