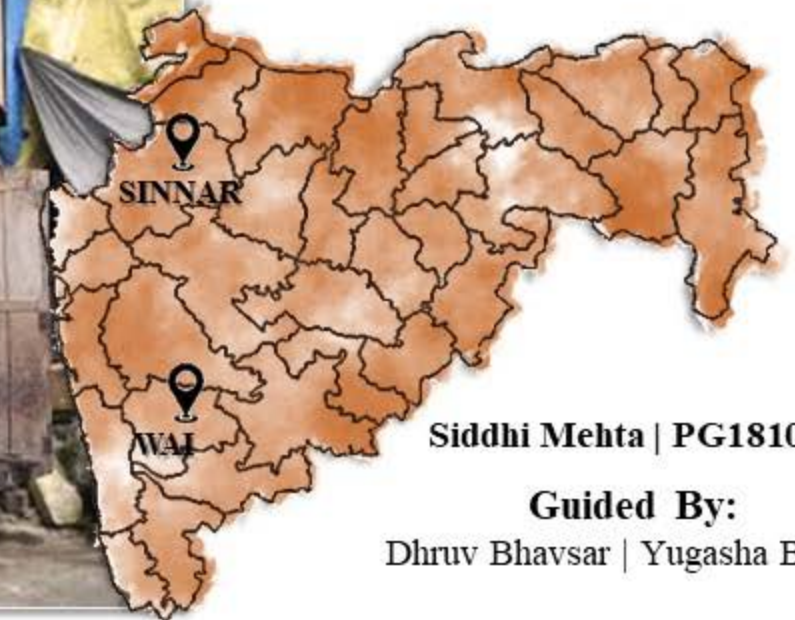


Is Space a Major Hindrance in Achieving Universal Access to Individual Toilets?

Case of Urban Areas of Maharashtra



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Guided By:

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This Directed Research Project on “**Is Space a Major Hindrance in Achieving Universal Access to Individual Toilets? Case of Urban Areas of Maharashtra**” was supported by the Center for Water and Sanitation. Guidance was provided by the CWAS team at CEPT Research and Development Foundation, CEPT University.

It was carried out towards partial fulfilment of the requirements for the award of a Master’s Degree at the Faculty of Planning, CEPT University, Ahmedabad, India.



*“Barriers to build individual toilets in urban areas are ability to raise funds, lack of information and limited space. Also the landscape of a given slum is an important factor that determines the construction of toilets. While some of the barriers are relatively easier to fix (improving information dissemination), **space constraints can be the most challenging**. Removing these initial barriers can improve household level access to sanitation.”*

Kumar D. S, ATREE, Bengaluru

01

Perception Study

How the research is articulated: Literature Review and Best Practices

02

Synopsis from Case Study Visit

Success case of Pune where households in slum settlements have overcome issue of space.

03

Sanitation in Wai and Sinnar

Issues and Challenges faced followed by findings and analysis

04

Recommendations

Contextual based Solutions that suffice the need



AIM

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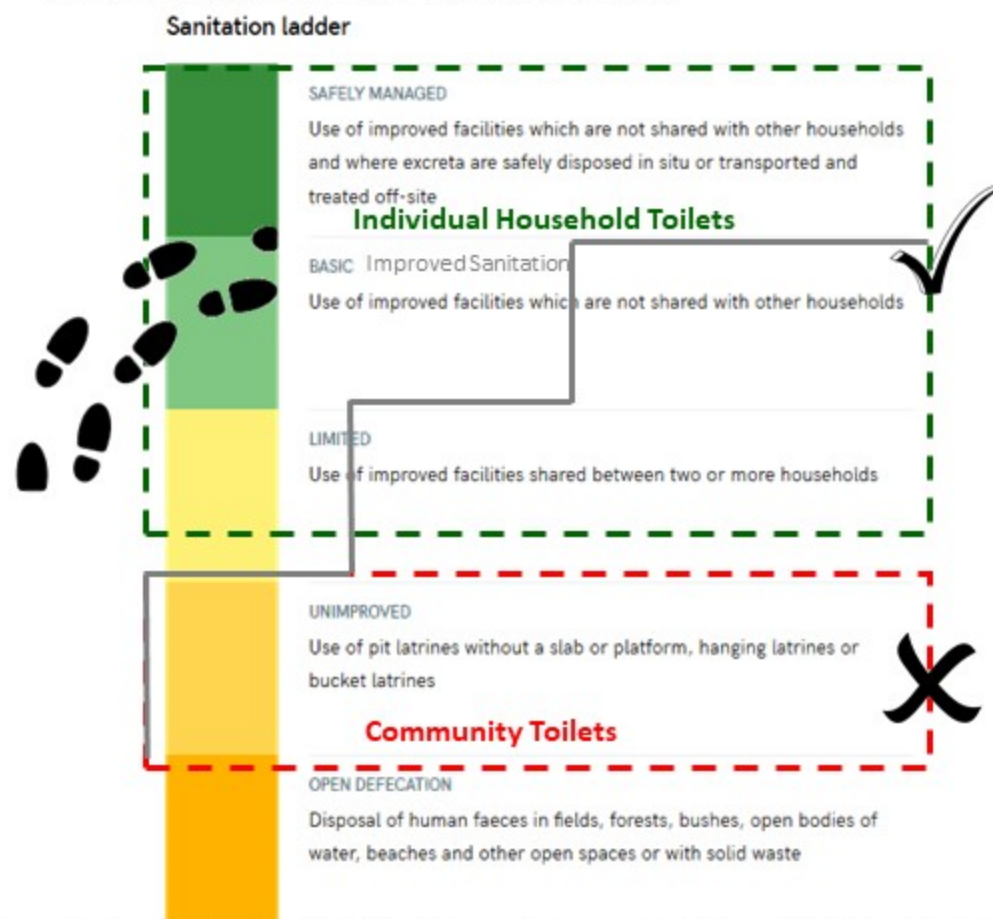
Recommendations

Contextual based Solutions that suffice the need.

Why Universal Access to Individual Household is Important?

THE NEED - especially during a Pandemic!

- Universal access to adequate sanitation is a **matter of dignity, fundamental need and human right**.
- **Health and Hygiene** are main risks from unimproved sanitation and so Universal access to safely managed Individual household toilet is a need.



“Poor sanitation only exacerbates public health emergencies”

- JMP considers **community toilet as unimproved sanitation** as it poses many challenges in terms of water scarcity, accessibility, hygiene, user charges, safety and improper maintenance.
- In this unprecedented Pandemic the impact of unimproved sanitation is clearly seen where it is advisable to follow hygiene and have 2 mts. distance. **Social Distancing is not practical** when it comes to use of such unimproved sanitation.



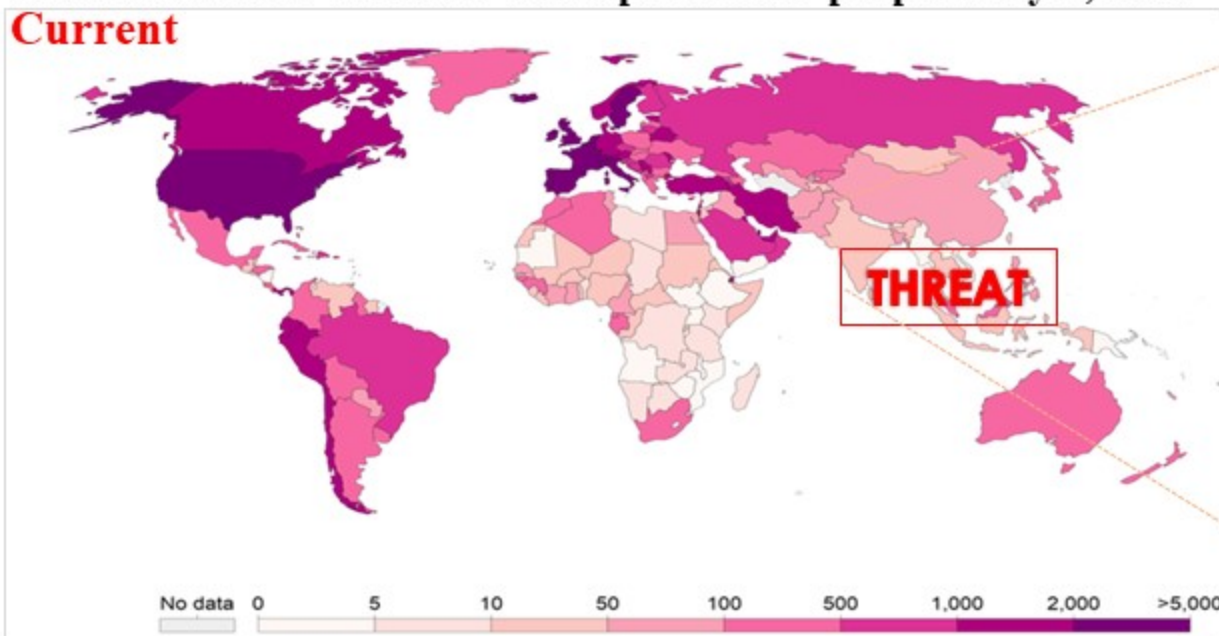
- To sustain the **ODF status** – as per JMP, Community toilets are major threat and **IHHL** is a strive to achieve **Universal access to sanitation**.

5.2% of India's GDP is lost due to inadequate sanitation every year

Global, National and State level Scenario of Sanitation

Total Confirmed Covid'19 Cases per million people May 5, 2020

Current



National Scenario

- According to the census of 2011, **53.1%** of the households in India do not have a toilet, with the percentage being as high as **18.6%** in urban areas.
- But according to the 2011 Census, **India's population density was 382** and these population density highlight how closely people might be living in some regions of India. **If the density is high in an area, maintaining a distance of one meter in public might be more difficult and lack of space issues might be more in these areas.**

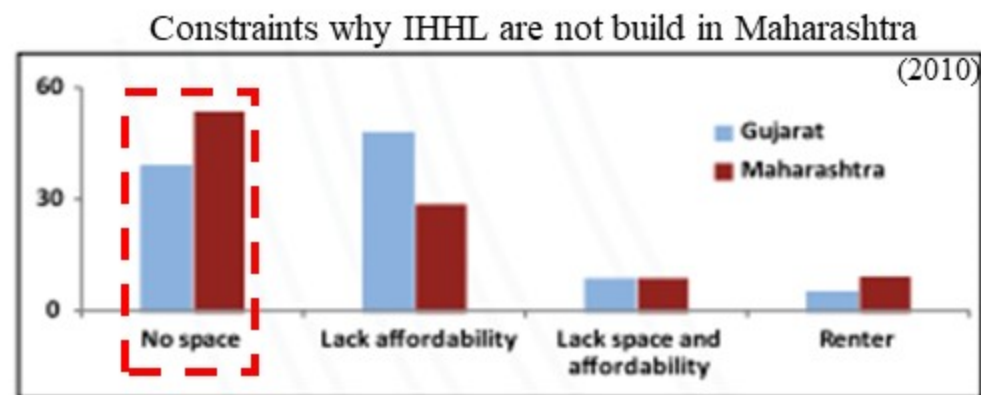
Before

- The world missed the MDG target for sanitation by almost 700 million people majorly because of unimproved sanitation practices and so in 2015 SDGs were launched include a target to achieve access to adequate sanitation.



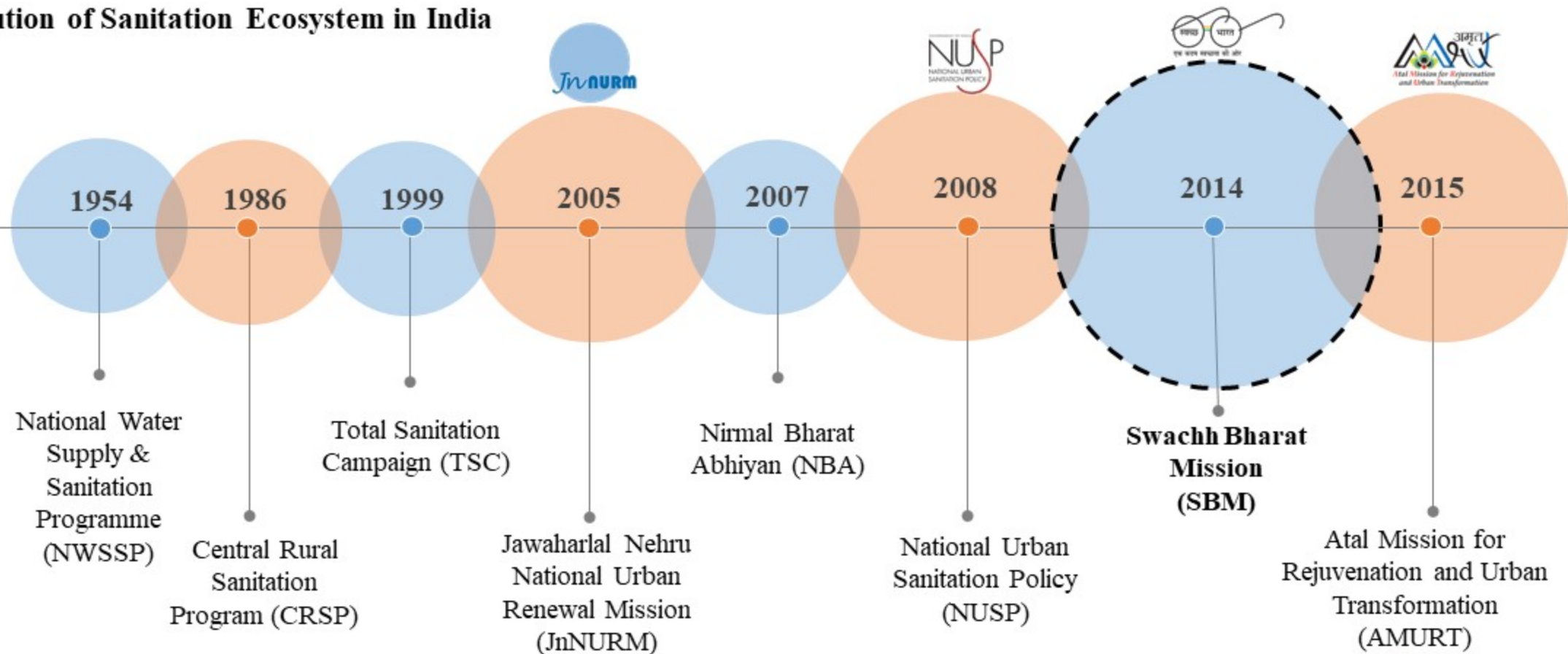
State Scenario : Maharashtra

Dependency on CT/PT – 21% in Census 2011



Policies and programmes that emphasized on construction of Individual Toilets

Evolution of Sanitation Ecosystem in India



- India's sanitation policies have used the top-down approach and are in a piecemeal manner, focusing on just financial assistance for latrine construction. **From the policy it is seen that though the main important objective is to build IHHL but community /public toilets are constructed more due to lack of space as major barrier.**
- And as **local governments spend an enormous amount on construction and management of community toilets rather from a 10-year perspective, the same outlay can be used for partial subsidy of individual or household toilets.**



Paradigm Shift in Sanitation Revolution v/s Crises affecting Public health in Pandemic

Swachh



Bharat

IHHL- Individual Household Latrine

It means a toilet which is available within the premises of a household. Operation and maintenance of individual toilet rests with the beneficiary.



One of the Objective

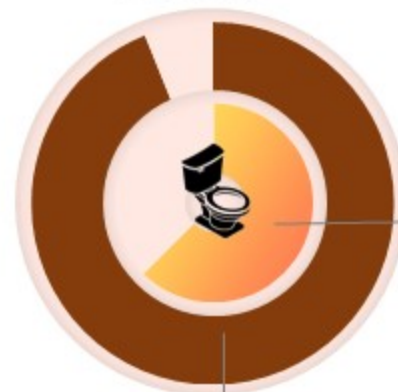
Household Toilets

Necessary conditions to be achieved **before declaring the city/ward as open defecation free**:-

- All households that have space to construct toilet, have constructed the one.
- **All occupants of those households that do not have space to construct toilet, have access to community toilet within a distance of 500 meters.**

Area of Mitigation for Research

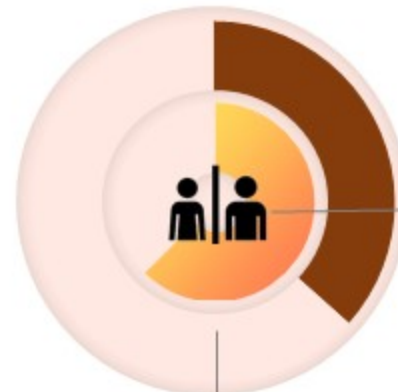
Under SBM
IHHL Constructed
Dec'2019



66 lacs
IHHL
Constructed

Estimated
requirement
97 lacs IHHL

Under SBM
CT/PT Constructed
Dec'2019



5.8 lacs
CT/PTs
Constructed

Estimated
Requirement of
3.5 lacs CT/PTs

So, nearly 50% of the targeted unserved and most vulnerable population, mainly living in high-density or old colonies and slums in India's cities.

Use of community toilets leaves residents to defy the lockdown and step out of their homes.



**Caution to Public Health
CT/PT posing hurdle to
Social Distancing**

Problem Statement

- Out of 73 Class B cities, Sinnar and out of 141 Class C cities, Wai are pioneering small towns reaching so far in terms of ODF certification. Both cities are ODF++ now.



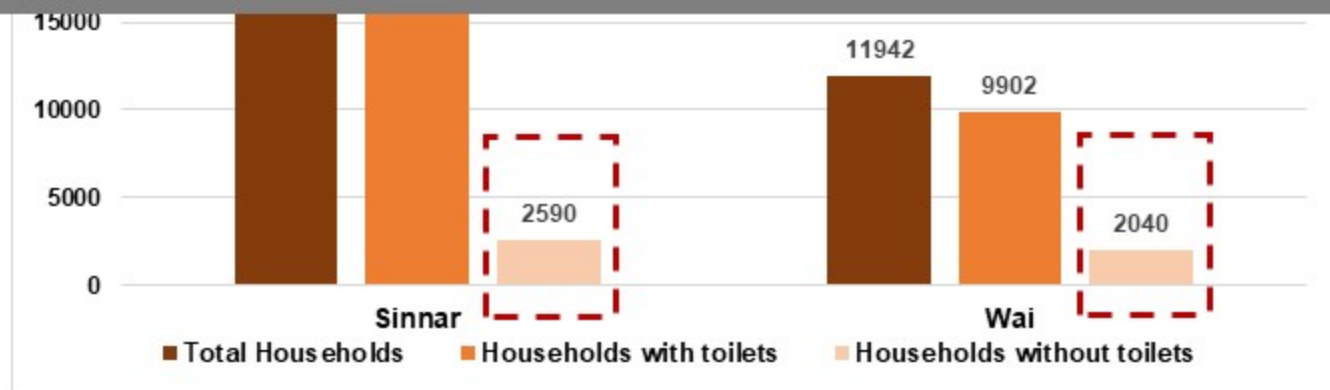
Acc. to SBM ODF Guidelines, MOHUA framework states
To achieve and sustain ODF sustainability
Access to Individual toilets is must.

- All the properties in the city have access to either own toilet or functional community/ public toilet
- Floating population in the city

- At least **80%** of residential properties in the city have access to own toilets
- Remaining properties and floating population in the city

PROBLEM STATEMENT

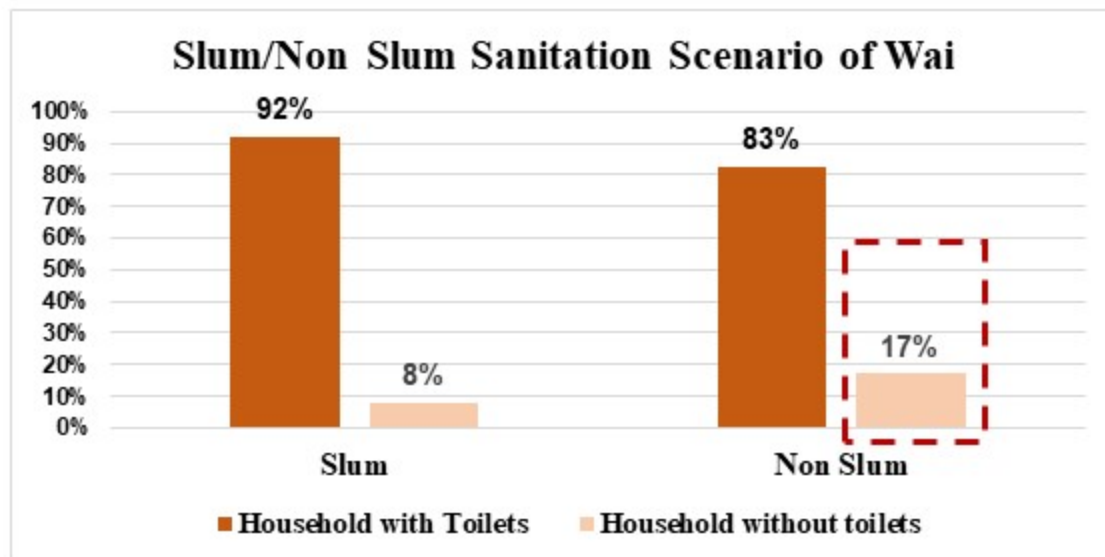
To mainstream the access fallacy and overcome barriers in order to construct individual household toilet in urban areas of Maharashtra with special emphasis on Wai and Sinnar. A scenario where demand for sanitation is high and though it has reached ODF++ but the dependency on unsafe sanitation practice still persist as factors such as lack of space and other issues suppressed behind it are very high.



- But even if Wai and Sinnar have scheduled desludging and had gain the status of ODF++ we must **never loose sight of the fact that still 14% of households in Sinnar and 17% in Wai are devoid of IHHL and are still dependent on unsafe sanitation.**
- To keep passing their ODF sustainability targets and to be a representative of 7400 towns in India it is necessary for both these cities to gain universal access to safe and improved sanitation.

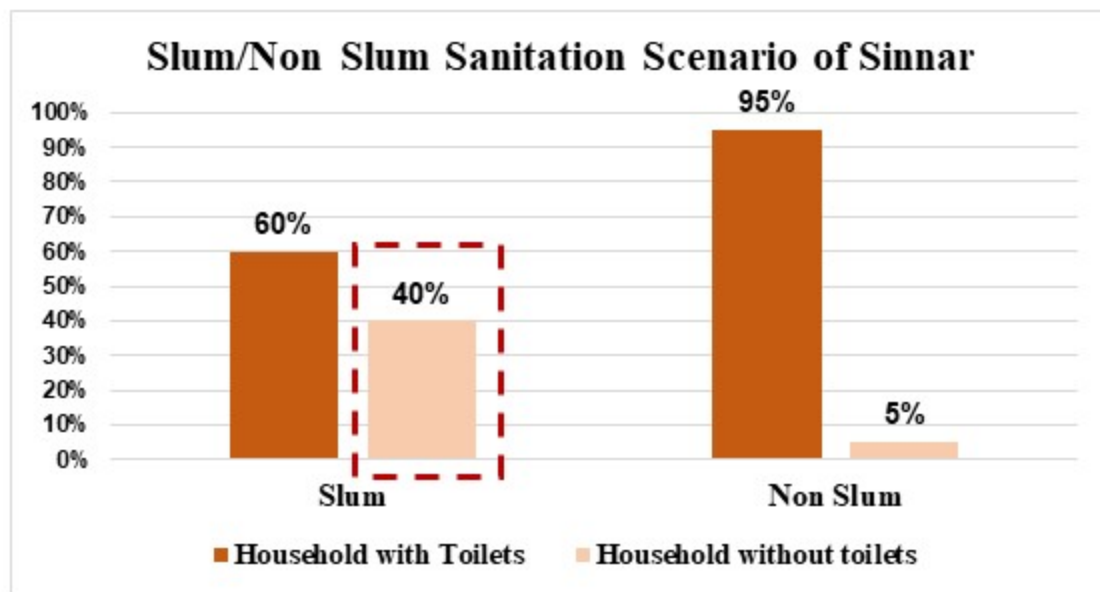
Rationale for selection of study areas

Wai



- **Out of total population of Wai, 4% lives in slum. Two Slums with 341 slum households out of which some are under IHSDP scheme by MHADA and MoHUPA, the houses come with attached individual toilets, thus providing improved access to toilets to all slum households.**
- **Therefore Non slums of areas of Wai are undertaken for assessment.**

Sinnar



- **Out of total population in Sinnar, 23% lives in slum. Household devoid of toilets in Non-Slum areas are 5% whereas that in Slum Areas are 40%. There are 12 slum areas in Sinnar. PMAY(G) redevelopment housing scheme proposal is ongoing for slums in Sinnar.**
- **Therefore, Slum areas of Sinnar are undertaken for assessment.**

Research Objectives - Approach, Methodology and Strategy Followed

Approach



Qualitative Approach



Participatory Approach

Tools

Focus Group Discussions



Wai – 4, Sinnar – 3
Members – 5- 15
It included interactive sessions to build rapport with the community.

Explain Validations



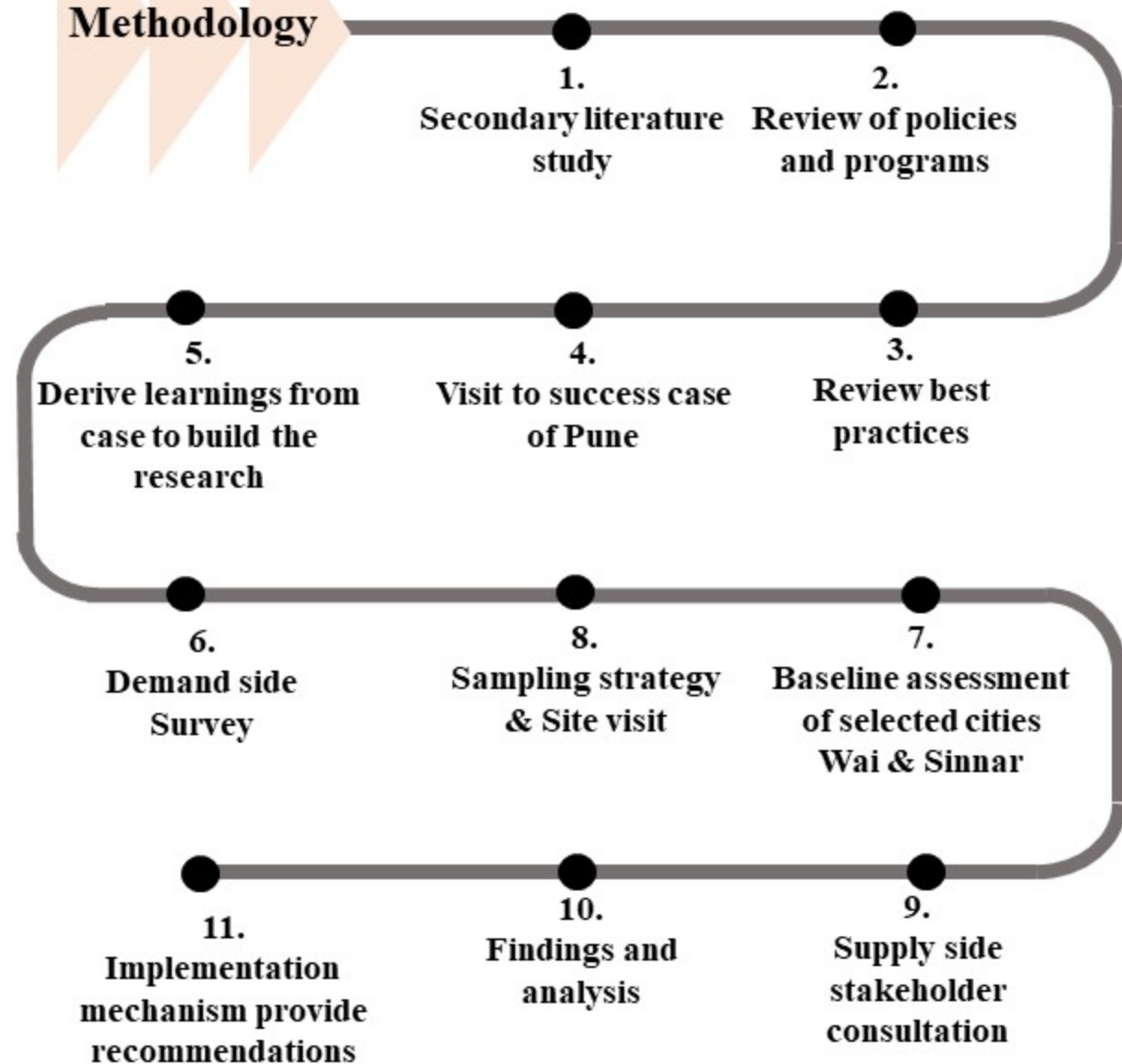
To mobilize community from layouts of Pune in order to encourage them to build toilet.

Household Interactions



Stratified Random Sampling
Pune- 36
Wai – 95, Sinnar - 42
It was done to conjure up with the barriers they face.

Methodology



Innovative Sanitation Solutions and Best Practices

Contextual Approach

It overcome psychological, economic, technical and sociological barriers in construction of IHHL. The sanitation system was developed using the existing sewerage that followed the natural slope of land through channels and nallas.

Orangi Pilot Project



Sanergy - Kenya

Sustainable – Container Toilets

“Fresh Life” container toilets are made where people face lack of fund and space issues. Sanergy collect waste from the toilets deliver it to a processing facility where the waste is converted into fertilizer for farmers.

An Incentive Approach

Sanitation credit at lower rate of interest and internal loan for toilets, construction of toilet became affordable and households preferred to construct ‘durable’ toilets using in-situ construction.

Mavim - Jalna



Gramalaya

An Innovative Approach

The solution to space constraints in individual household toilets was mobile and compact toilet units that can be easily be installed in a small space without connection to the sewer.

Civil Solutions

In areas where there no sewer network, due to hard rock at shallow depth, there was difficulty in providing septic tank. **Change in the design of septic tank** that space for waste storage can be achieved. .

Kolhapur - SA



Determinants that affects the construction of Individual Toilets

People are Unable to Build Individual Toilets Due to Following Functions acting as Constraints :-



Unavailability of Space,
High Density



Abundance of Water



Behavior – Preference



Landscape of Area,
High Density



Land Tenure/Ownership



Lack of Funds



Governance from supply
side



No Space for Disposal System

Consequences Faced if the Households devoid Individual Toilets

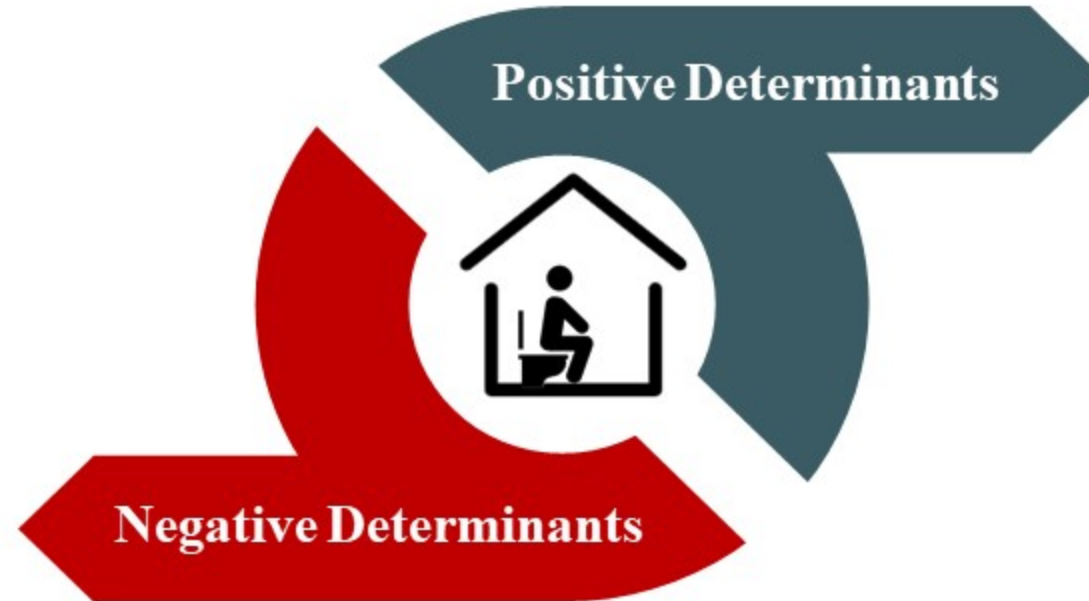
Infant Mortality

No Privacy It effects women's dignity

Waste Accumulation- Effects Environment

Unsanitary living conditions – harms health

Using Unimproved Sanitation taxes the govt. Budget



Construction of Individual Toilets will Lead to Following Benefits:-



Status



Privacy leading to Dignity



Proper Health & Hygiene



Improved Standards of
Living & Good Quality
of Life



Enabling Environment



Save time & money from
commuting to PT/CT

The visit to live success case of Pune and identifying ground reality was to learn factors houses were deprived of before and how they overcame it which fulfills research Objective 1:

Objective 1.

To identify best practices and understand measures taken to build individual household toilets even with space constraints.

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Mapping of slums visited from success story of Pune

Rajiv Gandhi Nagar Slum

- Households – 89 Inhabitants -500
- Community Toilets Surveyed - 8
- Adopted Model – OHOT 80% - SBM 20%
- Frequency of Water supply – Daily 2-3 hours
- Average House Size – 16.9 sq. mts
- Average Toilet Size – 1.9 sq. mts

Janata Vasahat Slum

- Households – 8396
- Community Toilets Surveyed - 47
- Adopted Model – OHOT 60% - SBM 40%
- Frequency of Water supply – Daily 3 hours
- Disposal System – sewerage line, single pit latrine, twin pit latrine, septic tank, bio toilet

Sanjay Park Slum

- Households Surveyed - 207 Inhabitants -1435
- Community Toilet – 1
- Adopted Model – OHOT 90% - SBM 10%
- Frequency of Water supply – Daily 1 hour
- Average House Size – 16.3 sq. mts
- Average Toilet Size – 1.54 sq. mts
- Disposal System – sewerage line

Premnagar Slum

- Households – 769 Inhabitants -3845
- Community Toilets Surveyed - 10
- Adopted Model – OHOT 60% - SBM 10%
- Frequency of Water supply – Daily 4 hours
- Average House Size – 15.8 sq. mts
- Average Private Toilet Size – 1.2 sq. mts
- Disposal System – sewerage line

Shivrainagar Slum

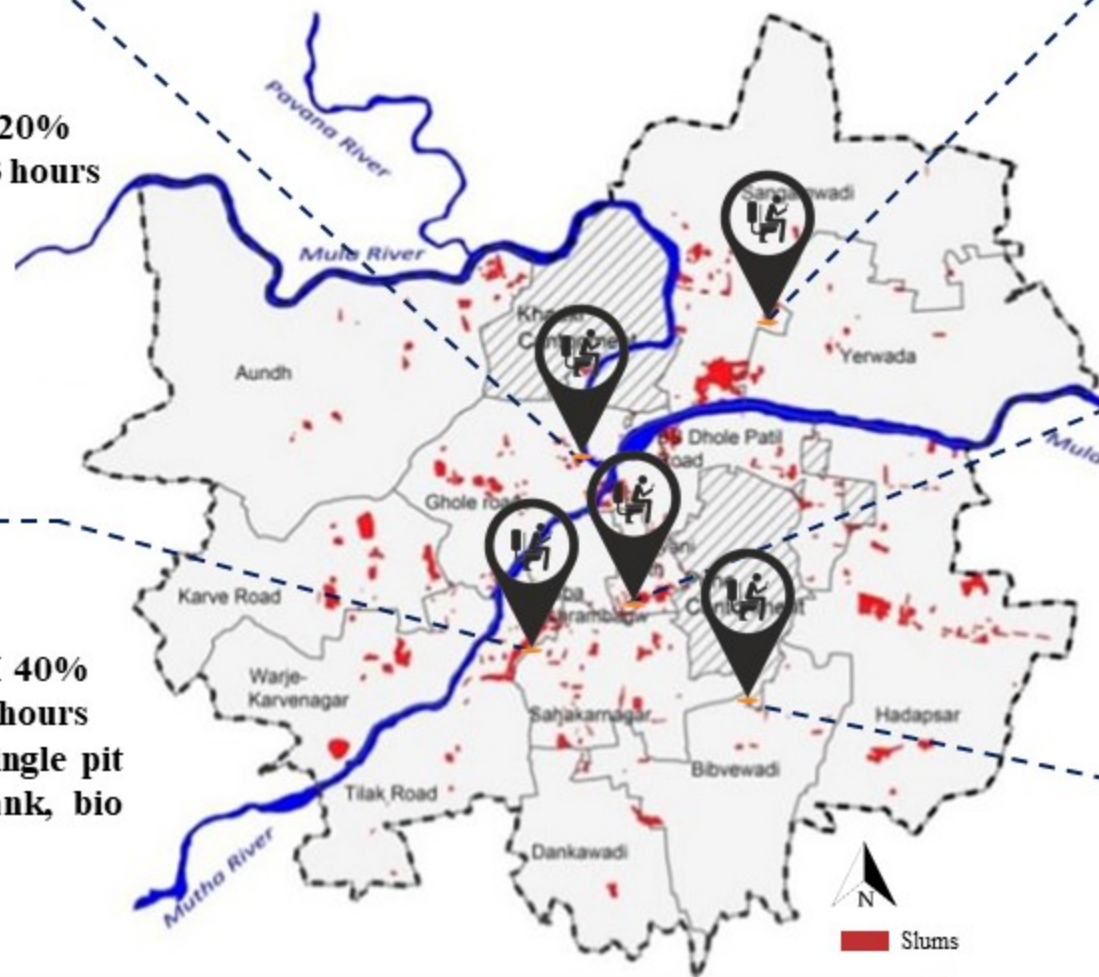
- Households Surveyed - 5 Inhabitants -5215
- Community Toilet – None
- Adopted Model – Average Private 40% Average SBM - 50%
- Frequency of Water supply – Daily 1 hour
- Average House Size – 1.1 sq. mts
- Disposal System – sewerage line, septic tank

Out of all the 36 houses surveyed that have build toilets

47% - 17 Semi Pucca houses

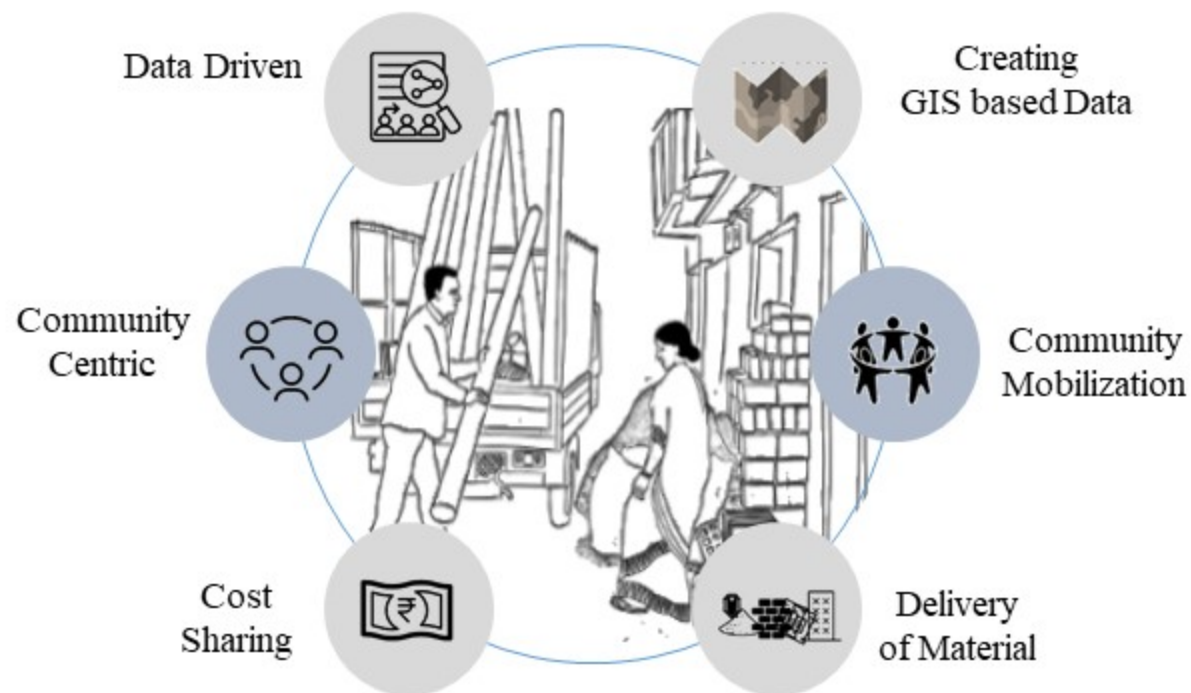
33% - 12 Pucca houses

20% - 7 Kutcha houses



How the “One Home One Toilet” Model works?

Approach Followed:



Steps of Intervention:

Comparative Analysis of all the three models

SBM, OHOT and Private Model



SBM

- Applications Rejected on the basis of lack of space constraints. Delay in material delivery and improper quality of materials. Partial monitoring and supervision.



OHOT

- Houses with lack of space were taken up on priority basis. Material arrived as soon as the construction starts and the quality of material was good with complete monitoring and supervision.



Private

- The installation was done fast as the material was brought by the beneficiary, but the sometime after the construction additional amount need to be spent on maintenance. Partial monitoring and supervision.

Space for construction of toilet in houses was decided by

50% Beneficiaries

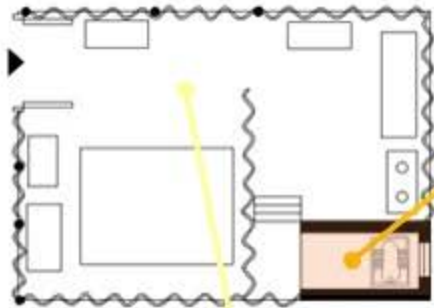
45% Shelter Associates
Members

5% Nagarsevak

Interesting Cases where households have built toilets in small spaces

Case of Shivrainagar Slum

- Inhabitants - 3
- House Size – 9.8 sq. mts
- Toilet Size – 1.2 sq. mts
- Superstructure – Kutchha
- Cost incurred to built toilet – Rs. 8,000
- Model - Private



Case of Janata Vasahat Slum

- Inhabitants - 2
- House Size – 20 sq. mts
- Toilet Size – 1.8 sq. mts
- Superstructure – Semi - Pucca
- Cost incurred to built toilet – Rs. 22,000
- Model - Private

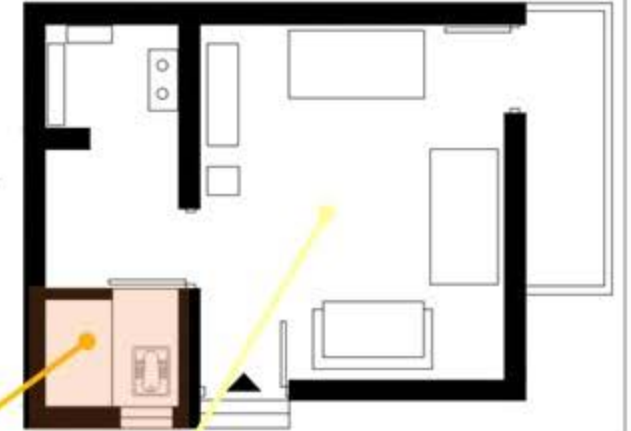
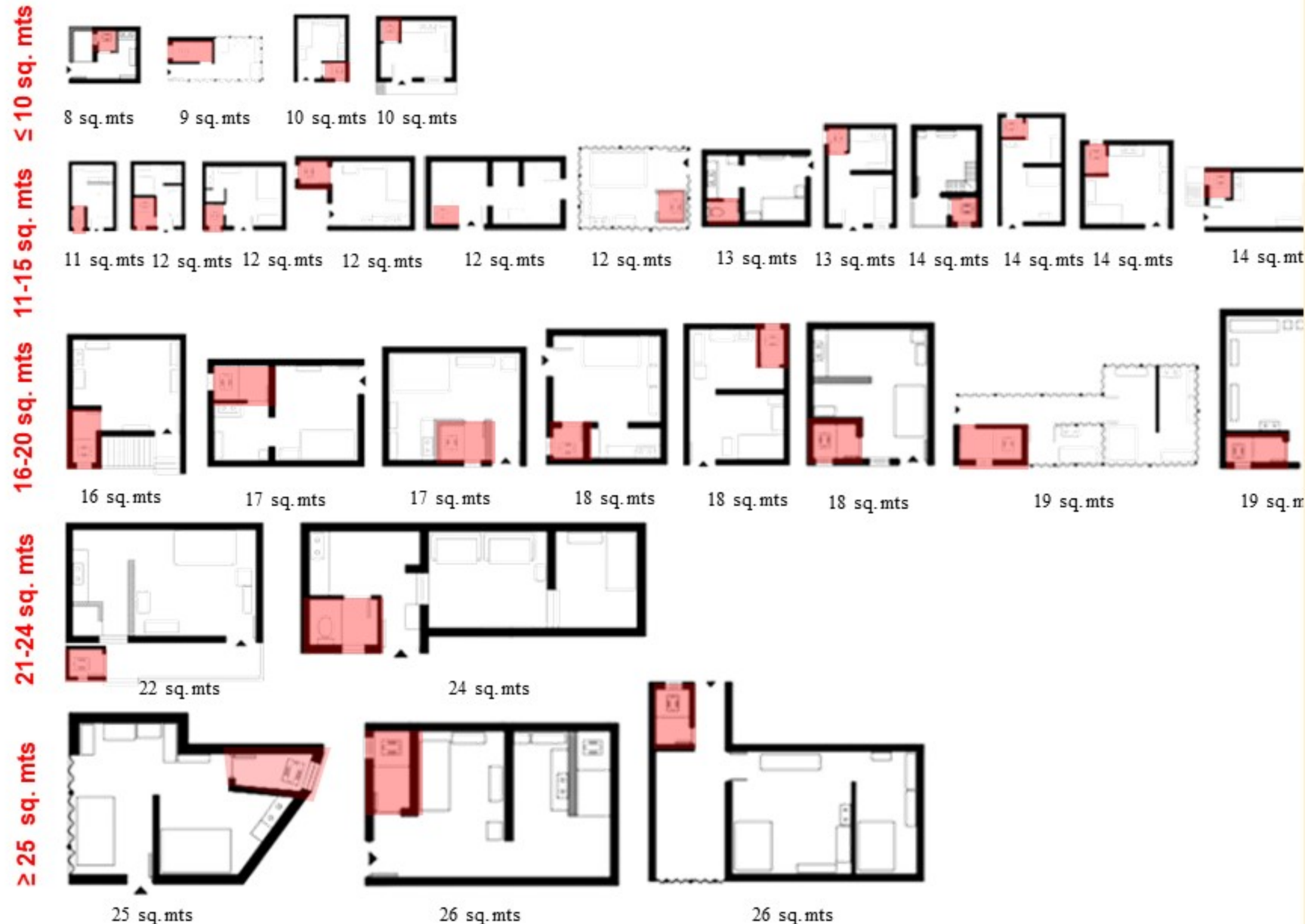


Illustration: Layout based analysis of dwelling units visited in Pune

To understand in what context have households build toilets



From all the 36 houses surveyed average house size is 16 sq. mts and average toilet size is 1.5 sq. mts.

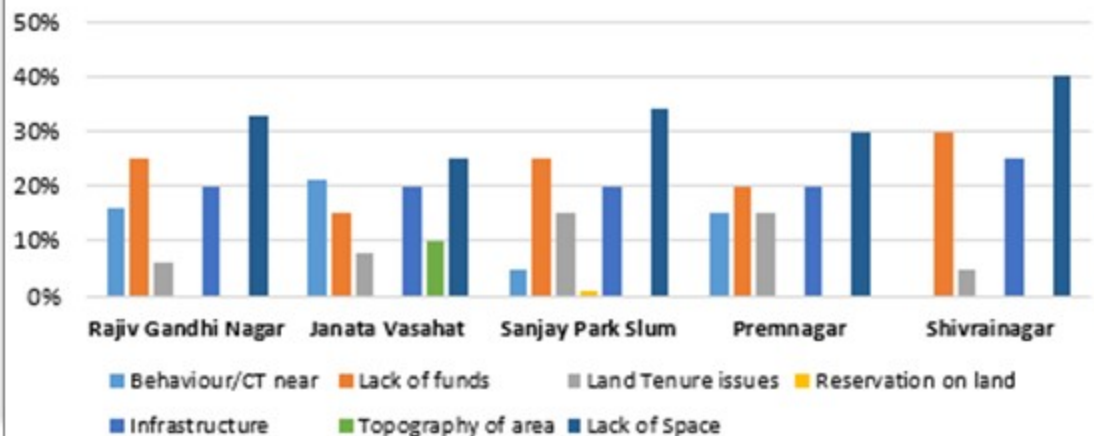
In most cases, the new toilet was an enclosed space generally built at the location of the former bathroom and combining a bath area and a toilet. However, the bathroom space and the toilet could also be located in separate spaces depending upon the disposal system.

All toilets have different dimensions and are equipped differently according to each house's size, layout, surroundings as well as household's needs and financial means.

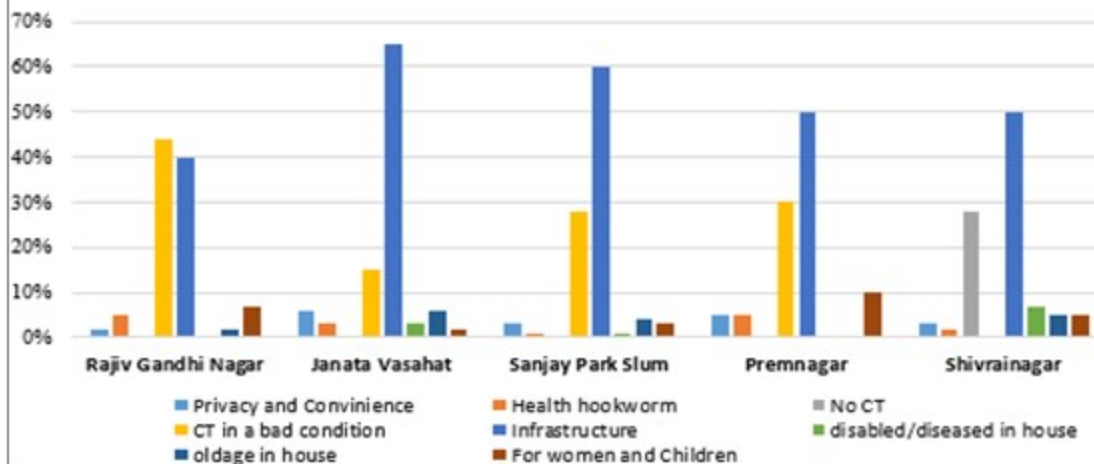
User Perspectives and Inferences

Impact of Individual household toilets on overall Health

Challenges faced by Households for construction of Individual Toilets



Decision Making Factor for construction of Individual Toilet



“Though difficult to built toilet as there was no space inside the house. But community toilets were not clean so for our small children we constructed it in the balcony”

Lack of Space



Lack of Funds



“When community toilet was closed for month and were forced to built toilet in houses we didn't recognized its importance but after construction of it we realized its valuable impacts.”

Lack of Infrastructure

- It is inferred from the graph that out of all 5 slums and 36 houses surveyed the majority affirmed lack of space followed by Lack of funds and infrastructure issues.

An overwhelming proportion of households affirmed that reasons of owning Rajiv Gandhi Nagar Slum Swachh Bharat awareness. Infrastructure came in place and community toilet was not there or in bad condition emerging as the top most driving factor for construction of toilets followed by infrastructure.



Community toilet in a state of disrepair in Rajiv Gandhi Nagar

Resident Shivrainagar Slum



“Veneer built in in toilet”



Resident Janata Vasahat Slum

In the Cities that are selected a Macro - Micro level assessment was carried out in order to understand the constraints behind not constructing IHHL and based on challenges faced in the area, layout based analysis was done which fulfills research Objective 2 :

Objective 2. To understand the demand side and supply side perspective for Wai and Sinnar in building IHHL, and perform gap assessment.

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Process Mapping of Wai & Sinnar

Secondary Data Analysis

From CSP 2015, It was inferred that there are Non Slum areas in 3 Prabhags i.e. 2,3,5 of Wai and 8 Slums in Sinnar which came out as vulnerable areas devoid of IHHL.

Citywide Macro level Assessment

All analyzed areas were surveyed on basis of sampling done through stratified random sampling method in both Wai and Sinnar.

Micro level Area Assessment

Further, 3 Non Slums areas were identified in Wai and 4 slum areas in Sinnar, FGDs were conducted to build rapport in order to survey households with space constraints and that devoid of toilet. Also to know decision making factor for those having toilets.

Recommendations

Recommendations are given on basis of contextual and layout based analysis as architectural solution for enabling environment.



City Profile - Wai



A pilgrimage Town



River Krishna



Elevation – 677 – 1092 mts
Surrounded by Sayadri Range
Majorly black cotton soil



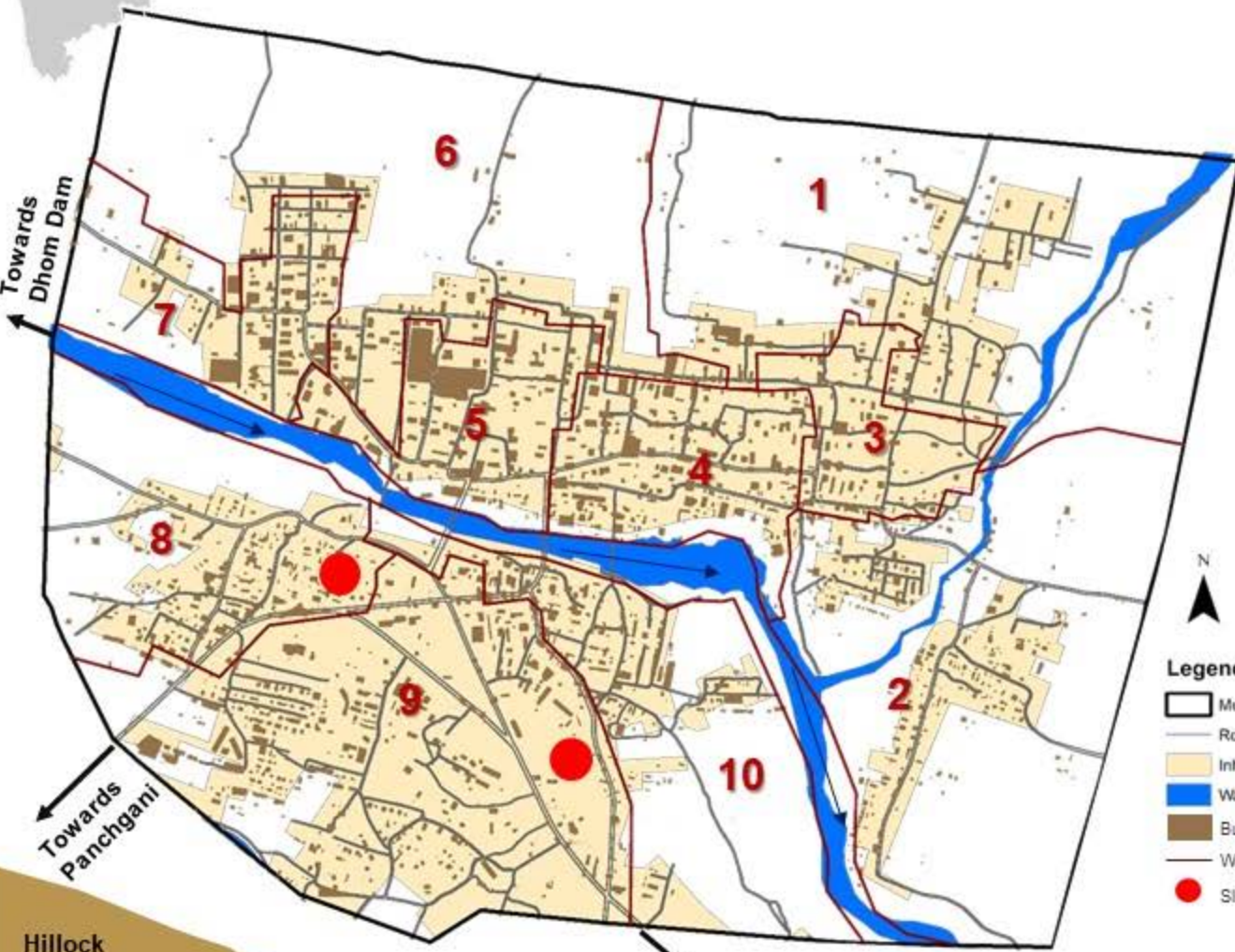
M.Council
Class C City



Area: 3.64 sq. kms



Decadal Growth Rate: 13.7%



Population (2018-19) - 47875



Prabhags/Wards - 10/10



Slums - 2



Total Households - 11942



Major Occupation - Agriculture



Area covered by open and covered drainage network - 3.64 sq. kms

Legend

- Municipal boundaries
- Road
- Inhabited Area
- Water Bodies
- Built up
- Ward Boundaries
- Slums

• The city does not have sewer network. Coverage of individual toilets is 83% in the city connected to septic tanks and pit latrines.

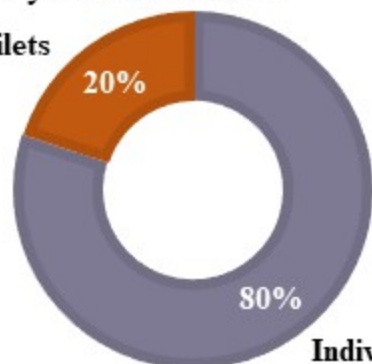
Challenges in Sanitation – Wai (Secondary Data)

Non Slum Residential Areas That are More Dependent on Community & Public Toilets Because of Space Constraints.

PRABHAG 3

- Population: 7805
- Existing Community Toilets : 8
- Preferred choice of sanitation facilities by the households

Community Toilets



Individual HH Toilets

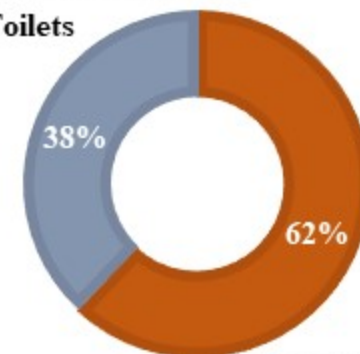
- Reason for not having IHHL:
No space available for HH level toilets



PRABHAG 2

- Population: 6916
- Existing Community Toilets : 6
- Preferred choice of sanitation facilities by the households

Individual HH Toilets



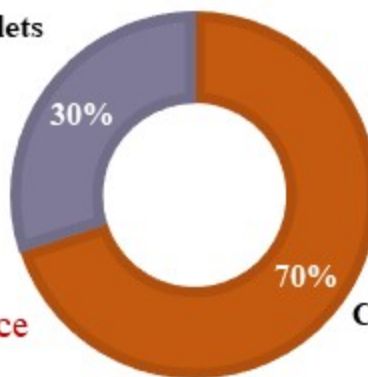
Community Toilets

- Reason for not having IHHL:
Densely located houses with space constraints at household level

PRABHAG 5

- Population: 6702
- Preferred choice of sanitation facilities by the households

Individual HH Toilets



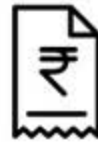
Community Toilets

- Existing Community Toilets : 15
- Reason for not having IHHL:
Topographical constraints and unavailability of space

Baseline Assessment

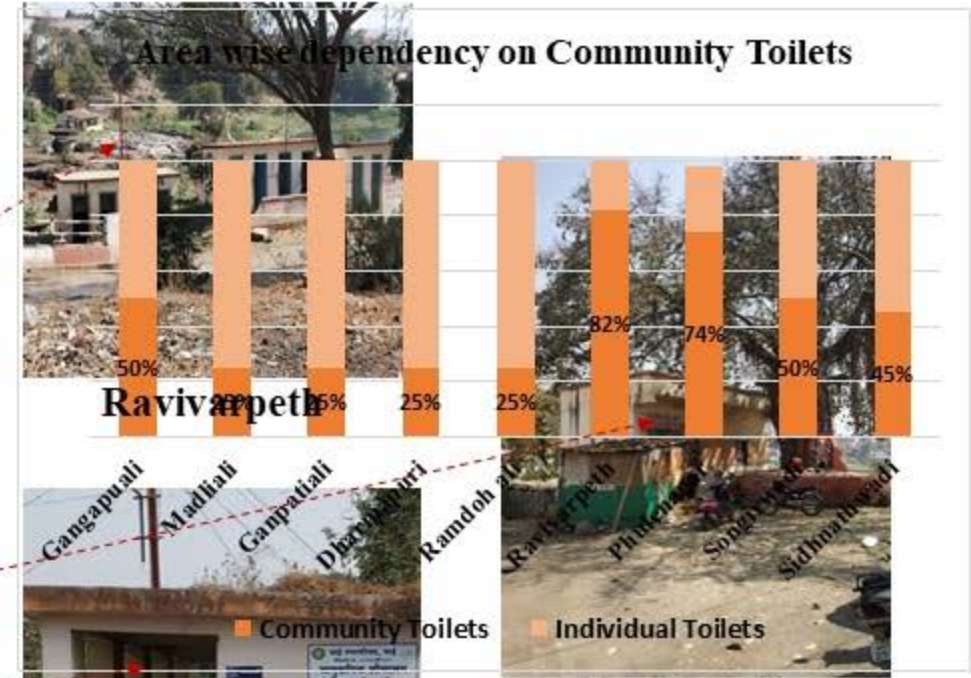
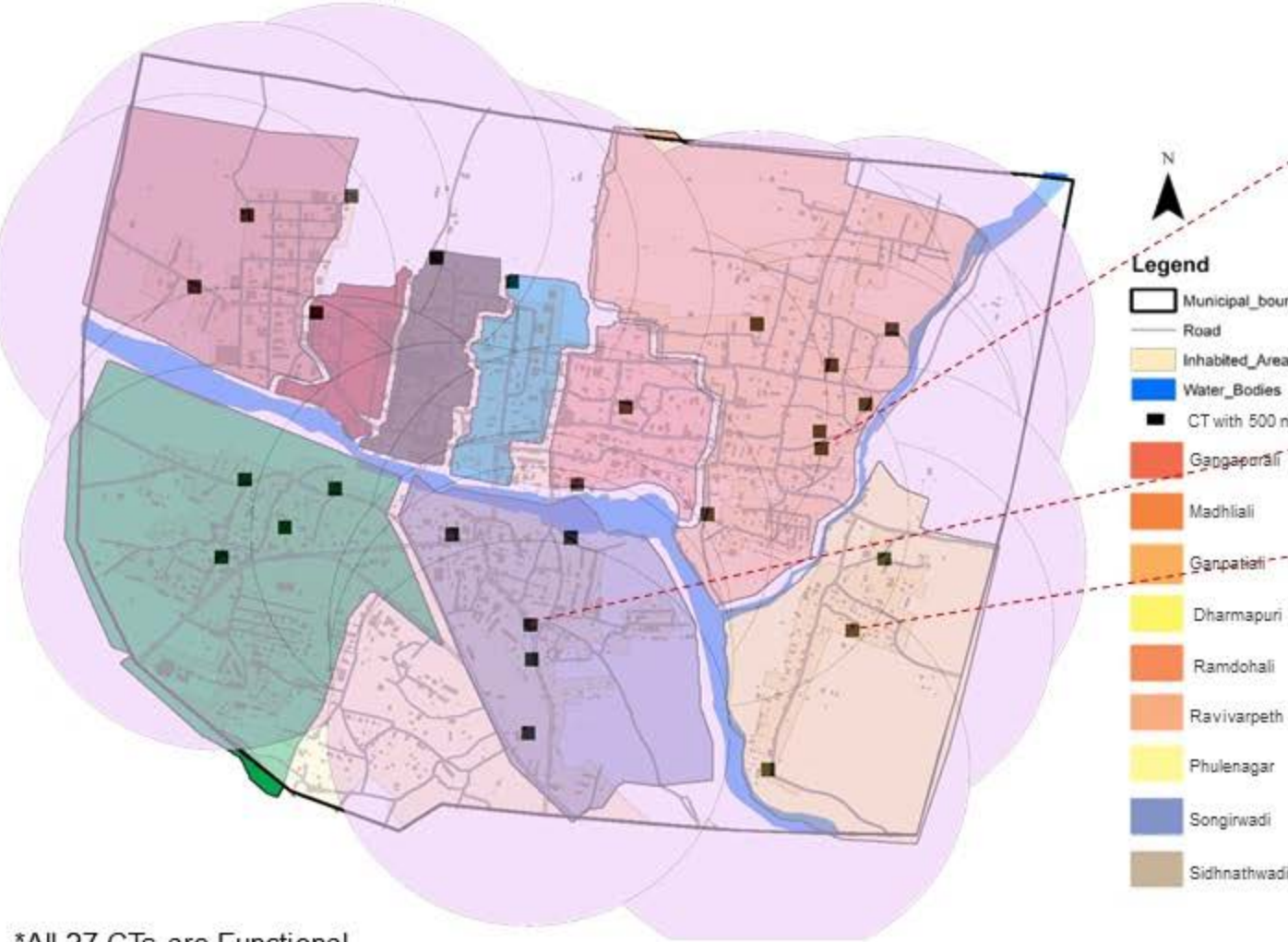


CT = 27
Seats = 277



In property tax, under sanitation tax
Rs. 60 is collected as user fee for CT

Location of Community Toilets

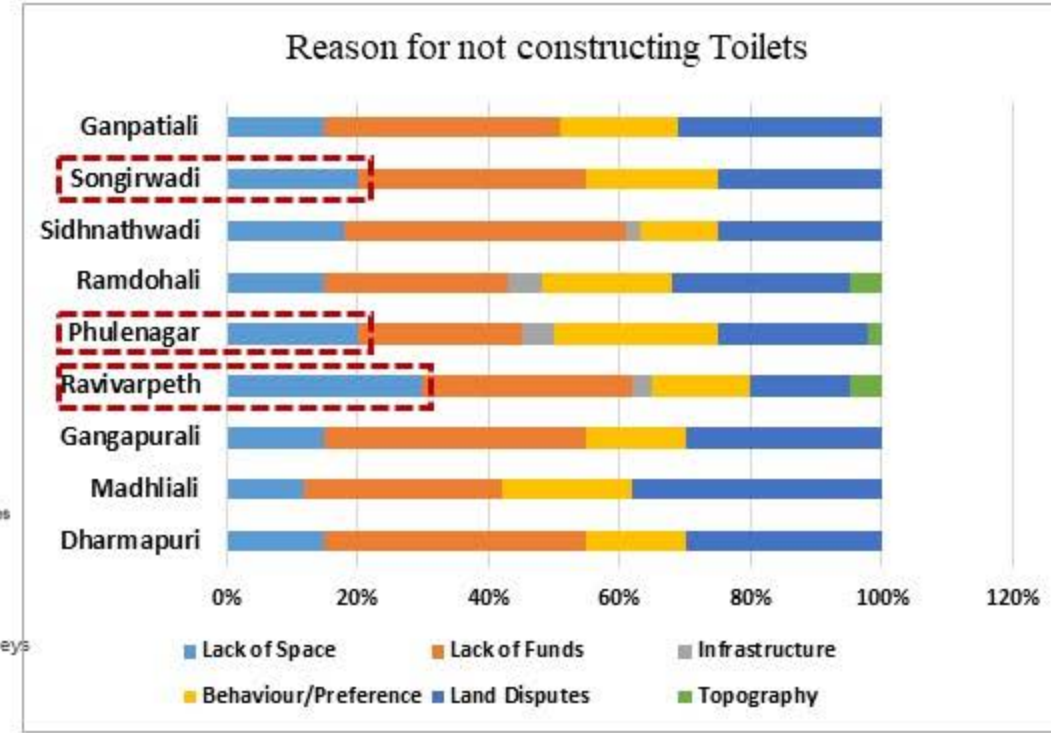
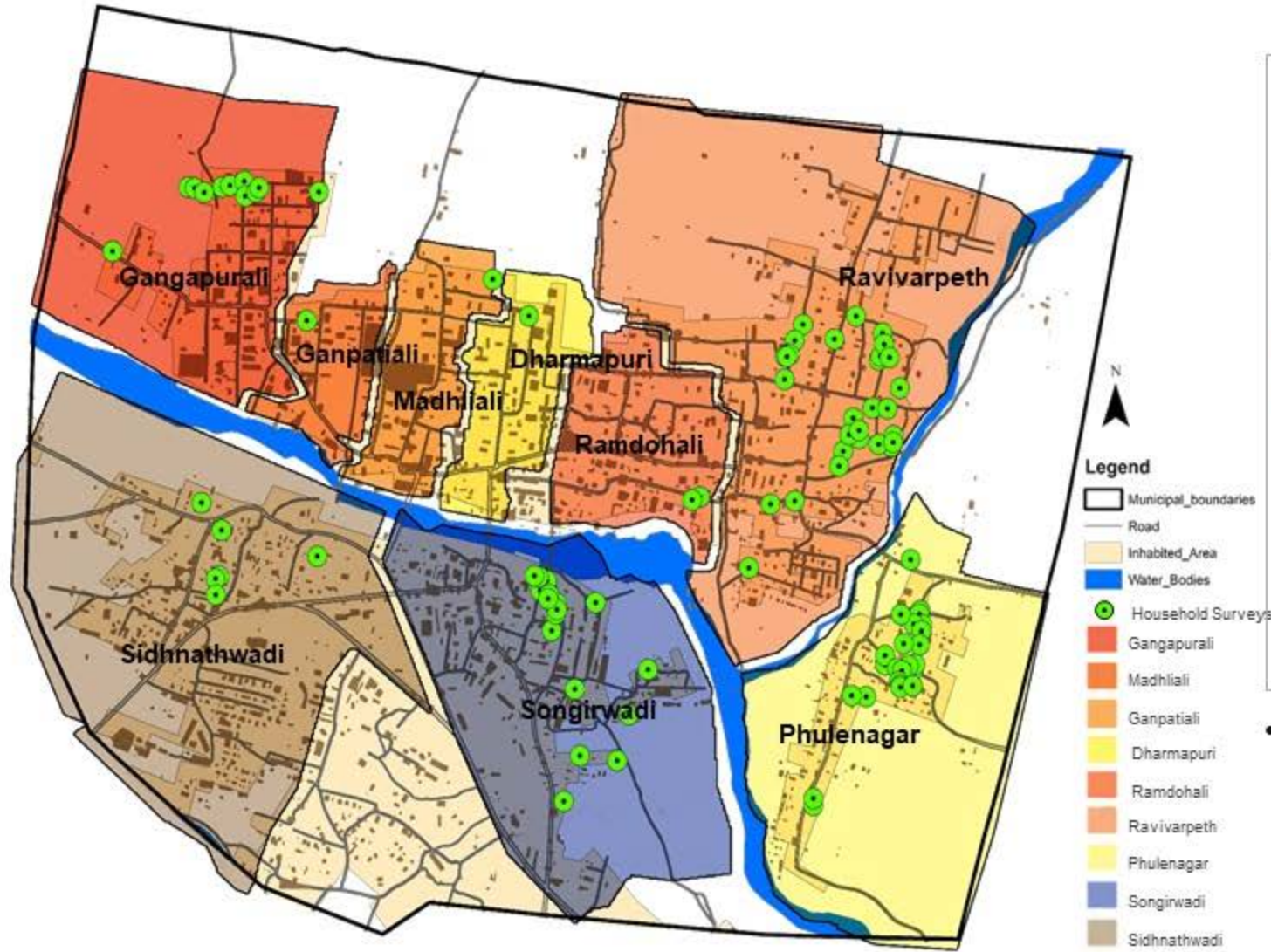


Among all the 9 Non-slum areas dependency on CT is more i.e. 82% in Ravivarpeth followed by Phulenagar, Songirwadi, Gangapurli and Sidhnathwadi.

It takes an average 300 – 400 mts walk to reach the nearest community toilet.

*All 27 CTs are Functional.

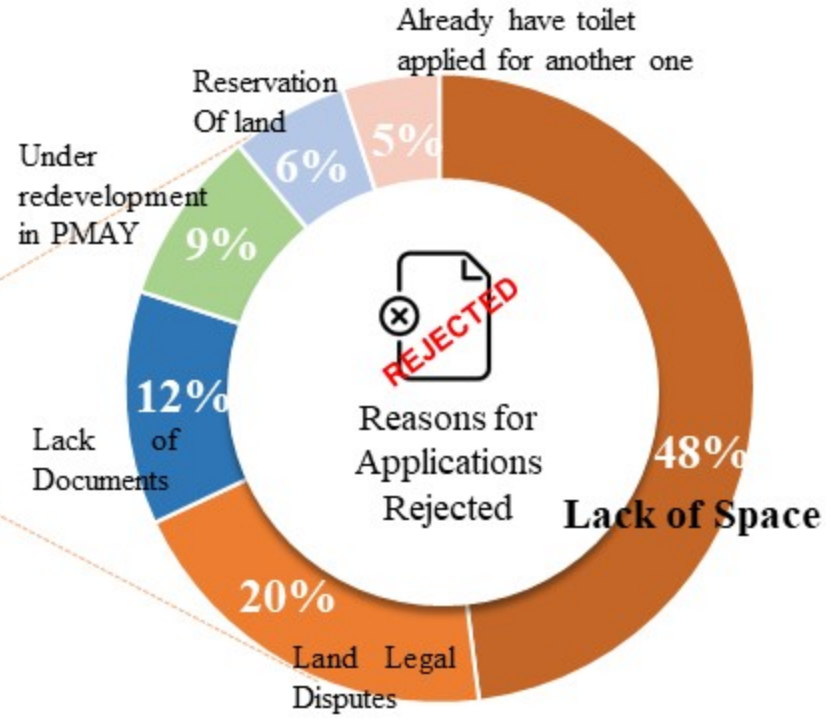
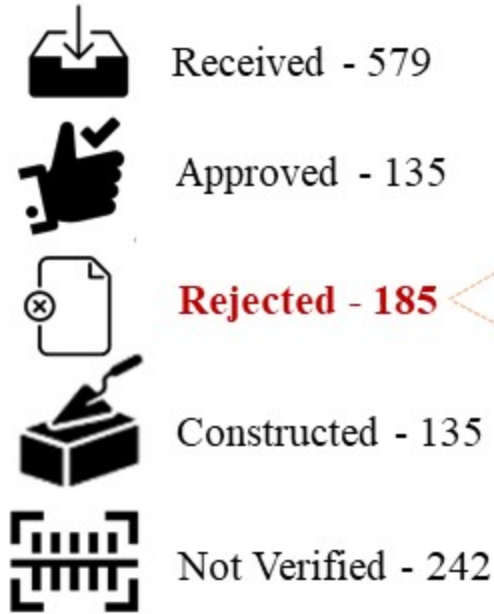
Macro level Assessment and Analysis



- From Household interactions in all the 9 slums it was found that **Ravivarpeth, Phulenagar and Songirwadi** are most vulnerable in as majority of respondents mentioned lack of space and funds issue in these areas.

Supply Side Scenario

SBM IHHL Status of Sinner



Under Swachh Bharat Mission Cost Provided to built toilet and septic tank:



From SBM funds – 12,000/-
From M.Council – 10,000/-



Total – 22,000/- in 4 Installments
(other cost incurred is taken up by the beneficiary)



Toilet size varies according to
space: 3 x 4 ft.



Septic tank size varies as per
guide CPHEEO according to
users

- There are **123 SHGs working in Wai** as per NULM list. Each SHG has **10 – 20 Members**.
- As per Swachh Survekshan 2018-19 Report, Total no. of households devoid of toilet are 280 in Ravivarpeth, 125 in Phulenagar and 118 in Songirwadi. It was found that these 3 areas are more vulnerable as they are underdeveloped and majorly applications rejected here are due to lack of space.

Interesting cases where households have overcome space constraints to avail access to individual toilets

I. Group Toilet, Kumbharvada, Ravivarpeth



Three Superstructures with one group toilet + septic tank

No. of Inhabitants in both houses	12
Super structure	Pucca
Toilet Size	3x 3.5 ft.
Septic Tank Size	5x3 ft.
Total Cost Incurred	Rs. 60,000
Subsidy Received	Rs. 22,000
Septic Tank Outlet Connected	Closed Drain

II. Group Toilet, Sidhnathwadi



Six Superstructures with two group toilet connected to septic tank

No. of Inhabitants in both houses	28
Super structure	Pucca
Toilet Size	3x 3.5 ft.
Septic Tank Size	5x3 ft.
Total Cost Incurred	Rs. 30,000
Septic Tank Outlet Connected	Closed Drain

Group Toilets was built due to lack of funds

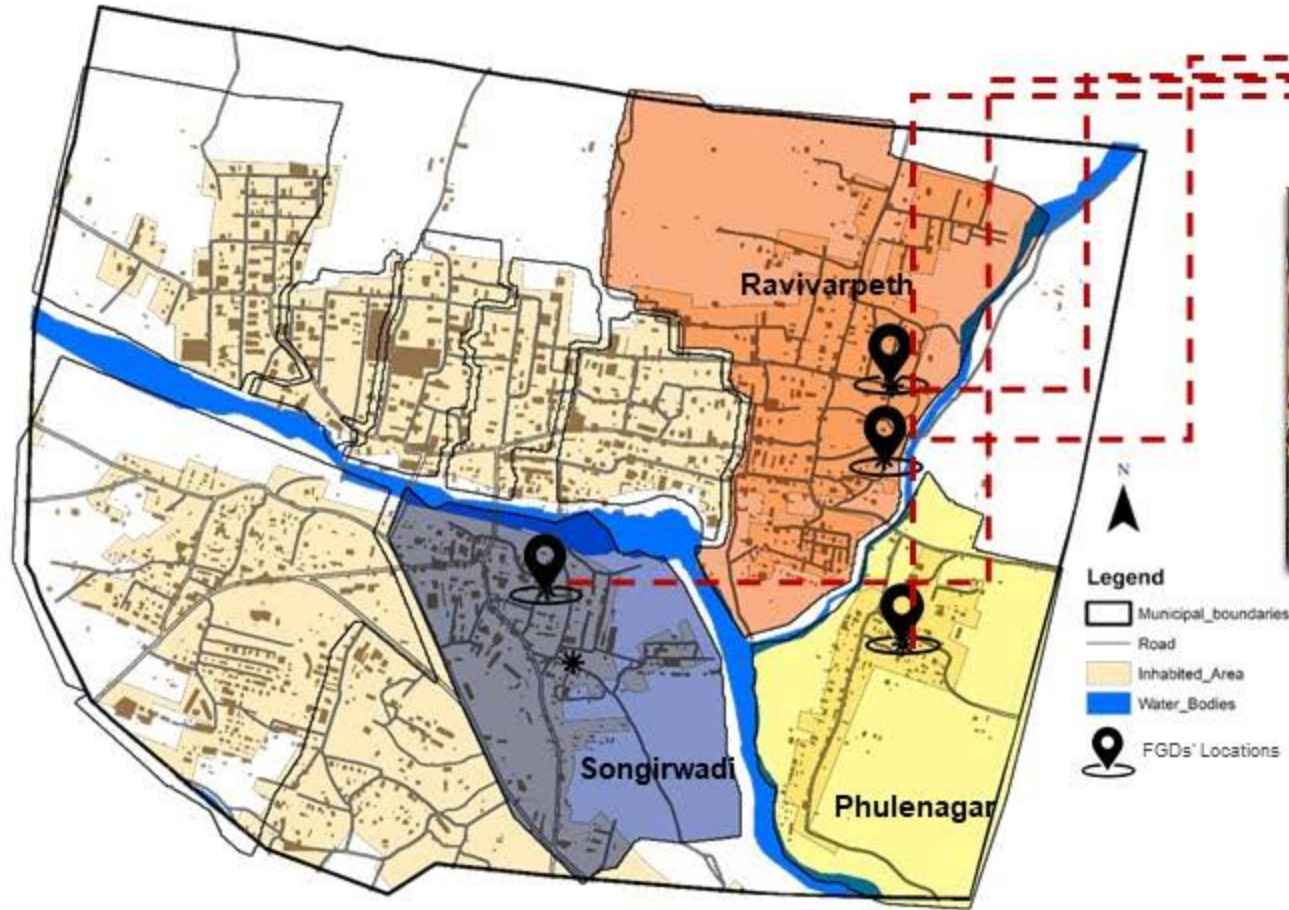


Group Toilets was built due to lack of space inside the houses.



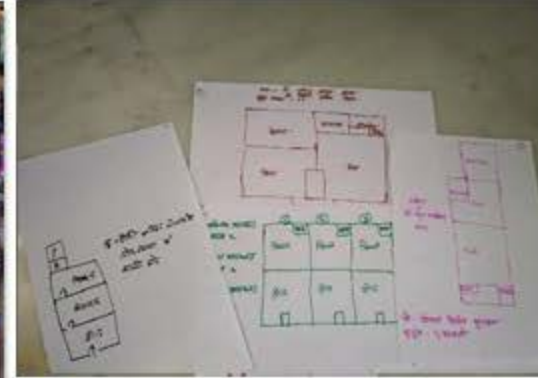
Micro Level Assessment – Focused group Discussions

- FGDs were conducted to build rapport and also an exercise was carried where all participants were given paper and pens to draw layouts of their houses which helped further to identify households with space constraints within these 3 areas that came up as in most vulnerable state.

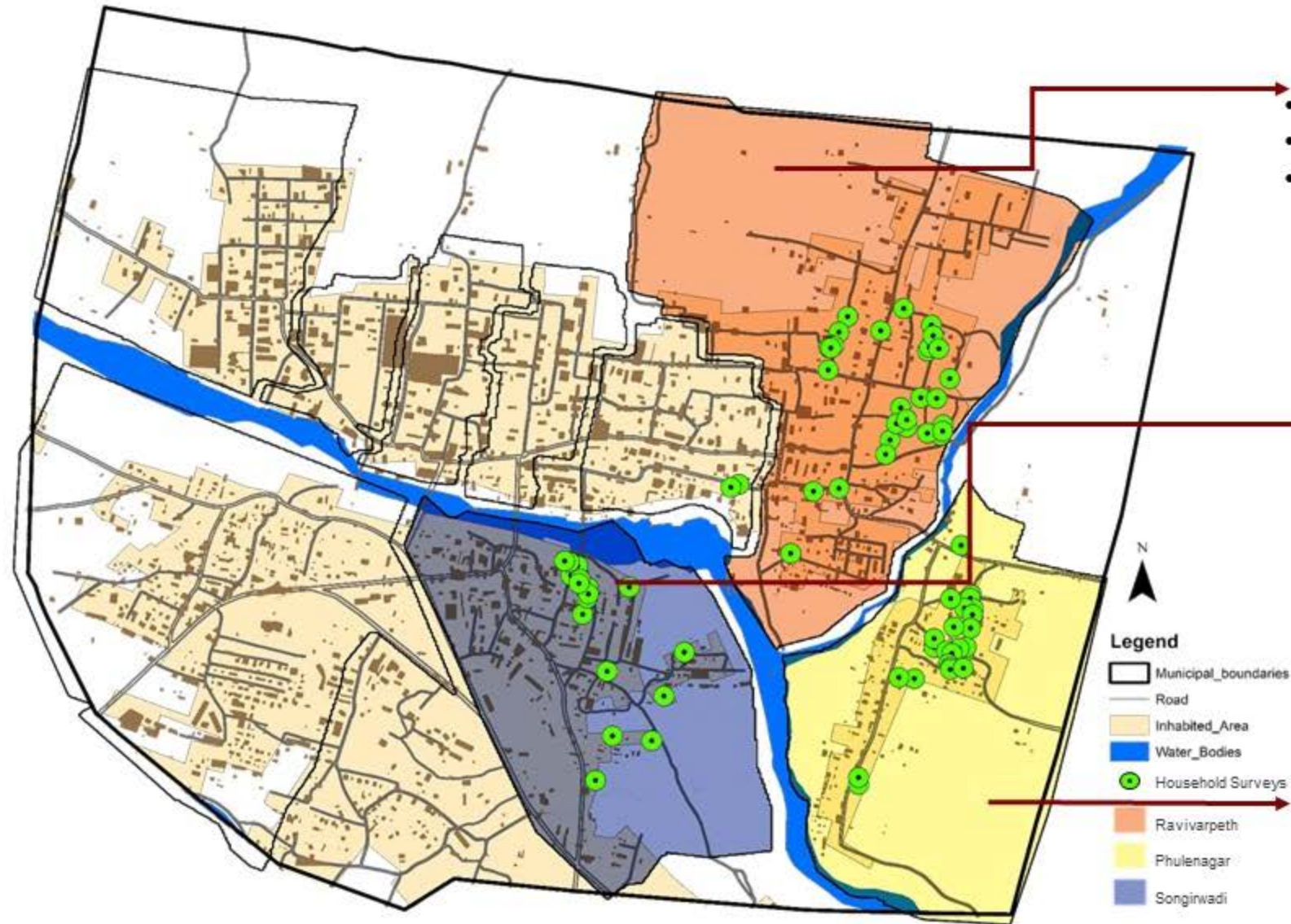


FGD-2 Ravivarpeth

- Conducted on 10th Feb 2020
- Participants - 10
- Among the Participants With Toilet - 0, Without toilet - 7



Micro Level Assessment – Identified Vulnerable 3 Non - Slums in Wai



Ravivarpeth

- Households surveyed – 38, out of 24 are devoid of IHHL
- Kutcha - 47% Semi Pucca- 27%, Pucca- 26%
- Household without toilet size – 11 – 42 sq mts



Songirwadi

- Households surveyed – 22, out of 15 are devoid of IHHL
- Kutcha - 9% Semi Pucca - 46%, Pucca- 45%
- Household without toilet size – 15 – 40 sq mts



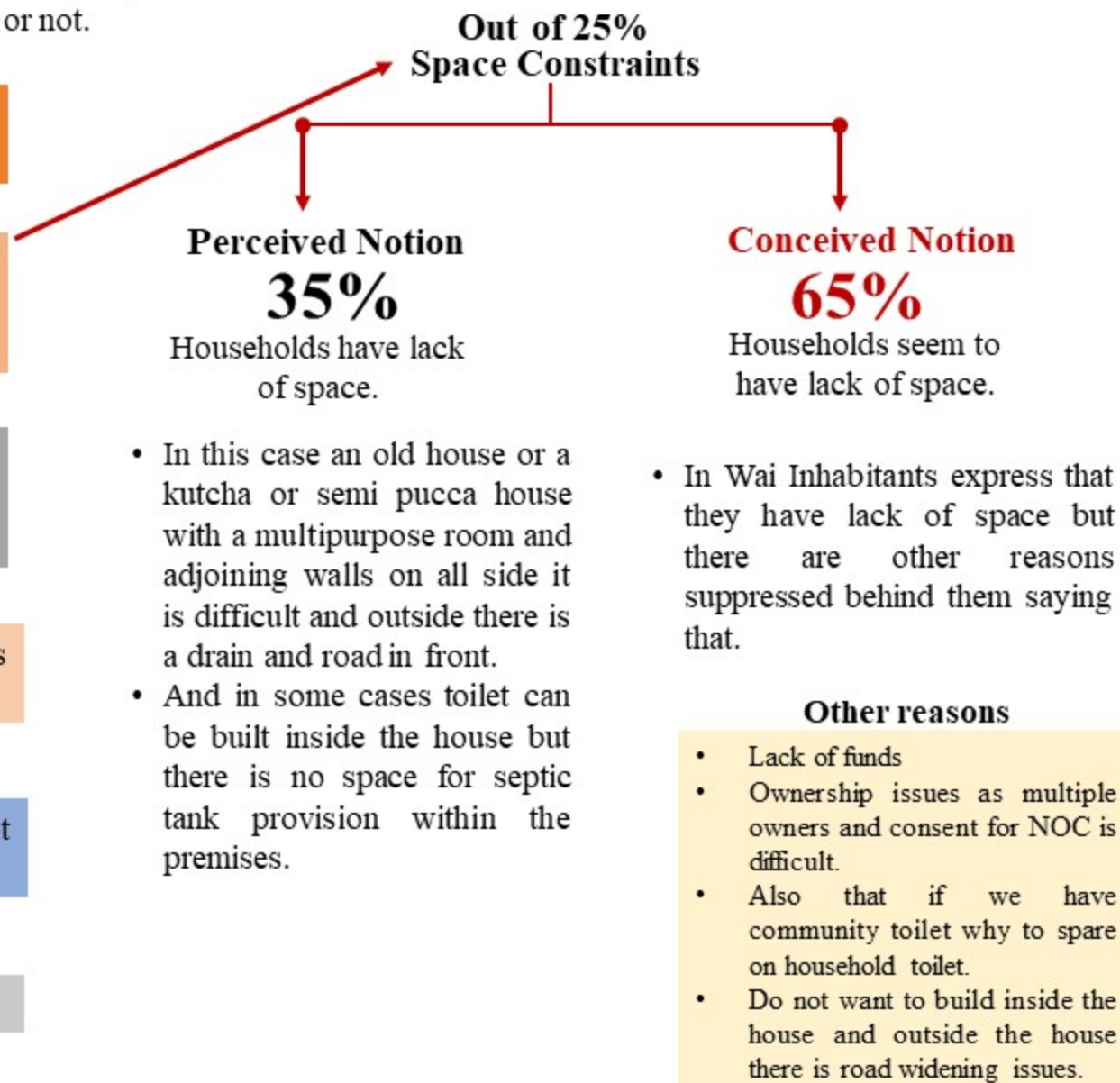
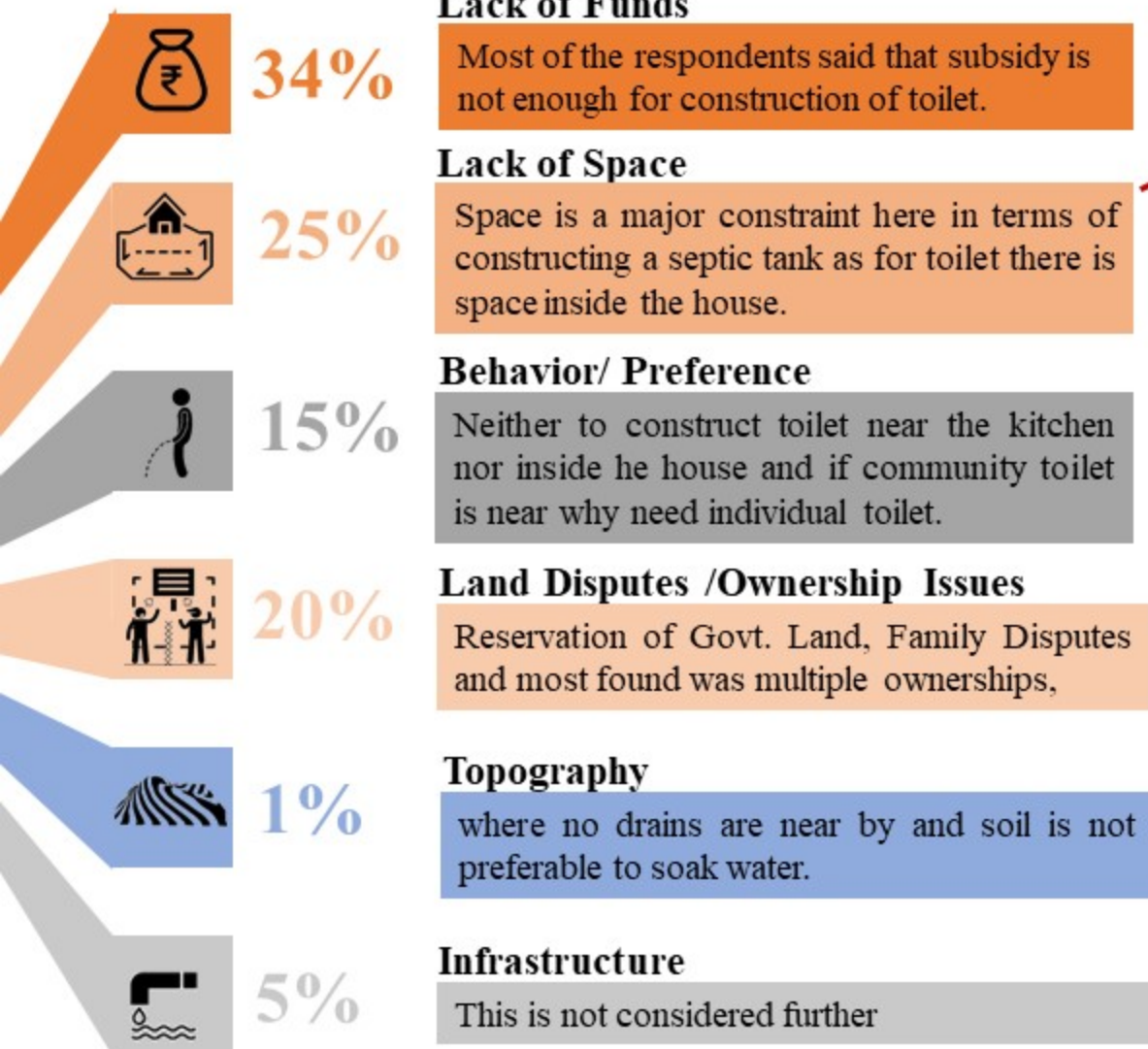
Phulenagar

- Households surveyed – 20, out of 16 are devoid of IHHL
- Kutcha - 45% Semi Pucca - 35%, Pucca- 20%
- Household without toilet size – 12 – 38 sq mts



Is Space a major hindrance in Wai or Not?

From the 60 households devoid of toilets, reasons for not constructing toilets were prioritize based on responses and observations to find if space is a major hindrance or not.



City Profile - Sinnar



An Industrial Town



River Saraswati



Elevation – 625 – 825 mts
Hard rock strata



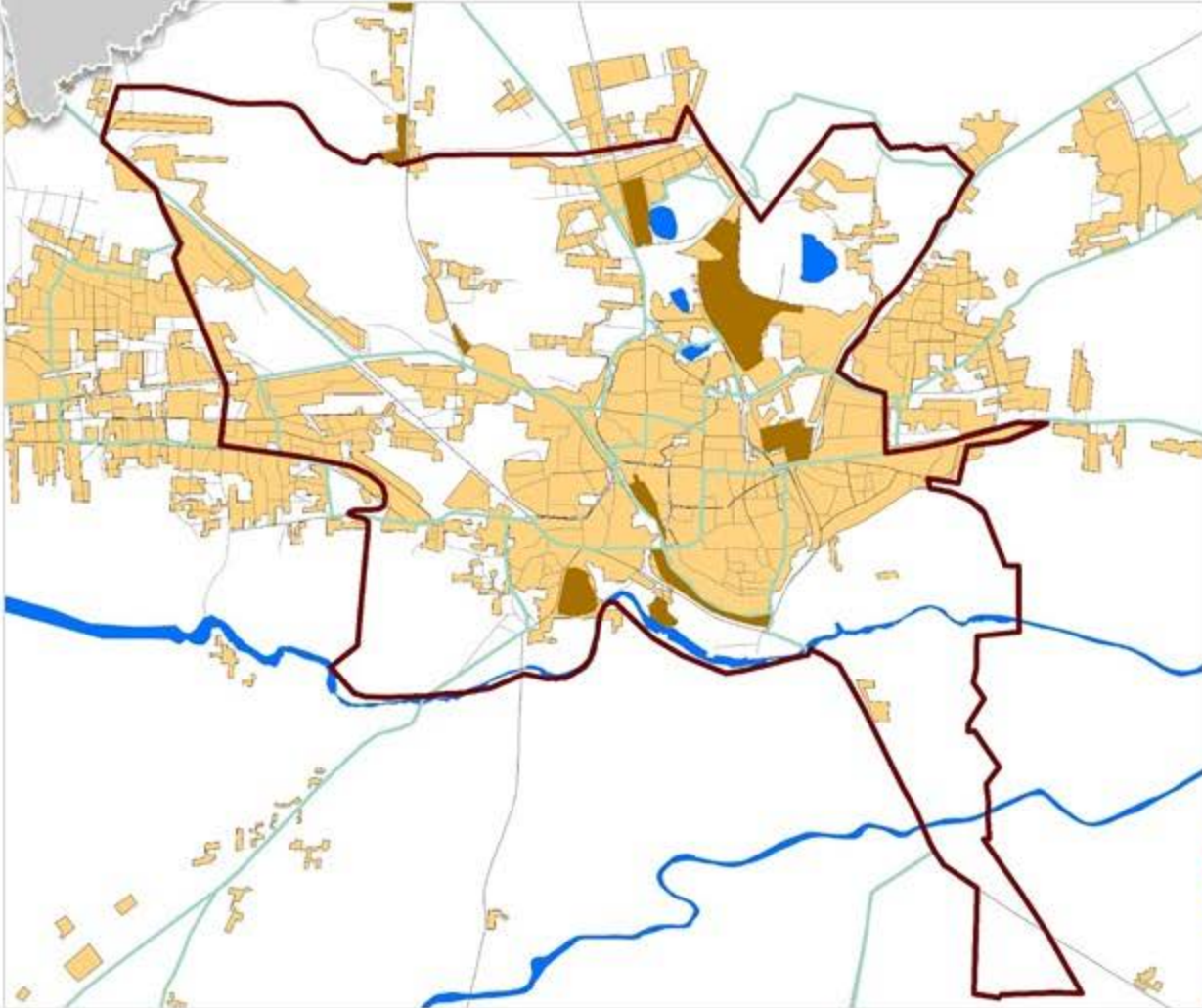
M.Council
Class B City



Area: 52.4 sq. kms



Decadal Growth Rate: 10.5%



Population (2018-19) - 82103



Prabhags/Wards - 28/14



Slums - 12



Total Households - 18500



Major Occupation - MIDC



Area covered by open and covered drainage network - 26.5 sq. kms



Source of Water supply- **Darna Dam**

• The city does not have sewer network. Coverage of individual toilets is 86% in the city connected to septic tanks and pit latrines.

Baseline Assessment – Dependency on Community Toilets in Slums

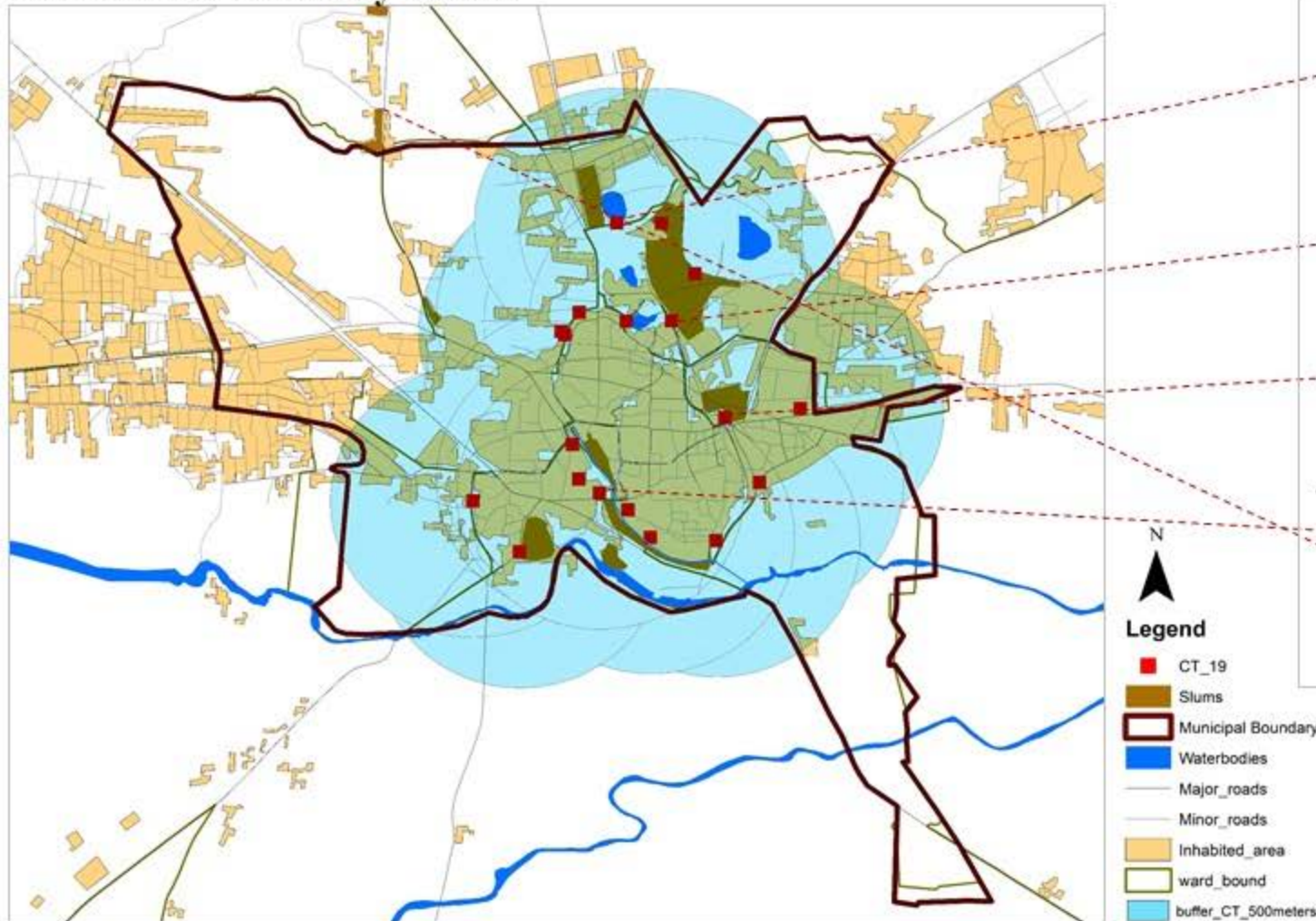


Functional CTs = 19
Total Seats = 342

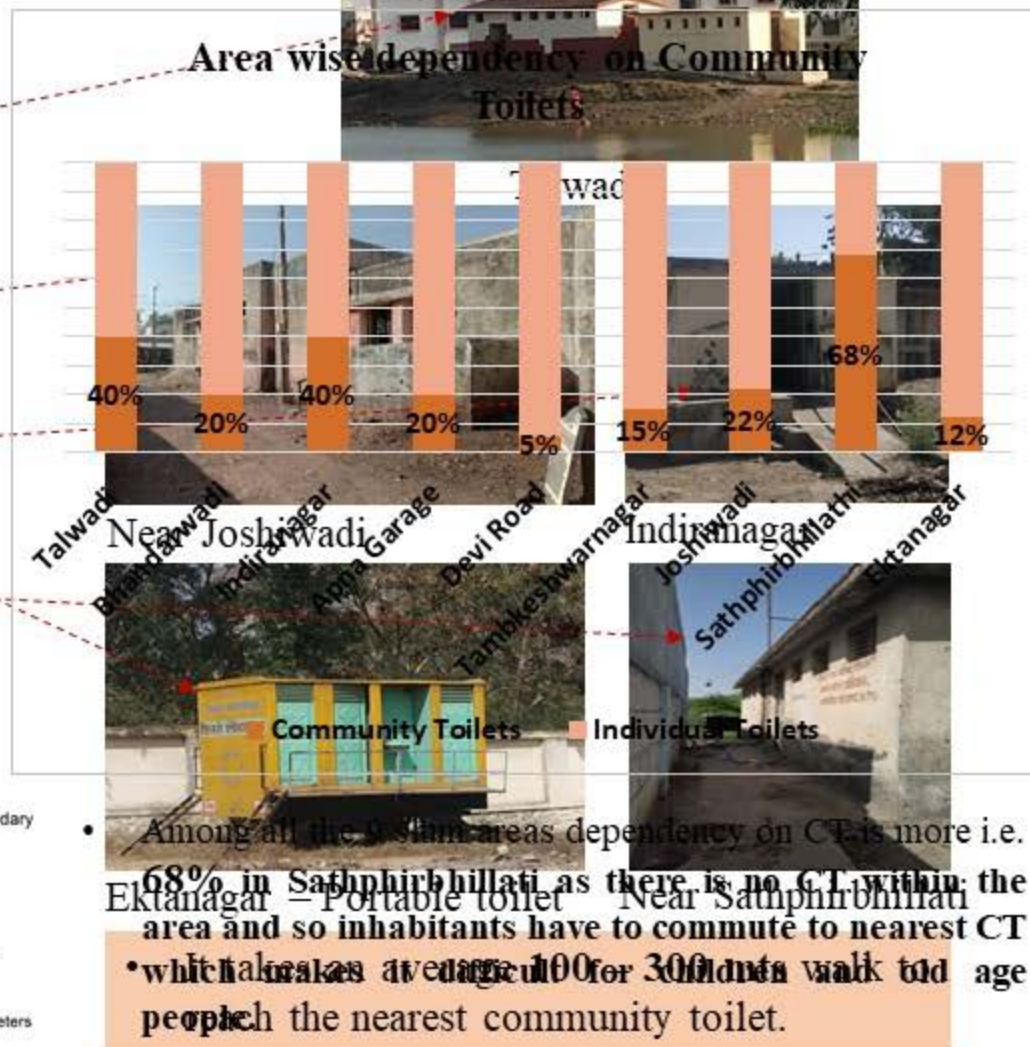


In property tax, under sanitation tax
Rs. 300 is collected as user fee for CT
per annum

Location of Community Toilets



Area wise dependency on Community Toilets



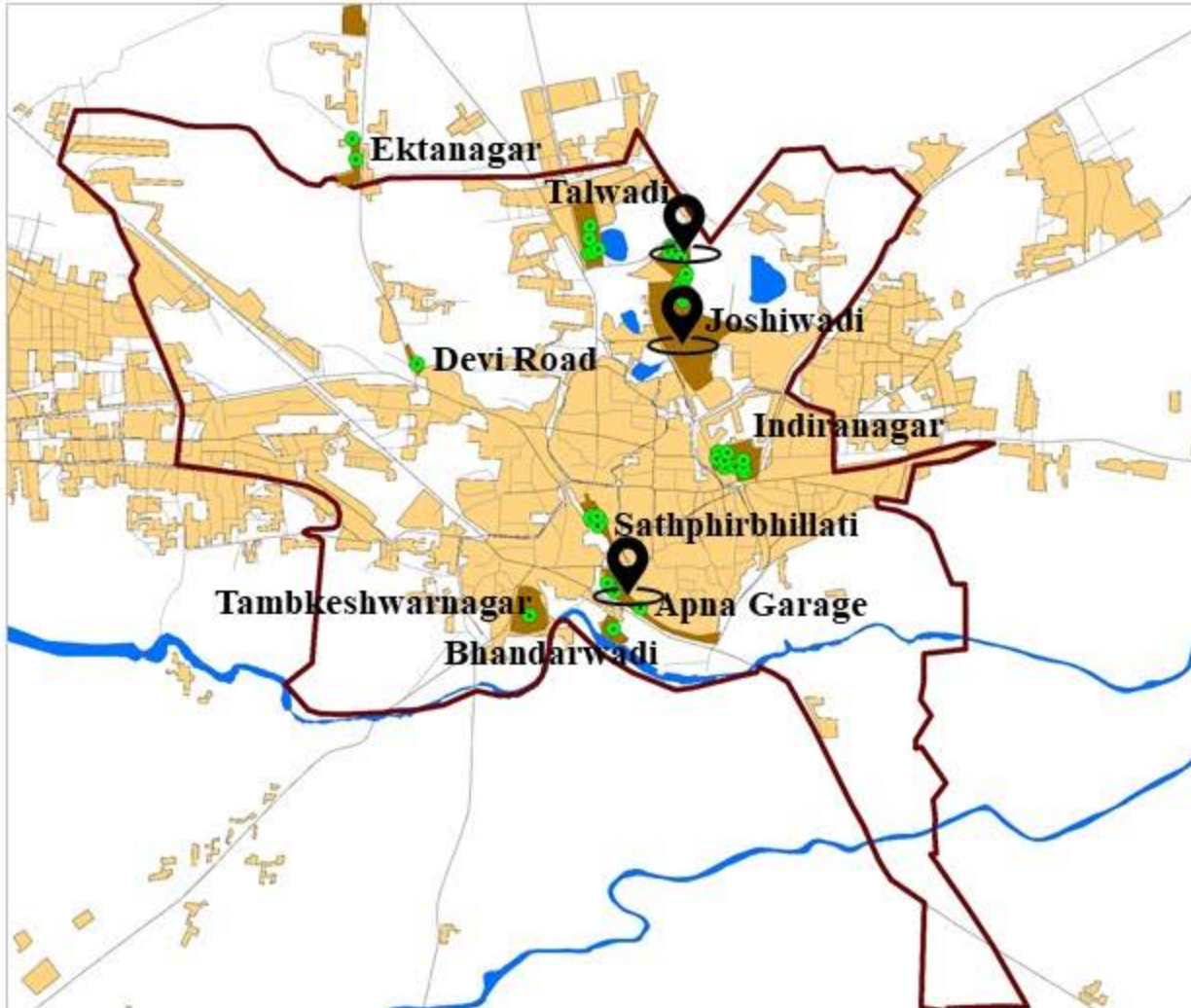
Map Source: PAS, Author based on Primary Survey March'20

Picture Source : Author

Source: Data Retrieved from Municipal Council March '20, Primary Survey March'20

Macro level Assessment and Analysis

Space Constraint was an issue mentioned in all the FGDs along with that it was found Lack of Funds and when asked it was found that no Livelihood Development Activities are carried out in Sinnar.



Map Source: PAS, Author based on Primary Survey March'20
Source: Primary Survey March'20

Focused Group Discussions



In Talwadi in the FGD it was found that cost incurred to built toilet under SBM was approx. Rs. 60,000 as the excavation cost for septic tank was high due to hard rock strata. So they have to take loan from SHGs.

Bhairavnath - Talwadi

In Joshiwadi people said that they face water supply issues so they had to buy water from tankers cost Rs 1000 per tanker. Also they mentioned that there is no water in the CT in that area so they had to take water along with them.



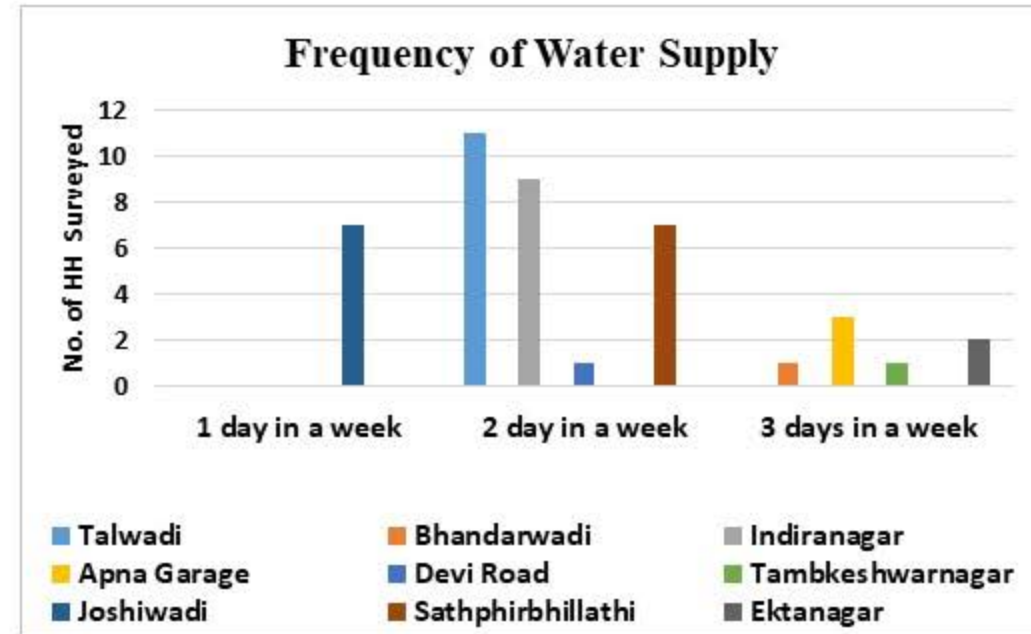
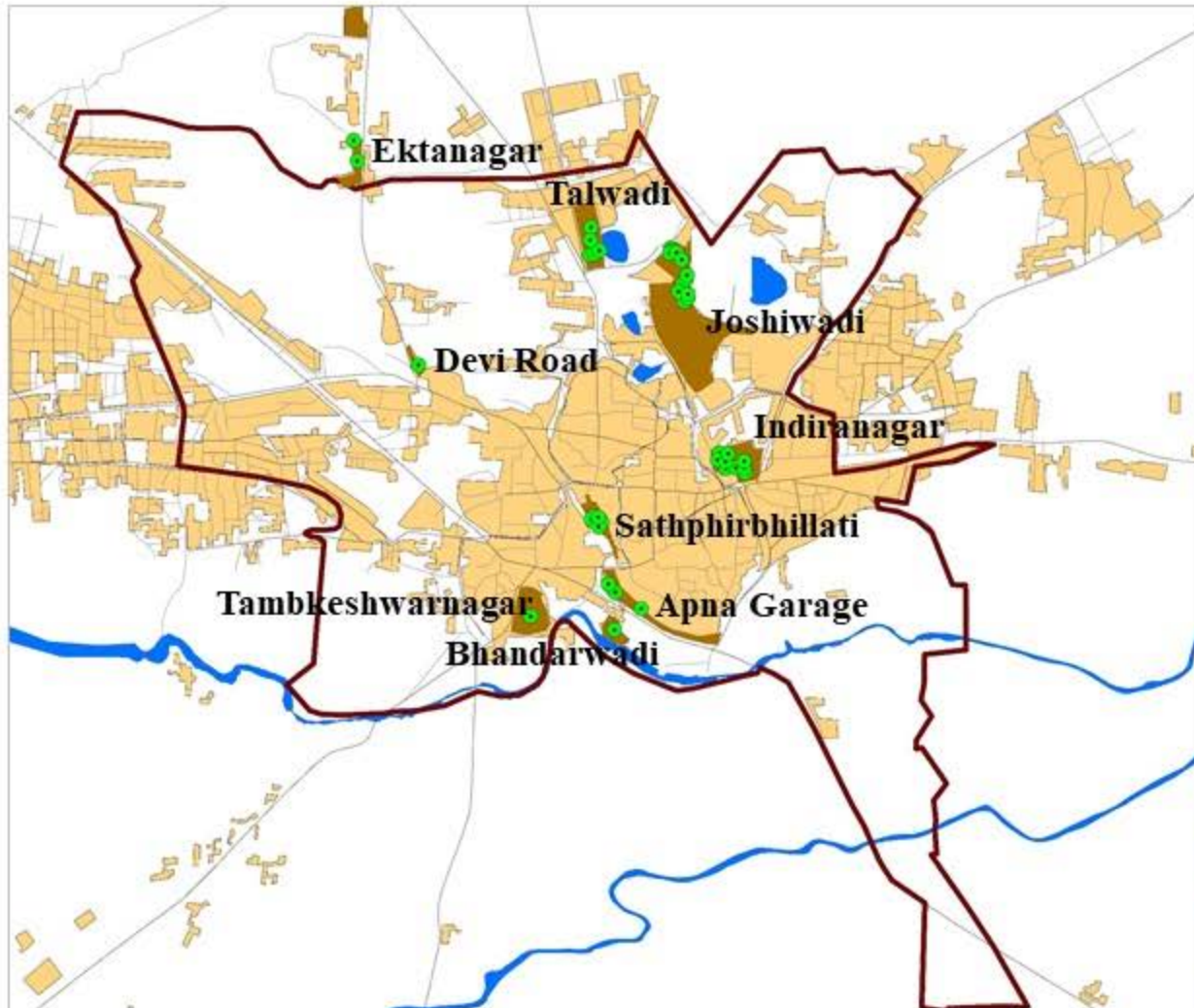
Vaiduwadi - Joshiwadi

In Apna Garage, it was found there is no CT in the area. Majorly people have built toilet under SBM and taking loan from SHG and other financial organizations but repayment was an issue.



Apna Garage

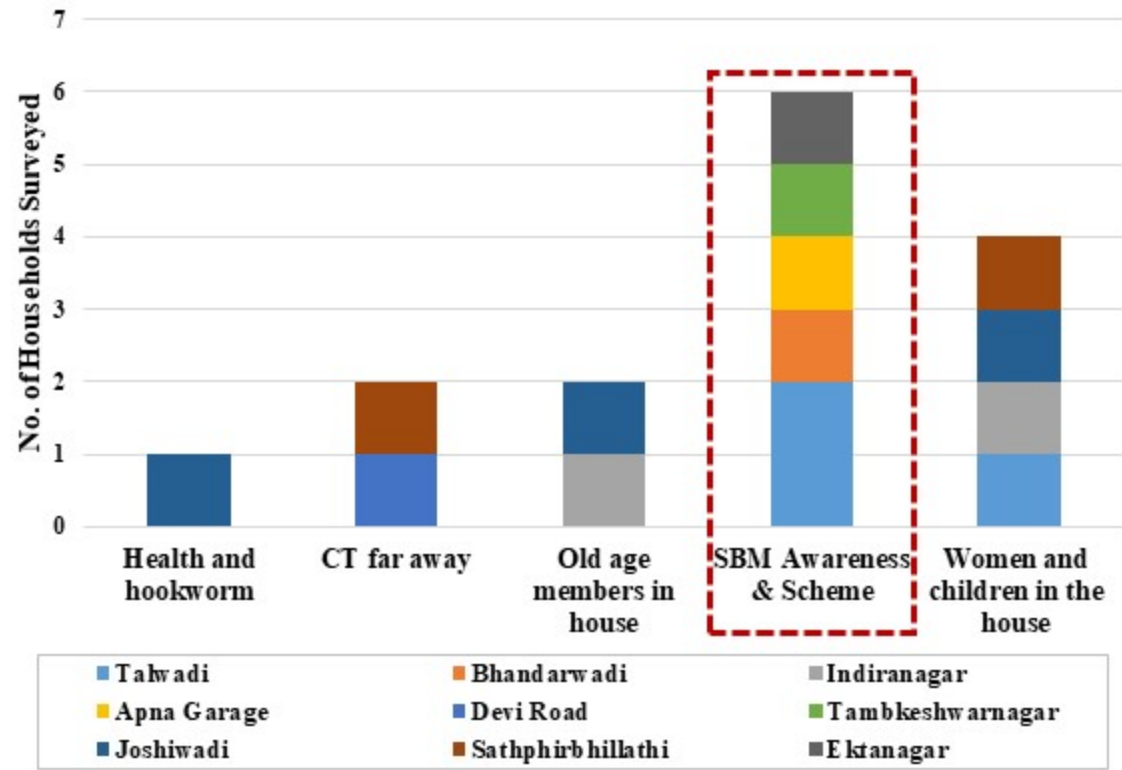
Macro level Assessment and Analysis



Joshiwadi has the lowest frequency of water supply i.e. 1 day in a week for duration of 2 hours. Coverage of individual water connection in slums of Simnar is **52%**. It is one of the reason for not constructing toilet.

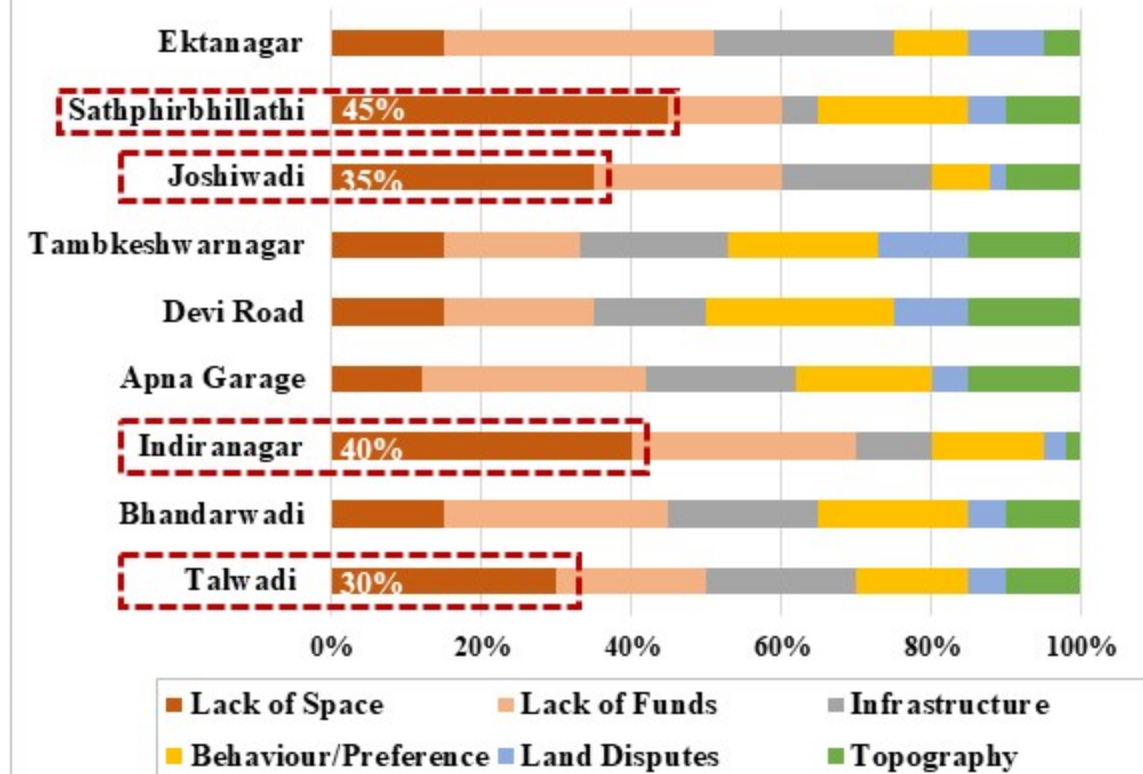
Macro level Assessment and Analysis

Decision Making Factor in Construction of Toilet



- It is observed that when asked to inhabitants about what was the driving factor that made them construct toilet it was found that responses from 5 out of 9 slums was that they build toilet due to awareness from SBM and as the scheme provided subsidy. Other factors were for safety-ease of women and children in the house.

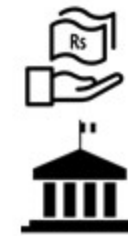
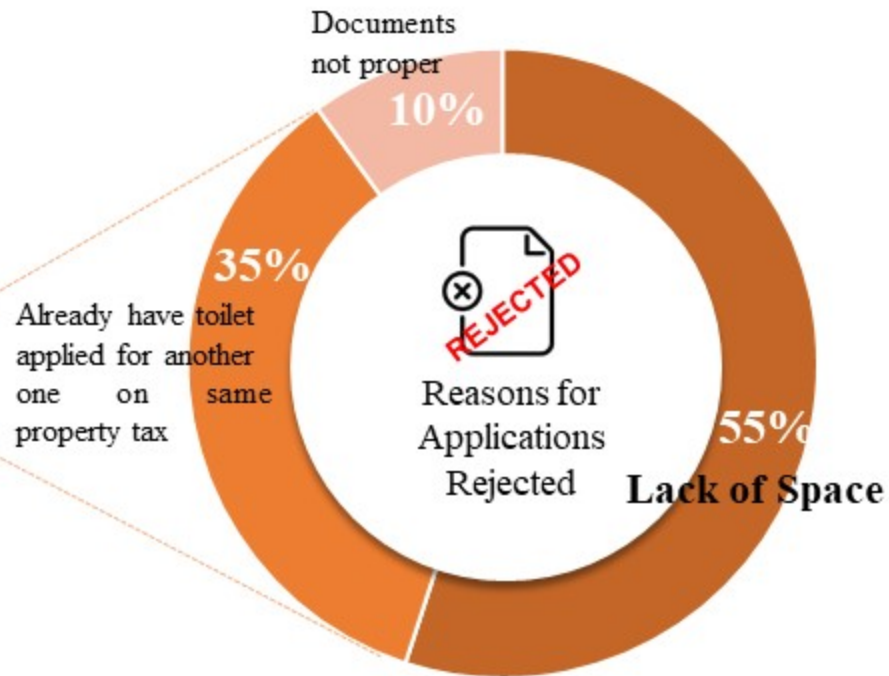
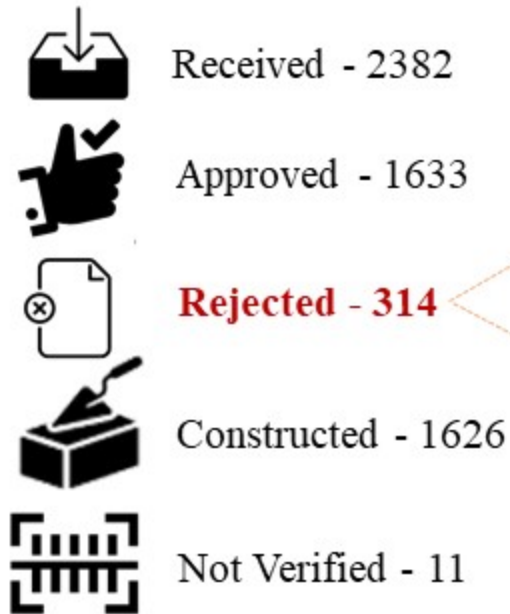
Reasons For Not Constructing Toilet



- From FGDs and Household interactions in all the 9 slums it was found that Talwadi, Joshiwadi, Sathphirbillathi and Indiranagar are most vulnerable in as majority of respondents mentioned lack of space issues in these areas.

Supply Side Scenario

SBM IHHL Status of Sinnar



Under SBM IHHL

- Council gives – 12000
- Portal Finance – 5000
- One with BPL card gets extra - 5000



Toilet built under SBM

Toilet size varies according to space: 3 x 4 ft., 4x 4 ft.



Septic tank size varies as per guide CPHEEO according to users: 6 x 5ft., 4x 10 ft.



No defined Criteria/ Indicator for Lack of Space

- **Family land dispute applications were approved** when beneficiaries provided death certificate of the owner.
- **All the slums in Sinnar are Notified** and have property tax document so they are eligible for application. Land Ownership is an issue as land belongs to Govt. so most of them do not possess land ownership documents.

- There are **21 SHGs working in Slum areas** of Sinnar. Each SHG has **10 – 20 Members**.
- SHG gets **Rs. 1 Lac- 5 lac loan** if its active.
- **Individual Toilet Constructed with SHG loan has 2% interest rate** + M. Council provides Rs. 10,000 or bank loan along with council subsidy. **Other Financial organizations such as Gram Shakti, Gram Kulti gives loan on 18 - 22% interest.**

Interesting cases where households have overcome space constraints to avail access to individual toilets

I. Shared Septic Tank



Location : Londhegalli



The house on the first floor had space issue to construct septic tank.

Both the houses were unable to construct toilet due to lack of space. (Family Members)

II. Group Toilet



Two Superstructures with one group toilet + septic tank

No. of Inhabitants in both houses	11
Super structure	Semi -Pucca
Toilet Size	3x 3.5 ft.
Septic Tank Size	5x3 ft.
Total Cost Incurred	Rs. 30,000
Subsidy Received	Rs. 17,000
Septic Tank Outlet Connected	Open Drain

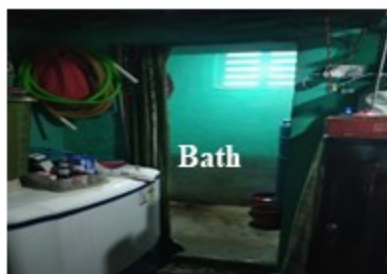
Interesting cases where households have overcome space constraints to avail access to individual toilets

III. Individual Household Toilet



DU Size: 15 sq. mts

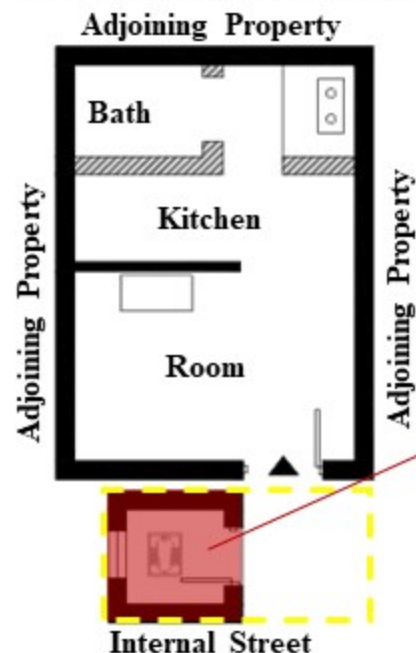
Lack of space overcome to build toilet financed under SBMIHHL scheme



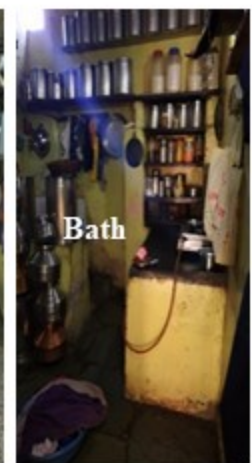
Water Connection is outside & shared between two houses

No. of Inhabitants in both houses	5
Super structure	Semi - Pucca
Toilet Size	3.3x 4 ft.
Septic Tank Size	3x5 ft.
Total Cost Incurred	Rs. 17,000
Subsidy Received	Rs. 17,000
Septic Tank Outlet Connected	Open drain

IV. Individual Household Toilet



DU Size: 17.5 sq. mts



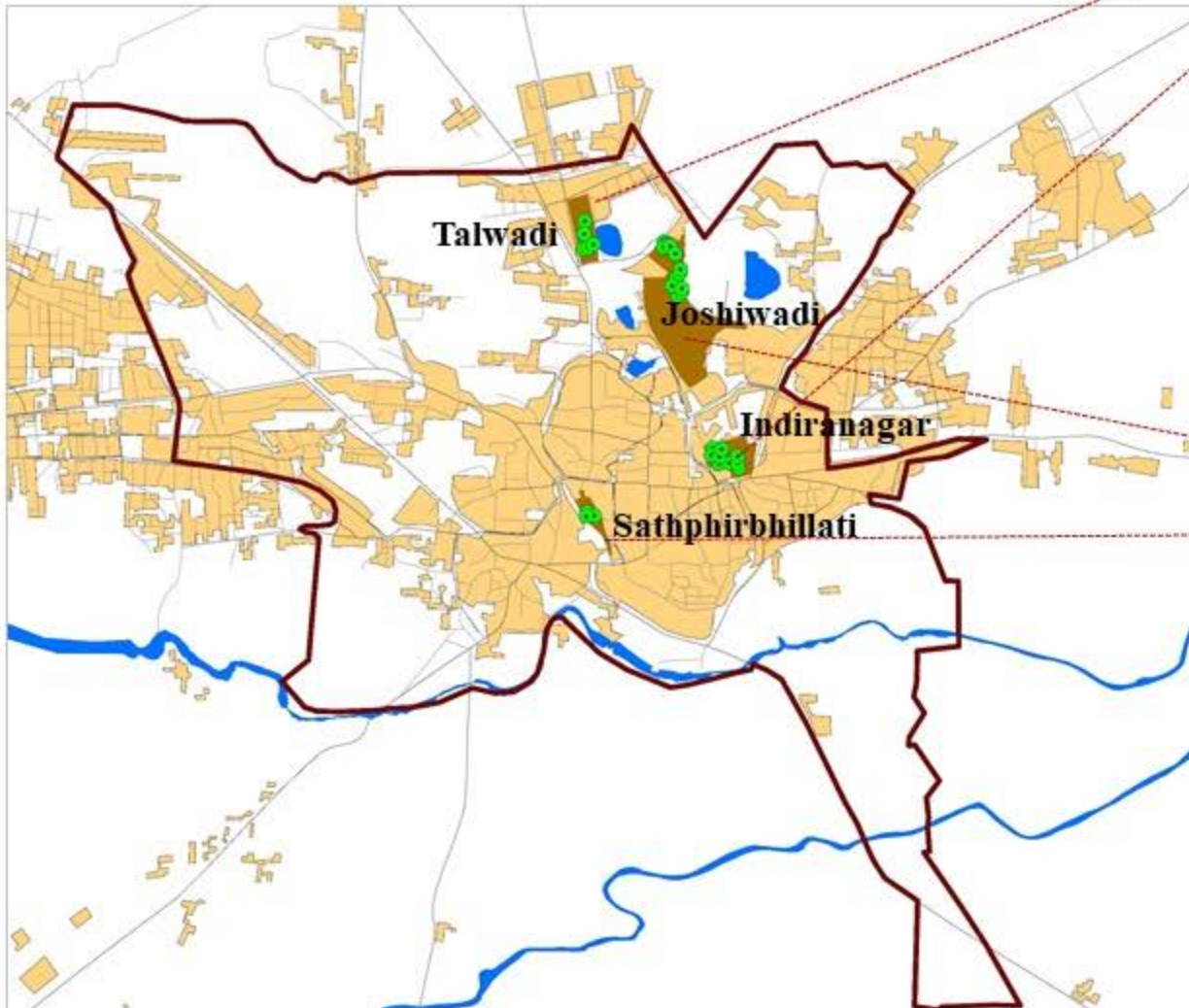
Water Connection is outside the house

No. of Inhabitants in both houses	9
Super structure	Semi - Pucca
Toilet Size	4x 4 ft.
Septic Tank Size	3x10 ft.
Total Cost Incurred	Rs. 25,000
Subsidy Received	Rs. 17,000
Septic Tank Outlet Connected	Open drain



Location : Pimprinaka

Micro Level Assessment – Identified Vulnerable 4 Slums in Sinnar



Talwadtagar

- Out of 9 HHs surveyed 7 devoid of toilets
- **There are 2 Community Toilets in that area.**
- Majority of the population coming from Lower economic group
- **Kutchha -3, Semi Pucca - 3, Pucca- 1**
- **Household without toilet size – 10 – 22 sq. mts**
- **Household without toilet size – 10 – 28 sq. mts**



Sathphirbillati

- Out of 7 HHs surveyed 5 devoid of toilets
- Slum is located near the river.
- **There are No Community Toilets in that area.**
- Majority of the population coming from Lower economic group
- **Kutchha- 4, Semi Pucca- 1**
- **Household without toilet size – 10 – 22 sq. mts**

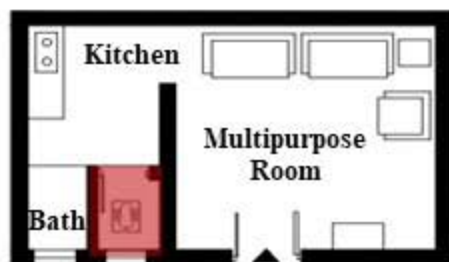


Micro Level Assessment – Identified Vulnerable 4 Slums in Sinnar

Households in 4 vulnerable slums who have built individual household toilets

Indiranagar Slum

Dwelling Units size – 24 sq. mts
 Inhabitants – 5
 Toilet Size : 1.2 sq. mts
 Connected to septic tank beneath



Joshiwadi Slum

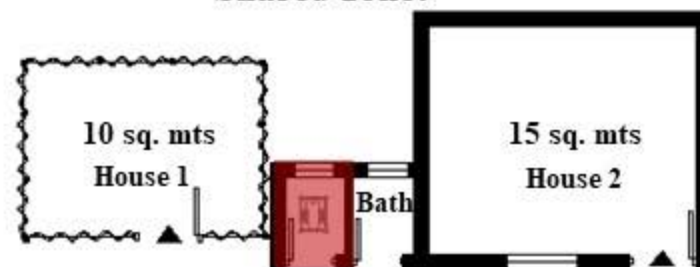
Dwelling Units size – 30 sq. mts
 Inhabitants – 4
 Toilet Size : 2.4 sq. mts
 Connected to septic tank beneath



Sathphirbillati Slum

Dwelling Units size – 10+15 sq. mts
 Inhabitants – 5
 Toilet Size : 1.2 sq. mts
 Connected to septic tank beneath

Shared Toilet



Talwadi Slum

Dwelling Units size – 18 sq. mts
 Inhabitants – 5
 Toilet Size : 1.2 sq. mts
 Connected to septic tank beneath

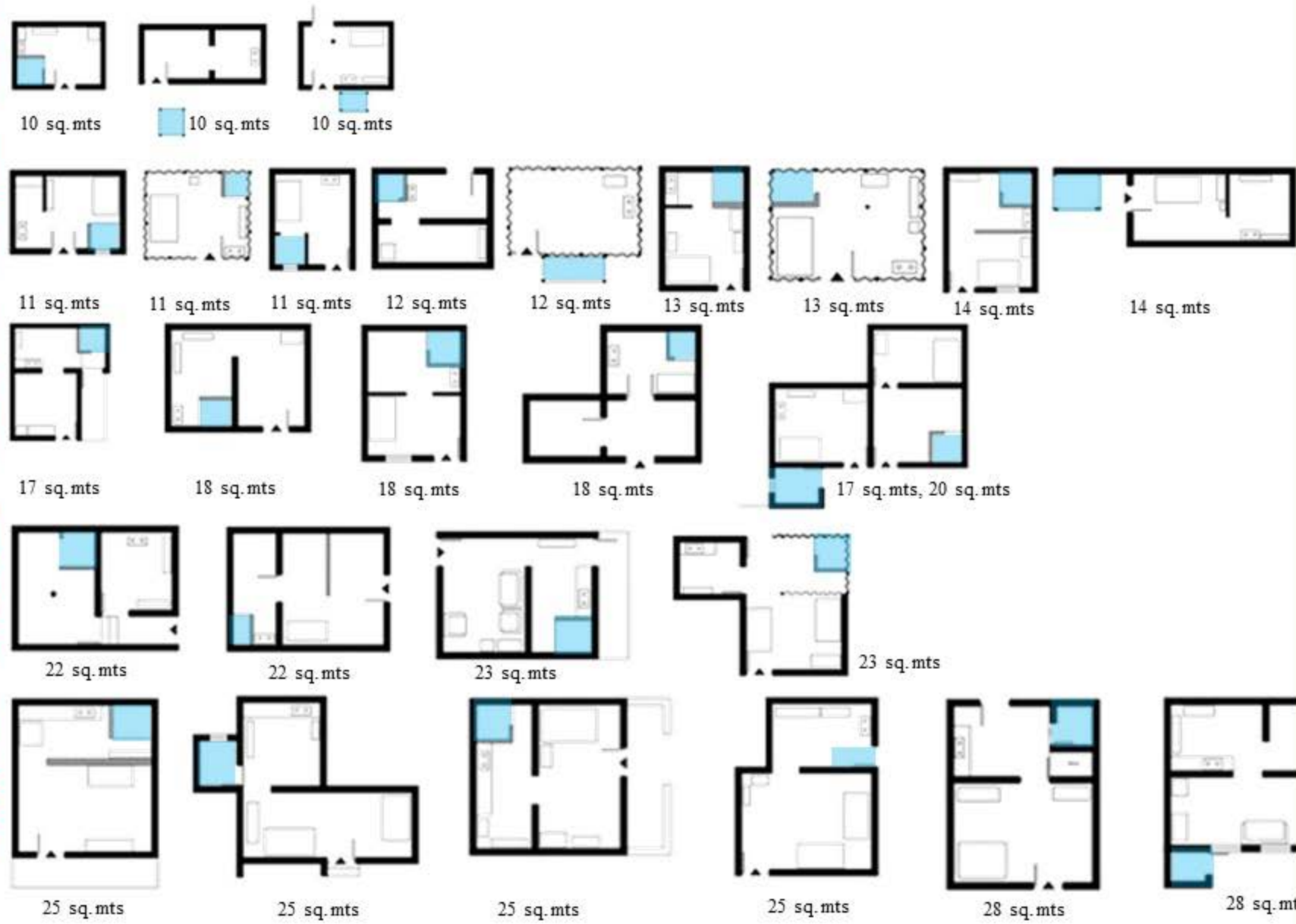


Dwelling Units size – 15 sq. mts
 Inhabitants – 7
 Toilet Size : 1.2 sq. mts
 Connected to septic tank beneath



Layout based Analysis - Understand in what context are households devoid of toilets in slum settlements

≤ 10 sq. mts
11-15 sq. mts
16-20 sq. mts
21-24 sq. mts
≥ 25 sq. mts



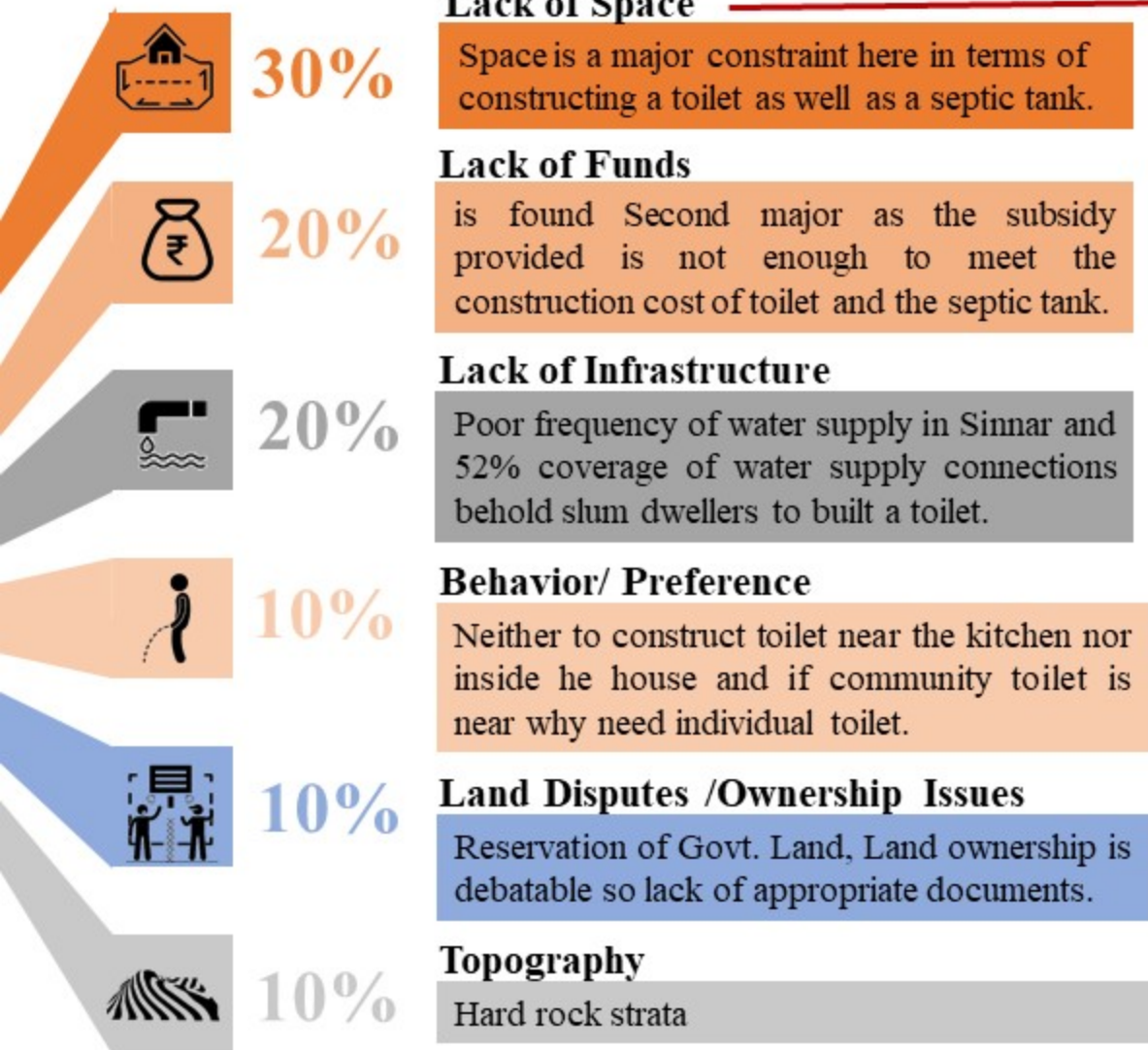
From all the 42 houses surveyed 30 households were devoid of toilet within the premises. Average house size is 18 sq. mts and are occupied by an average of approximately 5 people.

In the slum settlements, the bathroom was usually a space inside the house defined by a half-length or full-length brick/ mud wall. In order to provide additional privacy, metal containers were sometimes stacked on top of half-length walls or was made by a tin sheet/ brick temporary structure outside covered by a curtain near the door opening.



Is Space a major hindrance in Sinnar or Not?

From the 30 households devoid of toilets, reasons for not constructing toilets were prioritize based on responses and observations to find if space is a major hindrance or not.



Lack of Space

Space is a major constraint here in terms of constructing a toilet as well as a septic tank.

Lack of Funds

is found Second major as the subsidy provided is not enough to meet the construction cost of toilet and the septic tank.

Lack of Infrastructure

Poor frequency of water supply in Sinnar and 52% coverage of water supply connections behold slum dwellers to built a toilet.

Behavior/ Preference

Neither to construct toilet near the kitchen nor inside he house and if community toilet is near why need individual toilet.

Land Disputes /Ownership Issues

Reservation of Govt. Land, Land ownership is debatable so lack of appropriate documents.

Topography

Hard rock strata

Out of 30% Space Constraints

Perceived Notion
70%

Households have lack of space.

Conceived Notion
30%

Households seem to have lack of space.

- In this case a kutchha house made of mud and tin having a multipurpose room with more number of family members living together it becomes difficult.
- Also one with semi pucca or pucca house of one room kitchen area but due to adjoin properties surrounded and road just in front of house is also difficult.

- Inhabitants express that they have lack of space but have potential to built toilet within the premises and there are other reasons suppressed behind them saying that.

Other reasons

- If we have community toilet nearby what is the need of IHHL.
- Preference of not constructing toilet inside the house and outside land do not belongs to them.
- Lack of funds
- Poor water supply frequency and duration

User Perspectives' from Wai and Sinnar

Wai



“There is no space application got rejected and also that we do not have money to construct toilet other than subsidy provided.”
- Resident, Wai.”



“There is no space inside and road widening issue outside so unable to construct. Community toilet is near to house so we never thought of alternative.”
- Resident, Wai



“The land has disputes so was not able to build toilet even the grey water is not soaked by land and no drain near so water spills on road leading to unhygienic condition”
- Resident, Wai

“There is no space and we do not possess money, house is of tin and if we have community toilet in front why do we need toilet at home.”
- Resident, Sinnar



“Do not want to build toilet inside house and outside it is road widening. Also subsidy not enough here excavation cost for tank is very much.”
- Resident, Sinnar

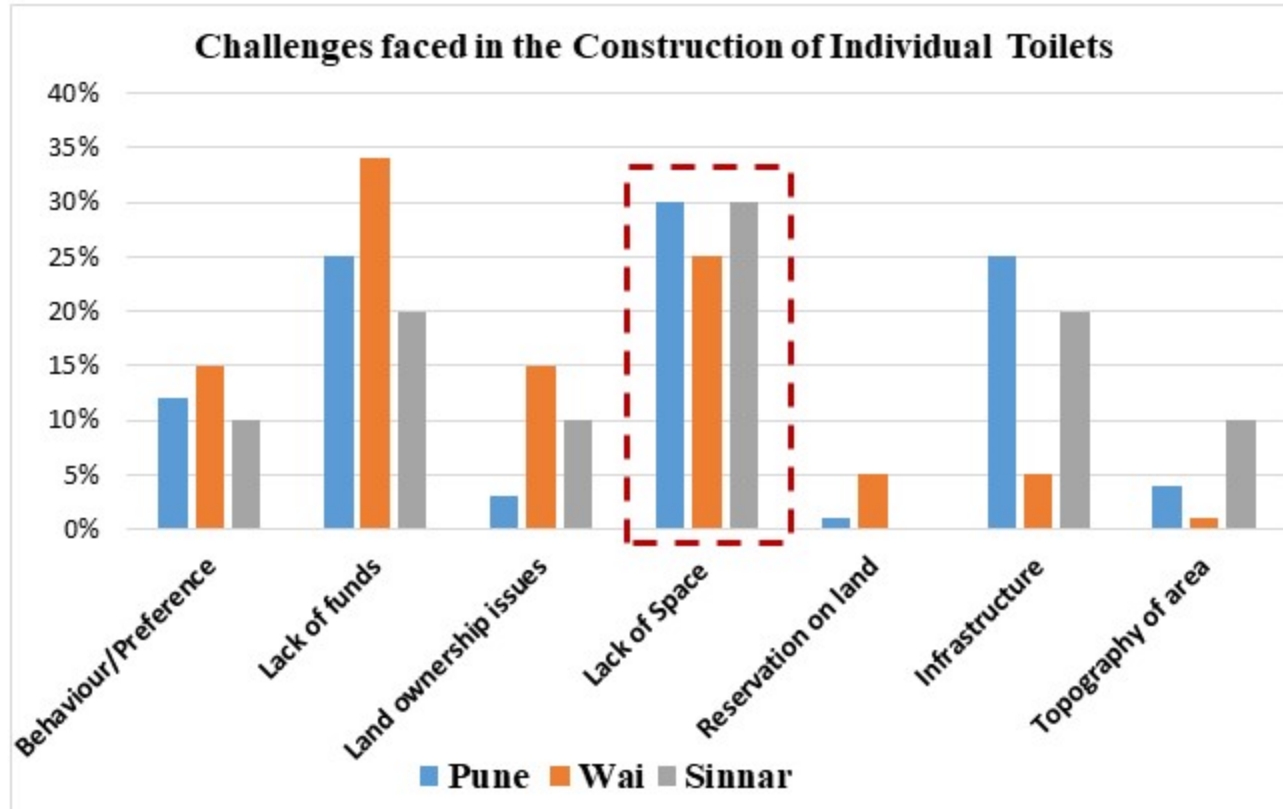


“There is no space for toilet and we didn't thought of making one due to less frequency of water. We do not have enough to wash utensils so even if we make toilet it will not remain clean.”
- Resident, Sinnar



Sinnar

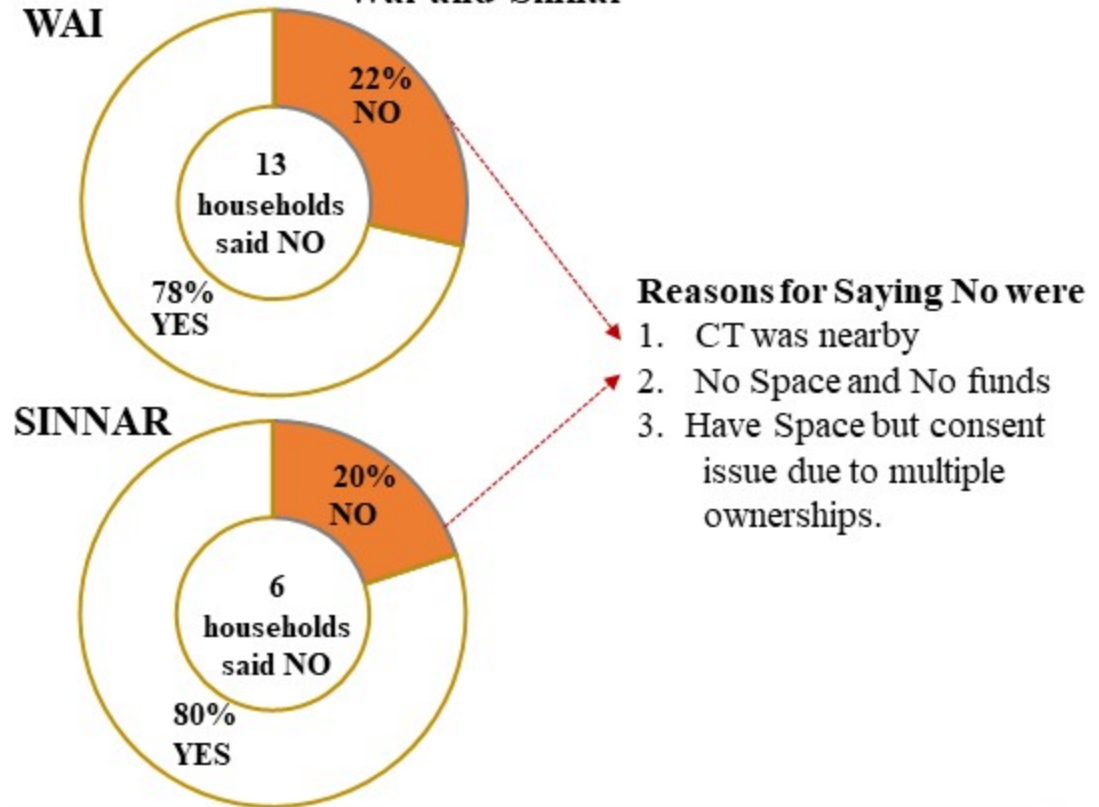
Comparative Analysis – Pune, Wai and Sinnar



Comparison is done between 36 households of Pune and 60 and 30 households devoid of toilets in Wai and Sinnar from total HHs surveyed.

- **Average house size of Pune is 16 sq. mts and that of Wai and Sinnar is 25 and 18 sq. mts.**
- **In Pune the households are occupied by an average of 4 people and that of Wai and Sinnar are 5 people.**

Willingness to built toilets in vulnerable areas of Wai and Sinnar



- From user perspectives' willingness to build IHHL it is clear that majorly households are willing to build but due to these constraints are unable to but, as **Pune overcame similar constraints**, so there is **potential for solutions where space constraints can be overcome** to achieve universal access to individual toilets in Wai and Sinnar.

Context and Layout Based Analysis – – Recommendation in terms of Sociology Based Planning Aspect
Architectural solutions that Enables Environment, which fulfill my research Objective 3:

Objective 3. To perceive the extent of what poses challenge to build individual toilets. Is it really space constraints or other reasons suppressed behind it and provide recommendations.

01

Perception Study

How the research is articulated: Literature Review and Best Practices

02

Synopsis from Case Study Visit

Success case of Pune where households in slum settlements have overcome issue of space.

03

Sanitation in Wai and Sinnar

Issues and Challenges faced followed by findings and analysis.

04

Recommendations

Contextual based Solutions that suffice the need

Bridging through the Standards – To adopt a benchmark for space constraints

An upgradation of lifestyle - housing improvement schemes has provision of individual toilets.

Housing Schemes	Provision of carpet area (sq. mts)
Rajiv Awas Yojana (RAY)	25-27 sq. mts
Ramai Awas Gharkul Yojana	25 sq. mts
JnNURM	36 sq. mts
PMAY	28- 30 sq. mts

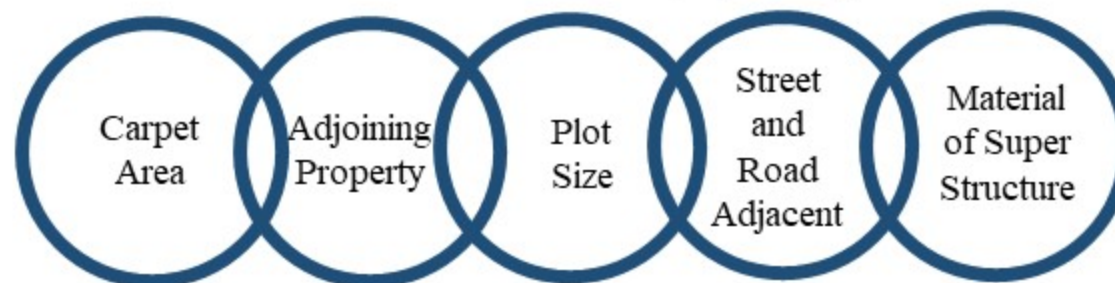
- From the standard identified it was found that a **household with area less than 25 sq. mts could have space constraint but if it is equal to or more than 25 might not be categorized as space constraint.**
- It is used as an **indicator or a benchmark to define, what exactly space constraint could be** because as of now, a margin or standard which would help us to identify space constraint is not determined.

EWS Housing/ Slum Redevelopment



<h3>Wai</h3> <p>Out of 95 HHs surveyed 60 dwellings devoid toilet within the premises :</p>	<p>No. of Dwelling Unit Size below 25 sq. mts</p> <p style="font-size: 2em; color: red;">37</p> <p style="text-align: right;">62%</p>	<p>Dwelling Unit Size 25 sq. mts and above</p> <p style="font-size: 2em; color: black;">23</p> <p style="text-align: right;">38%</p>
<h3>Sinnar</h3> <p>Out of 42 HHs surveyed 30 dwellings devoid toilet within the premises :</p>	<p>No. of Dwelling Unit Size below 25 sq. mts</p> <p style="font-size: 2em; color: red;">24</p> <p style="text-align: right;">80%</p>	<p>Dwelling Unit Size 25 sq. mts and above</p> <p style="font-size: 2em; color: black;">06</p> <p style="text-align: right;">20%</p>

This indicator can be one way to categorize space constraints in addition to that the below factors also plays an important role:

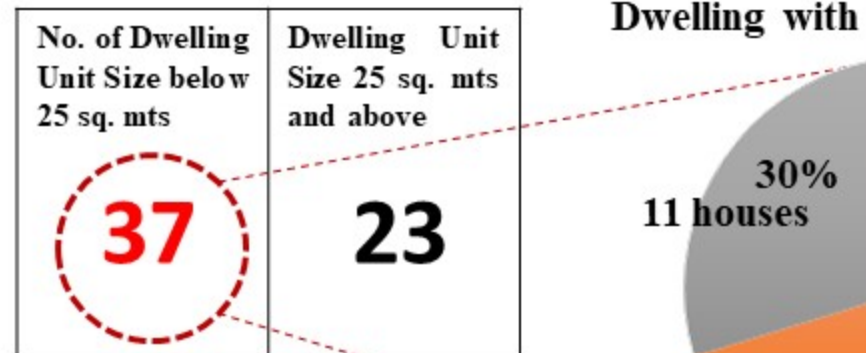


Housing Improvement Schemes – one means to provide IHHL

- In Wai and Sinnar there is Gharkul scheme, PMAY ISSR, BLC Scheme applicable as housing scheme, these below households still devoid of scheme in Wai and Sinnar because of land ownership and lack of documents required.

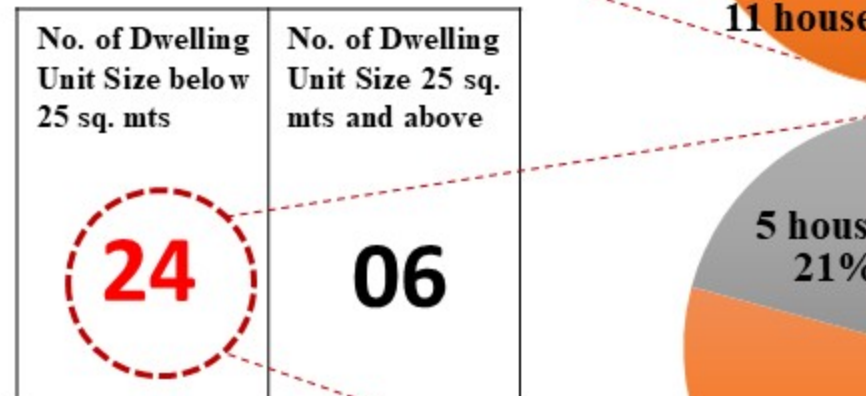
Wai

Out of 95 HHs surveyed 60 dwellings devoid toilet within the premises :



Sinnar

Out of 42 HHs surveyed 30 dwellings devoid toilet within the premises :



- Based on Availability of land they may foster large benefits as housing improvement schemes include toilet construction. Though Scheme may vary depending upon the income group in non slum areas of Wai and Slum areas of Sinnar.

In the current scenario,

It is necessary that adequate hygiene practices become a new normal for such vulnerable communities. This would ensure seamless transition from community to individual toilets and so in the immediate term need to shift strategy of providing IHHL in convergence with slum redevelopment schemes or PMAY and potentially the NULM can be an interim option.

So, Housing Improvement Schemes can be one means to provide IHHL.

Enabling Environment Solutions



Potential Options at Individual and Community Level



Shared Septic Tank

- Where there is space for toilet inside / outside the house but no space for septic tank provision with the mutual consent of section of families provision of common septic tank for 2 households can share.

Adaptive Reuse to Built IHHL Inside the House

- Proposing Individual Household Toilet in a small space inside the house by acceptance/ compromising a part of the house. Where a existing bathing or any other space relevant can be converted to toilet.



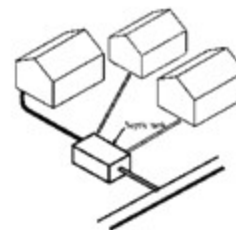
Group Toilet

- Where there is no space for toilet as well as septic tank inside or outside the house.
- No vent space inside
- Also that existing bathing space is near kitchen
- There are adjoining properties not possible due to common walls

2 - 4 households can come together to built a group toilet.

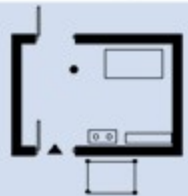
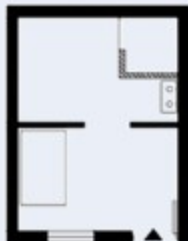
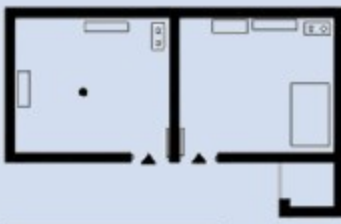

Community Septic Tank

- If all houses in a row or a cluster have no space inside or outside the house, due to covered drain in front so septic tank provision isn't possible Community Septic tank can be proposed in an area within the cluster which connects to either drain or soak pit.



Categorizing on basis of issues faced and optimum solutions

Categorizing households on the basis of issues faced

Size of the house	Superstructure	Plan	Issues	Potential Options
10 sq. mts	Kutchha		The area has covered drains passing so it is difficult for provision of Septic Tank as land area is debatable.	Community Septic Tank for similar households in the community cluster.
18 sq. mts	Semi pucca		Toilet can be made inside the house at former place of bath though it is in kitchen but away from covered drain so network connection from septic tank placement will be a problem.	Shared Septic Tank as there is no space for construction or septic tank inside or outside the house.
14 + 14 sq. mts	Kutchha		Both the houses share a bathing area as they have one room space. So for potential option of a toilet that bathing space can be converted to group toilet.	Group Toilet as a potential option for this space is considered.
18 sq. mts	Semi Pucca		Toilet in this case can be made at former space of bath though less space.	Adaptive Reuse of Space inside the house to build IHHL.

Prototype with proposal of Community Septic Tank in Wai



Phulenagar, Wai

Key Observation:

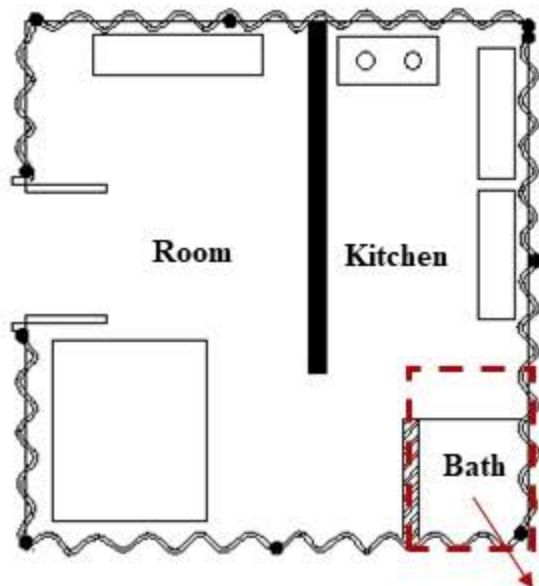
- In this area there is no drain in approx. 100 meters these households face issues of water logging and all households devoid toilets as nothing to connect to a septic tank also many houses have no space for constructing septic tank as land is debatable so provision of a community septic tank is a potential option.

Space for Community Septic Tank size as of for 5 households & 21 users – 2.3 x 1.1 with depth of 1.3 as per CPHEEO



CASE EXAMPLE

Dwelling Unit : Area 15 sq. mts
Inhabitants - 4

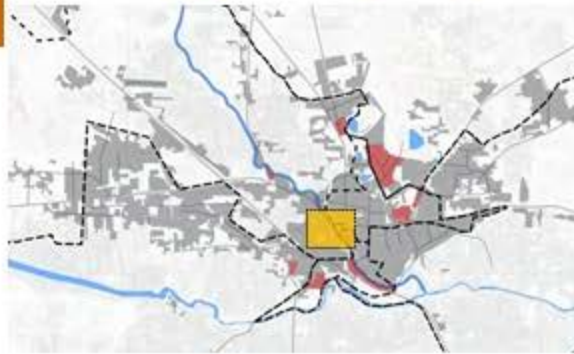


Proposed Toilet



As per NBC, Size of Toilet– 1.1 sq. mts

Prototype with proposal of Community Septic Tank in Sinnar



Sathphirbillati Slum, Sinnar

Key Observation:

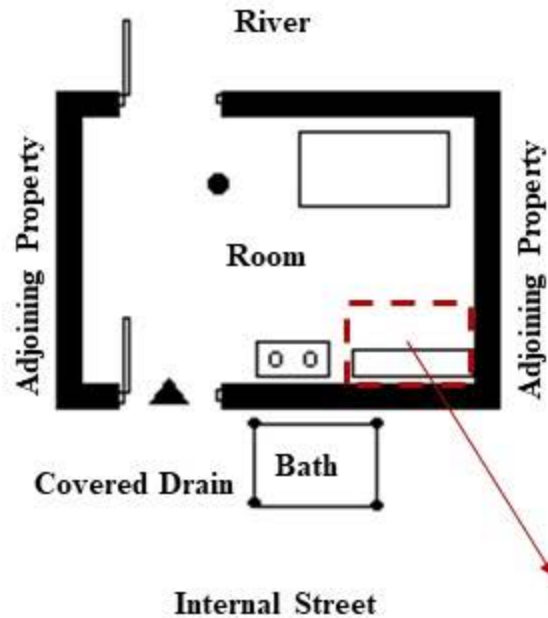
- CT is located at a distant location with a large user group.
- The area has covered drains passing so it is difficult for provision of Septic Tank as land area is debatable.
- Also Excavation cost is more due to hard rock strata for enabling environment the toilet can be connected to a community septic tank.

Space for Community Septic Tank size as of for 3 households & 16 users – 2.3 x 1.1 with depth of 1.3 as per CPHEEO



CASE EXAMPLE

Dwelling Unit : Area 10 sq. mts
Inhabitants - 5



As per NBC, Size of Toilet– 1.1 sq. mts

Proposed Toilet

Prototype with proposal of Group Toilet in Sinnar

Indiranagar Slum, Sinnar

Key Observation:

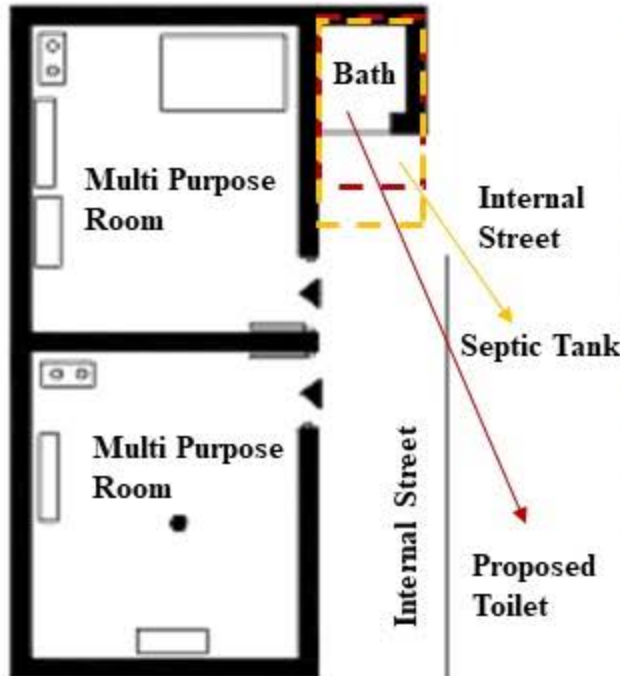
- Both the houses share a bathing area as they have one room space. So for potential option of a toilet that bathing space can be converted to toilet + bath as a shared toilet and septic tank for 11 users can be made underneath.



CASE EXAMPLE

Dwelling Unit : Area 14+14 sq.mts
Inhabitants - 11

Shared Bath - Before Group Toilet



As per NBC, Size of toilet – 1.1 sq.mts As per CPHEEO septic tank size 2 x 0.9 with 1 meter depth.

Prototype with proposal of Shared Septic Tanks in Wai



Phulenagar, Wai

Key Observation:

- There is an enclosed bathing space inside the house, as there is an open drain outside septic tank construction is a problem even though the toilet can be built inside the house.

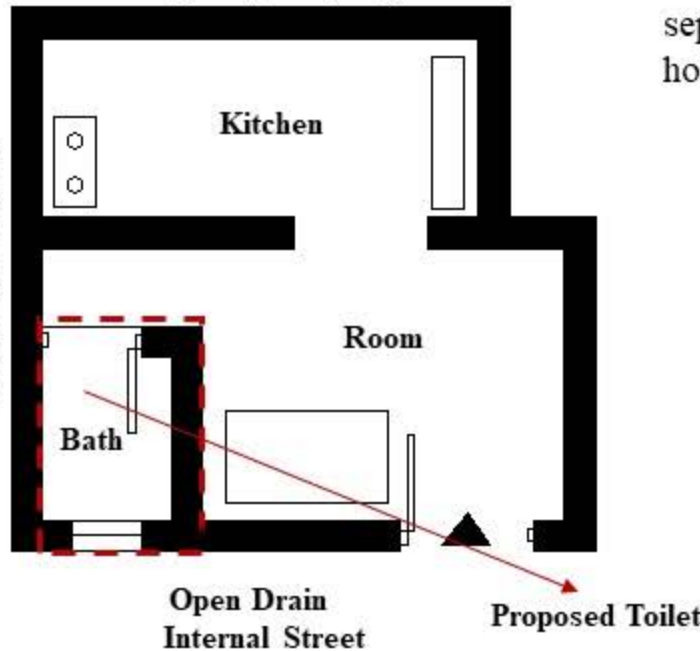
Shared Septic Tank

- If the house adjacent which has space of his own in front agrees to it with a mutual consent shared septic tank can be built.

CASE EXAMPLE

Dwelling Unit : Area 16 sq.mts
Inhabitants - 5

Adjoining Property



As per NBC, Size of toilet – 1.1 sq. mts As per CPHEEO septic tank size will be decided as per the users of both houses



Such Two Storey Dwelling Units can come up with option for shared septic tank



Prototype with proposal of Shared Septic Tanks in Sinnar

Joshiwadi Slum, Sinnar

Key Observation:

- CT is located nearby. The house had good front space of its own. But beneath is drain so septic tank is not possible and adjoin house has enough space for septic tank construction so with consent a shared septic tank can be proposed.



CASE EXAMPLE

Dwelling Unit : Area 18 sq. mts
Inhabitants - 6

Shared Septic Tank with adjoining Household

As per NBC, Size of toilet – 0.8 sq. mts

Adjoining Property



Toilet can be made at former place of bath though it is in kitchen but away from covered drain so network connection from septic tank placement will be a problem. In case placed in house there will be no space for vent.



Prototype with proposal of Adaptive Reuse in Wai

Songirwadi, Wai

Key Observation:

- There is a bathing space outside the house, the space also belongs to the owner. That existing bathing space can be converted to toilet as it will be easier for conveyance and septic tank beneath it.



CASE EXAMPLE

Dwelling Unit : Area 20 sq. mts
Inhabitants - 4



Proposed Toilet

Septic Tank

As per NBC, Size of toilet – 1.1 sq. mts As per CPHEEO septic tank size 1.5 x 0.75 with 1 meter depth.

Prototype with proposal of Adaptive Reuse in Sinnar



Talwadi Slum, Sinnar

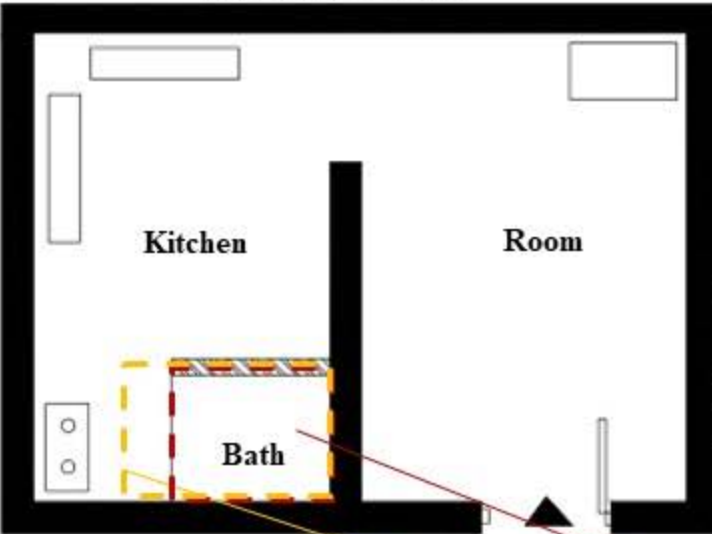
Key Observation:

- Toilet in this case can be made at former space of bath as it is near to drain and there is no space outside the house for the same. Even septic tank need to made beneath the house for proper conveyance. And here there is socio cultural aspect that no toilet placed near kitchen that needed to be changed along with change in position of toilet.

CASE EXAMPLE

Dwelling Unit : Area 18 sq. mts
Inhabitants - 4

Adjoining Property



As per NBC, Size of toilet – 1.1 sq. mts As per CPHEEO septic tank size 1.5 x 0.75 with 1 meter depth.

Internal Street

Proposed Toilet

Covered Drain

Septic Tank

Mapping of Stakeholders involved and Unit Costs for all potential option

Type of Potential Option	Approx. Unit Cost	Stakeholders Involved
Adaptive Reuse of Toilet inside the house	<p>Unit cost of Toilet + Septic Tank</p> <p>Rs. 15,000– 20,000 Standard size of the toilet – 0.9x0.9 Also it depends on the material used for superstructure and size of septic tank as per the users</p>	Subsidy under ULB, Beneficiary household
Community Septic Tank	<p>Cost of community septic tank for 50 users cost Rs. 50,000– 70,000 which can be of 10x10 ft. or 10 x 20 ft. varies upon number of users.</p> <p>Outlet chamber will be connected to drain and where the drain is not near with a soak pit.</p>	<ul style="list-style-type: none"> • This would bring down the total cost bear to built an individual toilet and solve space issue • Land ownership need to be verified if Govt. or Private • Project cost will be paid by beneficiary houses and incentives from ULBs • Cleaning Charges will be nil as Municipal council taxes the houses for cleaning tank.
Group Toilet	<p>Unit Cost for a Group Toilet + Septic Tank Rs. 40,000 Also it depends on material of superstructure and context Size of the septic tank varies as per toilet shared by the households i.e. no. of users</p>	Subsidy under ULB, Beneficiary households 2-4 Households can come together to build a group toilet
Shared Septic Tank	<p>Unit cost of a septic tank – Rs.18,000 – 20,000 depends on the no. of users</p>	Subsidy under ULB, Beneficiary households 2 households with mutual consent can come together to build shared septic tank.

Maintaining Behavior Change – Innovations in Demand Side Sanitation

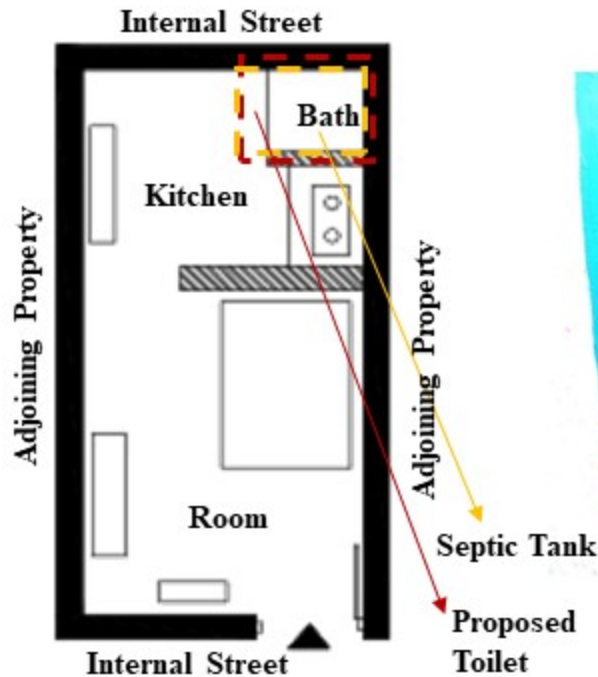
How ?

- Cultural and social preference for the placement of the toilet.
- The notion of not constructing toilet inside the house or near the kitchen need to be changed.
- Also construction of toilet in small spaces is possible need to be explained.
- A toilet inside or close to the house means that the inner space becomes physically and ritually impure that mindset need to be changed.

- ✓ Showcasing the interesting cases where households have built toilet in small spaces inside the house.
- ✓ Capacity Building – IEC
- ✓ Rewards and Incentives
- ✓ Tackling Superstitions/Mindset – Community influencers play vital role in debunking myths
- ✓ Health discussions in SHG Meetings

CASE EXAMPLE

Dwelling Unit : Area 14 sq. mts
Inhabitants - 3



Who will do?

SHGs

NGOs

Ward Committees

ULB

Other Private organizations or initiatives who does IEC and Social Marketing

- The house has former bath space in the kitchen and there is possibility of vent so potential option for toilet can be in that space but the inhabitants are not willing to built it inside the house.

Low Cost Sanitation Mechanism

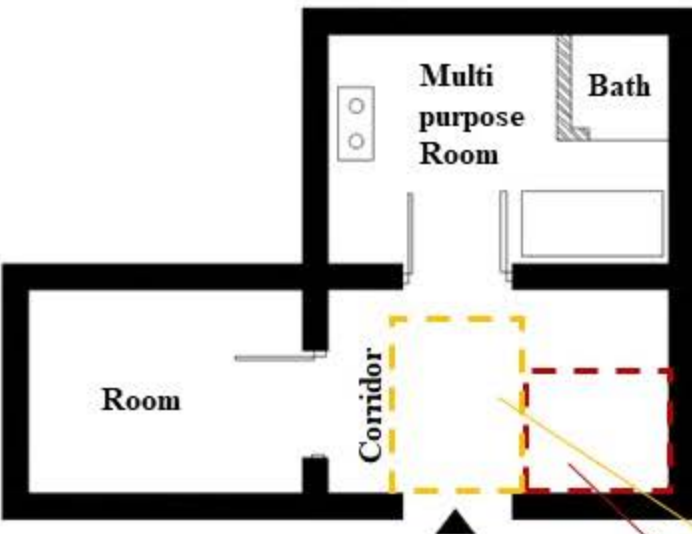
- The SBM guidelines clearly mentions that the toilets must have a superstructure acceptable to the beneficiaries. Just that Superstructure should be sufficiently durable to avoid any dysfunctionality of toilet due to lack of proper privacy.
- Especially for house made of tin and mud i.e. there are 40% in Wai and 29% in Sinnar – Kutcha super Structure
- This also caters to cases with lack of space and lack of funds issues.

CASE EXAMPLE

Dwelling Unit : Area 17.6 sq. mts
Inhabitants - 5

Contextual based options like done in Jalna

Tin roof for the Toilet
Partition wall for septic tank
Change in thickness of wall



Covered Drain
Internal Street

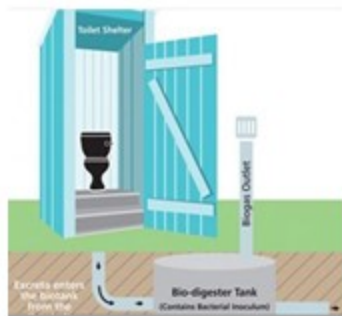
Septic Tank
Proposed Toilet

Type	Material	Advantages
Mud	<p>Wall materials: bamboo or straw wall plastered with clay on both sides</p> <p>Roof materials: straw/thatch</p>	<ul style="list-style-type: none"> • Low cost • Local materials • Skilled mason not needed for construction • Privacy can be maintained
GI Sheet	<p>Wall and roof materials: CGI sheet</p>	<ul style="list-style-type: none"> • Semi-permanent structure • Privacy can be maintained
Wood	<p>Wall materials: wood</p> <p>Roof materials: CGI sheet</p>	<ul style="list-style-type: none"> • Semi-permanent structure • Privacy can be maintained
Stone	<p>Wall materials: stone</p> <p>Roof materials: CGI sheet</p>	<ul style="list-style-type: none"> • Permanent structure • Privacy can be maintained • Maintenance is easy
Bricks	<p>Wall materials: brick</p> <p>Roof materials: CGI sheet</p>	<ul style="list-style-type: none"> • Permanent structure • Can use both clay and cement mortar for laying bricks • Privacy can be maintained • Maintenance is easy

Adapting Technologies that Suit the Context

- Depending upon the soil, topography and the financial aspect suggestions of some technologies which are **economically viable, Socially Acceptable, Technically Appropriate and environmental friendly.**
- Technological Options for toilets with cost based analysis which in turn can fit in small space, cope up with context.
- **The potential option fits those cases where space is less, practice of onsite sanitation, hard rocky soil, unavailability of funds, less frequency of water supply are all a challenge.**

BIO Digester Toilet



Bio toilet can be made at community level. Bio-digester tank and accompanying toilet, underground water storage tank, loft tank, and regular water storage tank. The recycled water is then reused as toilet water.

Unit Cost – Rs. 17,000

Shankar Balram Model



This model is more suitable for areas where people use water for ablution. It is basically combination of latrine and specifically designed septic tank.

Unit Cost – Rs. 12,000 per Toilet

SATO Toilet



The twin-pit system also helps in minimizing clogging and allows for water conservation, as it uses less than one litre of water per flush.

Unit Cost – Rs. 250 – 700 + the cost of superstructure

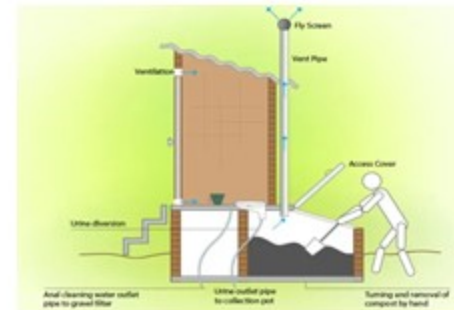
How ?

- ✓ **With the help of Participatory Tools – FGDs, Community Mapping**
- ✓ **Building Toilets by Sharing Finance**
- ✓ **Forming CAG Groups for better O & M of the toilets**

Who will do?

With the help of ULB, Private Agencies through CSR Funds, SHGs – CAG, Community Action Groups can build such toilets within their clusters or at individual level.

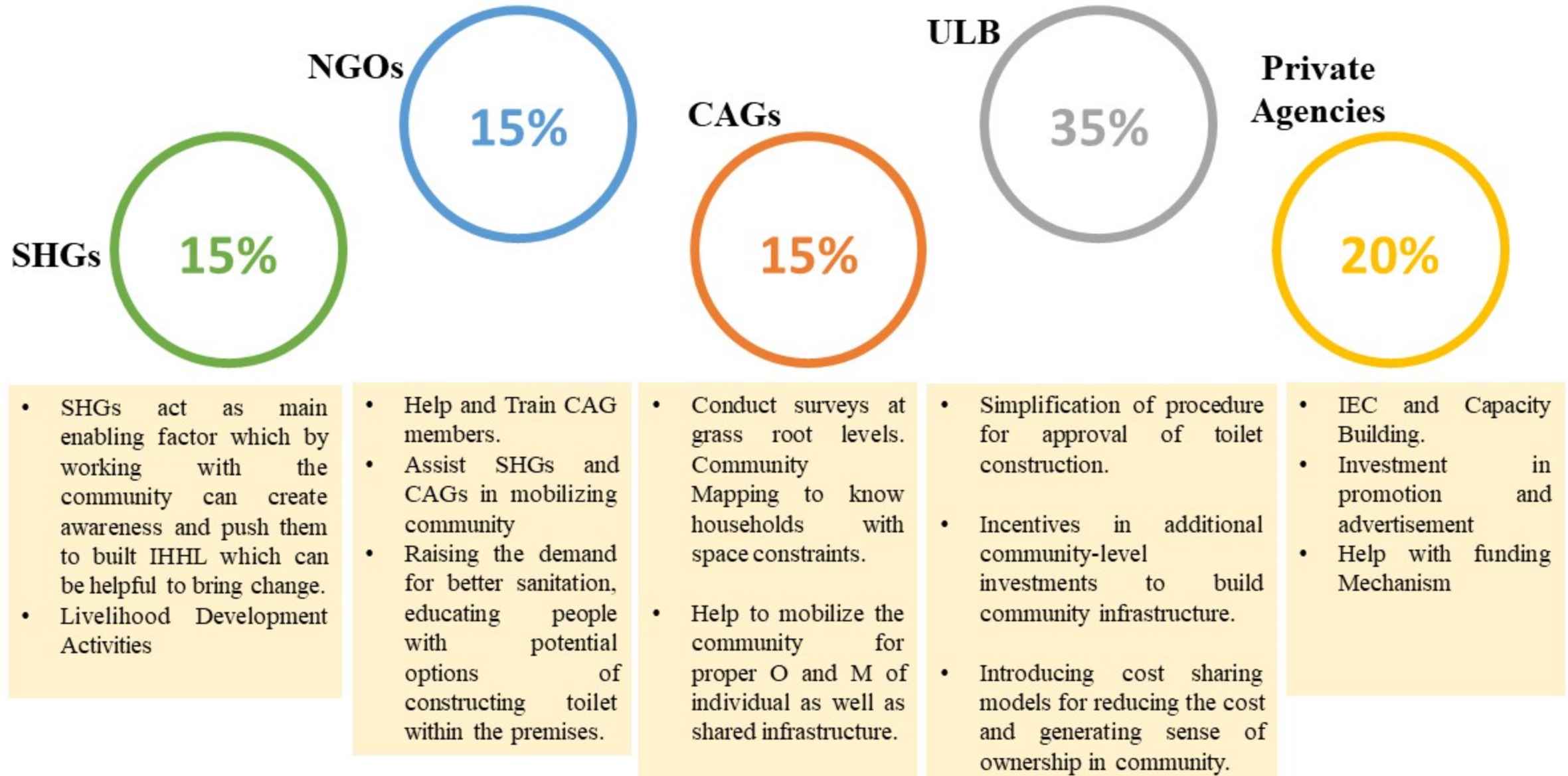
ECO San Toilet



Eco san toilets consist of two pits and a urine and anal wash water diversion outlet. After every toilet use, a handful of ash has to be thrown over excreta to create conditions for waste decomposition.

Unit Cost – Rs. 18,000

Engagement of Non Profits - other Stakeholders



Conclusion

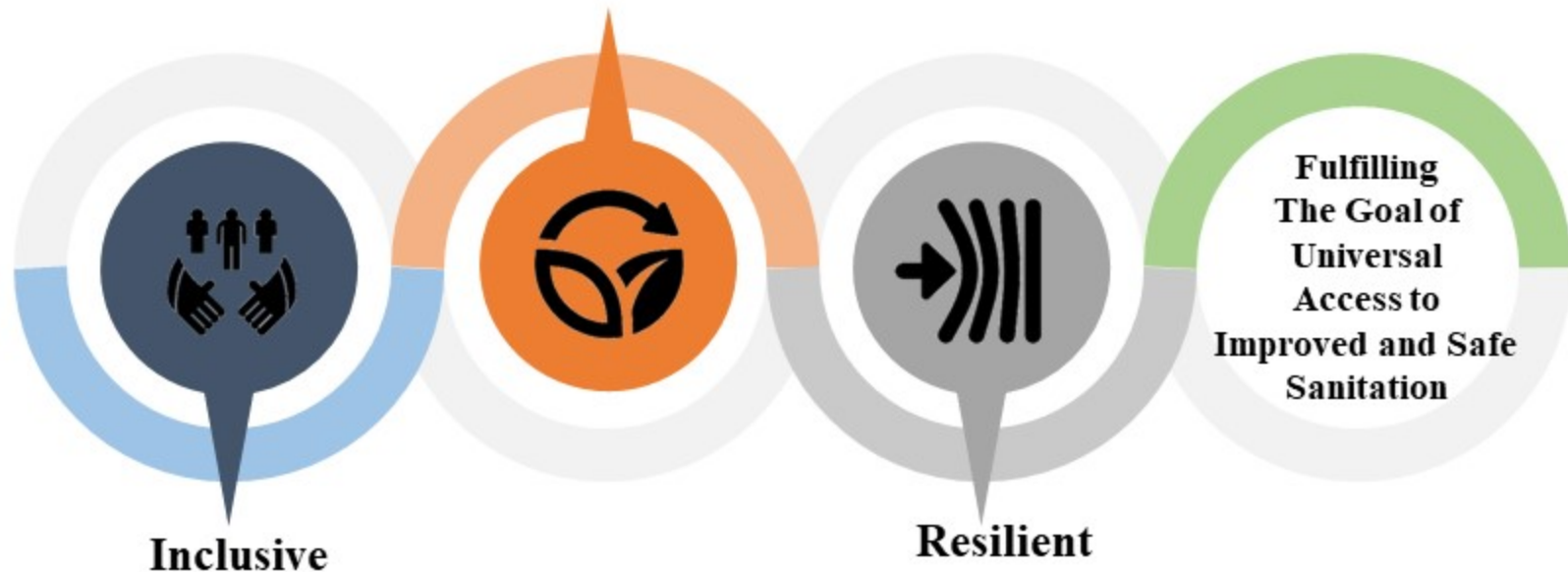
Enabling Environmental Solutions

Upgrading the sanitation ladder

Overcome space constraints and challenges interlinked

- Use of local materials and ecological technologies to overcome space and fund challenges.

Sustainable



- Extracting Space within the house
- Space constraints overcome with contextual solutions along with social and cultural determinants changing mindsets.

- Individual toilets create sense of ownership.
- For every rupee invested in **sanitation**, there is a **return** in the form of reduced health care costs for individuals.



TOILET



Thank You...