Bauhaus-Universität Weimar

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# Slum Upgrading Schemes for Better Liveability.

Case of Pune, India.

**Subhashree Nath**
MSc Integrated Urban Design & Development

Supervised by:
Prof. Dr.-Ing. Sven Schneider
Prof. Dr. habil. Sigrun Kabisch
Raphael Karutz, MSc.

# Slum Upgrading Schemes for Better Liveability.

(Higgs et al., 2019; National Research Council, 2002)

Quality of life in a certain community, measured by the resident's satisfaction with the residential environments, safety, attractiveness, crime rate, education, and employment opportunities, social cohesion, and inclusion or amount of open space

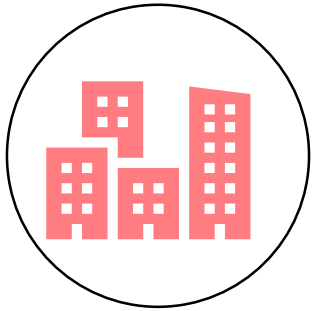
# Slum Upgrading Schemes for Better Liveability.

Slum
Upgrading
=
Better Liveability ?

Slum
Upgrading
=
Better Liveability,
if Community Ties
remain intact.

# Key Liveability Indicators according to residents for Better Liveability?

How do
Slum Upgrading Schemes
define its goal for
Better Liveability?



A method to guide Slum Upgrading Schemes for better liveability by finding the most central liveability indicator which act as a performance lever for improving overall liveability.

# How

## Methodology

Literature Review

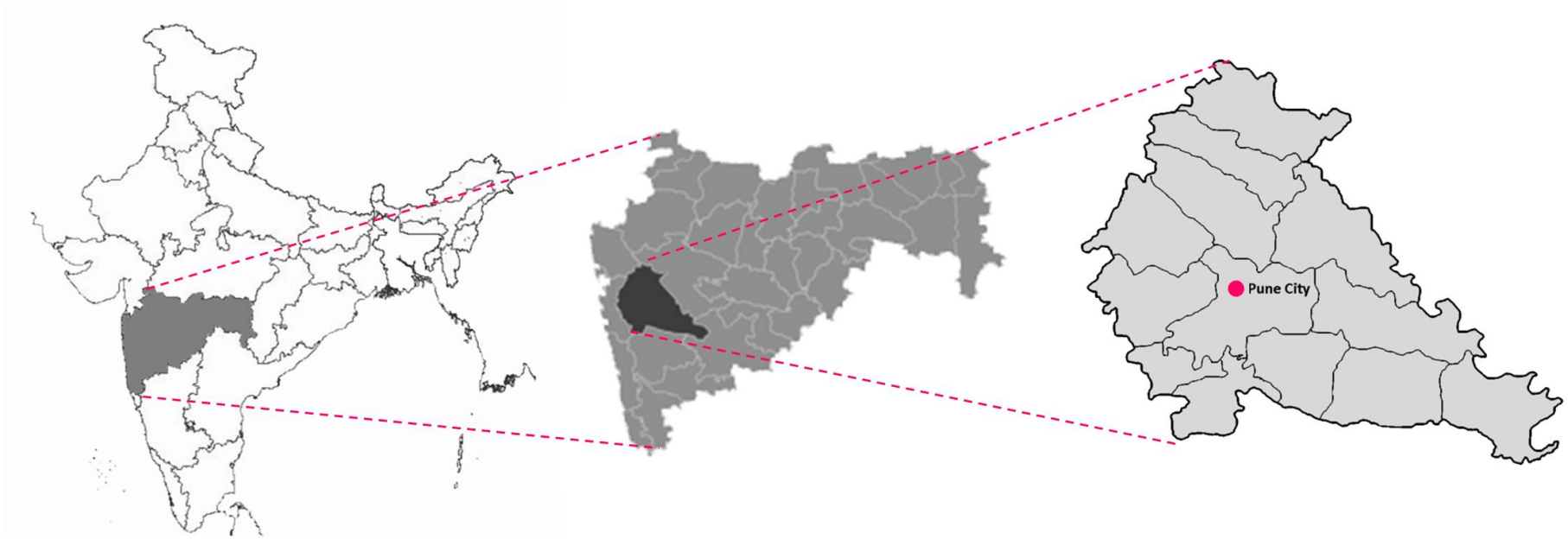
Telephonic Interviews

Analysing Interviews

A method to guide Slum Upgrading Schemes for better liveability

**Where**

City of Pune,
State of Maharashtra, India



**Where** City of Pune,
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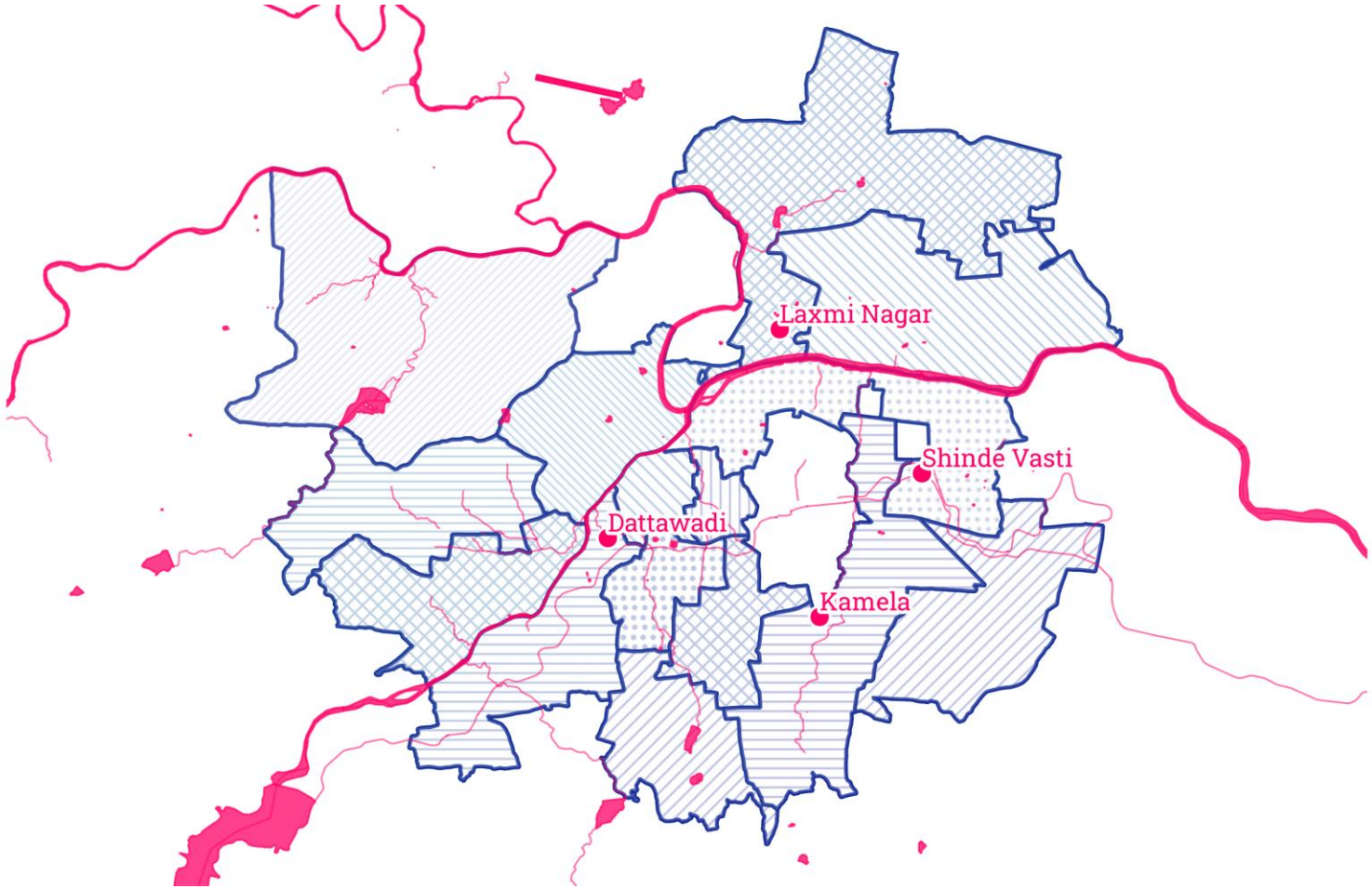
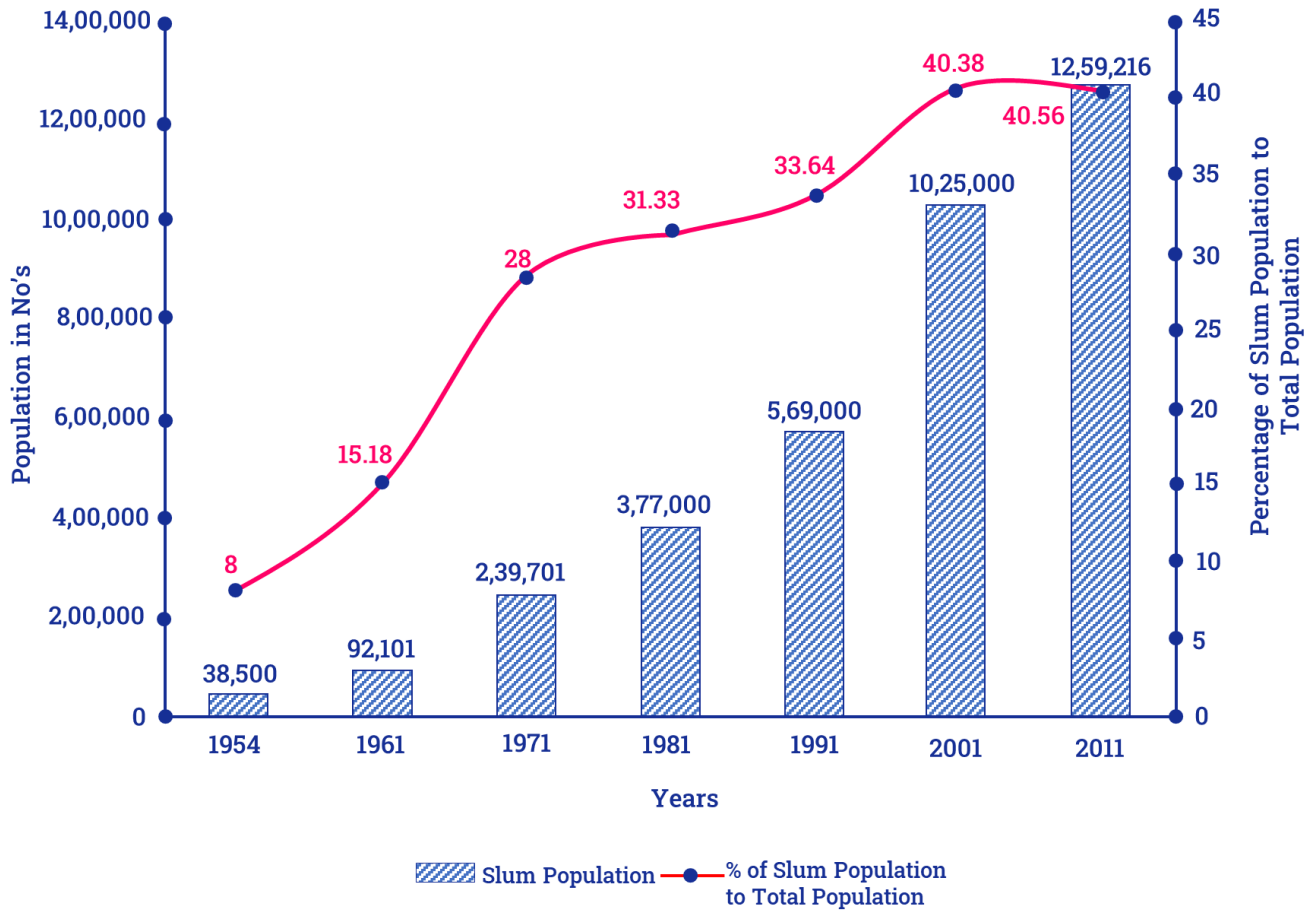


**Where** City of Pune,
State of Maharashtra, India

Pune Growth of Slum Population in Pune from 1951 to 2011 (Mundhe, 2019)



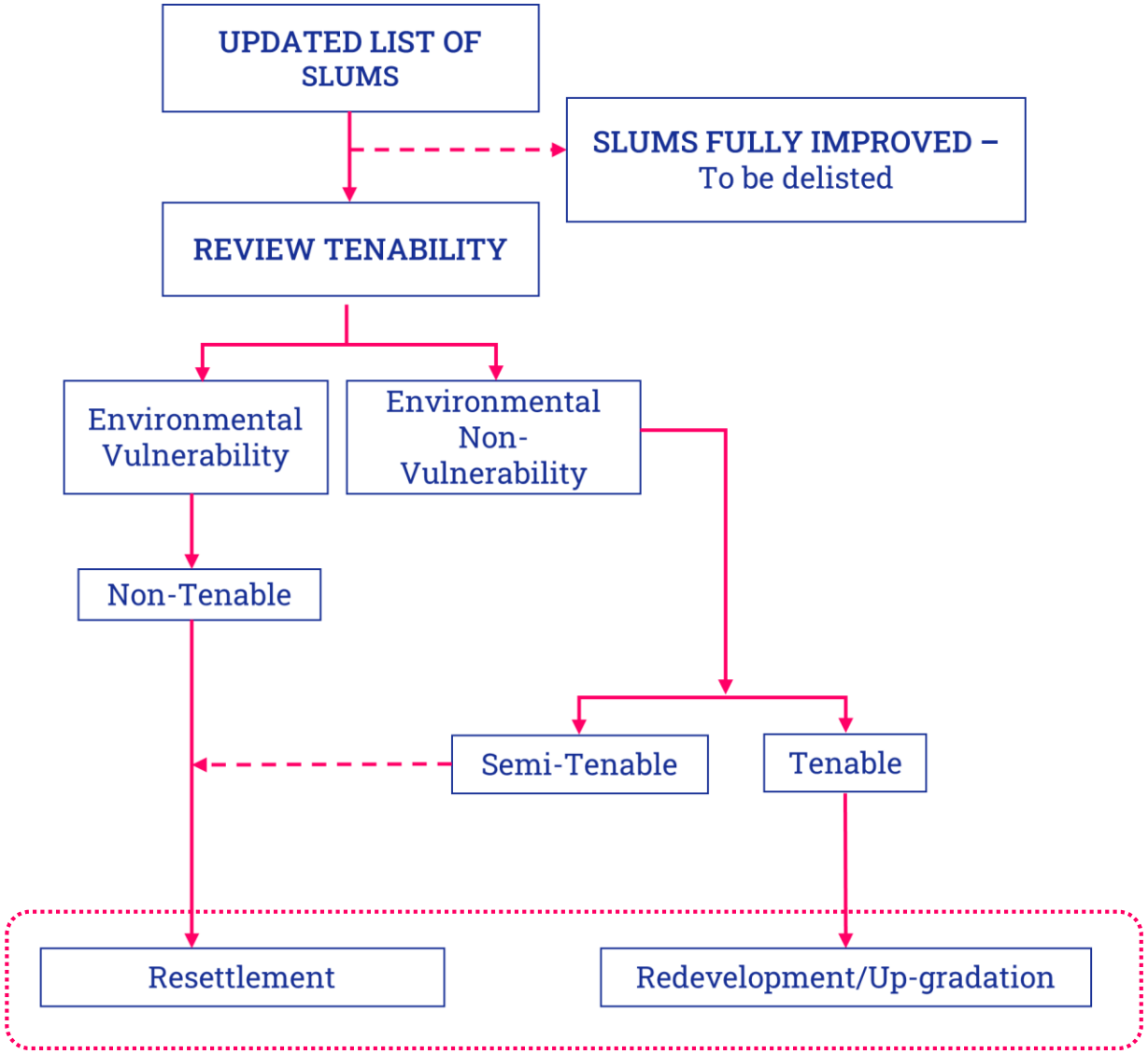
**What**

Slum Upgrading Schemes
In Pune, India

# What

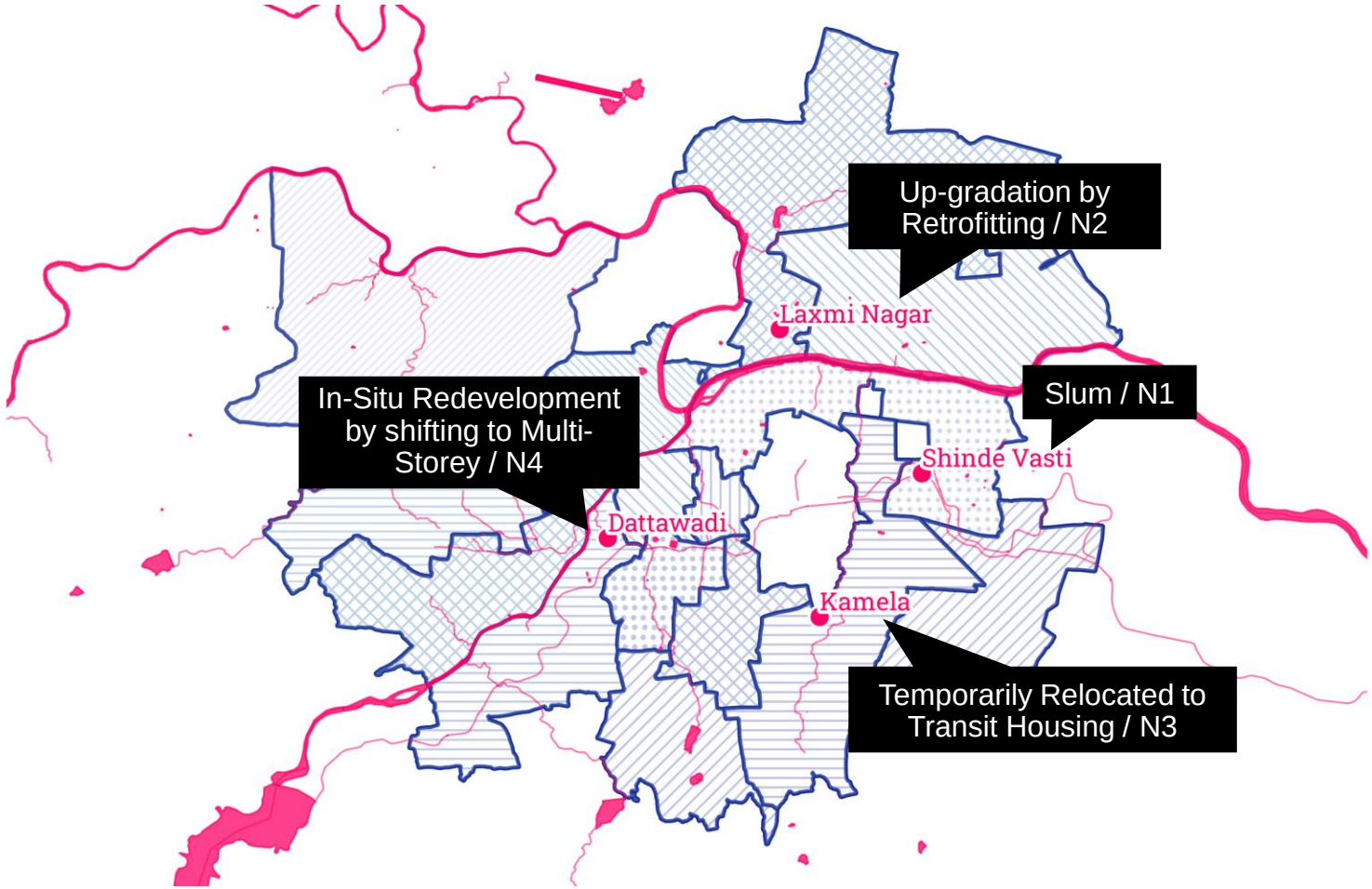
Slum Upgrading Schemes
In Pune, India

Mode of tackling slums based on tenability analysis as per Rajiv Awas Yojana (PMC, 2012)



# What

Selected Neighbourhoods
In Pune



# How

Deriving
Liveability Indicators

Literature Review to derive Liveability Indicators best suited for LMIC resident-centric liveability assessment.

# Deriving Liveability Indicators

## LIVEABILITY INDICATORS

### Physical

+ Access to basic services like household-level water, electricity, toilet/sewerage connection
+ Quality of housing structure
+ Proximity to public transport
+ Proximity to greenery
+ Availability of community space
+ Cleanliness of neigbourhood

### Social

+ Feeling of belonging to the neighbourhood (Sense of belongingness)
+ Good relationship with neighbours and community (Strong community ties)

### Functional

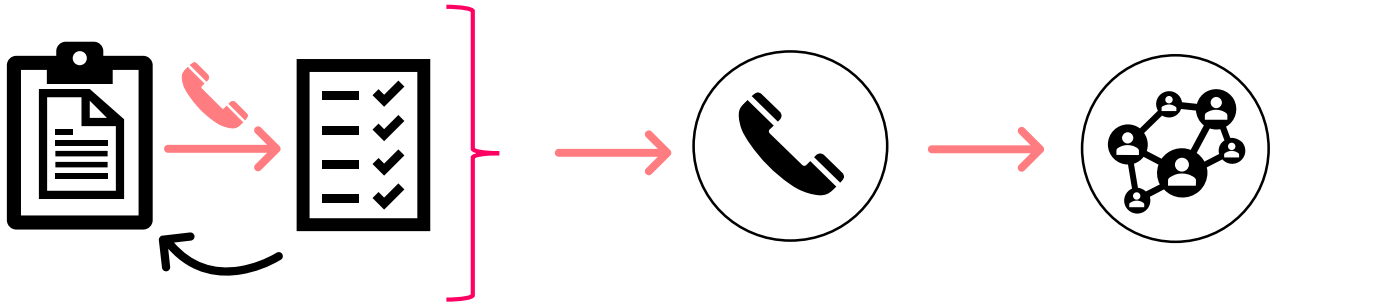
+ Proximity to employment opportunities
+ Proximity to primary & secondary schools
+ Proximity to healthcare facilities

### Safety

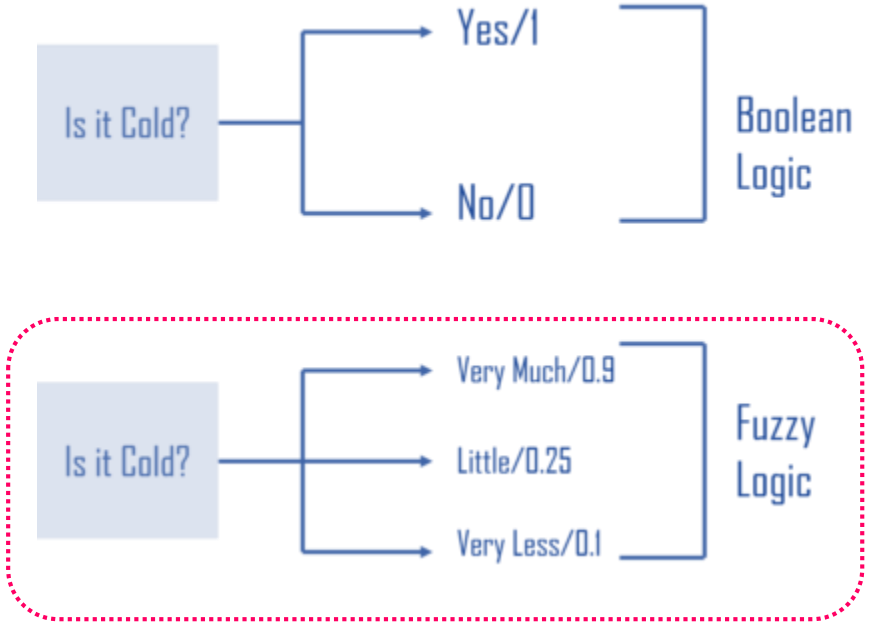
+ Security of tenure
+ Safety from crime

# How

Telephonic Interviews
& FCMs



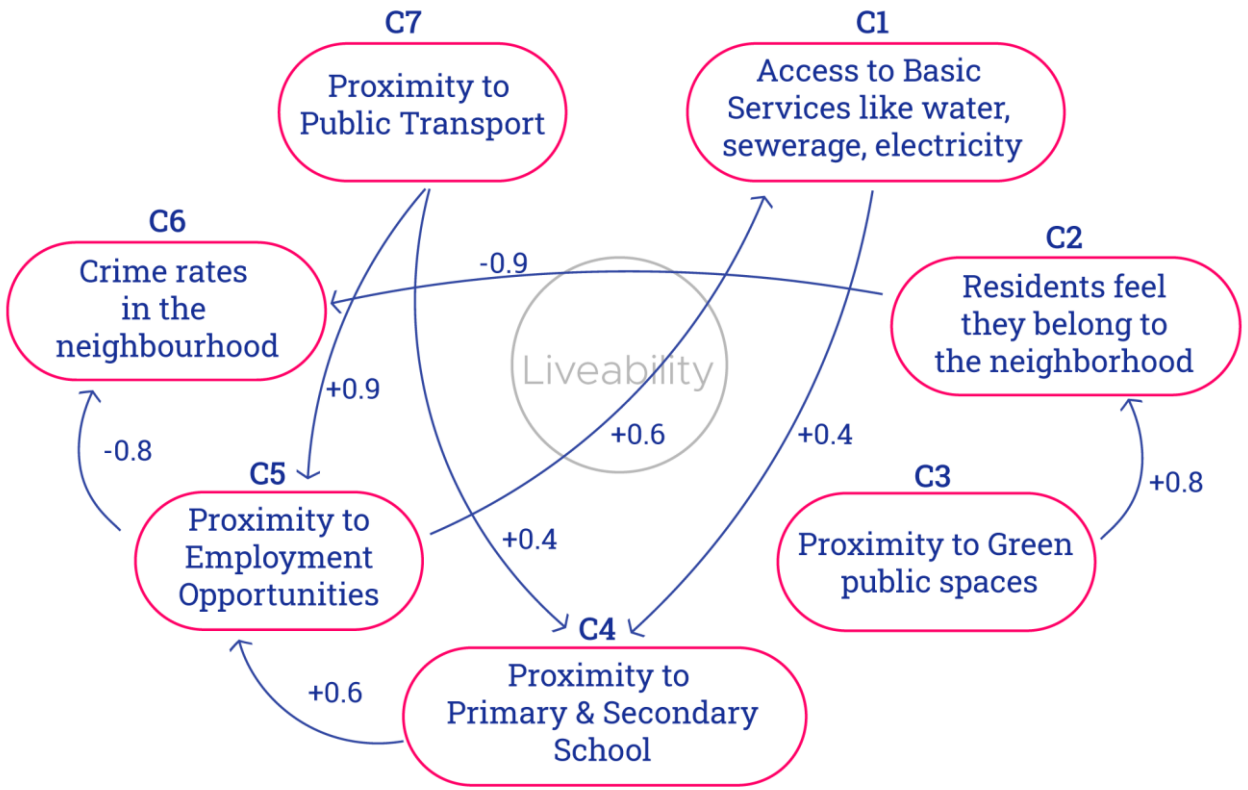
Pilot Interviews  Main Interviews  Drawing FCMs




Source: https://www.edureka.co/blog/wp-content/uploads/2019/12/fuzzy-logic-427x300.png

# How

Telephonic Interviews
& FCMs



A=

| | C1 | C2 | C3 | C4 | C5 | C6 | C7 |
|---|---|---|---|---|---|---|---|
| C1: Access to basic services like water, sewerage, electricity | 0 | 0 | 0 | +0.4 | 0 | 0 | 0 |
| C2: Residents feel they belong to the neighborhood | 0 | 0 | 0 | 0 | 0 | -0.9 | 0 |
| C3: Proximity to green public spaces | 0 | +0.8 | 0 | 0 | 0 | 0 | 0 |
| C4: Proximity to Primary & Secondary School | 0 | 0 | 0 | 0 | +0.6 | 0 | 0 |
| C5: Proximity to Employment Opportunities | +0.6 | 0 | 0 | 0 | 0 | -0.8 | 0 |
| C6: Crime rates in the neighbourhood | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C7: Proximity to Public Transport | 0 | 0 | 0 | +0.4 | +0.9 | 0 | 0 |

| | | not at all | a bit | a lot |
|---|---|---|---|---|
| 1 | How much do you like your neighbourhood?<br>आप अपने गली- मुहल्ले को कितना पसंद करते है? | ☑<br>बिल्कुल नहीं, | ☐<br>, थोड़ा सा | ☐<br>बहुत ज्यादा |
| 2 | How would you rate the following in your neighbourhood?<br>आप अपने गली-मुहल्ले में इन चीजों को कैसे रेट करेंगे? संतुष्ट | bad | okay | good |
| | Access to basic amenities like household level tap water, electricity, toilet/sewerage<br>घर में नलके का पानी, बिजली, लेट्रिन/ गंदे पानी की नाली , | ☑ | ☐ | ☐ |
| | Quality of housing structure घर की बनावट की हालत | ☐ | ☐ | ☑ |
| | Proximity to public transport like bus stop, बस स्टॉप से नज़दीकी | ☐ | ☐ | ☑ |
| | Proximity to greenery like public parks, gardens पार्क, बगीचे से नजदीकी | ☑ | ☐ | ☐ |
| | Access to community spaces where you can gather with your neighbours and friends/relatives<br>मुहल्ले में ऐसी सामुदायिक जगहों तक पहुँच जहाँ आप अपने पड़ोसियों, रिश्तेदारों और दोस्तों से बात और मुलाकात करें? | ☐ | ☑ | ☐ |
| | Cleanliness of streets/neighbourhood (मुहल्ले की साफ़-सफाई) | ☑ | ☐ | ☐ |
| | A feeling of belonging to the neighbourhood (मुहल्ले अपनेपन की भावना) | ☐ | ☐ | ☑ |
| | A good relationship with neighbours and community (पड़ोसियों और समाज के लोगों से अच्छे सम्बन्ध ) | ☐ | ☐ | ☑ |
| | Proximity to employment opportunities (रोज़गार/नौकरी के अवसरों से नज़दीकी) | ☑ | ☐ | ☐ |
| | Proximity to primary & secondary schools प्राथमिक और माध्यमिक स्कूलों से नज़दीकी और पहुँच | ☐ | ☑ | ☐ |
| | Proximity to healthcare facilities अस्पताल से नज़दीकी और पहुँच | ☑ | ☐ | ☐ |
| | Sense of safety and security सुरक्षा और सलामती की भावना | ☐ | ☐ | ☑ |
| | Security of tenure घर/मकान में रहने की सुरक्षा( निकाले जाने के डर से) | ☐ | ☐ | ☑ |
| | Safety from natural and manmade hazards प्राकृतिक आपदा flood | ☐ | ☐ | ☑ |

| Of the following, what do you think improves में सुधार | | | | |
|---|---|---|---|---|
| Proximity to greenery like public parks, gardens पार्क, बगीचे से नजदीकी | thoda | lagbhag | bahut jyada | bikul na |
| does improving this____ affects | very little (+) | a bit (++) | a lot (+++) | |
| 1. Proximity to public transport like bus stop | ☐ | ☐ | ☑ | ☐ |
| 3. Access to community spaces where you can gather with your neighbours and friends/relatives | ☐ | ☐ | ☑ | ☐ |
| 4. Cleanliness of streets | ☐ | ☐ | ☑ | ☐ |
| 5. Regular waste collection | ☐ | ☐ | ☑ | ☐ |
| 6. A feeling of belonging to the neighbourhood | ☐ | ☐ | ☐ | ☑ |
| 7. A good relationship with neighbours and community | ☐ | ☐ | ☑ | ☐ |
| 8. Proximity to employment opportunities | ☑ | ☐ | ☐ | ☐ |
| | ☐ | ☐ | ☐ | ☐ |
| | ☐ | ☐ | ☐ | ☐ |
| | ☐ | ☐ | ☐ | ☐ |
| | ☐ | ☐ | ☐ | ☐ |

| Of the following, what do you think improves | | | | |
|---|---|---|---|---|
| Access to community spaces where you can gather with your neighbours and friends/relatives मुहल्ले में ऐसी सा | thoda | lagbhag | bahut jyada | bikul na |
| does improving this____ affects | very little (+) | a bit (++) | a lot (+++) | |
| 1. Proximity to public transport like bus stop | ☑ | ☐ | ☐ | ☐ |
| 2. Proximity to greenery like public parks, gardens | ☐ | ☐ | ☑ | ☐ |
| 4. Cleanliness of streets | ☐ | ☐ | ☑ | ☐ |
| 5. Regular waste collection | ☐ | ☐ | ☑ | ☐ |
| 7. A good relationship with neighbours and community | ☐ | ☐ | ☑ | ☐ |
| 8. Proximity to employment opportunities | ☐ | ☐ | ☐ | ☑ |
| | ☐ | ☐ | ☐ | ☐ |
| | ☐ | ☐ | ☐ | ☐ |
| | ☐ | ☐ | ☐ | ☐ |
| | ☐ | ☐ | ☐ | ☐ |
| | ☐ | ☐ | ☐ | ☐ |

| Of the following, what do you think improves | | | | |
|---|---|---|---|---|
| Cleanliness of streets/neighbourhood (मुहल्ले की साफ़-सफाई) | thoda | lagbhag | bahut jyada | bikul na |
| does improving this____ affects | very little (+) | a bit (++) | a lot (+++) | |
| 3. Access to community spaces where you can gather with your neighbours and friends/relatives | ☐ | ☑ | ☐ | ☐ |
| 6. A feeling of belonging to the neighbourhood | ☐ | ☐ | ☑ | ☐ |
| 5. Regular waste collection | ☐ | ☐ | ☑ | ☐ |
| 7. A good relationship with neighbours and community | ☐ | ☑ | ☐ | ☐ |
| 8. Proximity to employment opportunities | ☐ | ☑ | ☐ | ☐ |
| 9. Proximity to primary & secondary schools | ☐ | ☐ | ☐ | ☑ |
| 10. Proximity to healthcare facilities | ☐ | ☐ | ☐ | ☑ |
| 11. Sense of safety and security | ☐ | ☐ | ☐ | ☑ |
| | ☐ | ☐ | ☐ | ☐ |
| | ☐ | ☐ | ☐ | ☐ |
| | ☐ | ☐ | ☐ | ☐ |

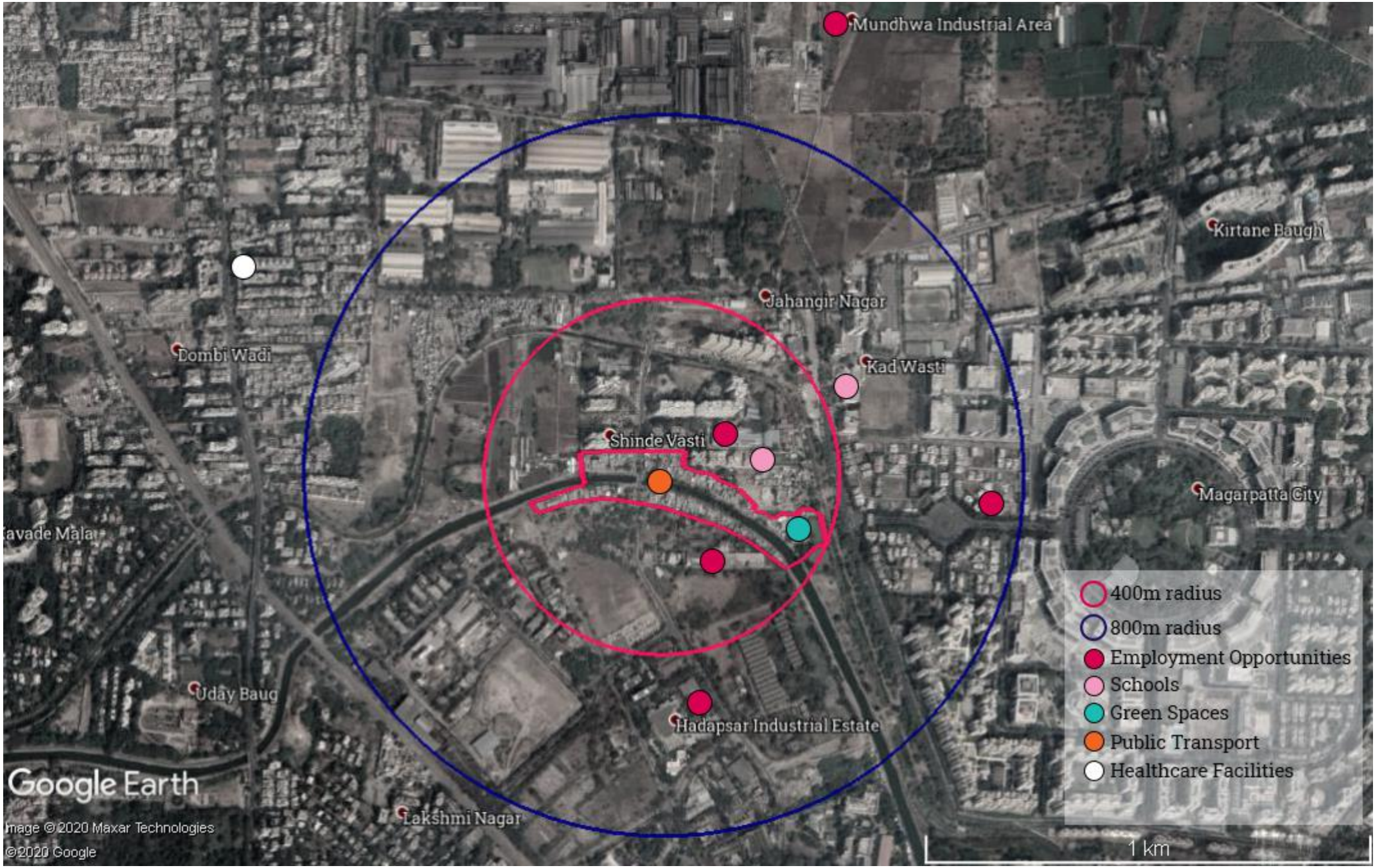
# Findings

Neighbourhood 1
Shinde Vasti

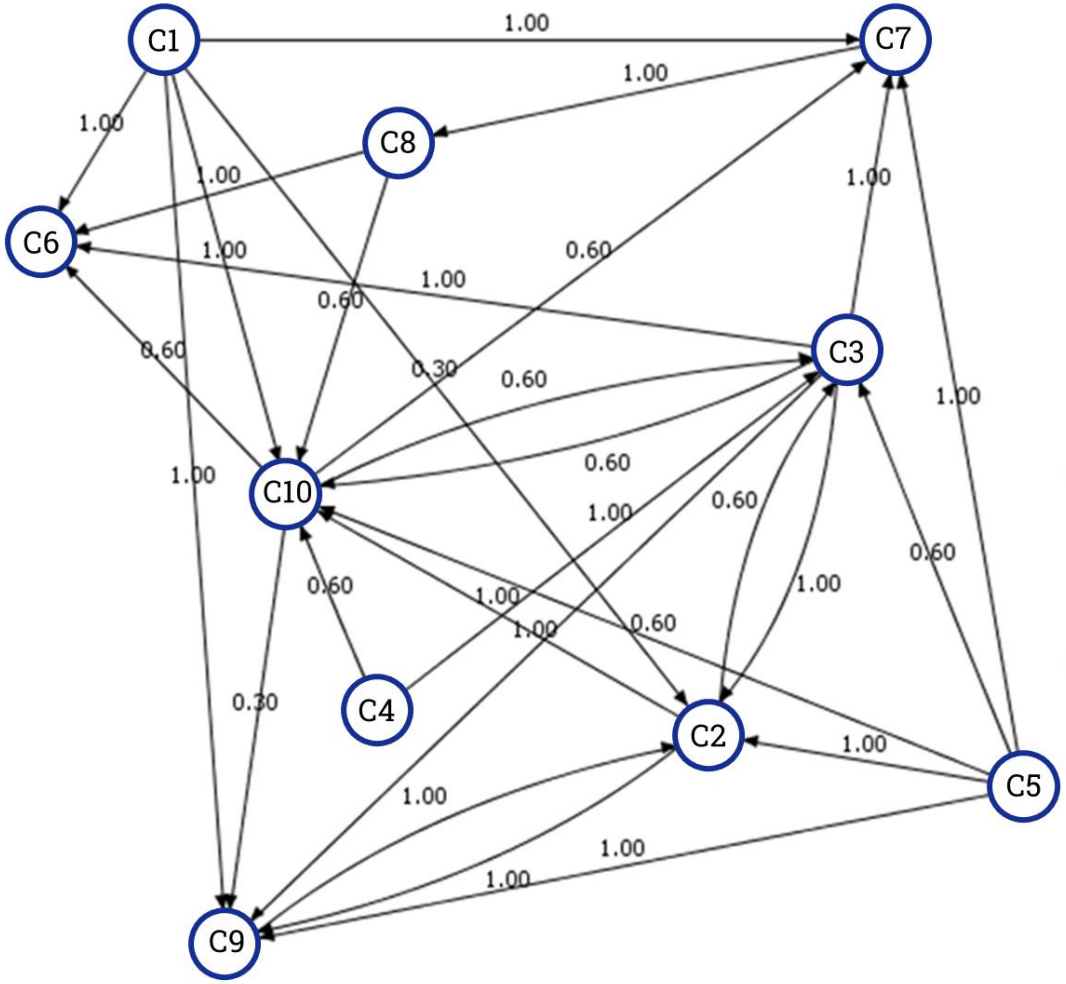
"***not at all**..3-4 meters from my house is a **large pothole** with stagnated water which breeds mosquitos. **The quality of drinking water is poor**…there is an open buffalo stable on the only street which takes you to the bus stop and **it's so dirty***".


Typical houses in Shirole Vasti, an informal settlement similar to Shinde Vasti (NTNU, n.d.)

"*… if we would have **a community space, like a hall**, it would give the ladies the **space to come together** and start some **small business**".*


Mundhwa Industrial Area
Kirtane Baugh
Jahangir Nagar
Dombi Wadi
Kad Wasti
Shinde Vasti
Magarpatta City
Uday Baug
Hadapsar Industrial Estate
Lakshmi Nagar
Google Earth
Image © 2020 Maxar Technologies
©2020 Google
400m radius
800m radius
Employment Opportunities
Schools
Green Spaces
Public Transport
Healthcare Facilities
1 km

Neighbourhood 1
Shinde Vasti




Interview 1 | Neighbourhood 1

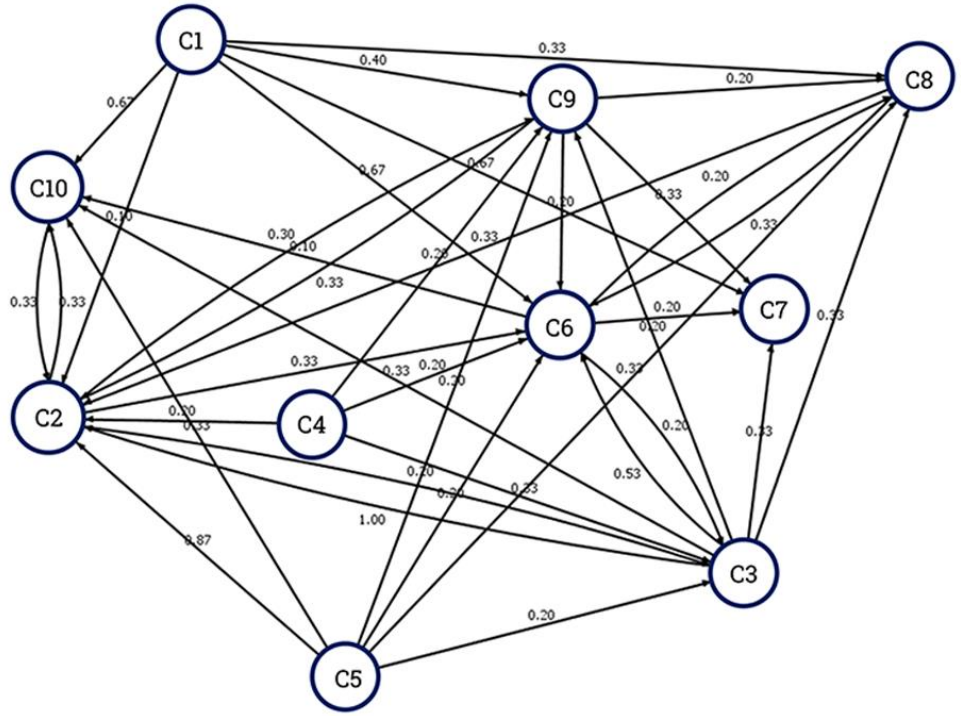
Unsatisfactory | Can be Improved | Satisfactory

Overall Quality of Life rating:

- Access to basic amenities
- Security of Tenure
- Quality of housing structure
- Safety from Natural Hazards
- C1: Proximity to Public Transport
- C2: Availability of Community Space
- C3: Cleanliness of Streets/ Neighbourhood
- C4: Feeling of Belonging to the Neighbourhood
- C5: Good Relationship with Neighbours & Community
- C6: Proximity to Primary & Secondary Schools
- C7: Proximity to Healthcare Facilities
- C8: Sense of Safety & Security
- C9: Proximity to Green Spaces
- C10: Proximity to Employment Opportunities

# Findings

Neighbourhood 1
Aggregated FCM




Neighbourhood 1: Informal Settlement with No Intervention

| Component | Indegree | Outdegree | Centrality | Type |
|---|---|---|---|---|
| C2: Availability of Community Space | 3.1666666660000002 | 1.1666666660000002 | 4.3333333320000005 | ordinary |
| C3: Cleanliness of Streets/Neighbourhood | 0.933333333 | 2.7333333320000004 | 3.666666665 | ordinary |
| C6: Proximity to Primary & Secondary Schools | 2.466666666 | 0.7000000000000001 | 3.1666666660000002 | ordinary |
| C1: Proximity to Public Transport | 0 | 2.8333333339999998 | 2.8333333339999998 | driver |
| C9: Proximity to Green Spaces | 1.2999999999999998 | 1.0666666660000002 | 2.366666666 | ordinary |
| C5: Good Relationship with Neighbours & Community | 0 | 2.133333333 | 2.133333333 | driver |
| C10: Proximity to Employment Opportunities | 1.7666666660000003 | 0.333333333 | 2.0999999990000005 | ordinary |
| C8: Sense of Safety & Security | 1.399999999 | 0.666666666 | 2.066666665 | ordinary |
| C7: Proximity to Healthcare Facilities | 1.5333333329999999 | 0 | 1.5333333329999999 | receiver |
| C4: Feeling of Belonging to the Neighbourhood | 0 | 0.933333333 | 0.933333333 | driver |

Partnership between Municipality, Non-Government Organisations (NGOs) and Community Based Organisation (CBOs)

# Findings

Neighbourhood 2
Laxmi Nagar, Yerwada

*"…**the quality of water is really bad**, it's almost like water from the gutters. There are no fixed supply hours… this is a big issue, **rest everything is fine".***

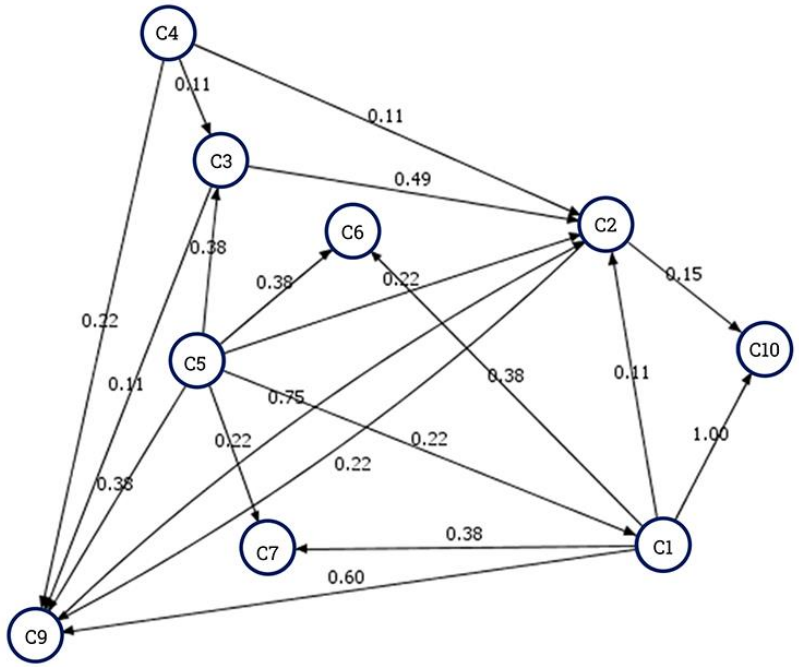
One of the upgraded neighbourhoods in Yerwada (Rawoot, 2014)

*"**for jobs we have to travel 5-10km**…"; " there are few jobs close by but depends on what kind of work you do".*


Shastrinagar
Gandham Nagar
Yerawada
Ganesh Nagar
Indira Park CHS
Laxmi Nagar
Janta Nagar
Mahindra Society
Line Bazar
Salwe Nagar
Yerwada Villa
Crown Co Op Housing Society
Jai Jawan Nagar
Ragvilas Society
Bund Garden
Rahul Housing Society
400m radius
800m radius
Employment Opportunities
Schools
Green Spaces
Public Transport
Healthcare Facilities
Google Earth
©2020 Google
Image © 2020 Maxar Technologies
1 km

# Findings

Neighbourhood 2
Aggregated FCM



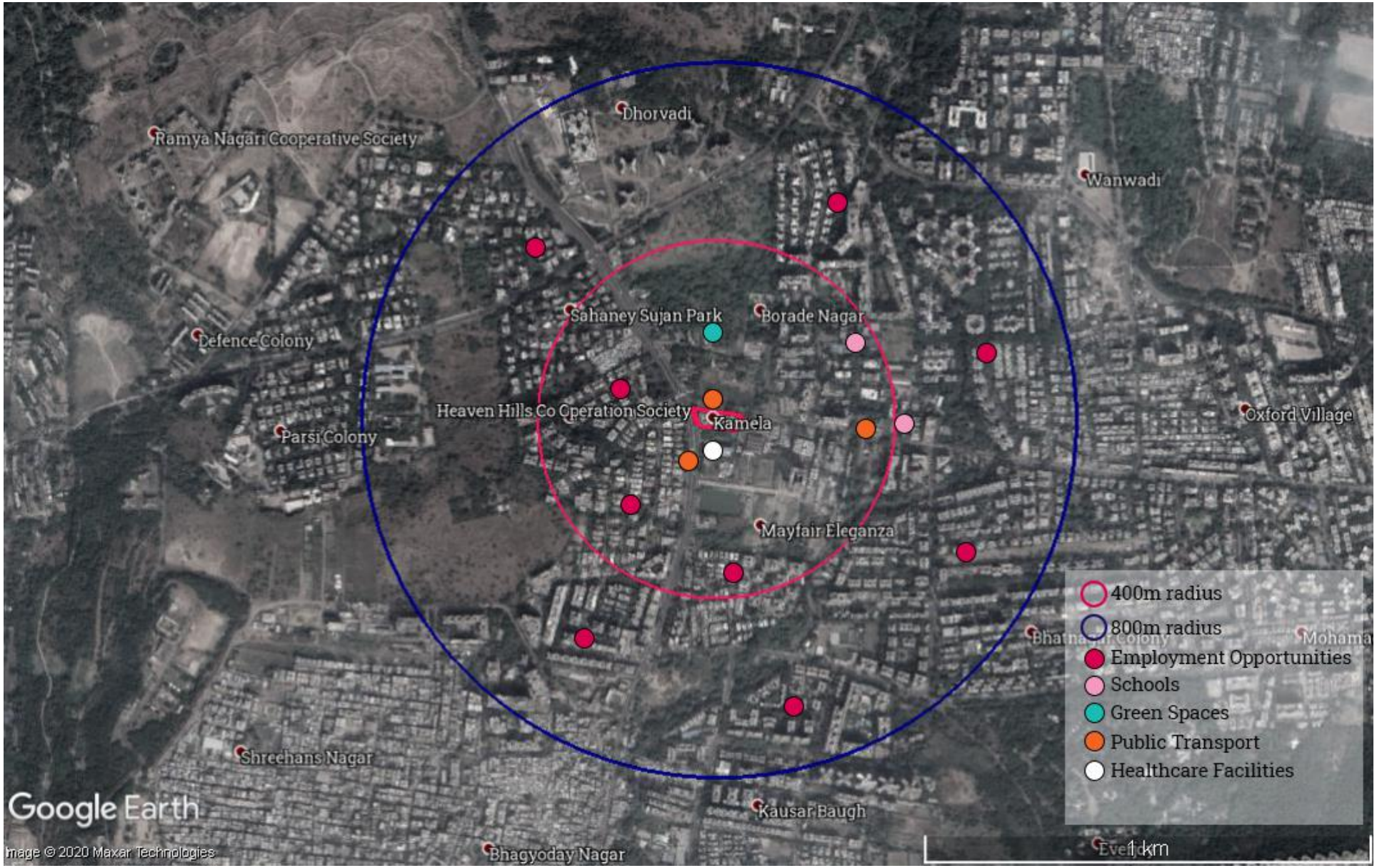

Neighbourhood 2: Upgrading by in-situ retrofitting

| Component | Indegree | Outdegree | Centrality | Type |
|---|---|---|---|---|
| C1: Proximity to Public Transport | 0.22499999999999998 | 2.4625000000000004 | 2.6875000000000004 | ordinary |
| C9: Proximity to Green Spaces | 1.5375 | 0.75 | 2.2875 | ordinary |
| C2: Availability of Community Space | 1.6875 | 0.375 | 2.0625 | ordinary |
| C5: Good Relationship with Neighbours & Community | 0 | 1.7999999999999998 | 1.7999999999999998 | driver |
| C10: Proximity to Employment Opportunities | 1.15 | 0 | 1.15 | receiver |
| C3: Cleanliness of Streets/Neighbourhood | 0.4875 | 0.6000000000000001 | 1.0875000000000001 | ordinary |
| C6: Proximity to Primary & Secondary Schools | 0.75 | 0 | 0.75 | receiver |
| C7: Proximity to Healthcare Facilities | 0.6 | 0 | 0.6 | receiver |
| C4: Feeling of Belonging to the Neighbourhood | 0 | 0.44999999999999996 | 0.44999999999999996 | driver |

A shift in the attitude of the local government is must, recognizing the rights of the inhabitants to the same network of infrastructure and services enjoyed by the planned housing developments

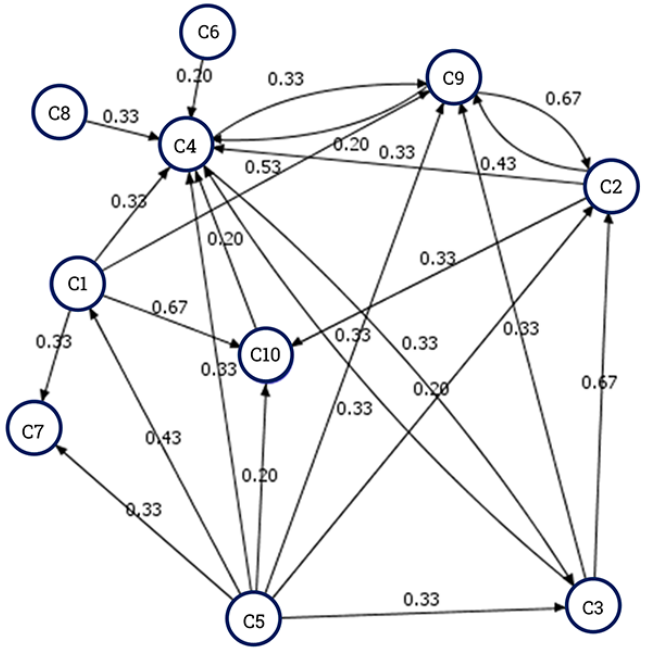
# Findings

Neighbourhood 3
Kamela



# Findings

Neighbourhood 3
Kamela




Neighbourhood 3: Transit Housing (relocated temporarily) for SRA in-situ Multi-Storey Housing

| Component | Indegree | Outdegree | Centrality | Type |
|---|---|---|---|---|
| C4: Feeling of Belonging to the Neighbourhood | 2.2666666650000002 | 0.666666666 | 2.933333331 | ordinary |
| C9: Proximity to Green Spaces | 1.966666665 | 0.8666666670000001 | 2.833333332 | ordinary |
| C2: Availability of Community Space | 1.533333334 | 1.099999999 | 2.633333333 | ordinary |
| C1: Proximity to Public Transport | 0.433333333 | 1.866666666 | 2.2999999989999997 | ordinary |
| C5: Good Relationship with Neighbours & Community | 0 | 2.166666665 | 2.166666665 | driver |
| C3: Cleanliness of Streets/Neighbourhood | 0.666666666 | 1.3333333330000001 | 1.9999999990000001 | ordinary |
| C10: Proximity to Employment Opportunities | 1.2 | 0.2 | 1.4 | ordinary |
| C7: Proximity to Healthcare Facilities | 0.666666666 | 0 | 0.666666666 | receiver |
| C8: Sense of Safety & Security | 0 | 0.333333333 | 0.333333333 | driver |
| C6: Proximity to Primary & Secondary Schools | 0 | 0.2 | 0.2 | driver |

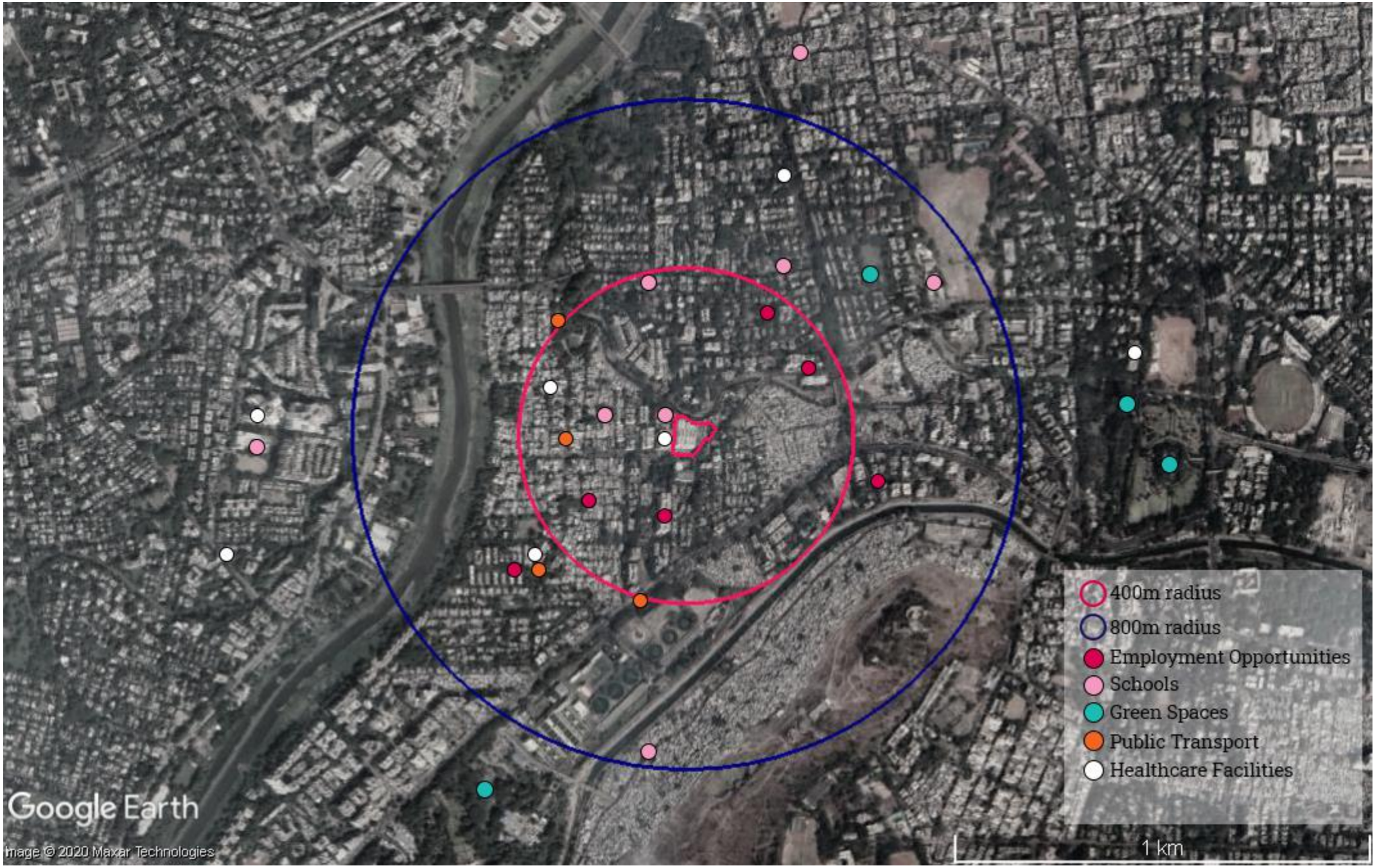
# Findings

Neighbourhood 4
Dattawadi

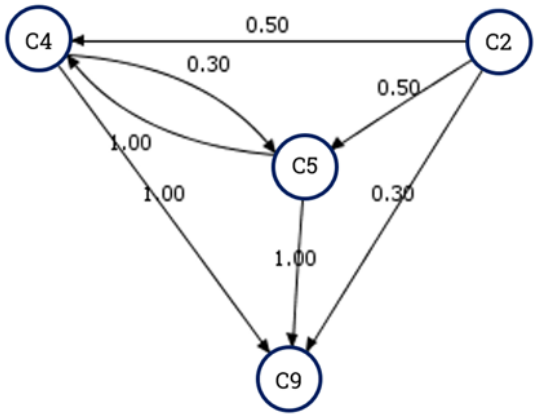
Ground Floor Shops allocated to the residents owning home run business, example from Dandekar Bridge SRA Project

*"…earlier everyone had their street, wide or narrow and we all kept our doors open during the day. Now all the flat doors always remain closed. Earlier if any mishap would happen, everyone would come running. Now nobody cares and keep to their businesses".*

*"…most of the people use their motorcycles and it is not feasible to run buses when nobody uses them. How would the municipality pay for the diesel if nobody uses the buses?"*


400m radius
800m radius
Employment Opportunities
Schools
Green Spaces
Public Transport
Healthcare Facilities
1 km
Google Earth
Image © 2020 Maxar Technologies

Neighbourhood 4
Dattawadi

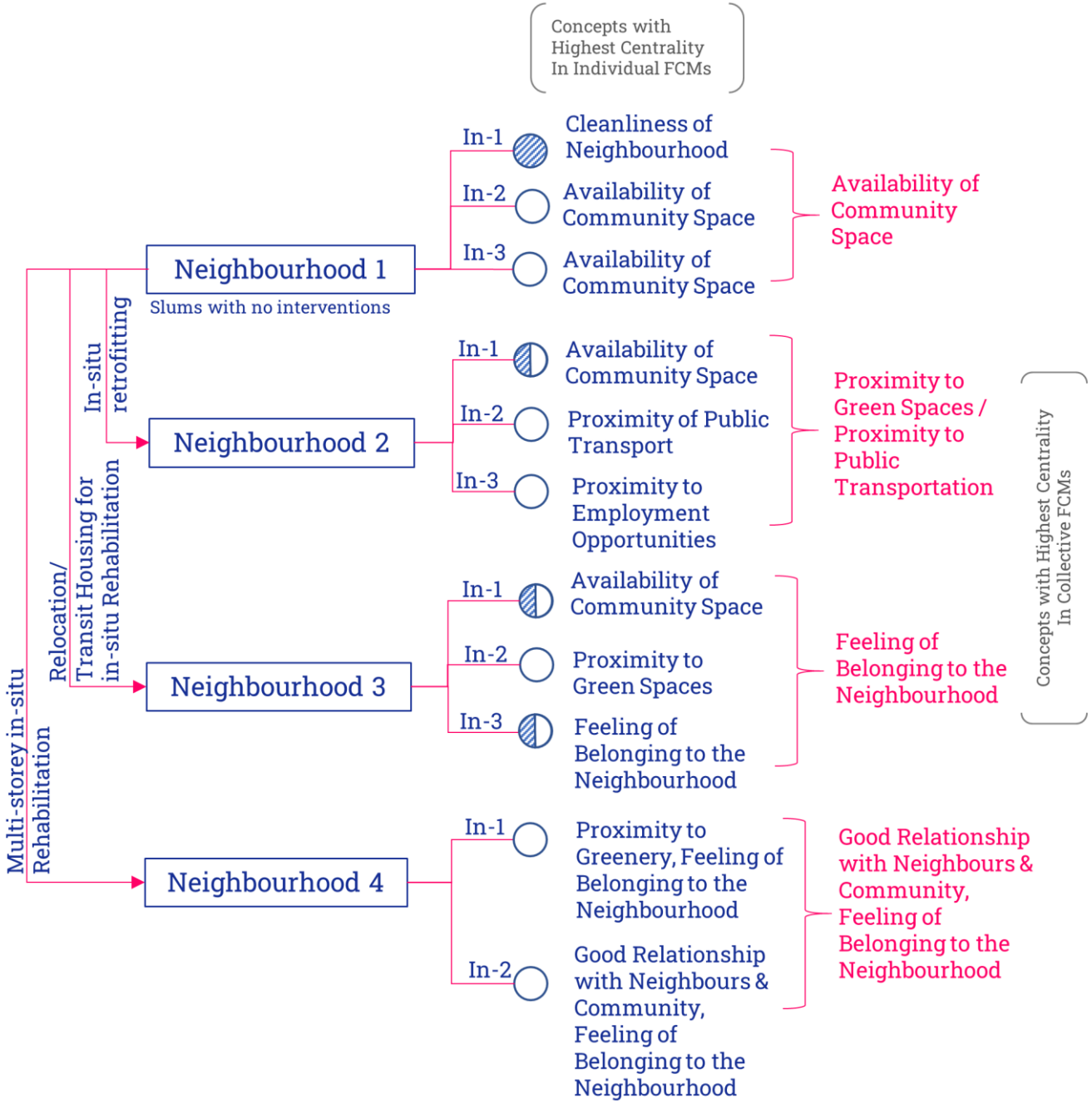



Neighbourhood 4: In-Situ Redevelopment to Multi-Storey Housing

| Component | Indegree | Outdegree | Centrality | Type |
|---|---|---|---|---|
| C5: Good Relationship with Neighbours & Community | 0.8 | 2 | 2.8 | ordinary |
| C4: Feeling of Belonging to the Neighbourhood | 1.5 | 1.3 | 2.8 | ordinary |
| C9: Proximity to Green Spaces | 2.3 | 0 | 2.3 | receiver |
| C2: Availability of Community Space | 0 | 1.3 | 1.3 | driver |

# Findings

Summary



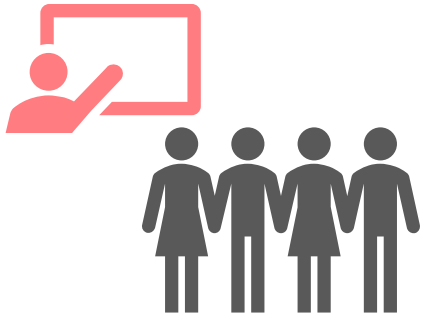
# Limitations

- Telephonic Interviews
- Sample Size

# Application

- Integrating the method in the SWOT (Strength- Weakness-Opportunity-Threat) analysis, would help in prioritizing actionable points by identifying performance leverages.
- Post Occupancy Liveability Evaluation

# Suggestions



Awareness Campaign, enabling partnership between Community Based Organizations and NGOs for a smooth transition from horizontal living to vertical living

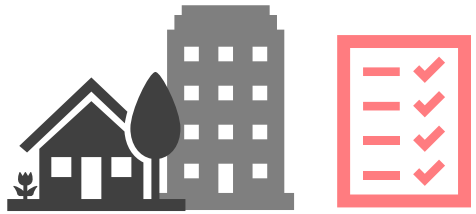
# Suggestions

Respecting social habits of the neighbourhood in the design of the built-environment.

# Suggestions

Integration of the rehabilitated neighbourhoods to the formal city fabric

# Suggestions



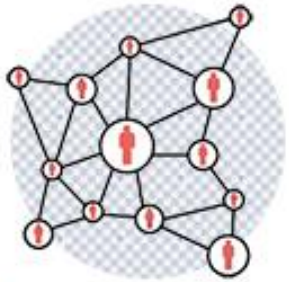
Mandating Post-Occupancy Liveability Evaluation (POLE)

In Rehabilitated Settlements

# Application

1 Select & evaluate the neighbourhood to be upgraded or redeveloped

2 Conduct interviews of each household in the neighbourhood & draw FCMs



3 Collect all the FCMs to form one FCM representing the neighbourhood

4 Priority checklist of Indicators to be addressed during design phase of new schemes or upgading existing

5 Repeat 1-4 for Post-occupancy evaluation and a feedback loop to improve future schemes

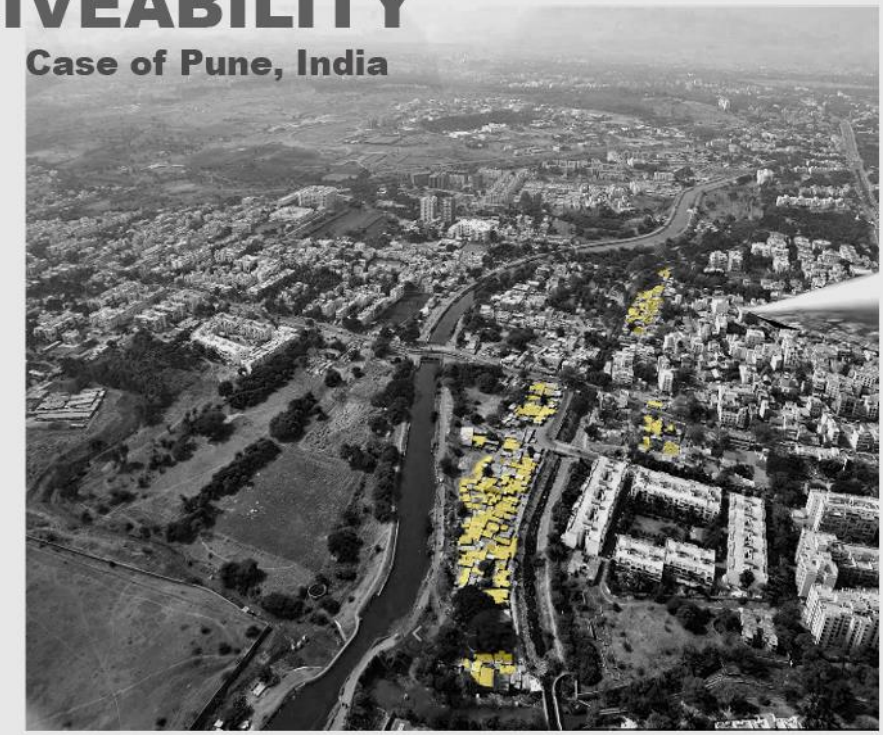
6 Liveability Indicators contextualised for Low/Middle Income Countries

## A Tool for Assessing & Improving Liveability in Slum Upgrading Schemes

Bauhaus-Universität Weimar

# SLUM UPGRADING SCHEMES FOR BETTER LIVEABILITY

## Case of Pune, India



**Subhashree Nath**
MSc. Integrated Urban Design & Development | **Master's Thesis 2020**