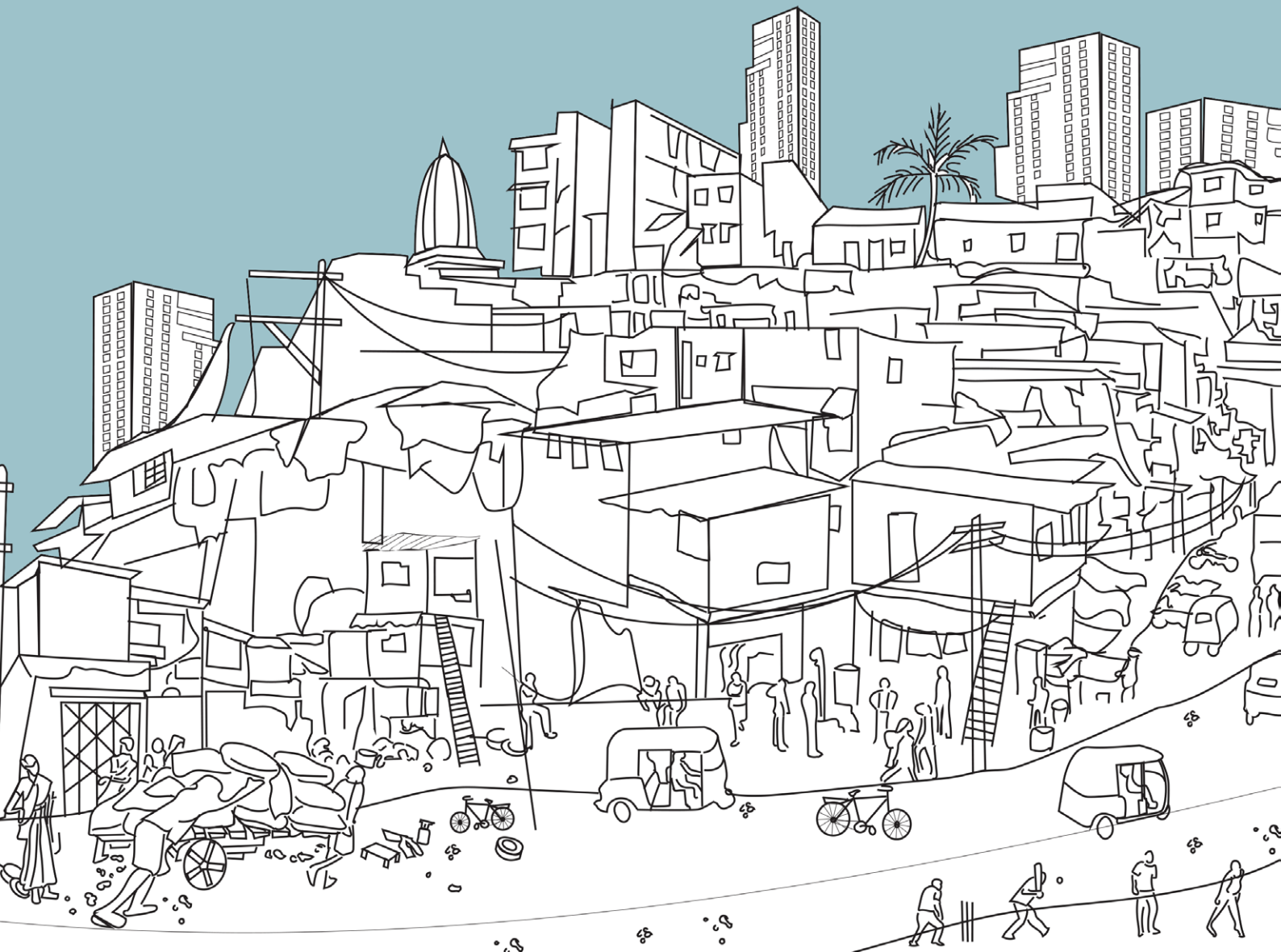# An alternative smart paradigm

Towards integrating informality in the smart city model in an Indian context

Masters Thesis
April, 2022

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MSc Urbanism
Delft University of Technology

Colophon

An alternative smart paradigm
Towards integrating informality in the smart city model in an Indian context

Masters Graduation Thesis Report

April, 2022

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Table of Contents

Abstract

Smart City forms the new urban imaginary of the recent era. It primarily emerged from the West and has a wide set of definitions that revolves around the use of technology for urban development. With the concept's growing popularity in the Global South, countries such as India have adopted it as a national program called Smart City Mission to guide the growth of its cities. However, it fails to address one of the crucial urban challenges of Indian cities - informality. This development model has created urban smart enclaves with aspirations to become a global city and has caused further fragmentation, segregation, and inequalities. The current informal area upgradation is essentially a top-down process seeking change by recognizing people's needs and empowering them to transform their quality of life.

The graduation project, 'An alternative smart paradigm,' explores the possible shift in approach towards an inclusive and just smart city in India by integrating informal areas in planning and governance.   The thesis explores redefining the word 'smart' through the lens of the local knowledge of the community. Peter Marcuse's critical planning theory is used as a guiding theory to structure the research. It acts as an operational platform to institutionalize local voices and form a co-production system to recognize the passive actors as smart agents of change.

In order to overcome the shortcomings of the current policies and processes, a 'Smart Slum Upgrading Program' is envisioned which converges the existing agendas and is activated using a strategic framework. It is formulated as an evolutionary process of change that revolves around the idea of co-creation and enabling people to become smart citizens. A strategic framework based on people's values and daily systems is expressed through the design of a spatial framework and finally operationalized using phases of transformation. A collaborative stakeholder engagement is developed to provide the right to the city for the marginalized groups. This project presents a people-centric approach towards informal area upgradation to integrate them within the smart city model and achieve socio-spatial justice.

Keywords: informality, smart city, inclusive development, collaborative approach, socio-spatial justice, Thane, India

1 Introduction

1.1 Introduction

The global processes in the post-colonial era has exposed to new forms of disparities, spatial inequality, and the formal and informal ways of urbanization. A contemporary urban imaginary among this is the concept of smart city that has been adopted worldwide with a wide range of blurred definitions. This mainly vary in their application and understanding in the Global South due to the existing urbanization processes

Informality is an inevitable part of development in the Global South. As defined by Roy (2005), "informality as a state of exception from the formal order of urbanization" and how it can be viewed as a "mode of urbanization" can help us derive a possible way to look at future of cities. Within the context of informality, this project intends to look at the informal settlement areas which are tackled using several redevelopment and upgradation strategies but tend to have its own shortcomings.

With the constant efforts of new schemes of urbanization in India, the Smart City Mission holds a new digital turn that can potentially empower its citizens in order to shape the city in a more inclusive manner. However, currently the imposition of this mission has been mainly a top-down approach that results in eviction of the informal practices and settlements for city beautification and other purposes.

The research project sets out to define the idea of smart within the context of informal settlement. This project will result in a strategic framework for the specific case of Thane, Maharashtra, India which is an adjacent city to Mumbai and belongs within the Mumbai's Metropolitan region. This city has slums over 50% and needs to integrate it well within the upcoming smart city. The smart city model which has been adopted from the West needs to adapt to the Indian context in order to successfully implement policy transfer and avoid forming splintering landscapes of spatial inequality. The thesis attempts to modify the smart city mission into an inclusive and just city program with the access to the right of the city specially to the marginalized.

1.2 Motivation

Growing up in India, I got interested in understanding different urbanization processes which contribute to making a city liveable and equitable. The growing inequalities in the Global South region often made me question the challenges of informality which is prominently present and forms an integral part of our daily lives. From the morning breakfast vendor that is located around station areas to the housemaid that arrives from the informal settlements, there is a large role of the informal sector that facilitates the economic development of a developing nation. These people and settlements are under the constant pressure of evictions and lack socio-spatial justice that is offered to them by the city.

In recent times, Western adopted schemes like the Smart City Mission has come into limelight which interested me to discover more about it and how an ICT-driven city can transform the future. The definition of smart is not entirely defined and is said to differ from city to city and country to country. Understanding the Indian context where there is lack of basic infrastructure for everyone, it is important to define smart in a more humanitarian manner and giving fair opportunities to grow and become part of the smart urbanization. My main motivation lies in having "right to the city" to all its citizens and curb segregation and fragmentation in future city fabrics. I am driven by the need to achieve fairness, inclusion and socio-spatial justice in the development of cities.

Fig. 2. Dhobighat in Mumbai
Source: https://cstep.medium.com/sustainable-urban-planning-to-counter-pandemics-5d820fa9b2af

2 Informal Urban Development

2.1 Informal Urbanization

Global urbanization is occurring at a rapid pace. This has changed the way population and resources are distributed across in the world. The developing countries have a higher rate of urbanization observed than the developed countries. This has resulted in urbanization being perceived as a both a solution and a problem for the countries in the Global South, such as in Central and South Asia, Latin America, and Africa. According to the United Nations, 68% of the world's population is expected to live in urban areas by 2050. Several decades ago, the largest urban agglomerations were mainly concentrated on developed countries, located in the Global North. However, this has changed and presently, the largest and fastest growing cities are located in the Global South. The inflating urban population in the cities has been mainly due to the continuous migration of inhabitants from rural to urban areas, seeking a better quality of life and employment opportunities.

Throughout the world, the distinct urban agglomerations have a huge diversity of type of settlements and their location within it. Overall, the continuous globalization and urbanization process has been increasing inequalities worldwide. The tensions created due to inequality extend beyond the economic aspects and have consequences on the spatial, social and political configurations of the society. One such direct manifestation of this urbanization in this era is the emergence of informal settlements, especially in the Global South. Nearly 60% of these informal settlements are found in Asia, anticipated to have maximum increase and pressure from urbanization.(Refer to Fig 3) Beyond the academia, these informal settlement have captured the attention of a number of concerned government and organizations. The UN-Habitat report on slums, issued in 2004, is one of the most prolific papers produced as a result of this interest. It describes four major patterns of urban population growth that have contributed to the establishment of informal settlements (UN-Habitat, 2004)

- Rural-urban Migration

- Natural Growth

- Combination of natural and migratory growth

- Population displacement due to armed conflicts, internal strife or violence

These sorts of informal settlements are especially important in emerging cities because they shelter a huge number of urban poor who do not have direct access to the formal housing market. (UN Habitat, 2003). As a result of natural and migratory growth, this sort of informal settlement is most common in India. Several causes have been given by UN Habitat and other experts (Tunas, D., 2008), the most important of which are:

- Long-term attitude of laissez-faire, from city authorities to land acquisition and abuse of building codes

- Unable to serve the poor in urban areas where housing and land markets are growing rapidly.

- Political inertia, which has allowed informal settlements to expand to such an extent that existing infrastructure and formal services cannot meet the demands.

- Tunas (2008) has also argued that, in many cases, city officials often tend to turn a blind eye to informal settlements due to lack of financial support and expertise. Building low-income social housing in developing countries is often a difficult process that requires large-scale investment, motivation, and engagement of the various stakeholders with their own agendas.

No data 0 1 million 5 million 10 million 25 million 50 million 100 million 150 million 200 million
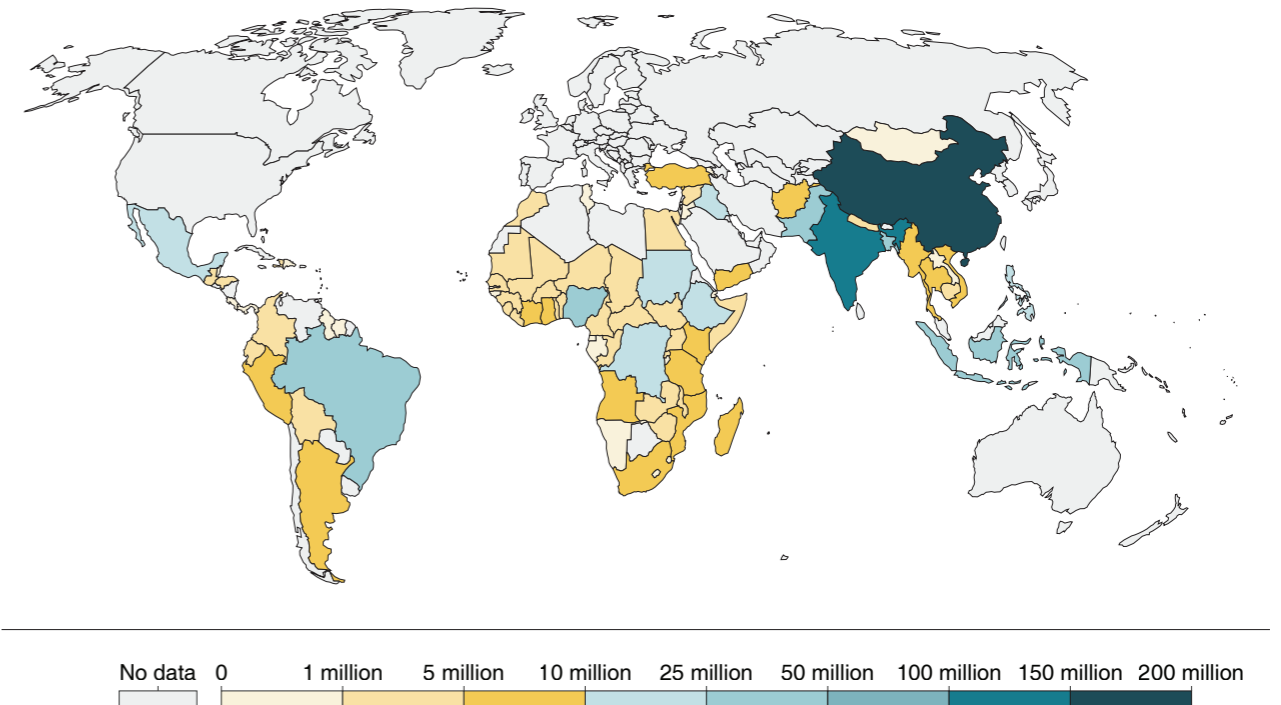
Fig 3. Urban population living in slums, 2014
Source: OWID based on World Bank, World Development Indicators

Latin America & the Caribbean
13%

Sub-Saharan Africa
25%

ASIA
61%
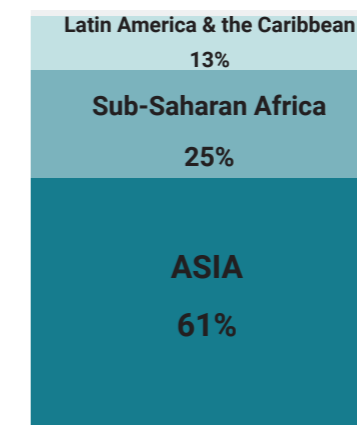
Fig 4. Proportion of slum in the world
Source: World Urbanization Prospects, UN Habitat, 2014

Defining Informality

As defined by the Habitat III Issue Papers #22, 2015,

"Informal settlements – are residential areas where

1) inhabitants have no security of tenure vis-à-vis the land or dwellings they inhabit, with modalities ranging from squatting to informal rental housing,

2) the neighborhoods usually lack, or are cut off from, basic services and city infrastructure and

3) the housing may not comply with current planning and building regulations, and is often situated in geographically and environmentally hazardous areas.

In addition, informal settlements can be a form of real estate speculation for all income levels of urban residents, affluent and poor. Slums are the most deprived and excluded form of informal settlements characterized by poverty and large agglomerations of dilapidated housing often located in the most hazardous urban land. In addition to tenure insecurity, slum dwellers lack formal supply of basic infrastructure and services, public space and green areas, and are constantly exposed to eviction, disease and violence."

These terms are used quite interchangeably in many countries and also used by alternative words such as shanties and squatter settlements.

In contrast, the "formal city" is recognized by the state. The lack of recognition from the state gives rise to the informal development and the formal city embraces the rules and regulations of the governing body. The two types coexist and one is a resultant of the phenomena of "informality". "Informality" extends out to both the urban rich and the poor. As defined by Roy (2009), it is essentially a state of deregulation, where the usage and purpose of land cannot be mapped as per any law regulations. Hence, it can be claimed informality is the mode of production of space that connects the divided

geographies of the slum and suburb (Roy, 2011). In sum, the formal city plays an essential role in the existence of the informal settlements, connected through the concept of "informality"

This research aims to deal with the informal settlement located within the city.

In the next sections, we understand informality in India and how it has been addressed over the years in different developmental schemes.

Fig 5. Informal Settlement in Bandra, Mumbai
Source: Reddit

2.2 Informality in India

To understand the idea of informal settlement in detail, the research explores the dynamics of informal settlements and their relation to the city in India.

India is growing at an unprecedented rate. As one of the densely populated countries in the world, India faces a major challenge of lack of the space in the ever-growing urban centers. India's urban population is projected to increase from 377 million in 2011 to 594 million in 2036 – a growth of 57% (The Wire, 2020). A major reason for this is considered to be high rate of rural-urban migration and the city's natural growth which constantly adds pressure to house them in urban areas.

Metropolitan cities in India, especially Mumbai display a large proportion of its urban composition as informal settlements (Refer to Fig 6) In order to understand urbanization process in India and its structure of informal settlements, it is necessary to explore urbanization through both micro and macro scales.

In India, the formation of informal settlements and slums takes place in inner city areas and the periphery of urban areas due to mainly lack of affordable housing and proximity to employment opportunities. According to the 2011 Census of India, there has been a growth of 37% of households living in informal settlements over the past decade.

Cities in the India are considered its engine of country's growth. However, poor living conditions affects productivity and human capital development. Ananya Roy has explored a more nuanced element of the state's incapacity to provide basic housing and services (Roy., 2009). She contends that the informality prevalent in the Indian planning system and institutions contradicts it's goal to address the issue of informal settlements in India (Roy, A., 2009). This argument is strengthened by the fact that these places are no longer only a source of cheap labor, but also a source of economic productivity (Nijman, 2015). Although it is not feasible to compare all

informal settlements because they have various social, economic, and geographical characteristics. As a result, finding a template that epitomizes the informal settlement typology in India is impossible.

Although, the cities might represent a space for opportunities, innovation and integration, they can also become areas of deprivation, marginalization and exclusion. Hence, the challenges of future urbanization are to achieve new ways of development, that could tackle the problems of life and growth of the city. This study, on the other hand, will look into a homogeneous informal settlement to better address its issues.
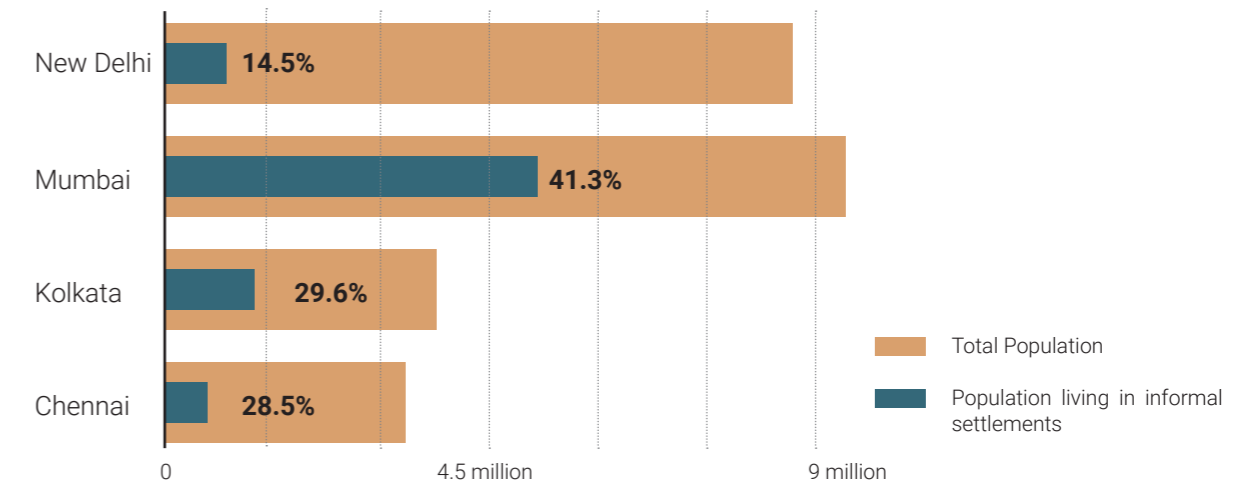

Fig 6. Percentage population of informal settlements in Indian Metropolitan cities
Source: Indian Census, 2011
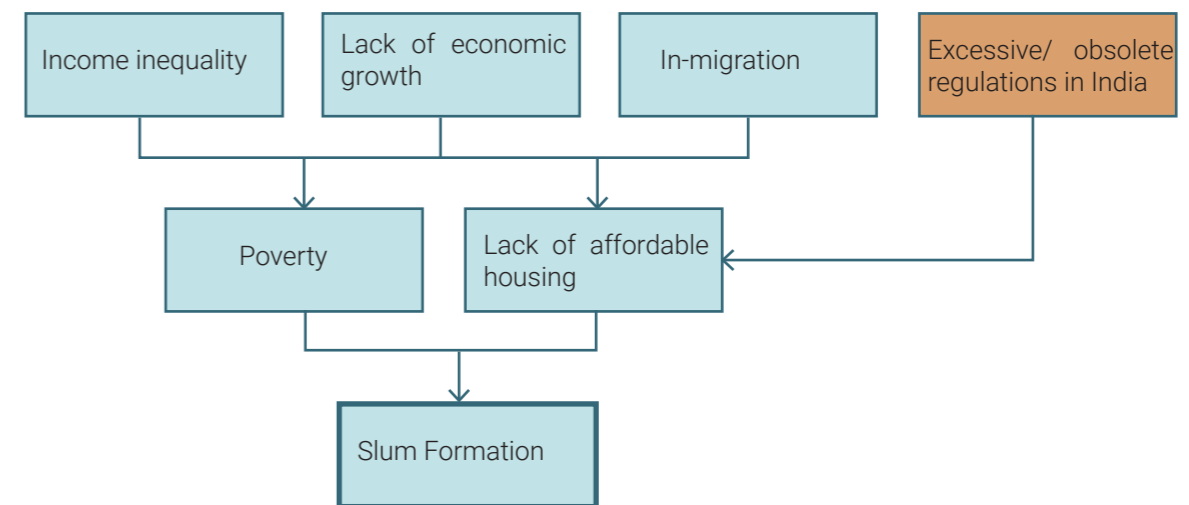
Fig 7. Inequality, Poverty and Slum Formation (modified in India)
Source: UN-Habitat (2003), Challenge of slums

2.3 Urban policy and planning in India

India is a young democratic country that has been adapting itself with several schemes to deal with the rapid urbanization in its cities. Post- independence till 2011, there are broadly three periods in which the course of India's urban policy can be classified (Batra, 2009, as cited in Bhattacharya et al., 2015).

The first phase between 1st to 3rd Five Year plan (Refer to Fig 8) were mainly towards housing provisions, slum clearance and rehabilitation which turned out to be a fragmented approach towards urban development. The master planning approach during this time resulted in expensive and low-density urban settlements.

The next phase from 4th to 6th Five Year Plans was moving away from slum clearance towards slum improvement and upgradation. The plan emphasized more on "balanced regional development and development of small and medium towns, while containing the growth of metropolitan cities, making land available for provisioning of services and urban poor housing, and control of land prices" (Bhattacharya et al., 2015). The postcolonial urban development policies dealt with the slum by either resettlement or upgradation which both resulted in an uninformed situation for the slum dweller itself. Slum rehabilitation through private developments emerged as a market-driven approach due to the changed political attitudes with the neoliberal economic reforms of the early 1990s.

The final phase i.e. from 7th to 11th Plan was accompanied by India's economic liberalization and a policy shift in urban sector was observed. "Some key developments during this period included the opening-up of the sector to private participation, participatory approach in city planning, strengthening the link between urban growth and economic development and employment generation. An agenda for decentralization was pushed through the 74th CAA, seeking greater accountability for ULBs" and municipalities (Bhattacharya et al., 2015). In the 1990s, the

Slum Redevelopment Scheme and then the Slum Rehabilitation Scheme were introduced. The latter scheme encouraged private builders to clear lands classified as slum and build high-rise buildings in which each family received a 225-square ft. unit. In exchange, the developer gets valuable 'transferable building rights' (TDR) on public land. Such schemes have led to a boom in land scams, corruption, and a toxic developer-government nexus. In addition, the quality of housing produced through this has been terrible and quickly deteriorating due to additional maintenance costs that cannot be afforded by the tenants. "Redeveloping 'slums' into high-rise residential housing will not magically turn the 'informal' into 'formal', nor will it bring social justice and equality.

And it will certainly not transform socially marginalized and economically weak populations into middle-class citizens." (Echanove, 2013) There needs to be an alternative paradigm to systematically upgrade and improve the livelihoods of the marginalized people.

In order to fast track the urbanization process, the changed financial regime, urban reform, and the desire to make cities 'world-class', India launched schemes like Jawaharlal Nehru National Urban Renewal Mission (JNNURM) in late 2000s. It had planning tools such as the City Development Plans which lacked to effectively link city growth plans to its spatial character. Also, the "use of template-based and over-simplified retrofitting city growth models resulted in less contextualized plan targets and generalized strategies" (Bhattacharya et al., 2015) leading to fragmented implementation and not achieving key agendas.

These plans look at how the informal development is addressed through policies and spatial planning and how it has evolved overtime. It has moved from being more neglected towards being more inclusive and participative in nature.
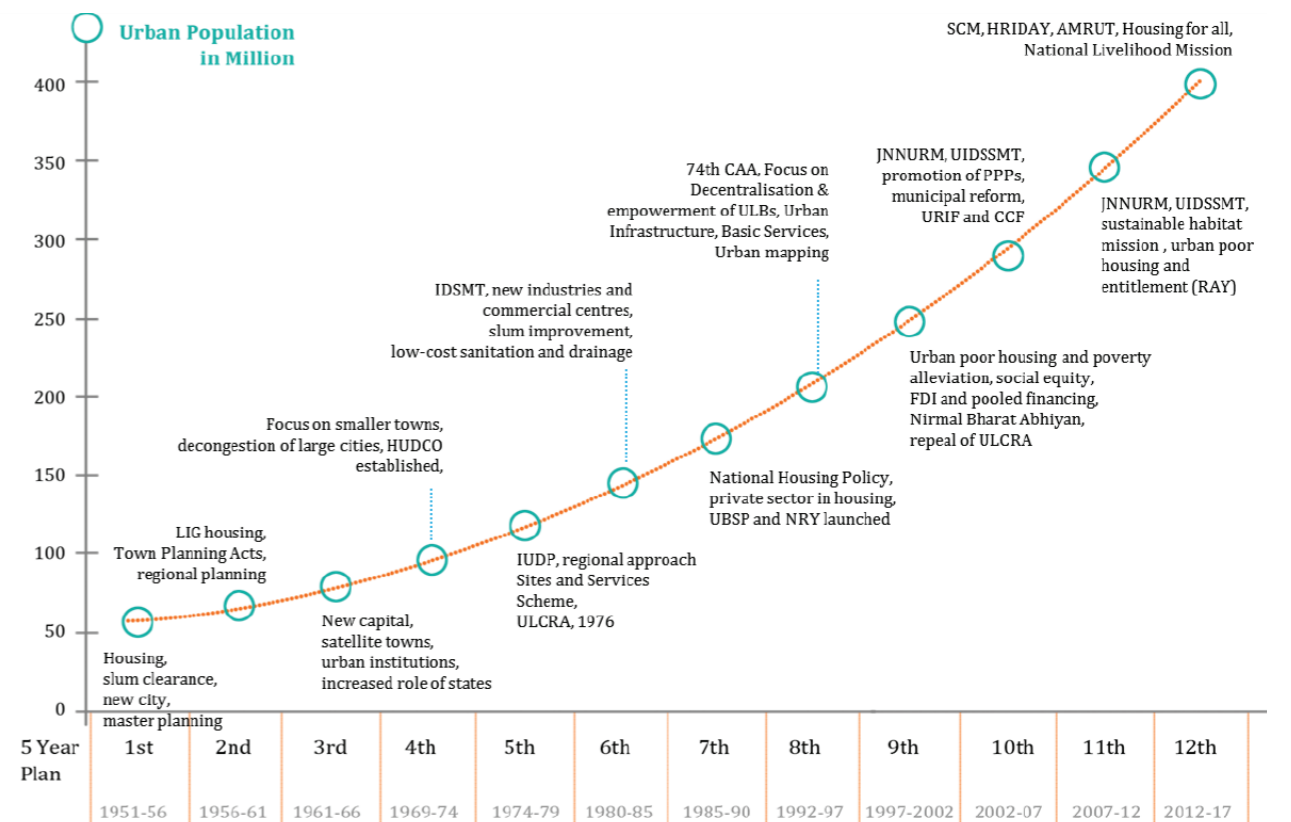
Fig 8. Urban-related Development Focus in India's Five Year Plans
Source: Bhattacharya et al., 2015

However in 2015, with the new government taking position, they decided to introduce a bunch of new policies for urban development. The largest scheme was the Smart City Mission (SCM) by Government of India to create 100 smart cities in five years (by 2020) in order to improve quality of life in Indian cities. The SCM guidelines does aim to bring some convergence with other government schemes such as:

Atal Mission for Rejuvenation and Urban Transformation (AMRUT): An urban renewal programme targeting 500 cities in the country with provisions for upgradation and creation of physical infrastructure such as water supply, sewerage, drainage, transport, and green spaces.

Pradhan Mantri Awas Yojana (Housing for All– 2022): A scheme that aims to provide housing for EWS and LIG, with a target of 20 million houses in urban areas and 30 million houses in rural areas by the year 2022. Swachh Bharat Mission (SBM), HRIDAY, Digital India, Skill Development, and others.

In the next chapter, we will understand the concept of Smart City and its adaptation in India as well as how it is addressing the existing informal development within the city.

Fig 9. Smart City Depiction
Source: https://www.syrma.com/smart-cities/

3 Smart City Mission

3.1 Smart City: An urban imaginary

Urban imaginaries have defined the way to transform cities and envision the development in a certain way to redefine the future of cities. One such phenomena that has been emerging all over the world has been the idea of "Smart City".

Origins

The concept of the smart city has grown popular among academicians and policy documents in recent times, however it is not so new. It originated from the 'smart growth movement' in the late 1990s (Bollier, 1998) in the USA. The phrase got more recognized after being adopted by several global technological companies such as IBM, Cisco and Siemens for the application of information communication technology (ICT) for managing urban infrastructure and services. Since then, it has evolved to mean almost any form of technology-driven innovation in urban management, planning and operation of cities.

The best examples of retrofitted existing cities to become smart city include Barcelona and Amsterdam, as well as complete greenfield projects such as the Songdo in South Korea which a high-tech smart city and world's largest private real estate development.

All six significant aspects associated with a smart city, namely smart mobility, smart economy, smart living, smart governance, smart people, and smart environment, are supported by Smart City Infrastructure. On the other hand, smart infrastructure components are context-specific, and their nature is dictated by the cities' level of development and special developmental issues.

Smart Cities, such as Songdo, Barcelona, and Lake Nona, use information technology, network communications, including the Internet, and sensors to automate routine processes and provide rapid and intelligent decision-making in existing functions and procedures, which results in improving efficiency and cutting costs. Smart Cities bring governments and citizens closer together. They provide the infrastructure needed to deliver new services and handle various urban issues, including environmental sustainability, job creation, and economic growth. (Sarkar, 2017)

A smart city can be defined in various ways, including sustainable, livable, intelligent, and green. Access to data and intelligent technologies to connect information and people to drive change appears to be the most common among all the ways.

The essential layers of smart city planning and development are depicted in the diagram below. A smart city's ICT infrastructure is its foundation. It is the foundation upon which all other components are built. High-speed wired and wireless network connectivity, high-end data centers, physical space enrichment with smart devices, sensors, actuators, and more are all part of the ICT infrastructure. The creation of strategic connections between various sections of a public sector organization is facilitated by the e-governance layer. This layer develops policies, rules, and legislation to help government agencies work better and provide potential advantages to residents. Various public services will be given to people and other stakeholders efficiently and effectively, regardless of the infrastructure and rules created at the e-governance layer.

In the West, the focus of smart city initiatives has always been on improving efficiency, sustainability and security. On the other hand, the adoption of smart city initiatives by developing countries focuses more on driving modernization and development of infrastructure. The goal of the development is to incorporate technological advances within urban planning agencies and cleaner production initiatives in order to offer innovative, effective solutions to

Fig 10. Top 100 words representing the smart city literature, identified using a topic modeling method.
Source: Lim et al. (2018), Smart cities with big data: Reference models, challenges, and considerations

existing problems and thus improve the quality of life in cities The Smart City Mission implementation has remained doubtful and fragmented and even varied and mixed. Initially, it excited and created an impression in the mind of people that turned too good to be true. It was separated from the reality and needs of the people and lacked planning and execution. In the Indian context, the smart city concept turns out to be unclear and indeterminate because of complexity and variability of the cities.

Since no definite meaning of the smart city exists, implementing schemes and plans for the same turned out to be an non-smart move. The framework of the smart city looks good on papers but in a competitive and time-bound system, most guidelines appear vague and often ignored in the name of the greater good, causing aberrations to

the Smart City concept itself. Given that the Smart City Mission is a futuristic initiative, its dedication to increasingly concrete issues such as climate change and deterioration of the environment is limited. The vocabulary and tradition of making fair and right-based urban planning and design decisions has also been lost over time, and the future of the ' citizens ' in the smart cities looks bleak if it persists on the existing tracks.

3.2 Indian Smart City Mission

Evolution of Smart City in India

Early visions (2000-2009)

As we saw in the previous section, in the late 1990s and early 2000s, the smart city concept emerged due to e-governance movements and partnership between technology companies and governments in Europe and United States. (Coe et al., 2001, as cited in Hoelscher, 2016). The best examples of retrofitted existing cities to become smart city include Barcelona and Amsterdam, as well as complete greenfield projects such as the Songdo in South Korea which a high-tech smart city and world's largest private real estate development.

In India, a shift towards urban e-governance was taking place in the early to mid-2000s. Information and communication technologies (ICT) based solutions were offered to ULBs and municipalities by companies such as Samsung and Siemens to improve governance delivery practices, citizen participation, accountability, and transparency.

Proliferation of smart city imaginaries (2009-2014)

Instead of developing further the e-governance initiatives, the smart cities meant more of an infrastructure-led growth which involved building new/ greenfield cities to promote industrial settlements and Special Economic Zones (SEZs) for an industry-led urban growth and new urban spaces for emerging populations. Along the Delhi-Mumbai Industrial corridor (DMIC) in 2007, two greenfield cities I.e. Dholera and GIFT City were the first smart cities in India in the state of Gujarat. This process of new industrial towns and entrepreneurial urbanization (Datta, 2015) focuses on the economic driven growth, formulates explicit polices on urbanization and actively implements this new established discourse. This falls under the Special Investment Region (SIR) Act which was passed in Gujarat as a solution to develop large-scale development projects which are ideally industrial towns which have been tied with the smart cities discourse.

100 new smart cities' (2014-2015)

With Modi becoming the Prime Minister and taking lessons as Chief Minister of Gujarat earlier, the smart cites sees a new discourse from being as SEZ for global investment for the urban elite to become more inclusive projects within existing cities. This was due to realization that 100 'new' smart cities were not feasible, affordable and politically possible. The shift in discourse tried to be engaging with more citizen participatory tools using the ICT and promote more 'inclusiveness' by involving marginalized groups. However, mechanisms of citizen engagement was poorly defined, and the idea of technologically driven urban growth remained for the smart city with the location being the existing cities.

Smart City Mission (2015 – today)

The Smart City Mission (SCM) was launched in June 2015 to develop 100 smart cities with a funding of 4800 crore rupees (USD700 million) over the period of five years. The cities were chosen in a competition and revealed in about 4 rounds. The SCM started getting inclined towards its strategic goals which was mainly improvement in existing cities: city improvement (retrofitting), city renewal (redevelopment) and city extension (greenfield development) (GoI, 2015). As compared to earlier guidelines, the new SCM guidelines states that 'core infrastructure elements' and 'affordable housing, especially for the poor' and the cities will be evaluated on inclusiveness and how the poor with be benefited (Hoelscher, 2016). However, this kind of development involves mainly the private sector or international organization for funding, that needs investor returns coming through commercial development and charging fees for services. Hence, the actual implementation of basic infrastructure and housing for the poor does not get realized due to the lack of investment returns in this kind of development. Another target of SCM is to have an inclusive citizen participation in planning processes. However, it has been setup at a national level platform such as the mygov.in which is a very large platform for a country so big and needs to be divided in further state and municipality level to truly incorporate the citizen voices. Also, the lack of access to internet and digital technology all over the country further marginalizes certain groups who cannot get access to 'right to participate'.

Existing areas (retrofit and redevelop), including slums, will be transformed into better-planned areas through area-based development, improving the city's overall liveability. New spaces (greenfield) will be constructed around cities to accommodate the growing population in metropolitan areas. Smart Solutions will allow communities to improve infrastructure and services by combining technology, information, and data. This comprehensive development would improve people's quality of life, create jobs, and raise incomes for everyone, including the poor and disadvantaged, resulting in inclusive cities.

The strategic components of Area-based development in the Smart Cities Mission are city improvement (retrofitting), city renewal (redevelopment) and city extension (Greenfield development) plus a Pan-city initiative in which Smart Solutions are applied covering larger parts of the city.

Fig 11. Smart City Logo
Source: Smart City Mission India

Fig 12. Smart City Strategies in the Indian Smart City Mission
Source: Smart City Mission India

Fig 13. Approach for Smart City Development in India
Source: Bhattacharya et al., 2015

Fig 14. The 100 Cities selected under the Smart Cities Mission
Source: Maps of India

Smart City Features

In order to create an urban transformation, the Smart City Mission focuses upon two strategies i.e. the a) Area-based strategy and b) Pan-city initiative.

The area-based strategy has three components:

a) Redevelopment (City renewal)

b) Retrofitting (City improvement)

c) Greenfield (City extension)

The pan-city initiative promotes application of smart city solutions to larger parts of the city or to the entire city so that maximum citizens are benefited. These smart solutions could range from e-governance to waste management, or intelligent traffic management among others.

In the approach to the Smart Cities Mission, the objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions. The focus is on sustainable and inclusive development and the idea is to look at compact areas, create a replicable model which will act like a lighthouse to other aspiring cities. The Smart Cities Mission of the Government is a bold, new initiative. It is meant to set examples that can be replicated both within and outside the Smart City, catalyzing the creation of similar Smart Cities in various regions and parts of the country.

As per the Indian Smart City Mission strategy states the following:

"The core infrastructure elements in a Smart City would include - adequate water supply, assured electricity supply, sanitation, including solid waste management, efficient urban mobility and public transport, affordable housing, especially for the poor, robust IT connectivity and digitalization, good governance, especially e-Governance and citizen participation, sustainable environment, safety and security of citizens, particularly women, children and the elderly, and health and education."

Some features of development are given below:

1. Planning for unplanned areas, mixed land for better flexibility and efficient use.

2. Affordable housing for all.

3. Improve walkable localities, air pollution, refurbish road for cyclists and pedestrians and ensure security with local administrative services.

4. Promote eco-balance with preserving and developing open spaces with parks, playgrounds and recreational facilities to reduce urban heat.

5. Promote Mass transport options like Metro Rail, highways, public transport etc.

6. Making cost effective and friendly governance through online services on mobile apps to monitor implementation and get timely feedbacks.

7. Giving identity to the City based on its main economic activity with local cuisine, arts, craft, culture, furniture, sports etc.

8. Applying smart solutions to provide better infrastructure, cheap services, adaptability to face any disaster, use fewer resources for area based development.

3.3 Criticism of Smart City

Barriers to Smart City Development in Developing Countries

- Budget Constraints and Financing Issues

- Lack of Investment in Basic Infrastructure

- Lack of Technology-Related Infrastructure Readiness

- Fragmented Authority

- Lack of Governance Frameworks and Regulatory Safeguards for Smart Cities

- Lack of Skilled Human Capital

- Lack of Inclusivity

- Environmental Concerns

- Lack of Citizen Participation

- Technology illiteracy and knowledge deficit among the citizens

(Tan & Taeihagh, 2019)

One of the major crises that physical urban planning is confronted with today is its inability to alleviate social issues such as poverty and exclusion (Healey, 2006, as cited in Echanove, 2013). Despite stating the idea of inclusiveness in the Smart City Mission guidelines, the smart city focuses on ICT solution which are mainly applied top-down. It rarely addresses issues of social differences in existing cities. Also, the implementation of actual smart city projects has led to "the displacement of informal groups from urban space, displacement and spatial segregation through land-use planning, reinforcing digital divides, gender disparities, and exclusion from the economic benefits of development" (Willis, 2019). The Smart City program and the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) scheme does mention in its objectives about upgrading slums and alleviating poor people, however in the spatial implementation of these

schemes, the effects are quite contrary and causing further gentrification. One of the biggest challenges is to incorporate the informality of the city in these developmental models. It is creating inequalities by causing 'enclave' based development that benefits private sector actors such as ICT companies and richer populations over others.   In the strive to accomplish 'world-class' status for India cities through their slum-free propaganda, the evictions or resettlement of slums are not just about reducing poverty but rather deeming the poor as invisible.

The Smart City Mission mainly focuses on 'Area-based Development' (ABD) where the majority of the funding is reserved for a small area within the city. The idea was to develop certain areas as prototype projects within certain time and rest of the city will follow. However, this process of ABD could result in severe inequalities due to studies that indicate that over 80% of the city's SCM budget is being spent over ABDs that are about 2-7% of the entire area of the city. Rest of the city has less than 20% of the city SCM budget. It is further argued that the selected areas within the chosen cities are already well-developed and better serviced which can potentially worsen the existing disparities (Anand et al., 2018). There is a shift of power away from local democratic institutions and more towards state governments. Further it is exacerbated through mainly private investments in the city-level SCM governing body which weakens the democratic processes.

There are two ways of denying right to the smart city through spatial segregation, and exclusion from citizenship participation and benefit from the smart city as well. The more planning fails to recognize informal processes, Roy (2009) argues, the more it contributes to the sense of crisis.

The acceptance of slums is denied as we can see in development plan of many cities in India, which leaves large patches of land blank and marking them as slum areas, making them unworthy or not being entitled to be mapped. Several cities are evicting slums, informal traders in the name

of beautification of the city or 'cleaning' the city. Willis (2019) in her paper looks at how through automation and privatization of urban services, it drives out low paid and informal labour force; and through cleansing and expulsion from the street space of street hawkers by using a case study of city of Chennai in India. The idea of smart cleaning was also adopted by cities like Chandigarh which sold an imagined idea of sanitized city for the social and political elite, thereby widening the gap between the smart citizen and the subaltern citizen (Datta, 2018). "The persistent failure of planning or the splintering of cities through the privatization of planning all seem to be convincing and adequate explanations for the crisis that is the Indian city" (Roy, 2009). The failure of delivery of Smart city in an Indian context is due to the digital technologies that could not solve urban challenges and fail to enable local knowledge to better integrate them in the smart city planning. This needs to be changed by having a more inclusive and equitable approach towards planning for the smart cities.

Following the liberalization of the Indian economy in 1991, there has been a significant shift in the country's housing laws and attitude to urbanization. National policies shifted from a mixed-socialist and heavily controlled economy in the 1970s to a free market system in the 1980s. This shifted India's attitude toward urbanization, which is now considered as an opportunity by the Indian government (Express, I., 2016), with policymakers considering it as a means of alleviating poverty. In the post-globalisation and neoliberal period, India's approach to informal settlements has likewise grown increasingly reliant on the "market" and local "self-help" organizations (Nijman, J., 2008).

The combination of changes in national economic policy and attitudes toward urbanization in India has highlighted a polarizing distribution of space – the presence and rise of informal settlements (with services, infrastructure, and shelter quality), which has been aided by the new format of rehabilitation and redevelopment policies (Nijman, J., 2008).

Policies aimed especially towards informal settlements are increasingly driven at the state and local levels rather than at the national level, making them more vulnerable to market pressures. A more direct influence on informal settlements, which is particularly noticeable in Mumbai, is the reformation of local politics and cultures, with a concentration on community groups and non-governmental organizations (NGOs).

This new approach to informal settlements in India presents a paradox, with on the one hand a reliance on smaller organizations and NGOs, and on the other a political culture that is strongly pro-growth with limited tolerance for informal settlements, especially in urban areas with intense competition for land (Nijman, J., 2008).

Out of the several criticisms towards Smart City Mission, the ones that will be highlighted in the project will be the issue of inclusivity and citizen participation. This will be problems that will be targeted towards improving within this research and design.

"From lack of infrastructure to concentrated poverty, megacities—urban areas of 10 million or more people—present significant challenges for any local government. Concerns over social inequality have also long been a fixture of the discourse around megacities, especially so in India where there are six such metropolitan areas amid a culture defined by the hierarchies of the caste system. At the moment, however, the issue of urban exclusion in India is now coalescing around that nation's burgeoning smart city movement." (Assink, 2017)

"Without hard work and attention to justice, this model could end up excluding those who would most benefit from it, or worse, divert funds from other distressed places. In India's rush to transform, build, and even engineer entire new cities, critics are right to raise concerns about citizenship and access." (Assink, 2017)

Fig 15. Worli Koliwada - Fishing Village, India
Source: Envato Elements

4   Problem Premise

4.1 Problem Analysis

One of the most significant criticisms of Smart City is the exclusionary nature of the program. Although the smart city program does have inclusion as part of its plan on paper, the effect of the chosen projects has resulted in the exclusion of vulnerable groups. As we can see from Figure 16, among the different definitions for smart cities, there is low weightage assigned to aspects of equity and resilience. This signifies a lack of effort to include marginalized and vulnerable groups within the smart solutions for the city's development plans. (Bhattacharya et al., 2015). Several characteristics of the smart city program have contributed to exclusion, such as selective target group, gentrification, Improper usage of funds, and a top-down approach in execution are discussed below.

Smart cities are mainly being projected as the epitome of India's educated citizens' aspirations. It is feared that it will lead to non-inclusive developments; smart cities will meet the requirements of only the educated middle class and their aspirations, and there will be profitable real-estate ventures in the form of restricted enclaves. Opportunities for marginalized groups will not be created in such an urban environment as it may not yield economic returns.

The current way of adopting a Western smart city model has concentrated on area-based development. It has resulted in spending the majority of the budget on this, which has caused gentrification of these areas and further causing inequalities. Also, the lack of access to the internet for the poor in the majority of the cities has resulted in a selective citizen engagement. It disables the marginalized group from having a say in the decision-making process. HLRN (Housing and Land Rights Network) research indicates that forced evictions occurred in 28 of the 100 'smart cities' being developed across the country.

The development proposals of the selected smart cities tend to spend a significant part of the funding ranging from 70-90% for a relatively small area with about 4% of the entire city's population. But India's drive to overhaul its cities to accommodate a growing population of migrants will force tens of thousands of people from their slum homes as city planners spruce up central business districts and build metro train lines.

Finally, there has been no consensus on defining the indicators for an Indian Smart city to date. This has resulted in a fragmented understanding of smart cities. Their implementation leads to further exclusion as it creates a lot of gaps and loopholes for exploiting weaker segments of society (Bhattacharya et al., 2015). The importance of integrating systems and the compatibility of frameworks on which a city functionally operates is largely missing in the definition of smart cities. This shows a lack of clarity in balancing sustainability constraints with a city's aspirational goals. Also, equity as an outcome of a sustainable city fails to mention and is often represented through the idea of 'people' in general. This partially indicates a lack of conscious effort to leverage the capabilities of smart attributes to include the marginalized and disadvantaged within a city's development plans. Overall, there is a sense of confusion between the end and the means. (Bhattacharya et al., 2015)
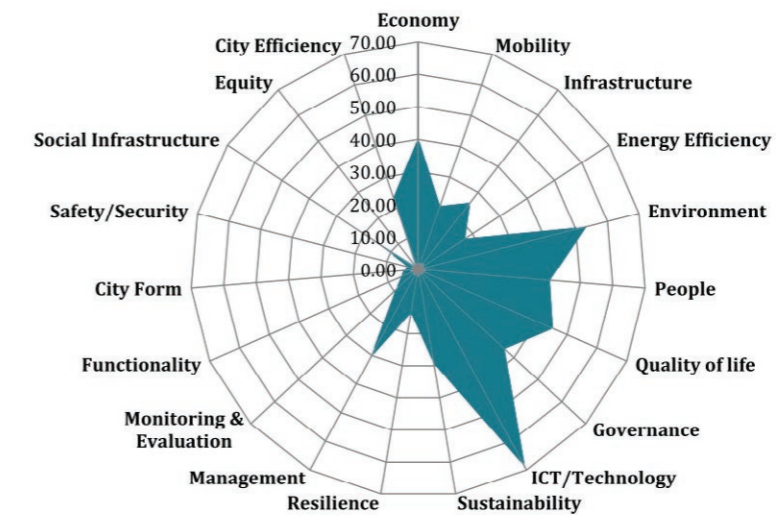

Fig 17. Definitions of Smart City in Literature as a Combination of Various Aspects
Source: Bhattacharya et al., 2015

Fig 16. Slum Eviction
Source: Daily Sun

Aimed at ending poverty, smart city project ends up hurting the poor itself

Globally, one in eight people live in slums where they face issues of durable housing, access to safe drinking water and toilets. In India, one in every six city residents lives in a slum

Rush for Indian smart cities 'ignoring poor and vulnerable'

14 Jun 2017
Joseph Flaig

Poor people and minorities risk losing out during India's Smart City Mission, says the report (Credit: iStock)

An "unseemly rush" to create 100 Indian smart cities is forcing people from their homes and destroying communities, experts have said.

'No place for the poor' in India's Smart Cities, campaigners say

By Rina Chandran, Thomson Reuters Foundation   3 MIN READ

Will India's experiment with smart cities tackle poverty – or make it worse?

January 27, 2016 2:04pm GMT

Wi-Fi but no water: Can smart tech help a city's poor?

By Sophie Davies, Thomson Reuters Foundation   6 MIN READ

Are smart cities excluding marginalized groups?

By *Emma Smith* // 26 February 2020

Urban Development   Innovation & ICT   Social/Inclusive Development   UN-Habitat

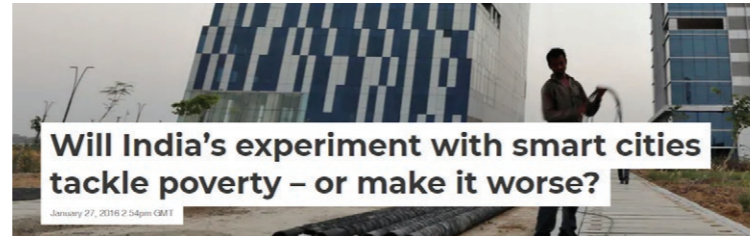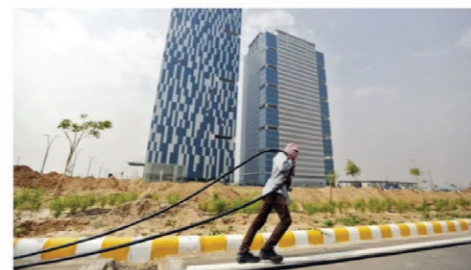A laborer at work in the smart city of Gandhinagar, India. Photo by: REUTERS / Amit Dave

Fig 18. News articles questioning Smart City Mission
Source: Thomas Reuters Foundation

While several Smart City Proposals cite many discussions held during their development, many of them were purportedly not participatory. People's engagement in developing Smart City Proposals, especially from low-income neighborhoods, has been tokenistic at best. While all of the chosen cities claim to have consulted with inhabitants, they primarily used online web portals, social media, and mobile text messaging services to determine citizens' priorities. As a result, members of marginalized groups who lack access to such technology have been generally excluded from these processes. It was only for a few focus group conversations in specific areas if they were involved. When a city's proposal addresses the creation of an informal settlement, the details of citizen engagement do not show that any efforts were made to interact with the communities that would be affected. In addition, appropriate information in terms of the dimensions of the mission was not provided.
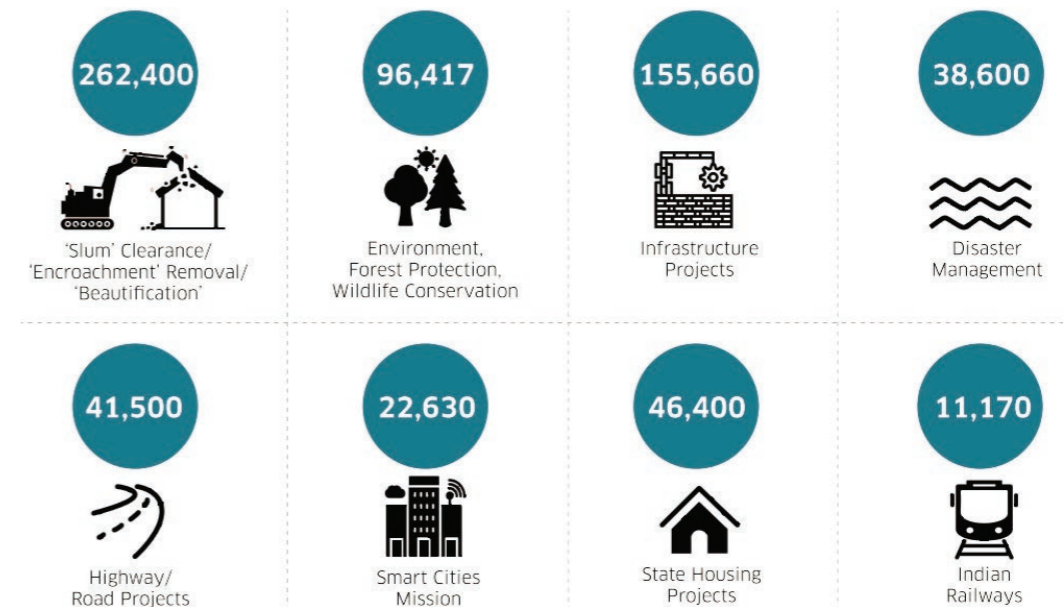
Other Reasons — 3%

'Disaster Management' — 7%

Environmental Projects and Forest/ Wildlife Protection — 17%

'Slum-clearance/ City-beautification' Drives — 46%

Infrastructure Projects — 27%

262,400 — 'Slum' Clearance/ 'Encroachment' Removal/ 'Beautification'

96,417 — Environment, Forest Protection, Wildlife Conservation

155,660 — Infrastructure Projects

38,600 — Disaster Management

41,500 — Highway/ Road Projects

22,630 — Smart Cities Mission

46,400 — State Housing Projects

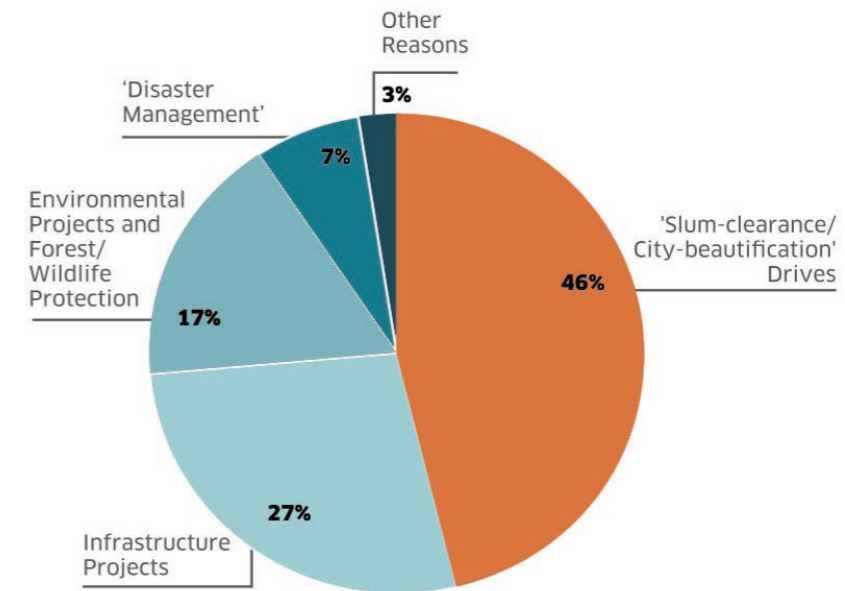**11,170** — Indian Railways

Fig 19. Reasons for Forced Eviction: 2017, 2018, 2019
Source: Housing and Land Rights Network, 2019

4.2 Problem Statement

India is experiencing a rise in the formation of informal settlements within its growing number of cities. However, it is in a state of neglect and despair due to the type of the solutions that are offered to these areas. Recent agendas such as the Smart City Mission, a proposal by the Indian government is a very much a state-driven top-down approach of urbanization process in India. It systematically excludes the informal settlements from the urbanization processes. The current redevelopment process does not involve the people, and their knowledge and needs in the planning system. There is a lack of integration between the government schemes and a shift of focus in developmental plans has led to different agendas being prioritized over others. An alternative mode of smart city development needs to be established to create a more inclusive and sustainable growth model of cities.

Under the impact of complex global processes of neoliberalism, a dominant smart urban imaginary based on economic agenda was able to perpetuate socio-spatial segregation and structural exclusion.

In spite of progress and attempts made towards improving the conditions of urban poor, inclusion of marginalized citizens in decision-making process still remains a major challenge leading to unsatisfactory outcomes from the projects.

Fig 20. Fragmentation between informal settlement and smart city
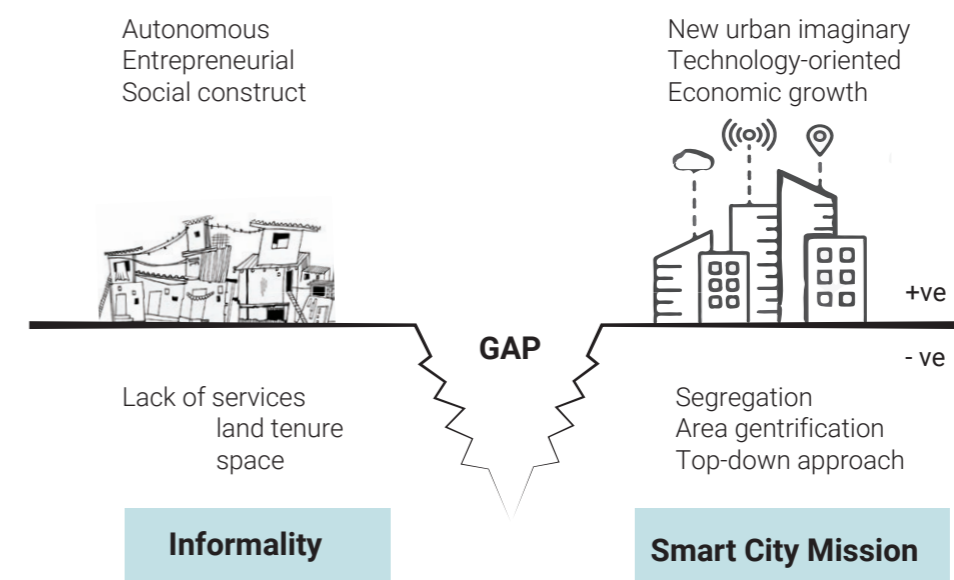
Source: VectorStock

Autonomous
Entrepreneurial
Social construct

New urban imaginary
Technology-oriented
Economic growth

GAP

+ve

- ve

Lack of services
land tenure
space

Segregation
Area gentrification
Top-down approach

Informality

Smart City Mission

Fig 21. Problem Summary
Source: Drawn by author

4.3 Research Aim

This graduation project will elaborate on a combination of top-down and bottom-up urbanization process through empowering the marginalized group and involve them in planning processes leveraging on the Smart City Mission perspective.

The project aims to propose an alternative development paradigm which redefines smart in an Indian context by involving the urban poor and community-based approaches to have an inclusive Smart City mission and allow a fair development all over the city.

It hopes to bring in a humanitarian perspective to the Smart city program and integrate informality within the city through systematic upgradation through innovative tools and processes, using the specific case of Thane city for a strategic design proposal.

Aim

To develop a collaborative planning process within the Smart City mission to gain right to the city for the marginalized groups. Inclusive policies and urban planning to empower the urban poor and integrate them better within the smart city model in Thane, India.

Objectives

- To achieve a collaborative planning model that combines top-down and bottom-up urbaniza- tion processes in vulnerable and marginalized areas

- To investigate smart city solutions that can incorporate and benefit marginalized groups fairly

- To develop effective mechanisms for fair citi- zen engagement of all and integrate informal- ity through endogenous development in the smart city model

- To redefine smart in a more Indian contextu- alized way and identify the existing smartness that lies within the citizens and communities
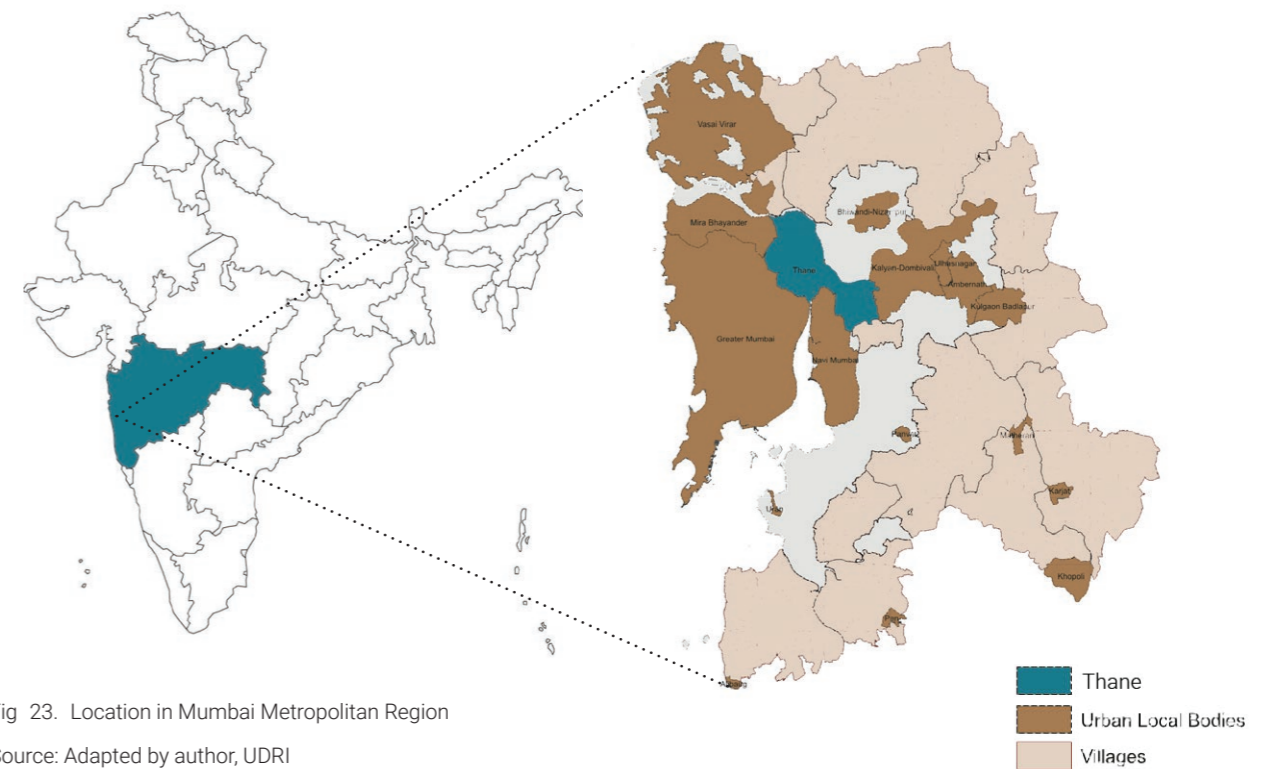
4.4 Case Study Area: Thane City

Fig 23. Location in Mumbai Metropolitan Region

Source: Adapted by author, UDRI

Since this graduation project targets at the low-income settlements in the smart city, the case study city of Thane is chosen to tackle this problem .It also has one of the highest observed percentage of the city's population living in the informal settlements which is above 50% as compared to other smart cities as seen in the table.
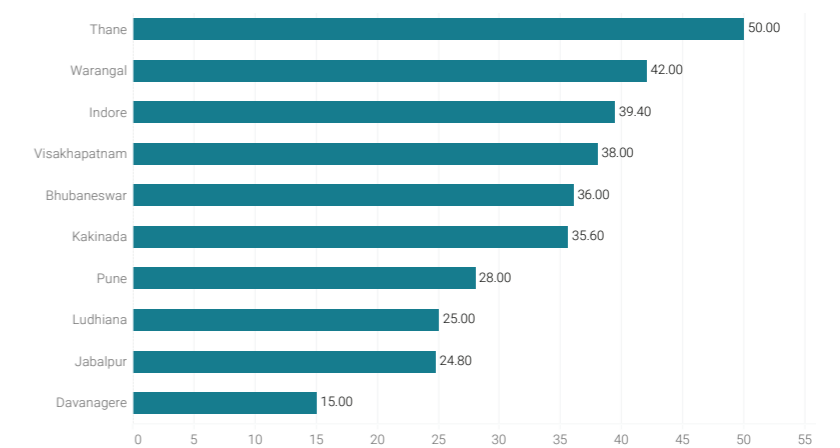

Fig 22. Percentage of the City's population reported to be Living in Low Income Settlements in Proposed Smart Cities

Source: Housing and Lands Rights Network, 2017

4.5 Research Questions

How can a **strategic framework** using **collaborative approach** help to **integrate informal areas** within the **Smart City Mission** to achieve an **inclusive and just** development of Thane city, India?

Sub research questions

Analyse	SQ 1	How have the urbanization process and urban planning policies, including the Smart City Mission, influenced social and spatial segregation and inequalities in the city of Thane?
Expose	SQ 2	To what extent do the current urban planning policies including Smart City Mission, meet the social and spatial needs of the dwellers of informal areas in Thane?
Propose	SQ 3	What are the effective spatial strategies and design principles for informal area in-situ upgradation?
Politicize	SQ 4	How can collaborative planning based on community-based self-organization in informal settlements help to build a more inclusive and just smart city of Thane?
	SQ 5	How can we judge the 'official' Smart City Mission and how should it be adjusted towards a smart slum upgradation program?

This project draws on advocacy, and critical planning approaches for examining existing oppressive patterns and developing alternative 'just' spatial planning systems. In Marcuse's critical planning theory, he posits four stages of social activism within the planning profession. (Marcuse, 2009)

Analyze, Expose, Propose, and Politicize.

The research questions will broadly correspond with these phases to produce radical solutions of engagement and inclusion. It facilitates collaboration and conversation between planners and marginalized communities and organizations, which push for the recognition of slum society and the empowerment of slum dwellers to demand their basic needs in the future.

Analyze includes identifying the context and the problem premise. Expose concerning analyzing the problem's roots and presenting that insight to those who need and can benefit from it. Propose, concerns engaging the affected individuals to generate concrete plans, programs, targets, and strategies to attain the intended outcomes. (Marcuse, 2009)

Critical urban theory can deepen the expose, devise remedies to the core problems revealed, and highlight the need for a politicized response. Politicize, concerns clarifying the political implications of what was shown and presented, and assist in organizing around the propositions through guiding action. Politicizing entails paying attention to organizational strategy as well as day-to-day politics. And, where appropriate, it includes directly supporting the group through media interventions.
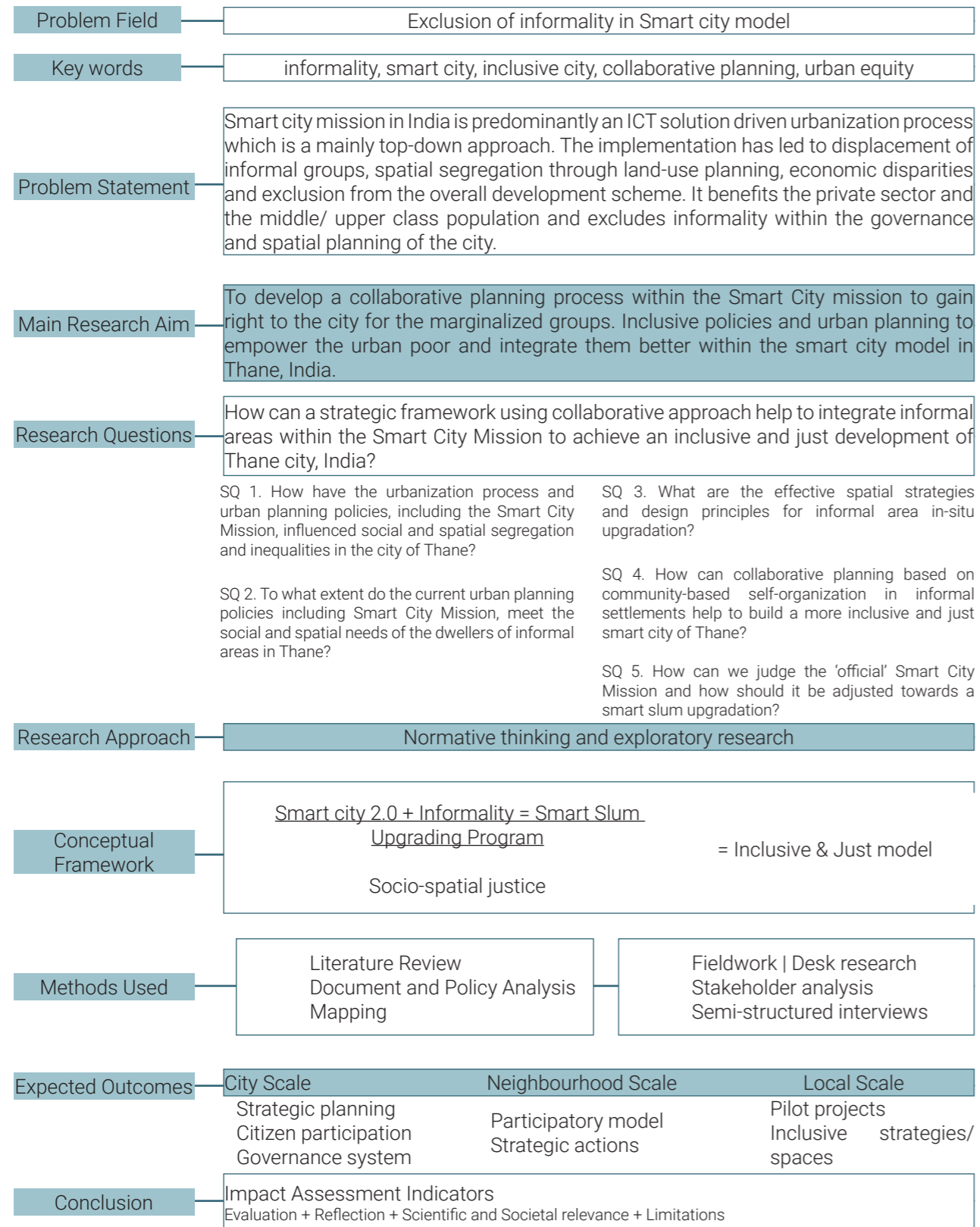
Fig 24. Dharavi Slum, Mumbai
Source: https://theculturetrip.com/asia/india/articles/dharavi-more-than-asias-largest-slum/

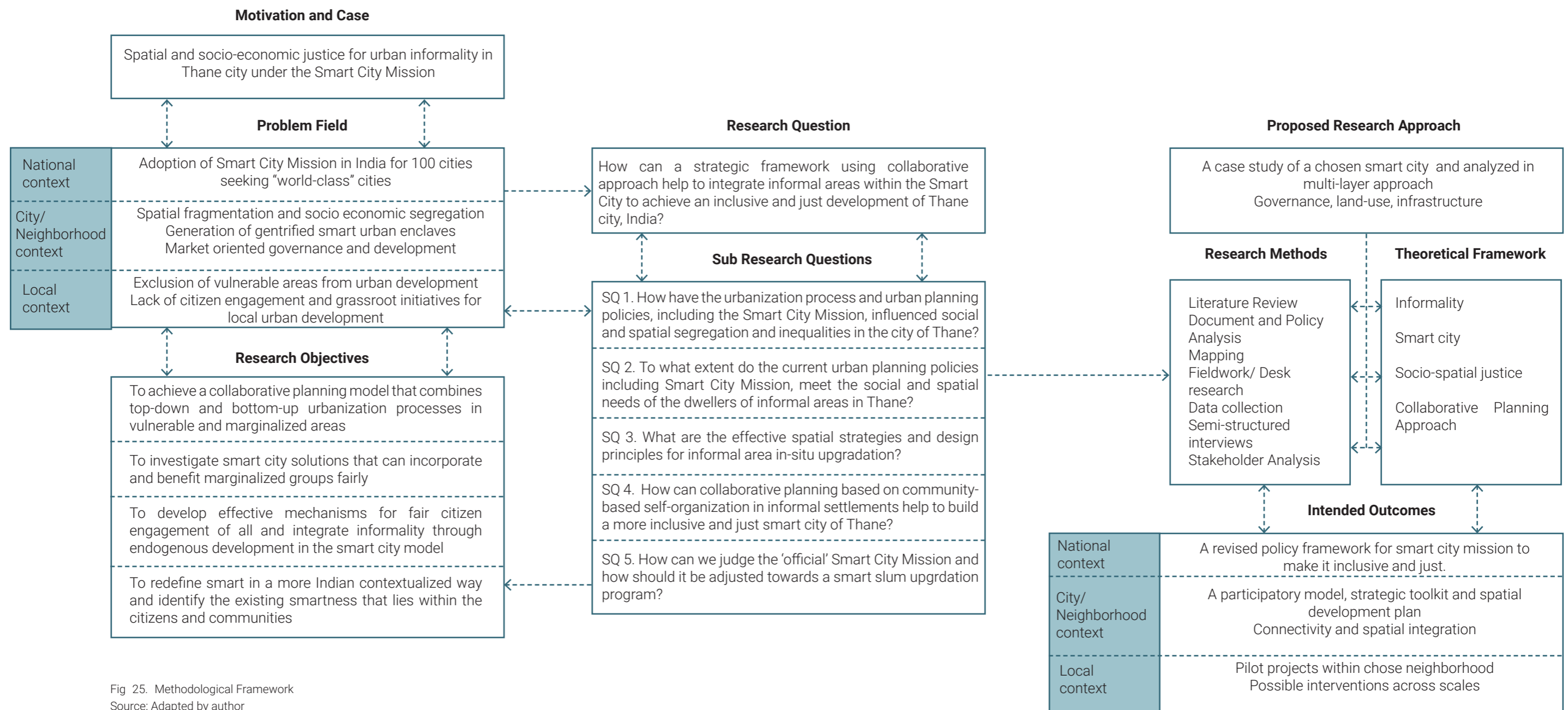# 5 Research Design Approach

5.1 Research Framework

Problem Field — Exclusion of informality in Smart city model

Key words — informality, smart city, inclusive city, collaborative planning, urban equity

Problem Statement — Smart city mission in India is predominantly an ICT solution driven urbanization process which is a mainly top-down approach. The implementation has led to displacement of informal groups, spatial segregation through land-use planning, economic disparities and exclusion from the overall development scheme. It benefits the private sector and the middle/ upper class population and excludes informality within the governance and spatial planning of the city.

Main Research Aim — To develop a collaborative planning process within the Smart City mission to gain right to the city for the marginalized groups. Inclusive policies and urban planning to empower the urban poor and integrate them better within the smart city model in Thane, India.

Research Questions — How can a strategic framework using collaborative approach help to integrate informal areas within the Smart City Mission to achieve an inclusive and just development of Thane city, India?

SQ 1. How have the urbanization process and urban planning policies, including the Smart City Mission, influenced social and spatial segregation and inequalities in the city of Thane?

SQ 2. To what extent do the current urban planning policies including Smart City Mission, meet the social and spatial needs of the dwellers of informal areas in Thane?

SQ 3. What are the effective spatial strategies and design principles for informal area in-situ upgradation?

SQ 4. How can collaborative planning based on community-based self-organization in informal settlements help to build a more inclusive and just smart city of Thane?

SQ 5. How can we judge the 'official' Smart City Mission and how should it be adjusted towards a smart slum upgradation?

Research Approach — Normative thinking and exploratory research

Conceptual Framework —
Smart city 2.0 + Informality = Smart Slum Upgrading Program

Socio-spatial justice

= Inclusive & Just model

Methods Used —
Literature Review
Document and Policy Analysis
Mapping

Fieldwork | Desk research
Stakeholder analysis
Semi-structured interviews

Expected Outcomes —

City Scale	Neighbourhood Scale	Local Scale
Strategic planning Citizen participation Governance system	Participatory model Strategic actions	Pilot projects Inclusive strategies/ spaces

Conclusion — Impact Assessment Indicators
Evaluation + Reflection + Scientific and Societal relevance + Limitations

5.2 Methodology Framework

Motivation and Case

Spatial and socio-economic justice for urban informality in Thane city under the Smart City Mission

Problem Field

National context	Adoption of Smart City Mission in India for 100 cities seeking "world-class" cities
City/ Neighborhood context	Spatial fragmentation and socio economic segregation Generation of gentrified smart urban enclaves Market oriented governance and development
Local context	Exclusion of vulnerable areas from urban development Lack of citizen engagement and grassroot initiatives for local urban development

Research Objectives

To achieve a collaborative planning model that combines top-down and bottom-up urbanization processes in vulnerable and marginalized areas

To investigate smart city solutions that can incorporate and benefit marginalized groups fairly

To develop effective mechanisms for fair citizen engagement of all and integrate informality through endogenous development in the smart city model

To redefine smart in a more Indian contextualized way and identify the existing smartness that lies within the citizens and communities

Fig 25. Methodological Framework
Source: Adapted by author

Research Question

How can a strategic framework using collaborative approach help to integrate informal areas within the Smart City to achieve an inclusive and just development of Thane city, India?

Sub Research Questions

SQ 1. How have the urbanization process and urban planning policies, including the Smart City Mission, influenced social and spatial segregation and inequalities in the city of Thane?

SQ 2. To what extent do the current urban planning policies including Smart City Mission, meet the social and spatial needs of the dwellers of informal areas in Thane?

SQ 3. What are the effective spatial strategies and design principles for informal area in-situ upgradation?

SQ 4. How can collaborative planning based on community-based self-organization in informal settlements help to build a more inclusive and just smart city of Thane?

SQ 5. How can we judge the 'official' Smart City Mission and how should it be adjusted towards a smart slum upgrdation program?

Proposed Research Approach

A case study of a chosen smart city and analyzed in multi-layer approach
Governance, land-use, infrastructure

Research Methods

Literature Review
Document and Policy Analysis
Mapping
Fieldwork/ Desk research
Data collection
Semi-structured interviews
Stakeholder Analysis

Theoretical Framework

Informality

Smart city

Socio-spatial justice

Collaborative Planning Approach

Intended Outcomes

National context	A revised policy framework for smart city mission to make it inclusive and just.
City/ Neighborhood context	A participatory model, strategic toolkit and spatial development plan Connectivity and spatial integration
Local context	Pilot projects within chose neighborhood Possible interventions across scales

5.3 Research Methods

Research Question

Method	Description
Literature Review	
Document and Policy Analysis	
Mapping	
Fieldwork	Desk research	
Stakeholder Analysis	
Case Study	

How can a **strategic framework** using **collaborative approach** help to integrate **informal areas** within the **Smart City Mission** to achieve an **inclusive and just development** of Thane city, India?

Sub Research Questions

SQ 1. How have the urbanization process and urban planning policies, including the Smart City Mission, influenced social and spatial segregation and inequalities in the city of Thane?

SQ 2. To what extent do the current urban planning policies including Smart City Mission, meet the social and spatial needs of the dwellers of informal areas in Thane?

SQ 3. What are the effective spatial strategies and design principles for informal area in-situ upgradation?

SQ 4. How can collaborative planning based on community-based self-organization in informal settlements help to build a more inclusive and just smart city of Thane?

SQ 5. How can we judge the 'official' Smart City Mission and how should it be adjusted towards a smart slum upgradation program?

Investigating literature for key concepts understanding existing trends and processes

Understanding current policies at national, city and neighborhood level

Mapping the land use, spatial patterns

Photo documentation, interviews with residents and stakeholders

To conduct actor analysis and understand the relations between stakeholders

Thane as a case study for testing design proposal

Fig 26. Research Methods
Source: Drawn by Author

Method 1: Literature Review

Type: Qualitative Mixed

Aim:

To develop and define theories that are related to informality, smart city and inclusive planning which offers different perspectives and forms the foundation of the project. It helps to identify gaps in the discourse.

Key words: informality, smart city, inclusive planning, right to the city

Main Sources: Google Scholar search engine - ResearchGate - Science Direct - SpringerLink and published books.

- -

Method 2: Document and Policy Analysis

Type: Pure mixed

Aim:

To collect qualitative and quantitative data from policy documents in order to analyze and criticize existing policies at national level, metropolitan and municipal levels. It is to identify governance structures, gaps and ways in which the current municipal development has taken place. It can help to modify the current policies and make suggestions to its limitations in order to open new opportunities in the governance structure.

Main sources: Thane Municipal Corporation (TMC), Smart City policy, Slum Redevelopment policy, Development Plans - MMR, Thane ∴.

- -

Method 3: Mapping

Type: Quantitative and Qualitative =

Aim:

To map the spatial conditions of the selected area at different scales and understand the conflicts and potentialities through land-use analysis and on-site empirical study.

Main sources: LoginMumbai - A Digital Inclusion Project by UDRI, Maps from reports, Shelter Associates

Method 4: Fieldwork | Desk research

Type: Quantitative and Qualitative

Aim:

The fieldwork will be conducted via researchers known to the author to understand the spatial layout, territorial characteristics and engage with the local actors to get their opinions through **semi-structured interviews.** Another method is to collect data via picture, sketches and maps that are developed.

Main Sources: NGOs, fellow researchers, Thane Municipal Corporation, Site residents

- -

Method 5: Stakeholder analysis

Type: Qualitative mixed

Aim

To understand the main actors who are part of the urbanization process based on the analysis conducted. These actors range from national governments to local actors that form the part of the governance structure. The relations between each other, interdependencies and influences are gauged to redistribute any power relations that needs to be readjusted according to the outcome of design and can be implemented.

Main sources: Ministry of Urban Affairs, Vikas Samiti, TMC, Smart City Private Ltd.

- -

Method 6: Case study

Type: Qualitative mixed

Aim:

The case study of Thane has been chosen for the research by design. Successful interventions in India at the local level which has been implemented using community participation needs to be studied to create a mode for the chosen site as well.

Main Sources: Shelter Associates, CURE India, Community Design Agency, MESN

5.4 Theoretical Framework
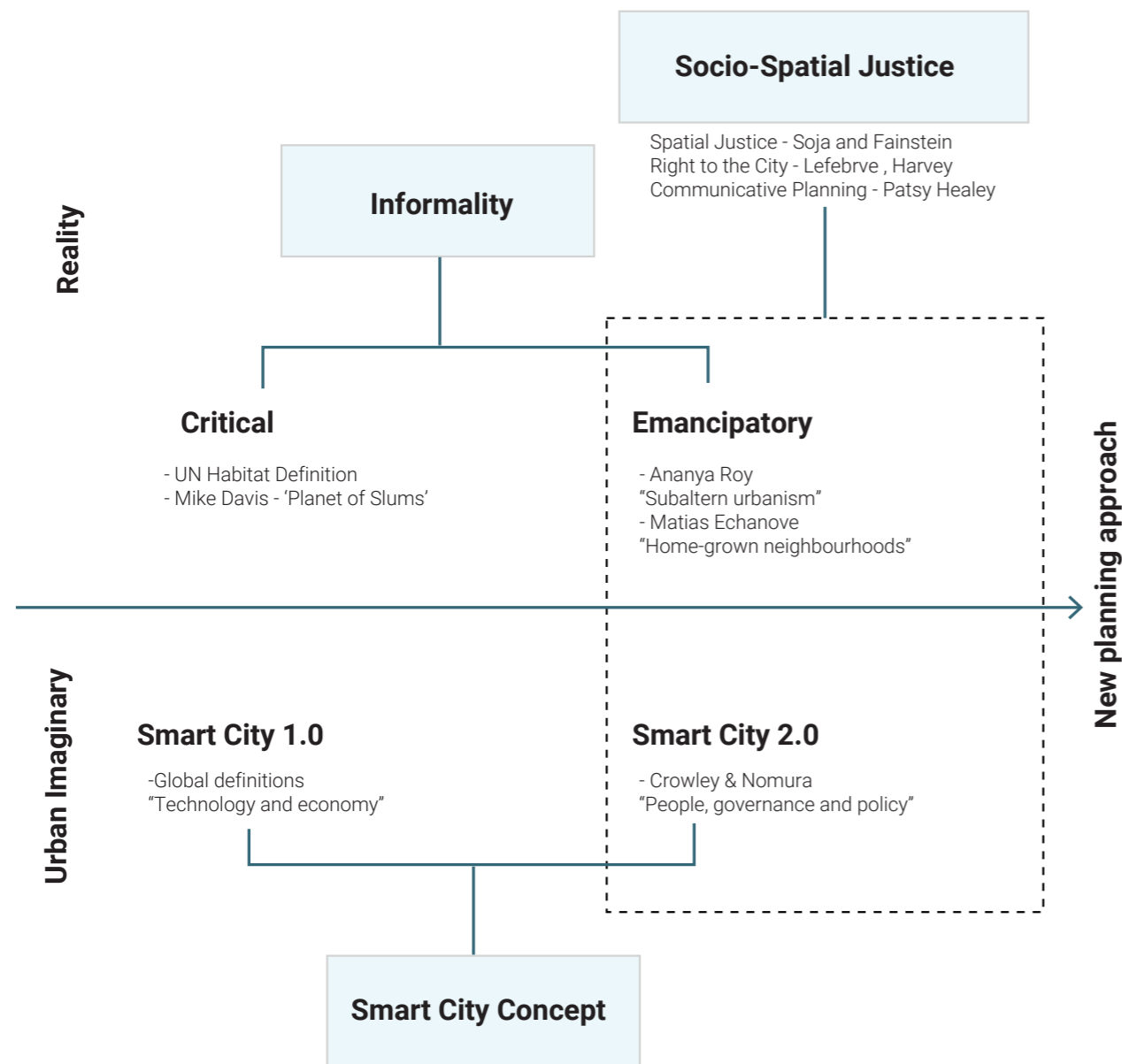
Fig 27. Theoretical Framework
Source: Drawn by Author

The theoretical framework provides the underlying understanding of the two main concepts of the project i.e. informality and smart city. It connects the two ideas using the broader umbrella term of justice as a way to claim the presence and existence

of informality within smart city. The different theoretical perspectives helps to understand the discourse position of this research.

5.4.1. Informality Perspectives

Informality has always been viewed through different perspectives as both derogatory and a complimentary term, more former than the latter. "The first perspective, more critical, sees informality predominantly in terms of political exclusion, inequality, and poverty. The second, the 'emancipatory perspective', frames urban informality as a practice that fosters autonomy, entrepreneurship, and social mobility." (Rocco, 2018). On one hand, it is perceived as a problematic unregulated and unplanned reality that must be addressed via regulation and on the other hand, it is their sheer independent existence as a joint community despite the economic, political and social exclusion.

Instead of understanding informality within a setting of certain communities; or sectors (housing/ labour markets); or an outcome related to legal status, it would be important to understand informality as a site of critical analysis. A multi-scalar perspective to explore patterns and processes at micro, meso and macro scales of the urban informality is required. (Banks et al., 2020) It happens due to the lack of regulation and allows for development via vernacular mediums.

Let us look at the example of informal settlements within informality and try to understand their presence in the urbanization process. The informal settlements are often referred to as slums in the South Asian context. A slum is a 'a group of individuals living under the same roof lacking one or more of the following necessities: access to improved water, access to improved sanitation, sufficient living area, structural quality and durability of dwellings, and security of tenure' as defined by the United Nations Task Force in Improving the Lives of Slum Dwellers (2006). Settlements emerging outside the regulatory framework and development plan are typically referred to as 'unplanned' and 'informal' and sometimes 'illegal'.

Informality occurs due to gaps in policies and regulations that allows for their occurrence and

not exactly a dichotomous term to the formal. Roy defines informality as "a state of deregulation, one where the ownership, use, and purpose of land cannot be fixed and mapped according to any prescribed set of regulations or the law" (Roy, 2009) She argues that informality is not a "bounded sector of unregulated work, enterprise and settlement", but rather believes that "legal norms and forms of regulation are in and of themselves permeated by the logic of informality" (Ibid). Hence, "India's planning regime is itself an informalized entity characterized by deregulation, ambiguity, and exception." (Ibid).

In contrast to the critical perspective which mainly considers it as an outcome of inequality, the emancipatory perspective which Roy states by rethinking subaltern urbanism is that it "provides accounts of the slum as a terrain of habitation, livelihood, self-organization and politics." (2011) It is supported by the Echanove's theory of organically developed settlements. As he introduces the concept of "home-grown neighbourhoods: and "neighbourhoods in-formation" as a new way to look at slums and could be a critical point for "policy, planning and architectural engagements based on the recognition of local dynamics, developmental processes, and emerging forms" (Echanove, 2013). Informality now moves beyond its association to squatter settlements to being a "generalized mode of metropolitan urbanization." (Roy, 2007). She also explains that informality has a certain organization logic, norms that governs the process of urban transformation itself. This is supported by Echanove's concept of "homegrown neighborhoods". The current way of upgrading slums and the focus on the physical environment is "aestheticization of poverty" (Roy, 2004, as cited in Roy, 2007) rather than upgrading livelihoods, incomes and political capacities. This leads to Henri Lefebvre's (1996) concept of "right to the city" which is at stake in urban informality today which is required to have a fair share of benefits from the ongoing urbanization processes and developments.

5.4.2. Smart City

Finally, the important issues that needs to be tackled are "moving from land use to distributive justice, rethinking the object of development, and replacing best practice models with realist critique—are not just policy epistemologies for dealing with informality. Rather, they indicate that informality is an important epistemology for planning." (Roy, 2007) "It has linked India's urban crisis to the idiom, rather than the failure, of planning. In particular, it has identified informality as a key feature of this idiom such that Indian planning proceeds through systems of deregulation, unmapping, and exceptionalism." (Roy, 2009). A combined perspective of the critical and emancipatory needs to be taken into account to understand informality and how planning processes and deregulation can help with the existence of it.

In order to understand the potential of informal development processes, it is necessary to delve into theories of the changing smart city paradigm, which has been currently shaping the urban development agenda.

The smart city concept has been mainly under the discourse of growing neo-liberal economies and gets critiqued for ignoring citizen needs. This has been established in Chapter 3 about Smart City, and this section focuses on the emerging model that targets citizens' desires and participation aspect. The shift toward this new model is known as 'smart city 2.0' on the concepts developed by many scholars. (Günter 2016; Saunders and Baeck 2015; Nomura 2017a, b; Etezadzadeh 2016; as cited in Trencher, 2018)

Smart City 1.0 is the current definition of a smart city and it is characterized by a focus on technology, economy, and a top-down approach. We can understand the shortcomings of this version of smart city discussed within the section of "Criticism of Smart City" in Chapter 3. One of the principal criticism is the exclusion of all voices within the decision and planning process which the new paradigm shift to smart city 2.0 tries to address.

Smart city 2.0 builds upon the existing definition of smart cities and is considered complementary to the current aspects covered in smart city 1.0. The new definition is based upon a people-centric approach which allows the people to define their needs and act as co-creators of their built environment and society.

The figure above shows the conceptual differences between the two frameworks have been summarized in Table 1. This research will build upon the concepts of smart city 2.0 to address informality and ways to integrate it within the formal city.

5.4.3. Socio-Spatial Justice

The discourse on linking equity and justice to space has been constantly evolving since the 1960's. Henri Lefebvre was the first to introduce it in his book Le Droit elle a la Ville. He mentions socio-economic segregation and its role in marginalization and hence spatial injustice. Calling it the 'tragedy of the banlieusards', he highlights that the people are forced into ghettos far from the city centre as a result of segregation. His preliminary concept of Right to the City proposed a reclamation of the urban space by the marginalised, leading to a more equitable distribution of resources. This was further refined to include integrated social, political, and economic rights such as the right to education, work, health, leisure and accommodation in the urban context. (Lefebvre, 1996,1998)

Consequently, David Harvey refined the concept of Right to the City as an individual's power to shape their living environment as per their wishes and desires. He connected marginalization to the capitalists' search for surplus value. To produce this value, the city is dependent on the surplus product, which is extracted from 'someone, somewhere'. (Harvey, 2008) This, therefore, makes urbanization a class phenomena. Harvey was succeeded by Edward Soja, who coined the term 'Spatial Justice'. He defined the term as - "(…) seeks to promote more progressive and participatory forms of democratic politics and social activism, and to provide new ideas about how to mobilise and maintain cohesive collations and regional confederations of grassroots social activists. (…) Spatial justice as such is not a substitute or alternative to social, economic, or other forms of justice but rather a way of looking at justice from a critical spatial perspective'. (Soja, 2010, p.60) She argues that the 'spatiality of (in) justice affects society and social life as much as social spaces shape the spatiality or specific geography of justice'. It focuses on two types of justice - distributive and procedural. The access or allocation of public services, goods and resources is termed as distributive justice, while the procedures of negotiation and decision-making constitute procedural justice. The latter revolves around the concepts of participation and democratic decision-making.

However, Susan Fanstein does not adopt the term spatial justice but presents the challenge as that of achieving a harmony between equity, diversity and democracy. Unlike Soja, she argues that the 'just city' is not a product of coalitions of groups demanding their right to the city. Rather, she conceptualizes justice as "emerging through—and being challenged by—the interplay of democratic practices, recognition of diversity, and equity". The cohesion of these factors is essential for justice to emerge as well as a challenge for it to exist. This makes the "achievement of justice is a circular process, whereby the preexistence of equity begets sentiments in its favour, democratic habits produce popular participation, and diversity increases tolerance" (Fainstein, 2006, p. 23). She emphasizes that the challenge of diversity is one of individuals being heard and the community finding a common

	Smart City 1.0	Smart City 2.0
Focus of vision	Technology and economy	People, governance, and policy
Role of citizens	Passive role as sensors, end-users or consumers	Active role as co-creators or contributors to innovation, problem solving and planing
Objective of technology and experimentation	• Optimize infrastructure and services • Serve demand-side interests and spur new business opportunities • Address universal technical agendas (energy, transport, economy)	• Mitigate or solve social challenges • Enhance citizen wellbeing and public services • Address specific endogenous problems and citizen needs
Approach	• Centralized (privileged actors) • Exogenous Development	• Decentralized (Diverse actors) • Endogenous development

Table 1. Comparison of key attributes in first and second smart city paradigm
Source: Trencher, 2018

ground to incorporate everyone's opinion - inclusive democracy. The three elements form a framework to assess the effectiveness of policies and planning practices.

Healey takes this a step further with her theory on communicative rationality. She argues that individuals are embedded in their diverse identities and perspectives, making the act of finding a common ground/issue and solution, the major challenge in an urban setup. Careful designing the process of communication to enable a fruitful engagement and feasible outcome is, as per her, the key to achieving justice. Inclusive participatory forms of democracy can be encouraged through inclusionary argumentation. This has the power to create and distribute justice, allowing marginalized communities to integrate in the complex urban systems. (Healey, 1996)

This research ties the above concepts to weave the needs of informal settlements into the idea of the 'Smart City'. As mentioned by Soja, informal settlements are the 'ghetto's' or marginalized areas that are a product of socio-economic segregation. In order to integrate them into the city, Fanstien's framework and Healey's take on communicative rationality for integration has been used to create a strategy for participatory planning. The communicative planning will enable the marginalized to avail recognitional justice, as a starting point to escape their socio-economic and institutionally invisible lives.

The participatory nature of the planning will encourage an inclusionary dialogue, empowering the space to be just. The method of integration of informal settlements within the smart city in this project may not necessarily mean imposing formal planning on the informal areas, but rather letting them thrive and grow upon the existing structures in place. This can be done through increased visibility and voice. Facilitating the marginalized to vocalise their needs and feel included through spatial design can change the perception of informal settlements

and provide for a better identity for its residents. Inclusive spaces can empower the people to then gain access to the basic amenities, opportunities and services from the city governments and dwellers. Transparent decision-making processes need to be set up to impart a sense of ownership of space and systems to the marginalised. Further, social segregation needs to be addressed across scales - neighbourhood, city, state, nation - to include the complex diversity and the identity attached to it. Participation will ensure the process of formalisation is people-centric and need-based rather than a top down, enforced exercise.

The Smart City projects aim at streamlining and upgrading the delivery of systems of a city to match the speed of technological growth and the expectations of the elite or the west. Incorporating participatory processes in this approach will make room for technological innovation to and address the more complex people- centric issues of the city. It can empower the marginalised with a voice, information and access to basic rights. This will have a direct impact on the quality of life of the marginalised as well as the society as a whole.

5.4.2. A new planning approach

A collaborative planning approach which is inclusive, equitable and provides right to the city is required for a fair and just urbanization scheme. A 'top-down' planning approach like most of the schemes in India are giving a small group of elite and technocratic people to control the kind of acceptable urban form. In contrast, the 'bottom-up' planning approach is the radical decentralization of that process through production of form handed over to multiple local actors, involved in planning their own spaces and coordinate with neighbors (Echanove, 2013).

"To be inclusive, it is necessary to adopt a democratic approach to city development and to explore the potential of connecting information technology with the marginalized sections of society, to enhance their access to employment, market, education, health, and help in building resilience against natural disasters" (Roy, 2016). The resettlement and rehabilitation schemes unlike seen before as projects of urban modernity, are now seen as intimidating the urban poor with new types of spatial injustices by disturbing their participation in the city's social production processes. As Arabindoo states that as the slums are carelessly resettled at sites of the metropolitan peripheries, "it is important to trace the new trajectory of their everyday networks and how this reshapes their marginality" (2011). Several examples shows that the possibility of grassroot organization and role of local government can create "more just and humane cities based on demand-driven, community-empowerment, incremental and participatory principles of development" (Roy, 2016).

A different kind of smart citizenship needs to be achieved that requires to be translated and vernacularized in the Indian context and talks from a difference space and positionality of the subaltern. It needs to be rethought from indigenous places and from the marginalized sections of the Global south. (Datta, 2018) As per the right to the city framework, it is important to make 'citizen-centric' smart cities and re-position their role in

conception, development, and governance of the city. One such way to recognize the social capital of marginalized groups to involve in smart technology and governance models is by involving actors of civic-cyber space such as civic hacktivists, local associations, and longstanding community groups (Sadoway & Shekhar, 2014, as cited in Willis, 2018). Instead of viewing informality as a weakness, it can be used as an opportunity for "low-cost citizen sensing, crowdfunding platforms, open data initiatives and repurposed social media-based sharing platforms" (Willis, 2018) which can be a "mode of production" within "sites of vibrant and entrepreneurial urbanism" (Roy, 2011).

Additionally, it is important to chart the topology of the urban poor whose criss-cross connections, flows and relations stretch across multiples physical spaces. In order to be more equitable, "the diversity and robustness of subaltern urbanization shows the myriad ways in which Indian citizens take their destiny into their own hands, often subverting patterns dictated from above. We are seeing spatial patterns emerge that represent an adaptive creativity that does not follow the logic of any canonical model" (Denis et al., 2012). Hence, it is important to understand the spatial implications of adopting a new approach of including informality in the future of smart city.

5.5 Conceptual Framework

Based on the understanding of the theoretical framework, a conceptual framework has been developed. It consists of a present and future scenario to indicate the changes proposed.

It essentially shows how there is a disconnect and gap between the informal urbanization and the current discourse of smart city being a highly technocratic one which focuses on technology and economy. This has led to problem regarding inequality, poverty and spatial fragmentation and injustices. Using the theoretical framework, it is important to establish a paradigm shift in the smart city approach that places co-creation with people at the centre of its values and achieves spatial justice and right to the city.

In order to do that, smart slum upgrading program acts as a proposal to achieve inclusive and just development through spatial cohesion and integration of informal settlements with the formal city.

PRESENT **FUTURE** **PROPOSAL**

Smart City 1.0

Technocratic

Gap

Informal
Urbanization

Problems + Threats

Inequality
Segregation
Spatial Injustice

Smart City 2.0

Co-creation
People-oriented

Socio-Spatial Justice

Spatial Cohesion
& Integration

Theoretical Framework

Smart Slum
Upgrading Program

Inclusive and
Just Development

OUTCOME
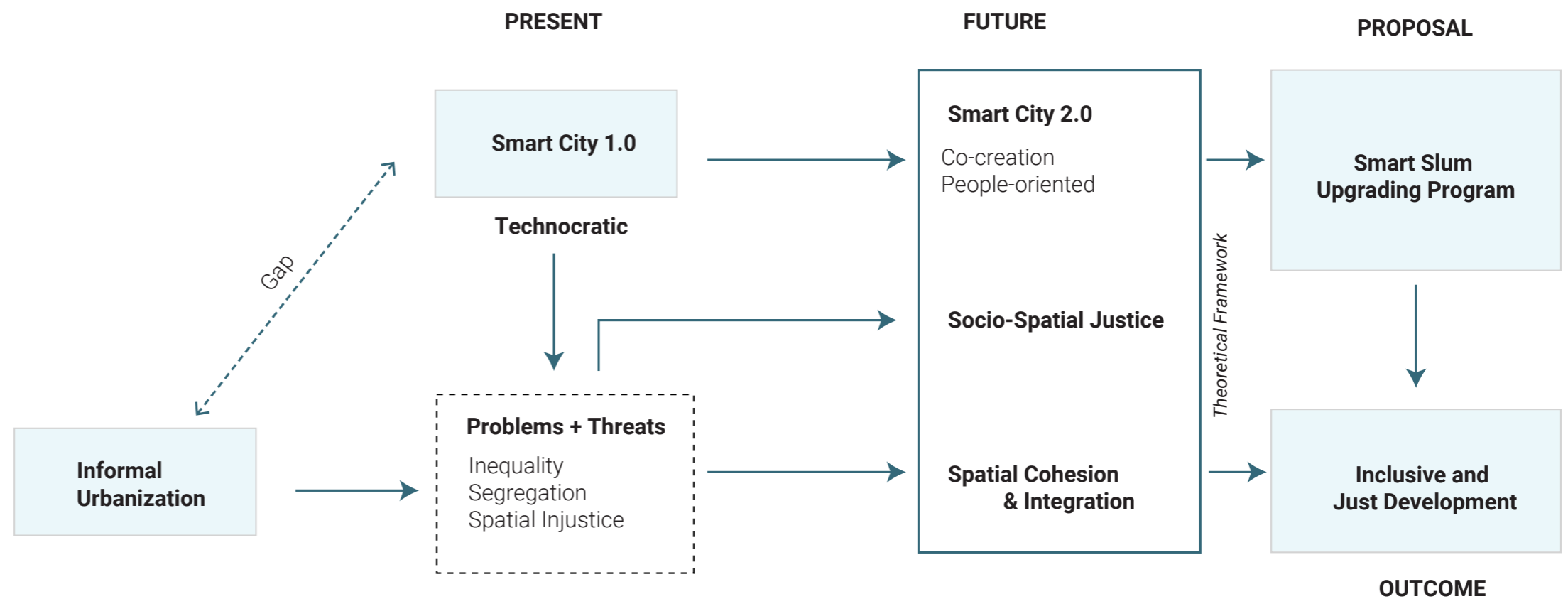
Fig 28. Conceptual Framework
Source: Drawn by Author

Fig 29. Thane City with contrasting developments
Source: Travel Triangle

6 Case Study City Analysis

6.1 Evolution of Thane

Thane city is located adjacent to the city of Mumbai, the financial capital of India, as the main lines of the Central Railway, the Mumbai-Agra Road and old Mumbai- Bangalore Road pass through it. The city is situated on a wide plain belt in between the dense forest hills of Sanjay Gandhi National Park and marshy land along the Thane creek and Ulhas River on the other side as seen in the map. Thane is known for its biodiversity and nature and is called as the City of Lakes, constituting of 33 lakes.

It was known for its strategic location for sea-borne trade and also became known due to the first railway in Asia that ran between Mumbai and Thane in 1853. The early settlers of Thane include the Kolis (fisherfolks) or Aagri (coastal cultivators) and salt makers.

In 1961, Wagle Industrial Estate was established and Trans Thane Creek Industrial Area in 1963 in order to distribute industrial activities from the island of Mumbai to Thane city. The industrial growth led to the expansion of the city and the villages and smaller towns in the vicinity started merging with it. In 1982, the Municipal Council was upgraded to Thane Municipal Corporation. From an area of 33 sq. km in 1961, the Thane Urban Agglomeration expanded to above 100 sq. km in 1991. The rapid growth is also a resultant due to it being considered as a "suburban dormitory town" of Mumbai. (Nangia et al., 1996)

Present Thane

Due to acute land shortage and escalating prices in Mumbai, Thane serves as an alternative for relatively affordable housing option, commercial and retail spaces. Its locational advantage is also a reason for higher-value services based industries (like IT), education, media, entertainment, hospitality, etc. It is one of the cities from Maharashtra that was selected in the Smart City Challenge in 2016.

Area: 128.23 km²

Population: 1.887 million (2011)

Eastern Express highway
Improved road connectivity

Included in 'Smart City Mission'

Growing business parks, office complexes, and real estate hotspot with upcoming metro line connection

1853
First railway from Bombay to Thane

1958

1962
First Industrial Estate at Wagle established by MIDC

1982
Establishment of Thane Municipal Corporation

2000
Commercial development

Trans-harbour line to Vashi (Navi Mumbai)

2009
Rapid increase in city slum

City change from Industrial town to Real Estate

2016

2021

Fig 30. Evolution of Thane timeline
Source: Drawn by Author, Geofabrik, UDRI, Sen & Hemshankar, 2021
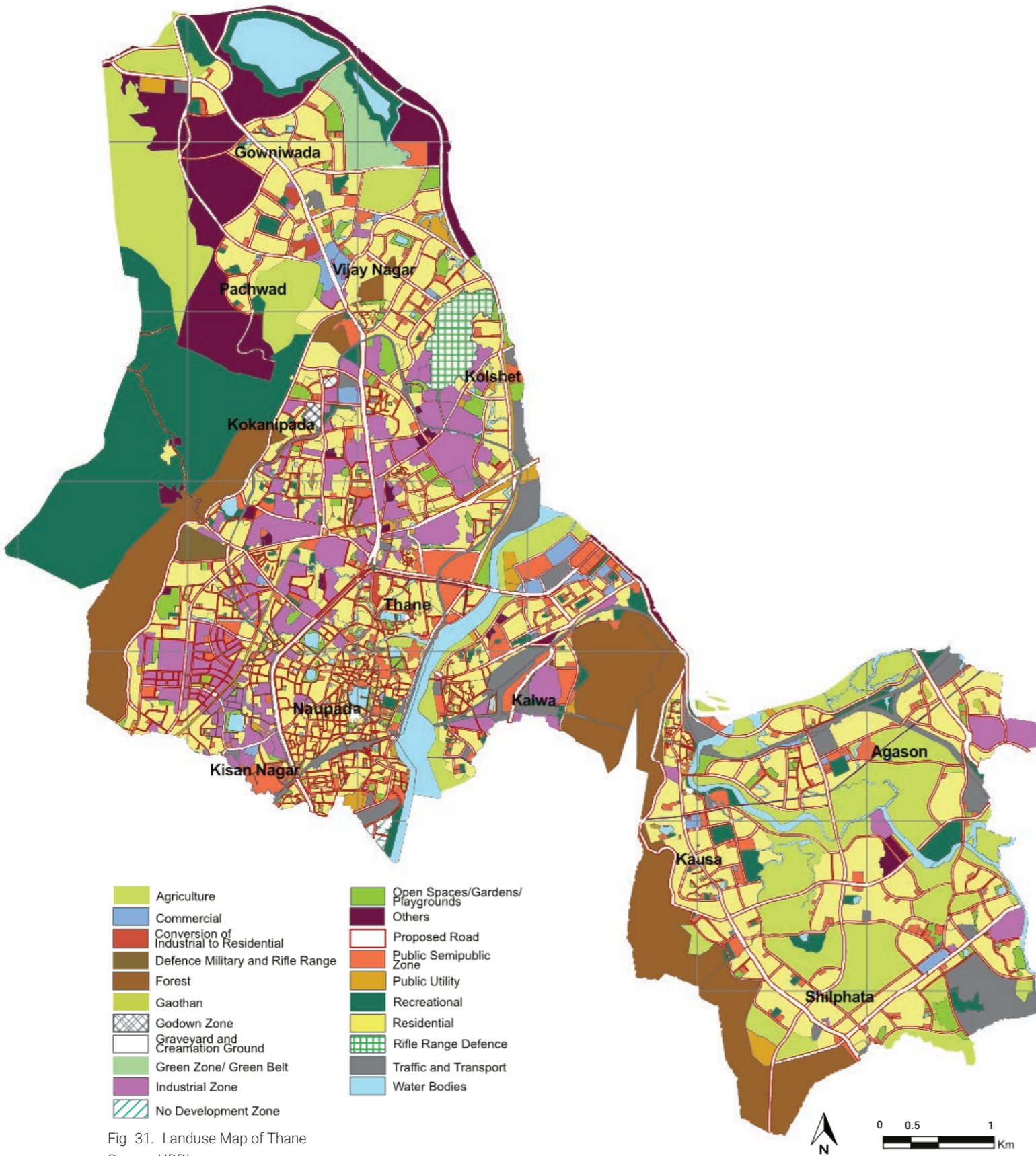
Fig 31. Landuse Map of Thane
Source: UDRI

Legend:
- Agriculture
- Commercial
- Conversion of Industrial to Residential
- Defence Military and Rifle Range
- Forest
- Gaothan
- Godown Zone
- Graveyard and Creamation Ground
- Green Zone/ Green Belt
- Industrial Zone
- No Development Zone
- Open Spaces/Gardens/ Playgrounds
- Others
- Proposed Road
- Public Semipublic Zone
- Public Utility
- Recreational
- Residential
- Rifle Range Defence
- Traffic and Transport
- Water Bodies

WORLD VIEW	DEVELOPMENT	INITIATED BY
	Fort, Old settlement - Charai and Squatters	Not Planned
Trading post **Before 1960'S**	Urban Blocks divided by Railways and Highways	Planned by State (MMRDA)
	Monofunctional Industrial Districts	Planned by State (MIDC)
	Social housing and neighbourhoods	Planned by state (MHADA)
Industrial Town **During 1960s – 70s**	Workers housing blocks	
	Squatter settlements	Not Planned
	Gated societies	
Real Estate Hub **Post-1990s**	Gated tower complexes	Planned by private sector
	Retail shopping centers and hypermarkets	
	Self contained redevelopment projects	
Post Industrial **2000 onwards**	Post industrial urban voids to IT parks and commercial centers	Planned by private sector

Fig 32. Thane Development Phases
Source: Mathur Radhika, 2009

LEGEND

— Natural Boundary
— Physical Boundary
— Social Boundary
— Spatial Boundary
▨ Slums

Fig 33. Slum settlements and spatial segregation in Thane
Source: UDRI, Ministry of Urban Development, 2017, Mathur, 2011

6.2 Slum Development

Slum Population: 0.983 million (2011)

Number of slums - 252

India being a developing country, big cities like Mumbai/Thane had employment opportunities created by the overall industrial and economic development, caused a large scale migration to Thane resulting in a rapid population growth since 1961. Thane city is called the entrance gate to Mumbai, the financial capital of India and it is on main Railway line as also on National Highway. The city is situated on a wide plain belt located between high hills on the one side and marshy land along the Thane Creek and Ulhas River on the other. The highways run through the central part of the plains and long stretches of built-up areas have developed on the sides of the highways. This growth also led to the problem of housing in Thane since there was no agency that provided shelter to the incoming migrants.

Haphazard informal housing activity started along with the proliferation of slums on vacant public and private land close the workplace which became a way to acquire shelter for poor migrants. The slum population as of 2011 stands at 0.98 million in 252 slums in the city. Slums consist of huts made up of inferior quality material, constructed in an unplanned and chaotic way, and lacking basic amenities like piped water, sewage connection and electricity. However, they provide easy accommodation to the poor migrants who cannot afford better housing. Slums emerge on the marginal lands, near the work place of inhabitants, closer to the roads and a source of water.

Factors

About three-fifths of the slums emerged between 1960 to 1980 due to the rapid industrialization and population growth during this period. The selection of site for squatting is influenced by a number of factors such as the **availability of vacant land, water resources, proximity to roads and workplace, risk of evacuation,** etc. The high land prices in Mumbai also had a spill-over effect on population growth in the surrounding towns, including Thane, where land was comparatively much cheaper and infrastructure and transport facilities were well developed. The rapid population growth increased the problem of housing in Thane. Since there was no high powered agency to provide shelter, informal sector housing activity started along with proliferation of slums. Squatting on vacant public and private land close to the work place became a way of acquiring shelter by the poor migrants. Gradually, these squatter settlements grew bigger in size and multiplied in number, so much so that, at present, slums appear to be omnipresent in the city. In 1976, 53.6 per cent of the city's population lived in 96 slums. When the Municipal Council was upgraded to a Municipal Corporation in 1982, and the city boundaries were further extended, 68 more slums were added to the list of existing urban poor settlements.

Among the oldest slums are Leprosy Colony, Plague Chawl, Marine Workshop, Hajuri Dargah, Walker Bungalow, Shastri Nagar and Lokmanya Nagar. Wagle Industrial Estate alone has attracted nearly thirty slums such as Indira Nagar, Rupadevi Pada, Carwallo Nagar, Ambika Nagar, Kishan Nagar, Sathe Nagar etc. (Nangia et al, 1996)
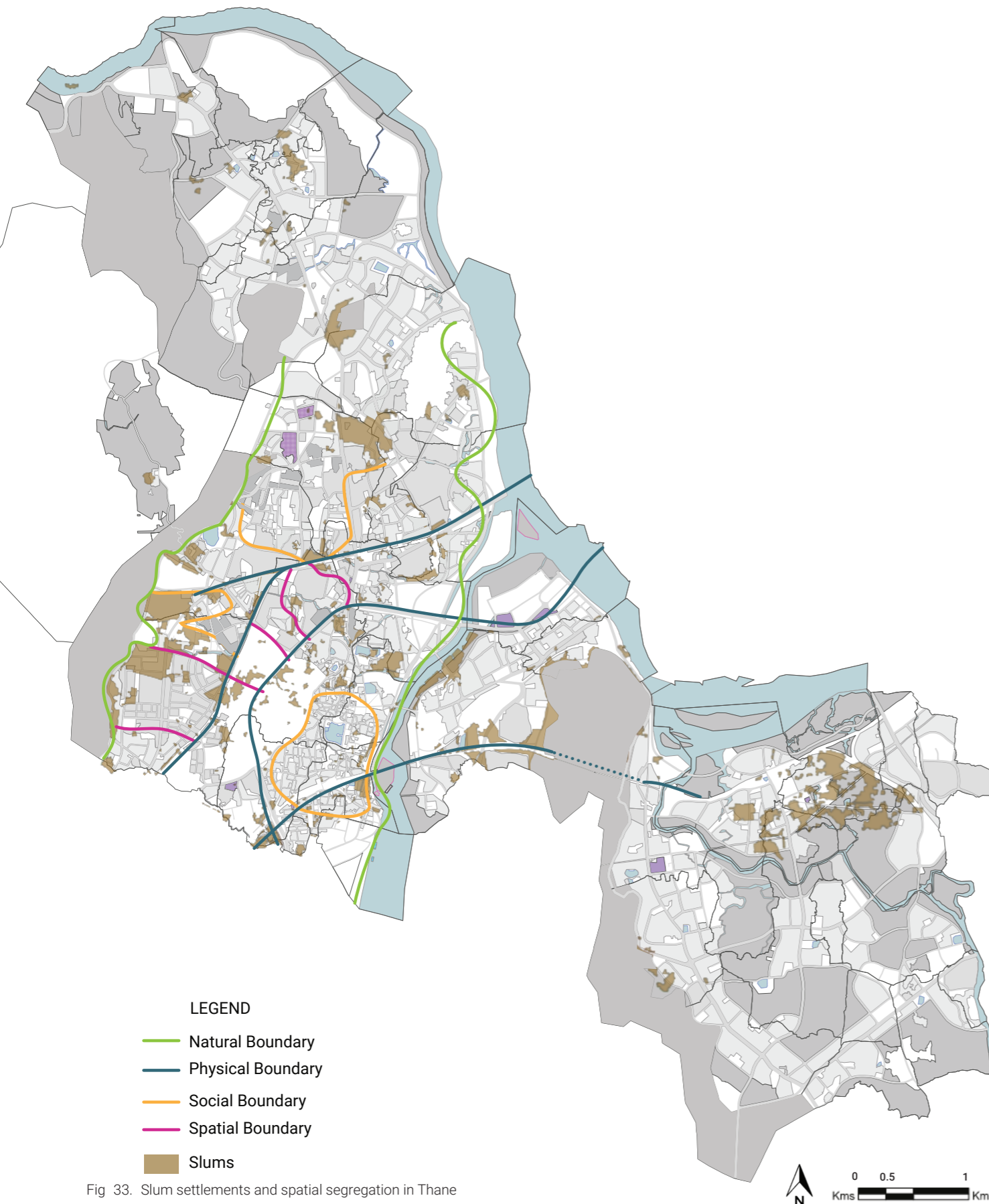
6.3 Slum Improvement Policies

In order to understand the urbanization processes in Thane with respect to the slum upgradation, it is important to look at this evolution in Mumbai as being part of the Mumbai Metropolitan Region as seen in Fig 35.

POLICIES

EFFECT

Pre 1985

| Rent control act, 1947 | → | Lack of interest of the landowners to create new housing stocks |

| Slum improvement and clearance act, 1956 | → | No resettlement scheme for evicted population of the clearance areas |

| The slum area (improvement, clearance and redevelopment) act, 1971 | → | Resettlement done in other informal areas |

| The Maharashtra vacant land (Prohibition of unauthorised structure and summary eviction) act, 1975 | → | Large scale eviction of slums and squatters without proper resettlement schemes |

Olga tellis vs BMC case, 1985 — Supreme court of India verdict

Post 1985

| Slum up-gradation program, 1985 | → | Lack of widespread impact |

| The prime minister's grant project, 1985 | → | Shortage of transit settlements, Delays in construction, higher prices of newly created stocks and lack of awareness |

| Slum redevelopment scheme, 1991 | → | No alternative scheme for the ineligible sanction and lack of interest of the private developers |

| Slum rehabilitation scheme, 1995 | → | Huge gap in implementation process, higher maintenance costs affects the occupational structure of the residents and success depends on the strength of the real estate market. |

Recent initiatives

| Rajiv Awas Yojana, 2013 / Cluster redevelopment, 2014 | → | Slow Progress in development, high investment of money required and needs to attract private developers |

Housing crisis and slum growth in Mumbai

Fig 34. Cause and effect diagram showing impact of housing policies
Source: Bardhan et al., 2015

Railway
Road

0 2 4 8 KM

N
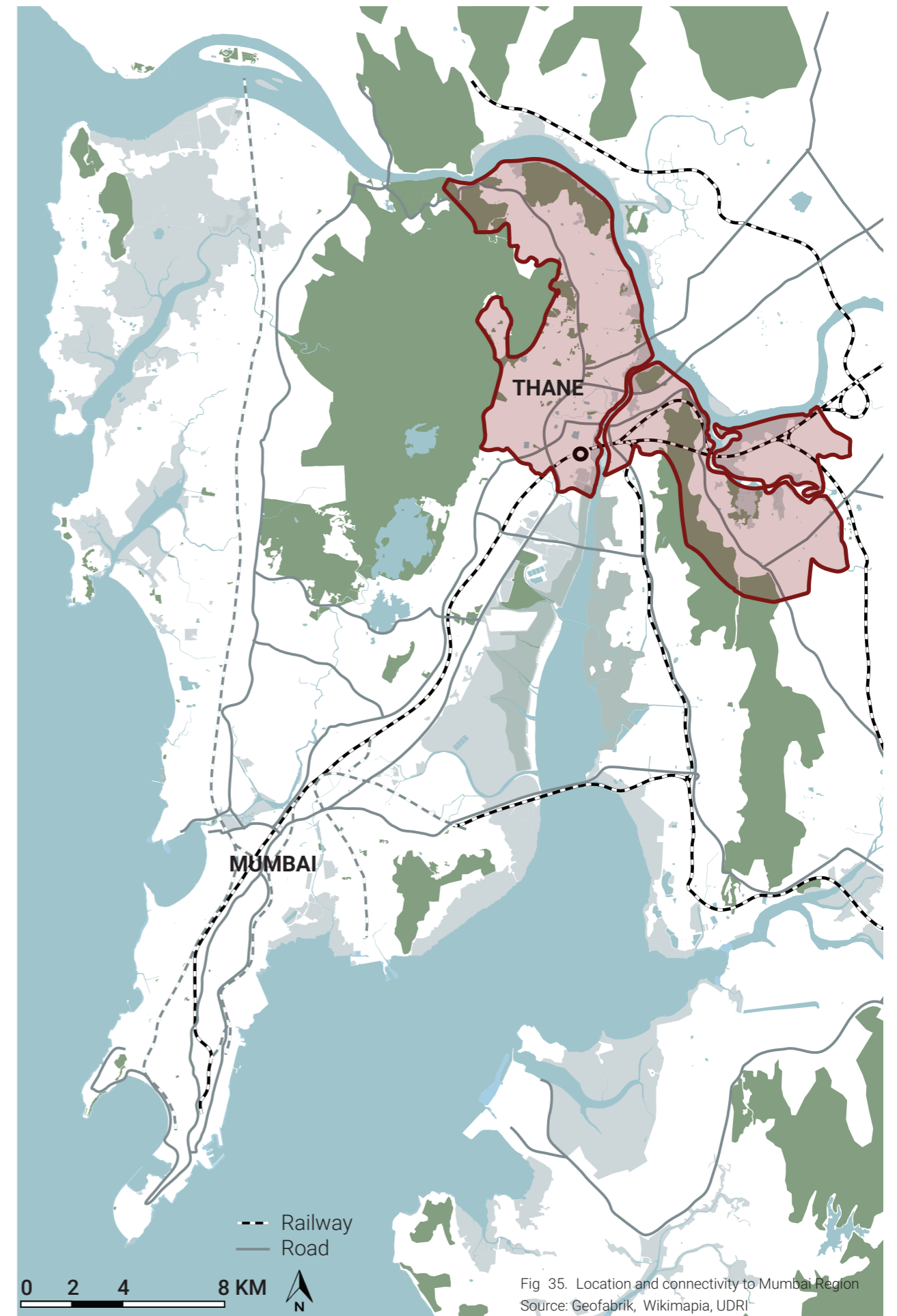
Fig 35. Location and connectivity to Mumbai Region
Source: Geofabrik, Wikimapia, UDRI

An overview of the downfalls of the different slum upgrading strategy or redevelopment is shown in Fig 34 on page 70. In the recent past, proposals such as Cluster redevelopment and RAY/ PMAY for subsidized housing is described below.

Cluster redevelopment is a strategy formulated using the association of different owners of buildings to pool their land for redevelopment. It is based on amalgamation of plots to form a cluster. The original tenants get better and safe housing without any financial investments and the developer get his profit on his investment by selling the additional FSI (Floor Space index). (Kulshrestha, 2018) The local body is able to provide public amenities to the residents with no additional cost and this appears to be a win-win situation for all. However, the current status of the project is still at the approval and documentation of beneficiaries stage. These are also very high on investment and as per the interview with a representative from SPV - Thane Smart City Ltd. It has been shifted from Smart City Project to a project under the Municipal Corporation.

In-situ upgradation is an urban renewal strategy that provides physical, social and economic infrastructure within the same site to improve their living and working condition and without displacement of people. It is the most feasible option for slums under socio-political considerations, that cannot be relocated and rehabilitated due to cost of land and non-availability in big cities. (Kulshrestha, 2018)

The main objective is to ensure access to basic services and amenities in order to improve the quality of life of people.

The advantages of this strategy include:

a) protection of people from displacement on humanitarian grounds

b) saving on the cost of relocation and rehabilitation

c) saving on time and cost escalation from delays due to litigations

d) implementation of the project

Rajiv Awas Yojana (RAY) was to essential create affordable housing stock and had been discontinued with formation of Pradhan Mantri Awas Yojana - Housing for All 2022 which essentially promotes slum rehabilitation with participation of private developers using land as a resource.

The current approach and proposal for housing development under the Smart City Mission for Thane City is mentioned in Table 2.
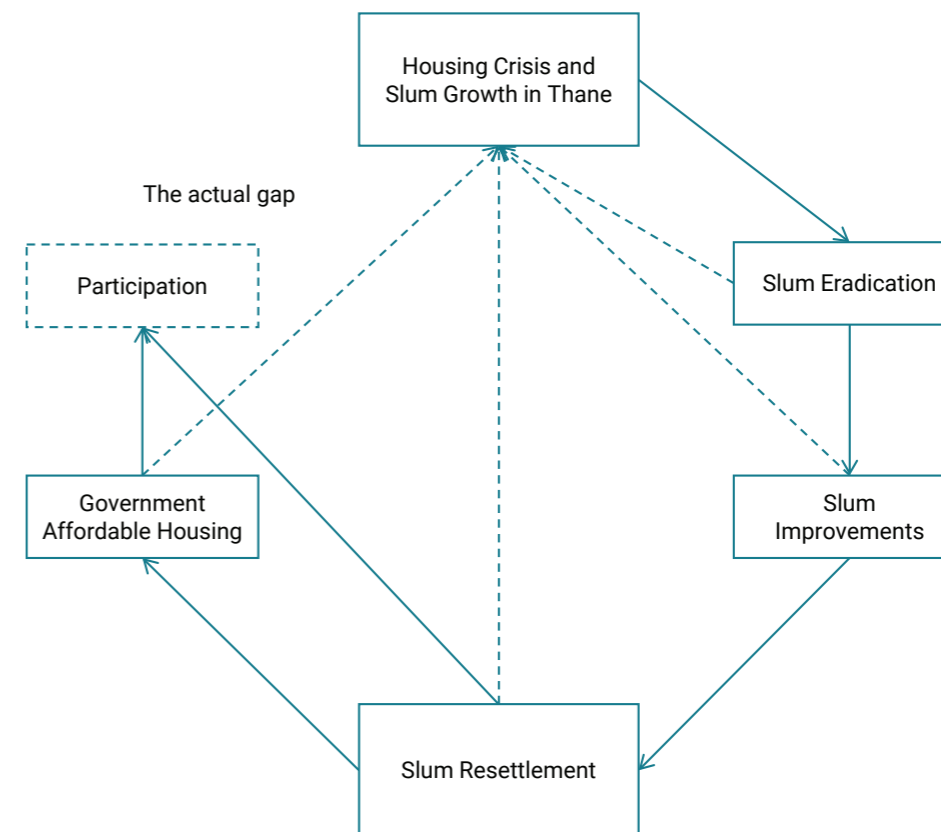
Table 3. Housing Crisis Summary
Source: Adapted by author, Bardhan et al., 2015

Proposed smart city	Situation of housing for marginalized groups	Mention of housing in city's SWOT (Strength, Weakness, Oppurtunities and Threats) Analysis	Mention of housing in city's goals	Mention of housing in city's vision	Proposal for improvement in housing	Expected timeline for implementation
Thane (Maharashtra)	According to the proposal, Thane municipal corporation has handed over 3062 tenements to the beneficiaries; 6000 tenements to be handed over in next two years,while an additional 18944 tenements have been approved.	The proposal mentions unsafe housing conditions as a 'Weakness'. According to the proposal, population living in slums and dilapidated buildings today constitutes over 50 percent of the total population, since affordable housing has not kept pace with growing population. The proposal also mentions unauthorized dilapidated settlements and infrastructure gaps as Threats.	The proposal mentions safe habitat for all, and enumerates the following goals, among others: - Rehabilitation of the population currently living in clusters of dilapidated structures. - Cluster redevelopment of dilapidated neighbourhoods to ensure adequate amenities and open spaces - Promotes mixed use, compact development	Not mentioned	Inclusive housing by redeveloping unsafe housing: 70 acre redevelopment of Kisan nagar	2020

Table 2. Housing proposal in Smart City Goals
Source: Housing and Lands Rights Network, 2017

Area-based development
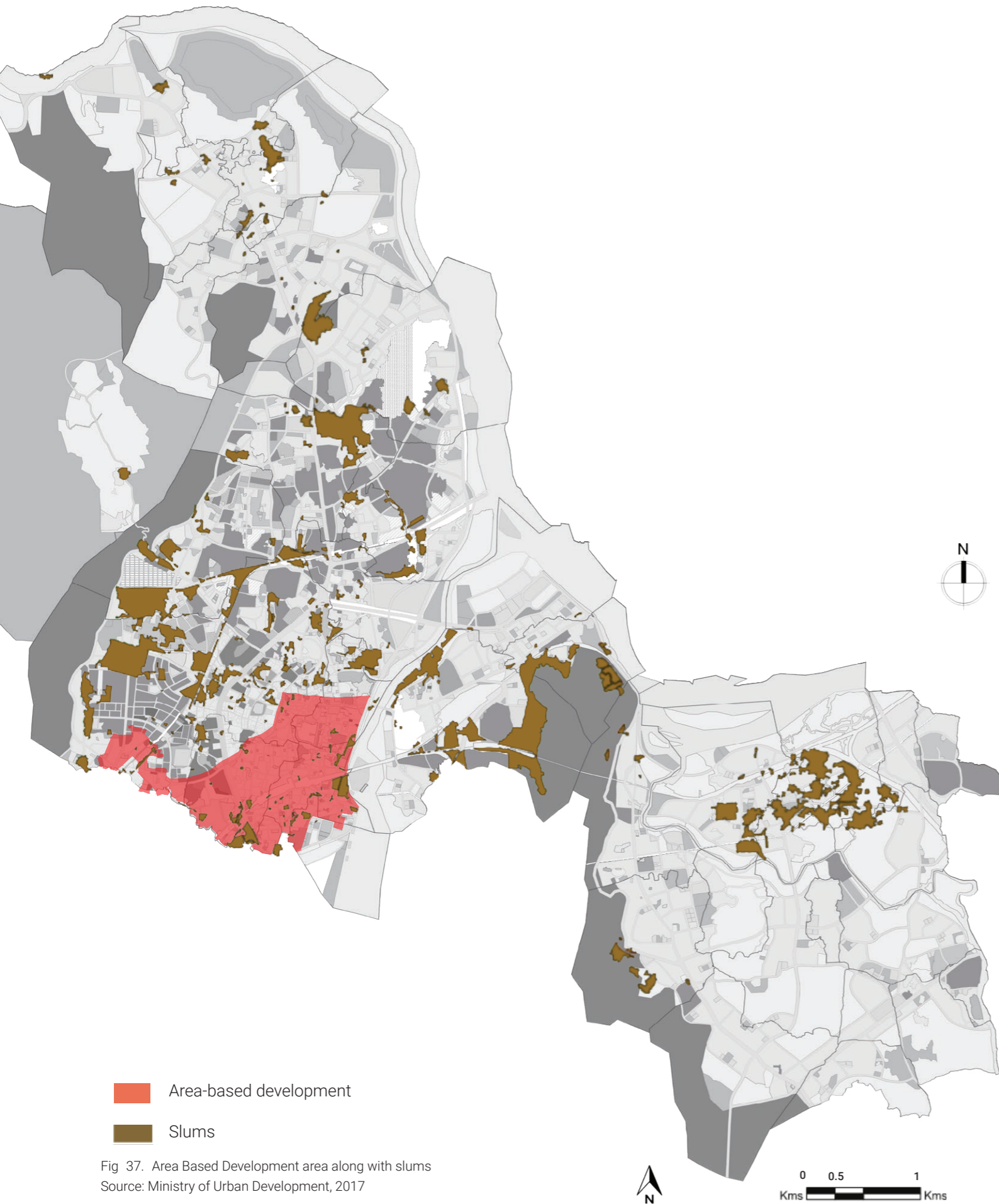
Slums

Fig 37. Area Based Development area along with slums
Source: Ministry of Urban Development, 2017

6.4 Smart City Proposal of Thane

Thane was amongst the list of cities shortlisted by the State Government of Mahaharastra and made it to the list of smart cities in Round 2 in the nationwide competition of Smart City Mission. The selection was made on 20 September 2016.

Based on the Smart City Development scheme discussed in the previous chapter, there are mainly two types of development in Thane Smart City: 1. Area Based Development (ABD) and 2. Pan City . There are two consultants appointed for each. 'CRISIL Advisory' has been appointed for ABD to look after core infrastructure development. For Pan City and ICT development, 'Palladium- DCF Consortium' is the consultant under which it is also looking after the Digital Thane Initiative.

In order to prepare the Smart City proposal, the Thane Municipal Corporation made claims that it had a huge public participation which was about 80% of the city's households

Special Purpose Vehicle (SPV) – Thane Smart City Ltd. (TSCL)

As per SCM guidelines, SPV by the name 'Thane Smart City Ltd.' (TSCL) was incorporated in 2016. The components of SPV Governance are Advisory Committee, Governing Board and Executive Committee.

The Advisory Committee should have persons from sector experts, academicians, leading NGOs, eminent urban planners, designers and Task Force for economic development. However, contrary to the expectations the Advisory Committee of TSCL has Guardian Minister for Thane, Incumbent Members of Parliament, Legislative Assembly, Council and District Collector, Mayor and CEO of TSCL. Overall model of SPV envisaged and pushed by the central and the state government. The local governing body is discouraged with this, as they found this model is against local democracy having participatory decision making. CEO of TSCL expressed that SPV led by Principal Secretary is a very good model of

administration, especially for fast tracking and timely completion of projects.

The elected representatives found SCM driven with top down approach and highly technical in nature. However, SCM was perceived to be shifting the norms of participation in house and gave more power to Administration, Member of Parliament and MLAs at the cost of Corporators who have local roots. However, CEO of TSCL expressed satisfaction at SPV model of Governance as it brought more professionalism in discussion and decision making. However, head of CRISIL seemed to address the core concern over SPV, like corporators, that tried to bypass the local government. Moreover, he felt that the idea to isolate or bypass local government did not come from Consultants but could have come from IT companies pushing forward the 'Smart Solutions'. Another feature of SPV, fairly visible in TSCL, was that though SPV was registered under companies act, there was no staffing and capacity with TMC to run the SPV. This lack of capacities, mainly in building datasets, hindered the consultants from giving ideas of innovation and inclusion. SPV model made the ULB answerable to state government but not to the people of the city.

The SWOT was taken into consideration to understand the real potential for slum dwellers to gain out of the overall city proposal and how they can be integrated within this vision. It is also to understand till what extent the informal areas are considered in the vision.

The key take-aways from the SWOT analysis in the Smart City Proposal document include that:

1. The stations being the driver of growth within the Thane city is suffering from congestion thus reducing accessibility. Improved mobility in city centers is needed.

2. Need for planned redevelopment for over 50% of population living in deteriorated housing stock, in order to create livable neighborhoods.

3. Attractive public spaces to be potentially developed along the 32-km long creek-line

4. Large scale energy efficiency projects and generate renewable solar energy to ensure energy conservation

5. The deficiencies in urban services such as water supply and sanitation that needs to be addressed to ensure attractiveness to the city

6. Thane Municipal Corporation needs to make service delivery and governance a seamless process to deliver the desired outcomes mentioned above.

The strategic focus areas of development based of the takeaways include:

- Improve mobility by de-congesting city-centers

- Safe habitat for all through redevelopment

- Enhance the natural habitat through conservation

- Energy savings through efficiency and renewable power

- Improve urban environment through infrastructure upgrade

- Accountable and responsive governance through use of technology

The smart city projects that directly affect the informal settlements is the upgradation of infrastructure such as the water supply and sewerage network in certain parts of the cities.

Vision

'Thane, a city where the waterfront and lakes are interwoven into the tapestry of everyday life of citizens providing them with a distinct urban experience that is a world apart from others. It shall be a city where the mind is free and, comfort and safety are assured, drawing a wave of creative employment opportunities; where anyone irrespective of their age, ability, gender or income are able to access all that the city has to offer and more.' (Ministry of Urban Development, 2017)

The city vision and goals started out to be ambitious, however concentrated in only very certain areas of the city. The informal settlements are perceived mainly as a weakness or a threat. By using the opportunity of good connectivity within the city and potential to develop into retail and service industry hub, it gives a chance for the informal settlement to fulfill their socio-economic desires and chances to spatially integrate with the city.

Strength

- Location and connectivity to Mumbai region
- Green areas and waterfront stretch
- Vibrant economy with emerging IT industry
- Strong financial and execution strengths of the Municipality
- Growing population
- High literacy rate
- Emerging retail and real estate hub

Weakness

- Congested city centre
- Unsafe housing conditions
- Infrastructural gaps such as inequitable distribution
- of water and sewerage network
- Dormitory city

Opportunity

- Improved regional connectivity to Thane with upcoming Metro line
- Enhanced liveability and sustainability in Thane
- Emerging centre for higher value service-based industries

Threat

- Downsizing of existing manufacturing and industrial base
- Increasing traffic congestion
- Deterioration of the creek area and waterfront
- Unauthorized dilapidated settlements which is more than 50% of the population
- Address infrastructure gaps

Fig 38. SWOT Analysis
Source: Ministry of Urban Development, 2017

6.5 Area-Based Development

The area selected for Area Based Development (ABD) is around the Thane Railway station on both the sides of the main railway line which forms the city centre of Thane old city.

"The aim of the 'Smart City Thane' is to make Thane a more liveable and workable city and creating infrastructure for 'liveable and workable' city was the main motive behind selecting the area for ABD. The Municipal Corporation and consultants thought of Thane City to be a dormitory suburb at the heart of which lies Thane station. Lakhs of commuters access Thane station and public spaces around - mainly the bus station, parking facilities, roads and alleyways-on a daily basis. A focus on station area development would make the space more accessible. Also, the Thane creek and few lakes are near station area and their potential needs to be tapped for making the city more liveable." (Ministry of Urban Development, 2017)

The chosen area for ABD is spread across 1070 acres (4.33 sq. km) in Thane out of which 1000 acres has been allotted for retrofitting as outlined in blue in the map. 70 acres has been chosen for redevelopment outlined in magenta for cluster redevelopment of old dilapidated housing stock. The Area Based Development is only 3.38% of the total area of 128.23 sq. km of Thane city.

The area lacks an overall long-term spatial vision and the interventions act like acupunctures and not structural.

Area Based Development Projects

Improving Mobility

1. New Suburban Station

2. Multi-modal facility

3. Teen hath naka junction improvement

4. Parking management

5. Pedestrian improvements

Inclusive housing

6. 70-acre brownfield township

Enhancing natural habitat

7. 3 lakefront developments

8. 1.5 km waterfront development

Energy Savings

9. LED street-lighting

10. 2MW solar roofing

Improving infrastructure

11. Water supply network remodelling

12. Sewerage works

13. Nalla works

14. Decentralized solid waste processing

15. Urban Restrooms

Pan-City Projects

Digital Thane Initiative

16. Digi-card

17. Enterprise resource planning

18. City-wide CCTV and Wi-fi

19. Online performance monitoring

20. Intelligent transport system

Fig 39. Area Based Development - Thane
Source: Ministry of Urban Development, 2017

6.6 Limitation of Smart City Thane

As per the review of the document Thane Smart City Report, Right To The City As The Basis For Housing Rights Advocacy In Contemporary India, 2016-18, the study highlights the following limitation to Smart City Thane.

Misconceptions:

Thane Municipal Corporation (TMC) has adopted newer forms of Citizen's Engagement under Smart City Plan like Essay writing competitions, Facebook page likes, feedback through Website and survey forms. TMC claims that through various channels of communication including social media, they could reach out to over 6 lakh peoples. However, the medium through which the issues were discussed, seemed that the people's voices were merely used for tokenism. Also, the people who were being addressed seemed to represent only a selective population.

Based on the interactions of some researchers with Corporators, it was sensed that the general perception of SCP in Thane was more about availability of free Wi-Fi services, Mobile Apps and Waterfront Development. Many senior leaders were confused with interpretation of "Smartness" in the Project. Many admitted that JNNURM Jawaharlal Nehru National Urban Renewal Mission was more concrete compared to highly discrete SCP. There interviews with media professionals, environmental activists, NGOs, Architects and TMC employees brought forth the similar confusion.

Oppositions:

Certain stakeholders have consistently raised objections over SCP projects on issues of local and general interest. The Cluster Redevelopment at Kisan Nagar has been proposed as test cluster. The prototype project was to be replicated across 42 sites in the city under separate 'Cluster Redevelopment Scheme'. The scheme included urban villages like Koliwadas – Chendani and Kopri Koliwada within ABD and Aagri Gaothans in Thane.

Taking clue from provisions for Kisan Nagar Cluster Redevelopment, the Koli and Aagri communities of Thane raised a successful fight against imposition of Cluster Scheme on their traditional settlements. The issue was raised in State Assembly Session and State Government had to declare that Koliwadas and Gaothans of Thane would be excluded from Cluster Redevelopment Scheme.

The Waterfront Development Project along Thane Creek also proved to be extremely controversial. The idea mooted in 2010 and finally incorporated under SCP was to develop 10.10 KM of waterfront along Thane Creek into promenades, access points and Jetties at cost of Rs. 224 crores and total funding was to be secured under SCM. The waterfront was to be developed in seven stretches mainly along the Agri Gaothans of Ghodbunder Road, required heavy reclamation across creek at the cost of mangroves and also involved displacement of some 310 families. TSCL was supposed to obtain permissions from Maharashtra Maritime Board and follow the Coastal Regulatory Norms. In blatant violation of these norms, without obtaining these permissions or without taking the local Koli and Agri Community into confidence TSCL started reclamation, destruction of mangroves and displacement of people. The green activists along with Gaothan Conservation Committee of Thane sought judicial intervention in the matter after which Hon. Bombay High Court directed the TSCL to stop waterfront development work until requisite permissions were obtained.

Change in Governance

SCM is a project-driven development launched after JNNURM. The elected representatives found both the Missions driven with top down approach and highly technical in nature. However, SCM was perceived to be shifting the norms of participation in house. This was particularly because of SPV. JNNURM did not have SPV and proposals were mainly related to works which were familiar to Corporators. There were discussions on proposals in General Body Meeting (GBM). However, SPV took away the scope of discussions in GBM, gave more say to Administration and MP, MLAs at the cost of Corporators, the elected representatives with local roots in true sense of the term. SPV model made the ULB answerable to state government but not to the people of the city.

The bypassing of interactions with Corporators who knew the local needs, aspirations for sake of Consultants lost the local connect of most of the projects under SCM. The involvement of Civil Society in the City Governance was missing. They were deprived from information/database of whole process of implementation of projects. The projects involved highly skilled, technical and professional knowledge. This has impact not only citizen's engagements but also involvement of elected representatives

JNNURM Cell constituted have been accessible by elected representatives and CSOs and NGOs. However, under SCM power lies within SPV which is an apex body at city level and this body is interacted only to state and central Govt. and not at city level. Hence, the Locals were excluded from involving in the Smart City projects.

Quotes on Citizen perception of Smart City

"Smart City is the city provides quality education, affordable and efficient transport facility and clean city"

"Smart City is about smart water management, smart energy renewal, solar proofing."

" SMART city promotes SMART governance without participation and transparency at municipal body."

"Thane smart city is without sustainability."

"Thane smart city is about superficial projects."

"SMART is exclusion of improving health services, transportation facilities, SWM, sewerage system, water supply but inclusion of wi-fi, Digi thane and beautification"

"No opportunity seen under SCM like JNNURM to the city";

"SMART city does not cover planning for citizens but planning of infrastructure.";

"SMART city is only about real estate development and grabbing the land parcels within city."

"SMART does not include environmental issues within city";

"SMART city does not recognise 'migrant workers' and their 'Nakas'"

"SMART in terms of creating data base and decision making on the database"

Fig. 40: Indira Nagar
Source: Author

7 Design Area Analysis

Sanjay Gandhi
National Park -
Yeoor Hills

Selected Design Area

Wagle Estate
Industrial Area

IT Park

Towards Proposed
Metro Station

800 M Radius
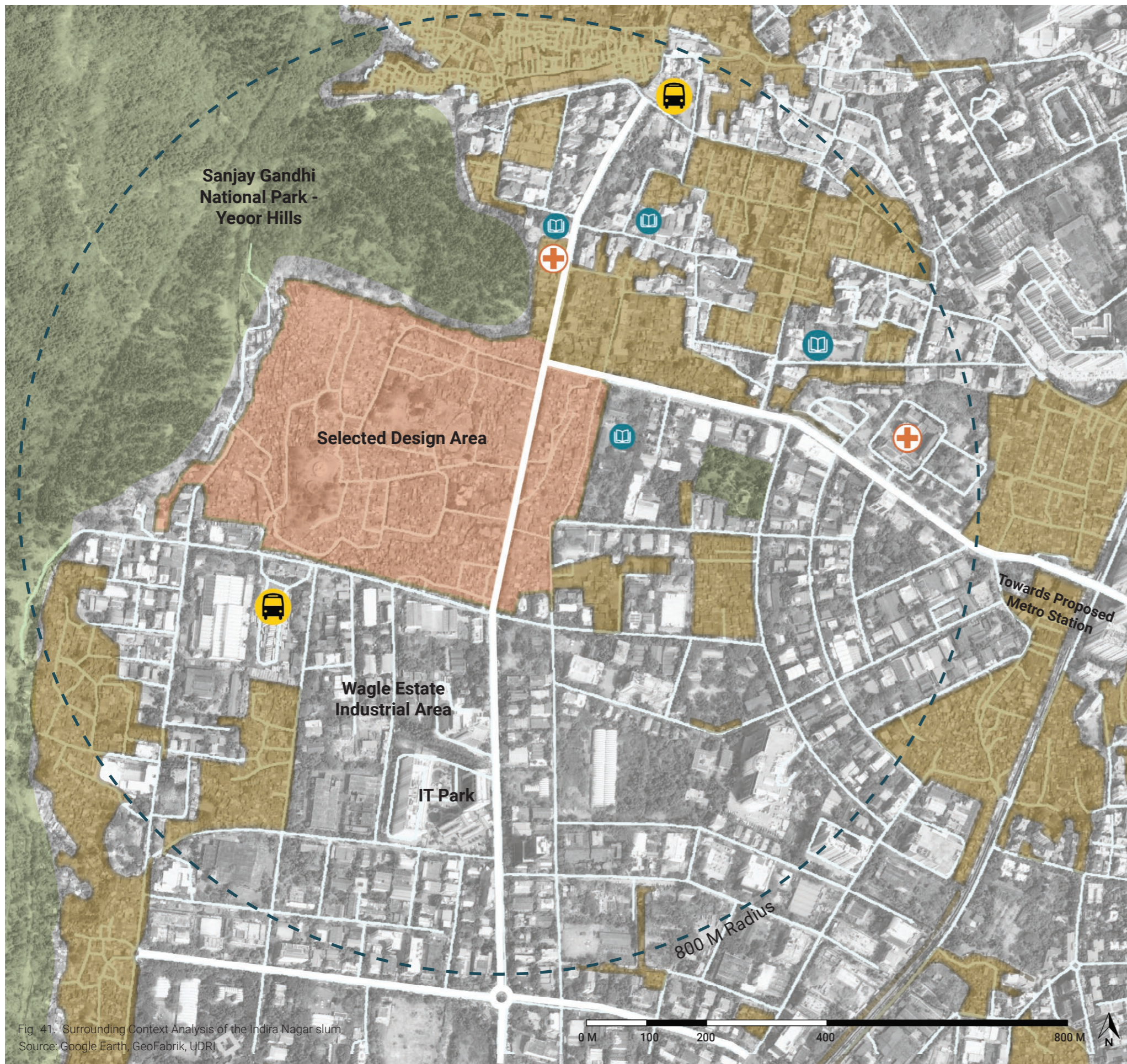
Fig. 41. Surrounding Context Analysis of the Indira Nagar slum.
Source: Google Earth, GeoFabrik, UDRI

0 M   100   200   400   800 M

7.1 Area Selection

Within the city of Thane, a suitable site is chosen to be analyzed and be a design intervention area:

The site has been selected based on the following criteria:

- Ownership of Land - Currently owned by MIDC

- Number of hutments/ Size of the slum

- Location of the slum

4.5 km
by road

Thane Railway
Station
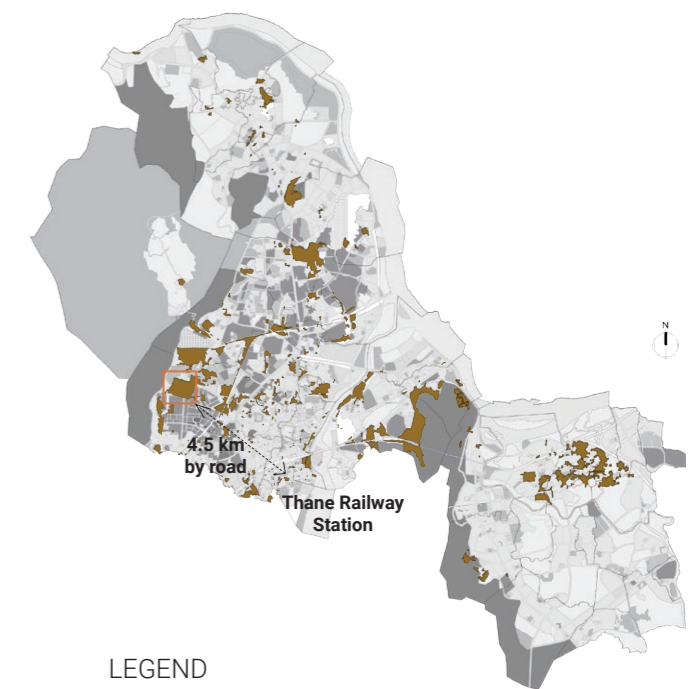
LEGEND

📖 Educational institute

✚ Health care

🚌 Bus

     Chosen Site

     Other Slums

Sanjay Gandhi National Park - Yeoor Hills

Google Earth
Image © 2021 Maxar Technologies

N

100 m

Fig 42. 3D Analysis Map
Source: Edited by Author, Google Earth

The site is flanked by roads on two sides of the settlement which is accessed through a bus network. The other two sides of the slum are surrounded by the Sanjay Gandhi National park. The contour slopes uphill towards the north-east part of the slum. It is surrounded by Industrial area to it south side. There are few schools around the area and the hospitals are mainly private making it unaffordable for the marginalized groups. The surrounding area has many more pocket of slums.

7.2 Design Area Analysis

Total Area: 308,468 Sq. mtr/ 30.46 Hectare

Total households - 9882 HH

Total Population - 42636 people

The slums of Indira Nagar, Sathe Nagar, Ambewadi, Hanuman Nagar and Rupadevi Pada in Wagle Estate, Thane West is chosen for the Project. The outlines of the individual slums are demarcated. For the purpose of this research project, these area are taken into consideration together since they function together and correspond to each other spatially.
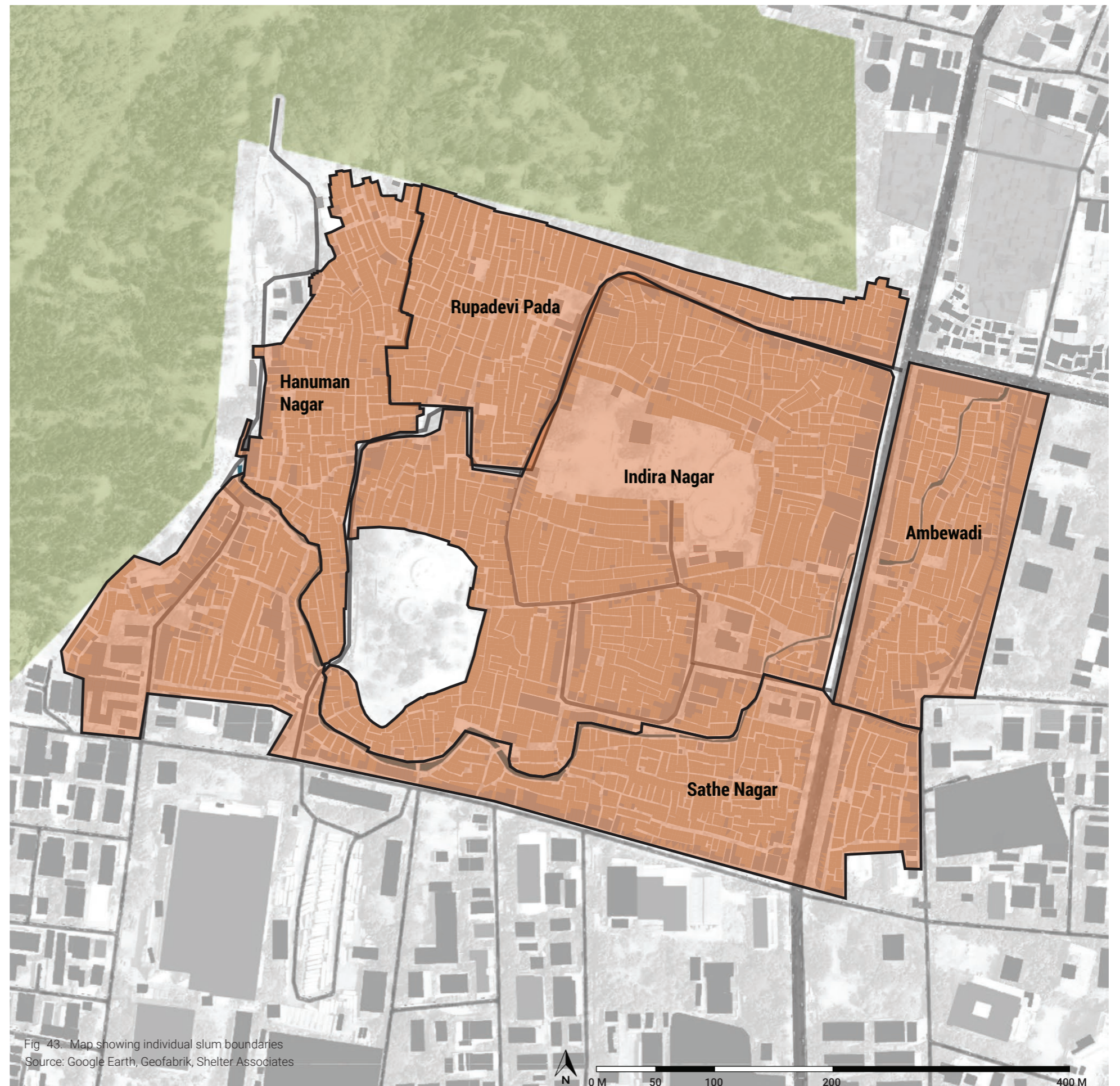
Fig. 43. Map showing individual slum boundaries
Source: Google Earth, Geofabrik, Shelter Associates

N 0 M   50   100   200   400 M

Living conditions in slums:

The houses in slums are made of bricks, mud, tin sheets, bamboo, and tarpaulin sheets, etc. Those who earn reasonably better are improving their houses with cement concrete and wooden panels. Most houses are constructed as ground plus first floor with an iron ladder. The living area of each dwelling is about 150-200 sq feet which are mainly used for storage of household items, bathing, and sleeping. Most of the population is using community toilets. Water taps with connection to public water facility is now available in every house but supply timings is very limited. Major water supplies is given by Thane municipal corporation (TMC) from a nearby water tank at Savarkar Nagar. There are around 3 ground wells in Indira Nagar and an hand pump is also available at this location for manually pumping the water. There is no proper drainage system in the area and hence the dirty water flows openly in ditches which is bad for the hygienic condition of the people.

The density of the population is very high in these five slums. There are about 42636 people living in these areas in about 9882 houses. (Shelter Associates, 2017) The total area is 650 meters by 460 meters (0.30 sq. Kms).

There are only two small schools present in the area which are presently closed due to Covid 19 situation . In the nearby location other schools are present, where majority of students go for primary and secondary education. There are many colleges in Thane, Mulund and nearby areas where academically talented students get admitted for higher studies. Garbage is collected by TMC pick up vans called 'Ghanta Gadi' at designated spots once a day at fixed timings. During rainy season, flooding takes place in some areas mainly in Ambewadi due to the canal (nallah) being blocked by garbage and getting overfilled . Health centers in the area are very limited with few no proper facilities. Few qualified doctors are available in the area and no government hospitals are nearby. Due to unhygienic conditions,

many waterborne diseases are very prevalent.

Social structure in slums:

Majority of people living in these areas work as drivers of cars, rickshaw, or sell goods such as vegetables and fruits in hand carts. In Indira Nagar and Thane city, many rickshaw drivers reside. Since these are privately owned vehicles it causes parking issues mainly at night hours since main roads are used for parking. Everyday about 300 daily wage laborers engaged in construction work, plumbing, painting, and carpentry get assembled at Indira Nagar circle in morning hours, where contractors come and engage them for the day's work.

There are number of shops like grocery, toys, hardware, bakery, snacks and factories like welding, manufacturing of nuts, bolts and parts of machinery are owned and run by people in this area. People with skilled education work in pharmaceutical firms, IT firms, and engineering industries in Thane and Mumbai. Skilled and semi-skilled laborers work in many factories situated in Wagle estate and other areas of Thane and Mumbai.

In these areas, there are about 22 Mitra & Seva Mandal (social groups) operating. . Mandal is an association of local residents and the main activity is to bring the community people together and give advisory on the celebration of various festivals like Ganeshotsav, Navratri, Holi, Chat Puja, etc. Few of these groups are registered and have space for office and other activities. Members contribute about Rs. 100 per month to fund the expenses of the group. Mandals also arrange for community Kitchen called 'Bandara', blood donation camps, educational material distribution, talent hunt, and medical camp including eye checkup. They also provide free computer education for young students and help students in applying for college admissions. For Chat Puja, they create artificial ponds out of air filling in tarpaulin. They plant trees and build small gardens near the mandal offices. Mandals also arrange for free education to orphans

living in their areas. During Covid 19 Pandemic, mandals helped people to get medical treatments and arrange vaccination for eligible persons in the area.

Availability of transportation facilities:

Some people own two wheelers which they use to move within the areas or nearby places. There are Two bus terminus, at Wagle estate (near Sathe Nagar) and Lokmanya Nagar (600 meters from Indira Nagar chowk). Buses go the Thane railway station, Mulund checkpost and places in Mumbai. There are bus stands in three areas where people can walk down easily to board the bus. There are Rickshaw Stands at Indira Nagar circle and Sathe Nagar for private transport. Sharing rickshaw is available for Thane station, Mulund checkpost and other important places. It appears that adequate transportation facilities are available, though they are crowded during peak hours. The proposed metro station at Nitin company junction is about 2 kms from this area which is planned to open in two years.

Market places:

In Ambewadi, there is big market place for fruits, vegetables, fish, poultry, meat, spices and other grocery items. Small vendors sell fruits and vegetables in Sathe Nagar and Hanuman Nagar chowk.

Local leaders/Nagar Sevaks:

The corporators (Nagar sevaks) are elected by voting. There are four corporators in these areas and they stay in nearby places. TMC while planning for the development of slum areas coordinate with corporators and take their feedback in decision making. Corporators understand the local people's problems and try to solve it within their budget/powers. They regularly meet with other corporators to discuss common problems of neighbouring areas.

Ecological Conditions:

Indira Nagar and Sathe Nagar covers about 70% of the area chosen and are in plain ground level. Ambewadi is on lower level and are prone to water logging during rainy season. Hanuman Nagar and Rupadevi Pada are on sloppy and hilly level. Hanuman Nagar is on foothill of Yeoor Hills and rain water from mountains comes through the broad Nalla running through the Sathe Nagar down to Ambewadi.

Transportation

Majority of the Amenities are Temples

1489 Shops

BUS DEPOT

N   0 M   50   100   200   400 M

Fig 44. Map showing access to Transport
Source: Google Earth, Geofabrik

Majority of the Amenities are Temples

1489 Shops

N   0 M   50   100   200   400 M

Fig 45. Map showing daily systems
Source: Google Earth, Geofabrik, Shelter Associates

Ownership

72% Ownership
28% Tenants
Lower middle class family and poor
Mainly families

It is observed that lots of people throw garbage in the canal
and open space.

LEGEND

■	Door to door waste collection or ULB service
■	Garbage bin disposal
■	Open garbage disposal
■	Along/ Inside canal or Inside gutter
●	Garbage Bin
✕	Open garbage area
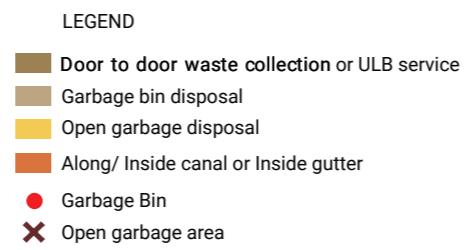
Fig 46. Map showing waste collection system
Source: Shelter Associates, Google Earth, Geofabrik

Access to Toilet

Total community blocks - 27

79% use community toilets

20% Own toilet

1% Open defecation

Majority interested in private toilet

LEGEND

■	All defecate in open
■	Own toilet
■	Use Community Toilet
■	Community Toilet
○	50 M Radius
■	Open defecation spot

Fig 47. Map showing toilet availability
Source: Shelter Associates, Google Earth, Geofabrik

Under-utilized spaces and Waste disposal

Source: All images by Author

Inefficient public space usage

Need for improvement of streets

Source: All images by Author

Poor condition of housing

7.3 Survey and Interviews | Diagnosis

A survey was conducted among the local residents during the months of January and February 2022. of the chosen site area to identify the problems, perceptions and people's values within the area.

Semi-structured interviews were conducted with local corporator (Municipal Corporation - ward committee head), Youth group and urban designer in practice in Mumbai.

A survey was conducted in the area to understand the preliminary perspectives of people with regards to the problems in their area as well as understanding systems that lie within their daily lives.

The survey was divided into multiple sections namely: General Statistics, Problems, Involvement and Decision-making, Solution, Responsibility and Contribution, Public space activities, Support system, Accessibility, Smart City Awareness (Refer to Appendix)

The primary identified problems were education, Housing, and waste management. This information was used in to determine the people's values.

The data indicate that 75 percent of the people would like to get involved in decision-making, and most are interested only in local scale participation. This participation is not restricted to social media and surveys but extends to attending meetings and discussions. This shows that their willingness to bring about change within their area by having a voice in decision-making and choosing to participate.

In a participative approach to planning, the opinion of the residents goes beyond their homes and extends to the neighborhood. The survey indicated that the most popular choice for the use of public spaces is for public services and entertainment. Refer to Fig 58 on page 105. The residents also showed interest in taking responsibility by contributing financially and in time to the development of their neighborhood. Refer to Fig 56 & Fig 57 on page 104.

Top 3 Problems

Fig 54. Choice of top three problems identified for the area

First Choice
Second Choice
Third Choice

General Statistics

60%   40%

Fig 48. Number of years as residents of the area

Fig 49. Number of years as residents of the area

Area Name
Ambewadi
Hanuman Nagar
Indira Nagar
Rupadevi pada
Sathe Nagar
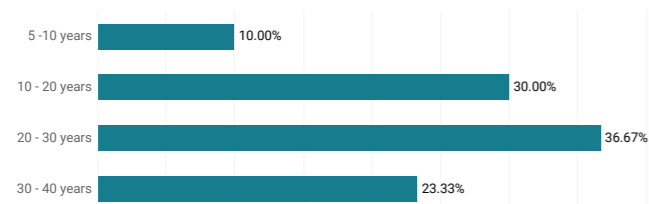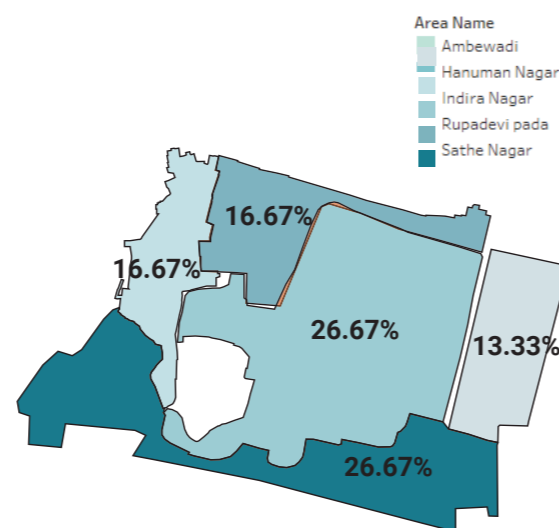
Fig 50. Survey participant's distribution across the area

Source: Author's own survey

Involvement and Decision-making

Yes
Get involved only when things go wrong
Maybe
No, (I trust the politician to take decision)
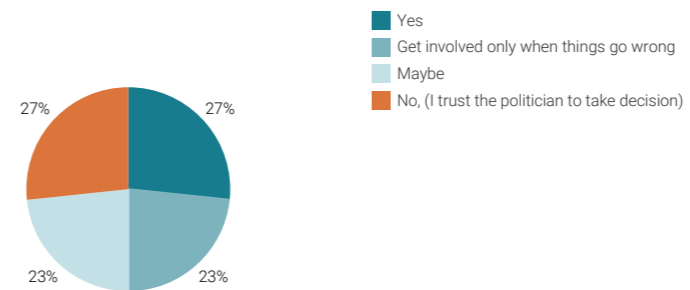
Fig 51. Level of interest in involvement in planning or decision-making

Local scale participation
City scale decision making
Both
None
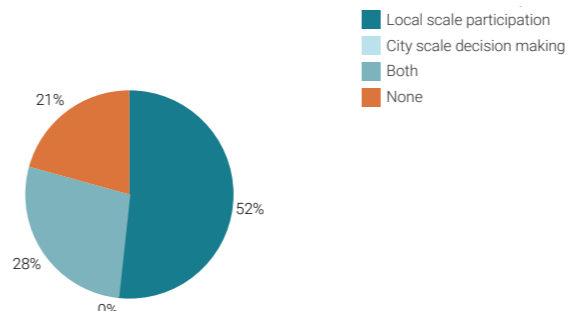
Fig 53. Planning scale at which participant would like to be involved

Methods
Meetings and discussions
Surveys
Social media/ technologically involved
NGO
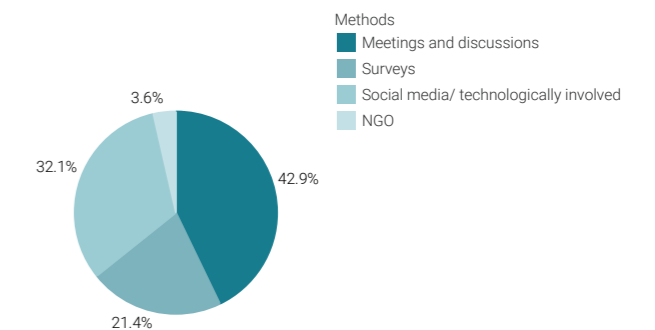
Fig 52. Involvement in planning or decision-making

Solutions/ changes

Which of these solution/ changes would you like to see in your area?

Public space and gardens	60%
Better waste collection and cleanliness	50%
Better streets	50%
Training centers for employment	46.7%
New Housing	40%
Private toilet with sewer connection	36.7%
Rain water harvesting	20%
More community toilets	20%
Community Hubs	16.7%
Better lighting	3.3%
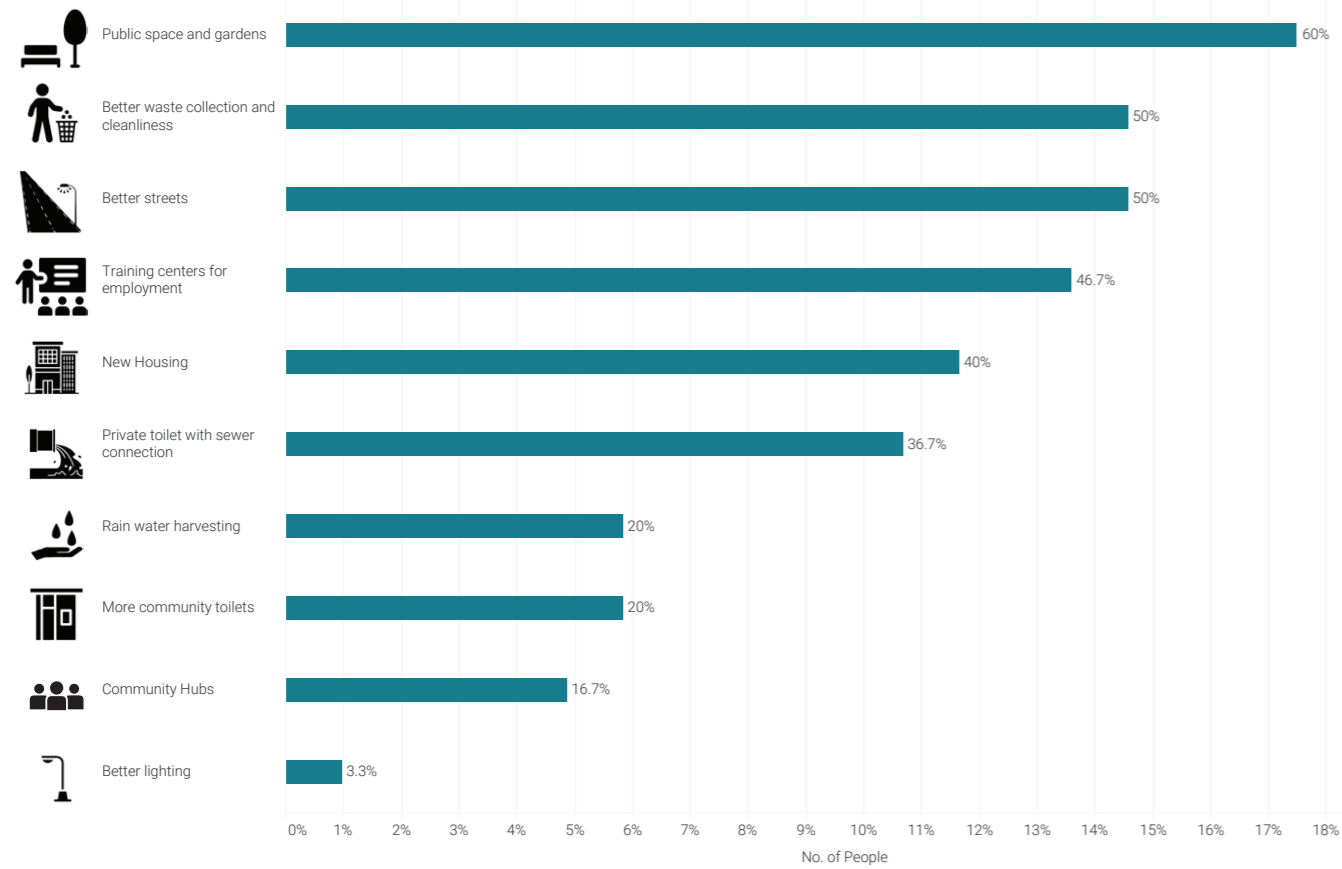
Fig 55. Preferred solutions/ changes for the area

Responsibility and Contribution

- More than ₹500/ month
- ₹100 - 250/ month
- ₹50- 100/ month
- Less than ₹50/ month
- None

10.00%
26.67%
26.67%
16.67%
20.00%

Fig 56. Willingness of monetary contribution for area improvement
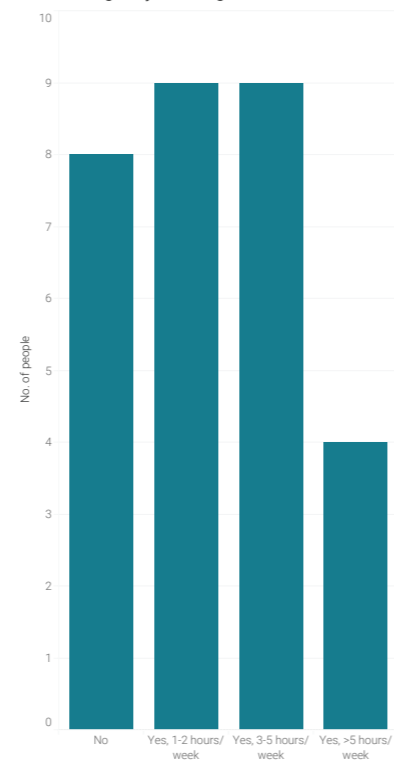
Fig 57. Willingness of time contribution for building and maintenance

Public space activities

What type of public space and activity would you like to have in your neighborhood?

Amenity (group)

Cafes/ restaurant	33.3%
Childcare centre	10%
Community Fair	10%
Community Kitchen	10%
Cultural events	46.7%
Entertainment (Small theatre/ library)	50%
Public services (Hospital/ Bank)	60%
Sports playground	26.7%
Parks	43.3%
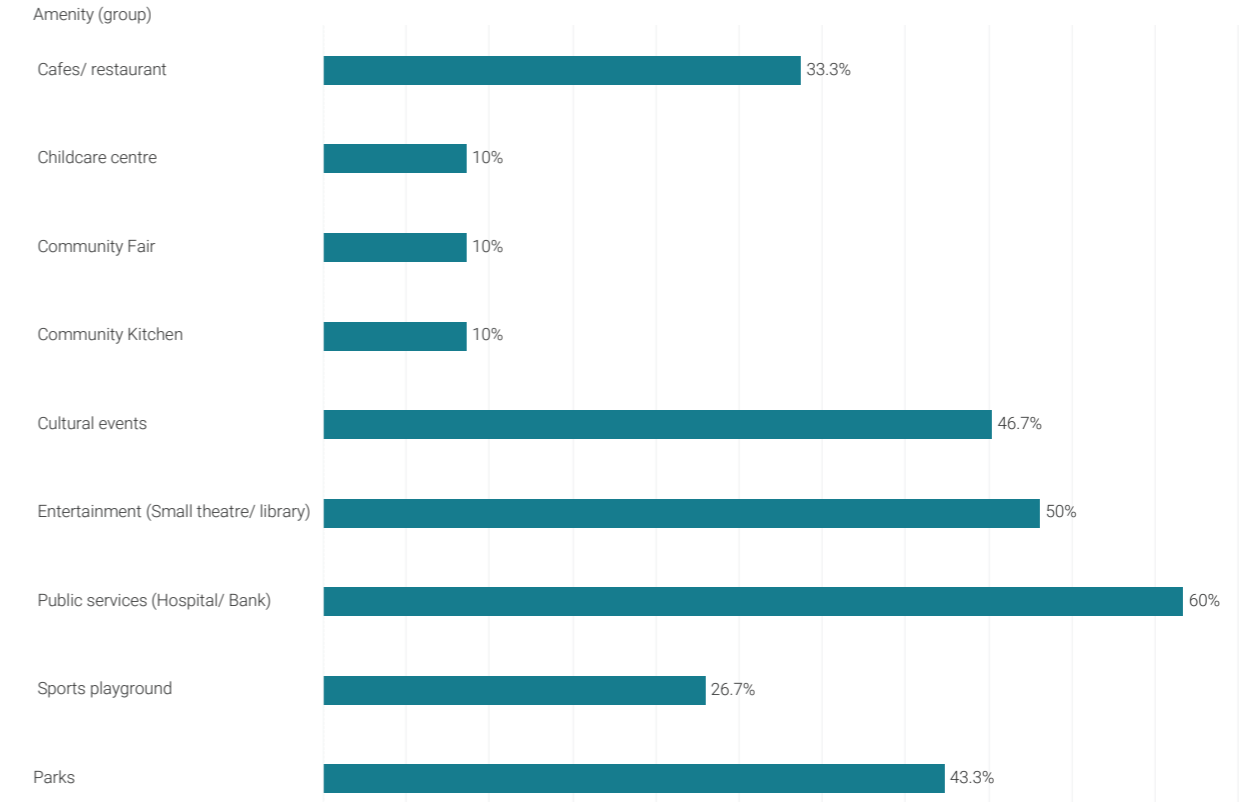
Fig 58. Preferred public activities in the area

Support system

Least support   High support

Fig 59. People's perception of support by local area representative (TMC Corporator)

Least support   High support

Fig 60. People's perception of support by Mitra/ Seva Mandal (Youth group/ CBOs)

Most of the residents indicated that they do not receive any help from the local youth groups or corporations, and hence it is evident that we need to activate these stakeholders.

Accessibility
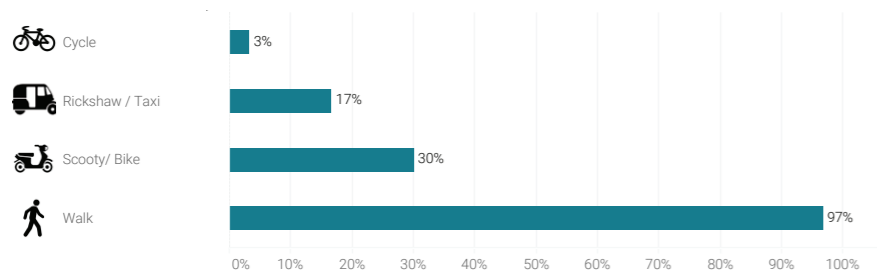
Fig 61. Mode of Transport within the settlement
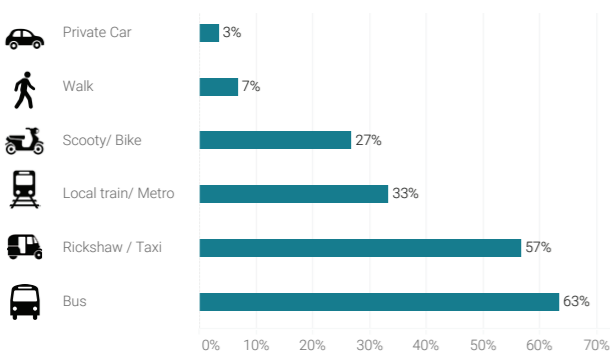
Fig 62. Mode of Transport outside the settlement
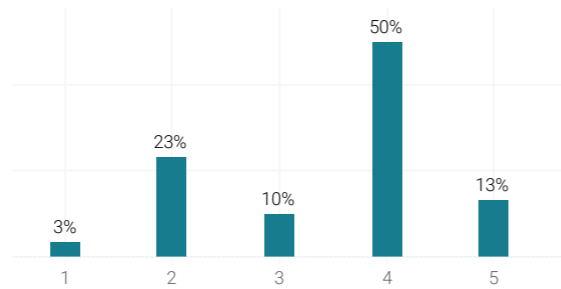
Fig 63. Rating for access to the city

Smart City Awareness

Maybe
No
Yes

31.03%
41.38%
27.59%
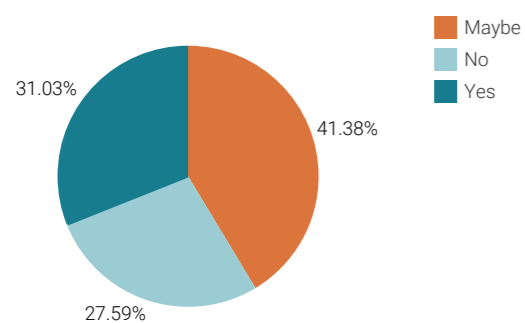
Fig 64. Awareness about Smart City among residents

The residents also indicated that their primary mode of transportation inside the area is walking and outside the area. Hence, it becomes essential to make the streets more walkable and accessible to public transport. Many people haven't read about smart cities, so public awareness about programs becomes a critical aspect of engaging with the residents.

Semi-structured interview findings:

Corporator (Municipal Corporation):

The SCM implication is mainly on acquiring private toilet and putting lights on the road. There is general lack of funds towards slum improvement and piecemeal improvement are made. Cluster redevelopment has mixed opinions regarding it.

Mitra Mandal (Youth Group):

Lack of hygiene, and basic amenities is the core problem. Desire to make a change in the community and take responsibility for community mobilization and nearby public spaces.

Urban Designer:

The need for self-help mechanisms is essential in sustainable upgradation projects. It is important to understand for whom and what is the smart city and go beyond the looks of Smart City. Community engagement and ownership to create sense of belonging is key in these projects.

The idea of the surveys and interviews are part of the co-production approach.(Described in next chapter) It is used as a critical tool to continue the process and build up upon the different strategic initiative and through that to build upon a common ground through time.

General Public Opinion

Hope we have a toilet in my house

Age: 15
Occupation: Student
Location: Ambewadi

Wish our school was near our house

Age: 12
Occupation: Student
Location: Hanuman Nagar

There is no playground to play in after school

Age: both 10
Occupation: Student
Location: Indira Nagar

We must do something to clean the garbage

Age: 67
Occupation: Retired Postman
Location: Sathe Nagar

Tree shade is missing here

Age: 34
Occupation: Deliver Person
Location: Rupadevi pada

How to cross this crowded street?

Age: 43
Occupation: Housewife
Location: Sathe Nagar

Smart City Perspectives

Smart means efficient system around. Better Transport, Medical Facilities, Parks, Schools, and Hospitals.

Age: 72
Occupation: Shopkeeper
Location: Ambewadi

Link to main city activities

Age: 42
Occupation: Auto-rikshaw driver
Location: Indira Nagar

Good roads, Better Sanitation and Cleanliness

Age: 37
Occupation: Medical Representative
Location: Ambewadi

Not seen in my area. Government should develop our area under Smart City Project

Age: 64
Occupation: Retired Auto driver
Location: Rupadevi pada

7.4 Current Stakeholders

A stakeholder analysis forms the bases for creating any changes to societal and planning processes. The stakeholder analysis will be used to identify which stakeholders to encourage and discourage, forecast behavior, and locate possible coalitions. Furthermore, it is possible to derive knowledge of how to change the views of each of the stakeholders. A stakeholder analysis was conducted as a part of the site investigation. There are four main categories of stakeholders identified: governmental bodies, municipal bodies, private bodies, and residential bodies. The analysis begins with an initial assessment of the power and interest of each of the stakeholders. The result of the investigation can be found in Fig 66. The role of the stakeholders in the planning process has also been identified and cataloged in Table 4.
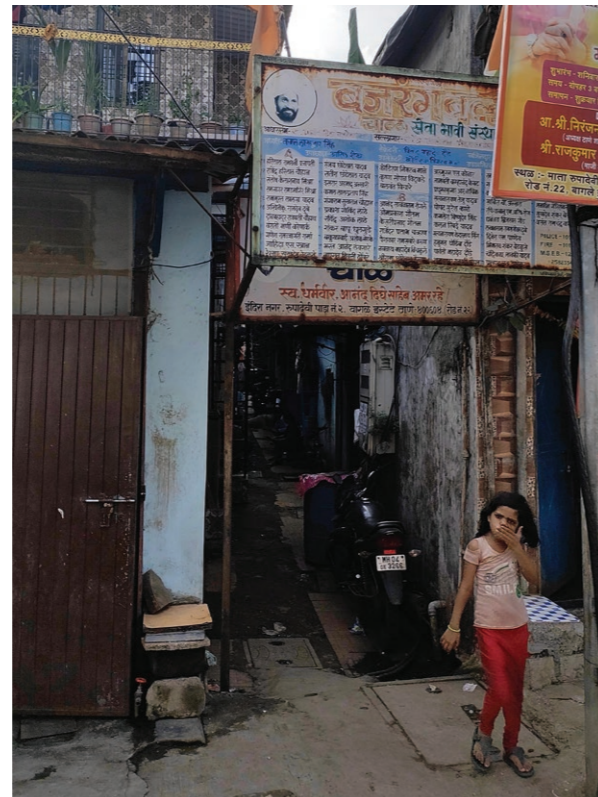
Fig 65. Residential Chawl organization
Source: Author's own image

Fig 66. Mitra Mandals/ Youth groups
Source: Author's own image

Elements / Stakeholders	Conventional development							
	Planning	Implementation					Maintenance	
	Settlement Planning	Finance provision	Physical Infrastructure	Community services	Housing redevelopment	Labour	Management	Labour
Local government	X	X	X	X	X	X		
Ward committee	X		X				X	X
NGO				X				
Youth group, CBOs and FBOs								
Residents								
Neighbourhood council								
Urbanist								

Table 4. Existing Stakeholder relationship Matrix
Source: Adapted by Author based on UN-Habitat, 2014
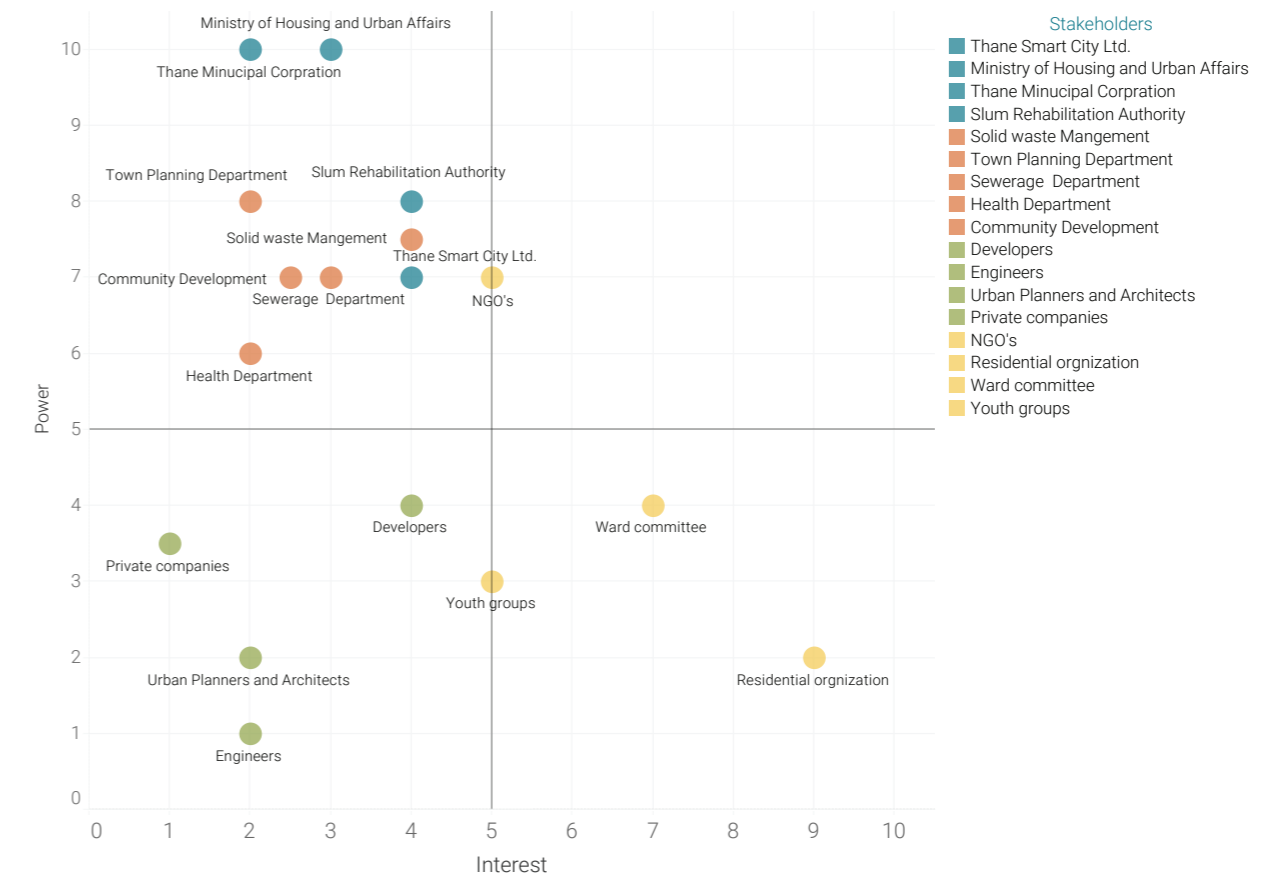
Fig 67. Existing - Power-Interest Matrix
Source: Drawn by Author

7.5 Potentials and Challenges

Potentials	Challenges
Locational advantage - connectivity to city	Topography - Sloping hill
Booming IT industry in area	Congested and very high density
Interest in education	Forest surrounding and preservation act
Informal shops - new business opportunities	Industries closing - leading to loss of employment
Existing social and socio-economic networks	Poor sanitation and waste management
Community willingness to participate	Lack of pre-school for children
Surrounded by ecology	Lack of open space
	Lack of space in alleys and local narrow streets

Fig 68. Potentials and Challenges
Source: Drawn by Author

Based on the site analysis and survey results, people values, daily movements and systems as well as cultural values were understood.

The potentials and challenges were listed down based on understanding of the problems by the people. The interests of stakeholders around this issue.

The chosen slum is located at the edge of the city bordered by the national park and flacked by roads connects via bus transport system making it accessible to the city. The need for better socio-economic opportunities can be explored by keeping in mind the good accessibility and creating work opportunities in and around the slum.

It is necessary to deal with the tight space and optimizing it best to users needs and demands and retaining the urban fabric for better socio-economic relations. Integration with ecology and developing interaction with it is also to be explored.

Fig 69. Incremental Housing Strategy at Pune
Source: https://un.se/en/work/incremental-housing-strategy/

8 Approach:

Smart Slum Upgrading Program

8.1 Smart City Mission Revisited

In order to achieve the overall aim of an inclusive developmental model within the smart city paradigm, it is important to adopt the principles that help moving towards the Smart City Mission 2.0 as understood in the theoretical underpinning. (Refer Chapter 5). This principle mainly consists of citizens as co-creators to planning and this becomes the basis of forming an extension to the current Smart City Mission as a program know as "Smart Slum Upgrading Program".

It is crucial to define what is "smart" within the context of this project and it is essentially built upon the idea of theoretical perspectives and people's perspectives of what this smartness could possible mean.

The current Smart City Mission does have set agenda and goals such as the provision of core infrastructure, public participation and improving quality of life.

The defined smart city mission for Thane does try to
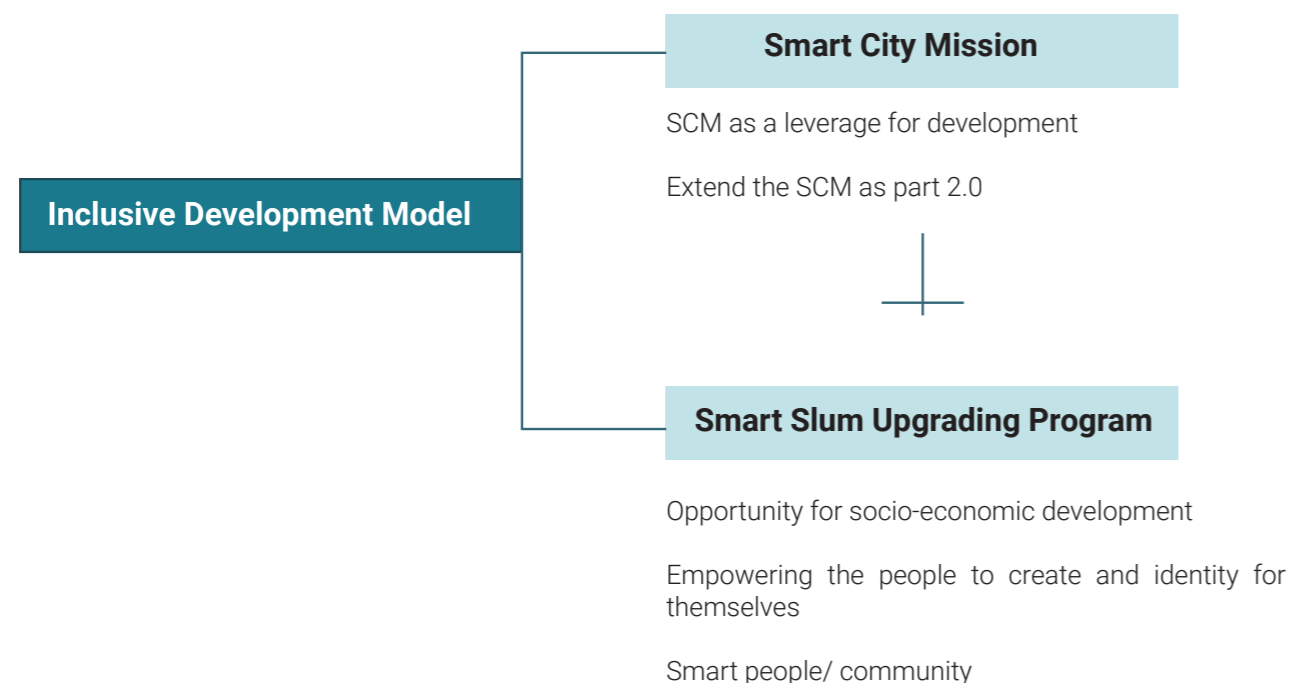
address the problem on inclusive housing through proposal of cluster redevelopment at a test site. However, this process does not have an interest in elaborate public participation to understand what people want and needs. And at the current pace of the proposal which is still at enumeration of the residents that are staying, it took 6 years to achieve and also removal of the proposal from the Smart City Mission due to its large investment of funds.

To tackle the gaps of addressing the informal settlements within the Smart City Mission, it is expanded to form the program of "Smart Slum Upgrading Program" as part of this research project's proposal which elaborates on the process and steps to be taken in order to hear the people's demands and the voices.

Parameter	EIUS 1989	ILCS 1980	UBSP 1990	NSDP 1996	VAMBAY 2001	JnNURM 2005	AHIP 2009	ISHUP 2009	RAY 2012
Size USD mil	150	75	30	775	200	13333(5350)	1100	132	-
Shelter	-	-	-	✓	✓	✓	✓	✓	✓
Urban basic services	✓	Toilets	-	✓	Toilets	✓	-	✓	✓
Community infrastructure	-	-	✓	✓	-	-	-	-	-

Fig 70. National Policies
Source: Rajiv Ranjan Mishra, Ministry of Housing & Urban Poverty Alleviation

Inclusive Development Model

Smart City Mission

SCM as a leverage for development

Extend the SCM as part 2.0

Smart Slum Upgrading Program

Opportunity for socio-economic development

Empowering the people to create and identity for themselves

Smart people/ community

The existing schemes at national level and at city/state initiatives for slum upgrading programs have different goals that range from complete new housing to in-situ development.

The limitations of the existing programs are listed below:

· Lasts for short duration usually upto 5 years

· Lacks integration of stakeholder capacities - specially at local level participation

· Lack of synergy between one program to the next causing discontinuation

· No spatial continuity in execution of infra- structure

· High investment funding

In order to tackle the inefficiencies of the current and past programs, a new program is proposed under the Smart City Mission, known as the Smart Slum Upgradation Program.

It acts as medium for existing policy convergence at different scales of governing bodies. A consolidation of the past programs and in order to operationalize this new proposed program, there would be an evolutionary plan set for achieving each goal. This would last for a long duration and acts as a model for citizen engagement, spatial transformation and improvement using a vision which can be revised by the people periodically.

8.2 The Approach: Smart Slum Upgrading Program

In order to overcome the limitations of the current processes of slum redevelopment or upgrading, an alternative urban renewal scheme termed as the Smart Slum Upgrading Strategy is formulated. This is a strategic proposal that places importance on co-production of spaces with the informal settlement inhabitants to improve their quality of life and enhance their existing socio-cultural and socio-economic networks.

The Smart slum upgrading strategy is based on the principles that possibly provokes citizen engagement in order to integrate their perception, needs and potentials to improve their area. This is needed to have a wholesome approach and a collaborative planning approach as an alternative to the current top-down process of slum upgrading.

This is formed using an overall framework that adopts strategy from the existing Smart City Mission and extends it as a systemic process for a informal area development. It is necessary to align the strategy to existing programs and integrating actors through co-participation in an evolutionary process. This would be attained through establishing an emancipatory co-participation platform that allows the urban regeneration process to have a continuum. Certain elements would be identified and strategic goals would be set as milestones that each future transformation is building up on.

It is an incremental process which can be achieved by rebuilding the people's trust upon the government by tapping into the community's inbuilt potential and allowing their knowledge to develop their own neighborhood.

The strategic framework ahead demonstrates the way this strategy can be applied to the design study area of Indira Nagar which will act as a pilot study and how this method can be institutionalized and expanded to other informal settlement areas within the case study city of Thane.

Smart Slum Upgrading Program

Core Principles

Co-creation process

Smart citizens

Placemaking

Strategic Framework

Spatial Framework

Strategic Actions

Operationalization

Co-create and build

Fig 71. Smart Slum Upgrading Program
Source: Drawn by Author

Multi-scalar approach

Policy Framework

Smart City 2.0

+

National

Spatial Design

Design of Governance system which is more inclusive of marginalized groups and gain right to the city

Possibility of City-wide slum upgradation by initiating an pilot area of Smart Slum Upgrading Program.

City

Apply spatial vision for better integration of informality

Develop and implement strategy toolkit at neighborhood level for self- organization and decentralized development

Neighbourhood

Implement pilot projects within the chosen neighborhood

Local

Define possible Interventions applied across scales for better connectivity and spatial integration

Fig 72. Multi-scalar approach
Source: Drawn by Author

8.3 Components of Strategic Framework

The proposed Smart Slum Upgrading Program is operationalized by the strategic framework. The selection of the slum needs to be made and their local conditions need to be understood to make a proposal for the long term.

The primary objective of the strategic framework is to facilitate an integrative strategy and design that seeks to achieve the derived goals of the project that would build up to achieve the main goal of inclusive and just development of an area.

It is developed as a possible way to strategically plan the informal settlements within the Smart City proposal framework. This would be an extension to the area-based development strategy mentioned in the Smart City mission.

The Strategic Framework consists of a system to determine strategic and operational goals. These goals along with the urban design concepts for resilience such as heterogeneity, polyvalency will be used to develop a spatial framework. Spatial Framework forms the definition for ways to classify and organize the space to engage different actors within the process.

The spatial frameworks creates the basis for the strategic actions guided by the urban design concepts. This is then used to create a spatial vision through the author's understanding of the site. The spatial vision consists of elements of spatial framework adapted to strategic locations within the site.

To operationalize the spatial vision, a phasing strategy along with process of transformation is formulated as an evolutionary process. This is tested using a local scale example. It finally ends with recommendation for city scale and national level policies.
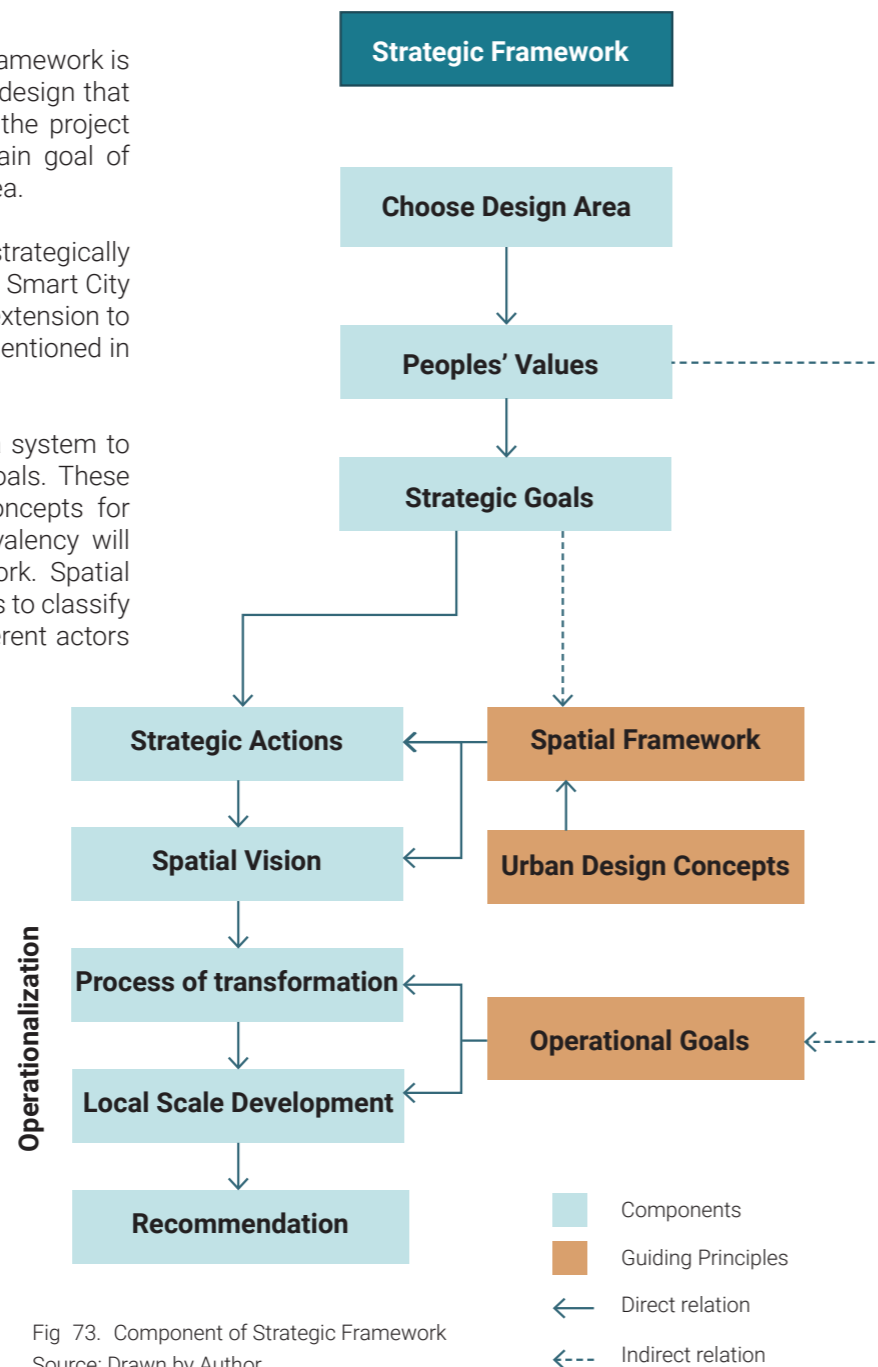
Fig 73. Component of Strategic Framework
Source: Drawn by Author

8.4 People Values

The data from the survey was used to determine the key value of the people within the informal settlements. The concept of social sustainability is defined by the emergence of design and planning of urban communities based on the how people and space relate in order to fulfill the human needs. (Ghanam & El-Deep, 2021). is used to classify the values.

The value drivers for social sustainability are mentioned in Table 5. The need for these drivers are discussed below:

People's participation: It is important for people to be part of the planning process for them to feel included and accept the design. This was also supported by 75% of the people's opinion willing to get involved in the planning, as seen in Fig 52 on page 103.

Social diversity: The ability to use spaces by multiple gender and age groups to optimize the space available within the area.

Health & safety: Accessibility to public toilets by woman and children at night, enabling streets for access of emergency vehicles.

Public awareness: The information regarding the Smart city mission and other such urban programs was lacking in the survey participants as a majority of them were not aware of Smart city mission

Local economic: Improved facilities for local businesses, employment (daily wage workers) square conditions to be improved.

Training and employment:: The need for access to jobs within the city, access to educational facilities and vocational training centres

Social sustainability	
Social equity	-Participation and empowerment of women.
Human rights	-Bring the symbolic attainment of citizenship rights. -Integration of slums into the city administration system.
People participation	-Participation of a variety of economic groups. -Participation during all steps of slum upgrading. -Participation in decision making over the street.
Social diversity	-Responsive to gender, youth, children, the elderly, and the disabled. -Accessibility and social control of public spaces optimization of density. -Promotion of mixed uses.
Socio-environmental sustainability	
Safety	-Identify factors that increase insecurity in the public space. -Safety and security of public spaces. -Social control of public spaces. -Streets provide access for emergency vehicles.
Health	-Reduce the effects of natural disasters, green urban design
Public awareness	
Socio-economic sustainability	
Local economic	-Access to jobs and economic hubs in the city. -Trigger economic value and local economic development processes. -Improve tenure security.
Training, development and employment	-Integrate job creation and vocational training.

Table 5. Indicators of achieving social sustainable upgrading in slums
Source: Ghanam and El-Deep, 2021

Self-Actualization
Achieving one's full potential,
including creating activities

Tangible Values

Training and employment, Entrepreneurship,
Co-creation of spaces

Esteem needs :
prestige and feeling of accomplishment

Local economy, Sense of ownership

Belongingness and love needs:
intimate relationships, friends, social

Public awareness,
Community, Cultural identity

Safety needs:
security, safety

Health and safety for all

Physiological needs:
Food, water, warmth, rest

Basic services and infrastructure,
Secure housing

Psychological Needs

Basic Needs

Fig 74. Extended Maslow's hierarchy needs
Source: Adapted by Author, Original Pyramid from https://www.simplypsychology.org/maslow.html

Maslow's hierarchy of needs is a framework that can be used to interpret and classify the needs of a community. The framework broadly separates needs into basic, physiological, and self-fulfillment needs, as seen in Fig 74.. Maslow tells us that the lower goals need to be met first before moving up to the higher needs. This means that the goals, strategies, and frameworks that will be developed for the Smart Slum Upgradation Program should be cyclic and take an evolutionary perspective to achieve a just city in which citizens are self-fulfilled individuals of society.

The identified values from the social sustainability have been mapped onto the hierarchy of needs to ensure that the proposed Smart Slum Upgradation Program is comprehensive in its approach and ensures that the residents are on the path to self-actualization. Furthermore, by ensuring that values cover all the different levels of needs, we can consider the proposed system to be different from other programs designed to address informality.

8.5 Goals

Main aim

To develop a collaborative approach for improving quality of life of marginalized community by a people-centric approach in order to achieve an integrated, inclusive and just smart city

The strategic goals are formulated according to the potentials and threats mentioned in the previous design area analysis chapter. These goals align with the programs and policies at the national, metropolitan and local level. It is also in alignment with the people's perspectives and demands from the area.

Strategic Goals

- Improve mobility within the slum & outside with the city

- Better access to services and amenities

- Creation of public spaces and preserve socio-cultural values

- Provide opportunity for better housing and surrounding area improvement

- Strengthen socio-economic networks and ensure new employment opportunities

Operational Goals

- Activating the existing socio-cultural networks

- Involve and empower people for decision making of development of their area

- To create a platform for co-creation process

Ease of Accessibility

Basic Services and sanitation

Collective public space

Improved local conditions

Enhance socio-economic opportunities

Social Empowerment

Inclusive process

8.6 Elements of Spatial Framework

In order to translate the strategic goals and actions into a given space or neighborhood, the spatial framework helps translate the daily systems, needs and aspirations into a physical space and achieve spatial justice.

Components of the spatial framework is guided by the urban design concepts derived from the theory of building resilience of urban form which facilitate long-term changes. (Dhar & Khirfan, 2017) The concepts of heterogeneity, modularity, connectivity and polyvalency present an opportunity to design the space for certain objectives and optimize the outcomes of the design.

This becomes a tool to locate the strategic goals and action and formulate into a vision for the neighbourhood.

The role of this operational step is an instrument for the co-design workshop phase with the diverse stakeholders. It facilitates the communication between stakeholders and guide people's perception within the space as well as the values of this process.

The nodes, links , edges and zones are spatial framework elements inspired from the Kevin Lynch elements of urban design.

This is operationalized by using the tool of spatial framework governed by urban design guiding concepts identified for co-production for the area.

Urban Design Concepts

Heterogeneity

Modularity

Connectivity

Polyvalency

expressed by

Elements

Nodes

Links

Edges

Zones

guides

Actions

Societal

+

Socio-economic
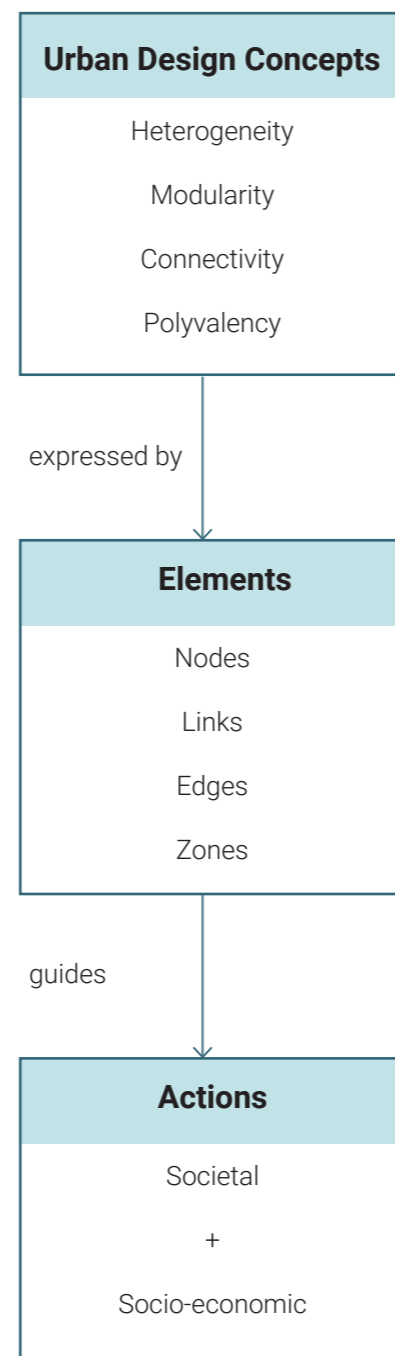
Fig 75. Elements of Spatial Framework
Source: Drawn by Author

Urban design Concepts

These concepts enable spatial cohesion of the area with the rest of the city which currently lacks integration and can be transformed into something more cohesive. It allows making spatial configuration to achieve resilience that can make the area more adaptable from a more closed system to a more open system belonging to the city. The idea is to allow transformability, flexibility and adaptability in order to deal with uncertainty (Dhar & Khirfan, 2017) that comes along with people's evolving needs and influences of external stakeholders and policies.

Heterogeneity

Combination of design elements for daily systems designed at different stages having varying life span is essential for adaptable and evolutionary transformation of the area. This possible idea of retrofitting within the area can be viewed as a means for long-term adaptation planning. (Dhar & Khirfan, 2017)

Connectivity

Better access and mobility within and outside the slum will give rise to new spatial opportunities

Modularity

Redivision and forming local smaller spatial divisions for better restructuring, design and governance. Also, prevents social fragmentation by creating new opportunities within the smaller cluster

Polyvalency

Need of multifunctional spaces within the limited space available in the high density area and the optimization of the use of such spaces

Physical, Spatial, Natural

Functional, Physical, Spatial

Functional, Physical, Spatial, Natural
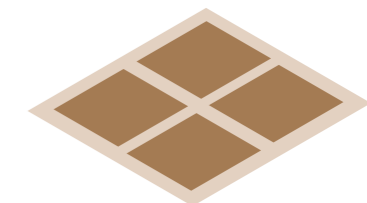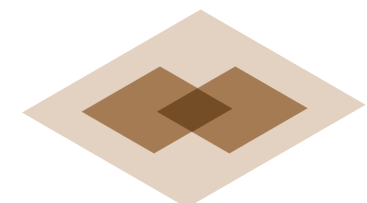
Functional

Spatial Framework

Nodes

- Cultural Node
- Living Node
- Service Node

Links

- Primary pedestrian network - strengthening existing links
- Multi-functional streets
- Commercial corridors

Edges

- Buffer area along natural boundaries
- Interacting with physical edges

Zones

- Multi-functional spaces
- Community square
- Densification/ Restructuring of housing zone
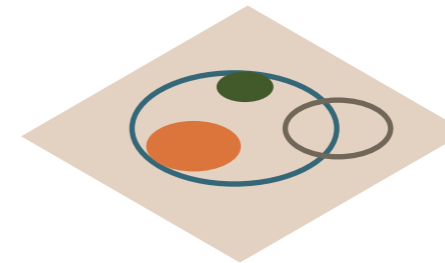
Overlap of functions
Polyvalency
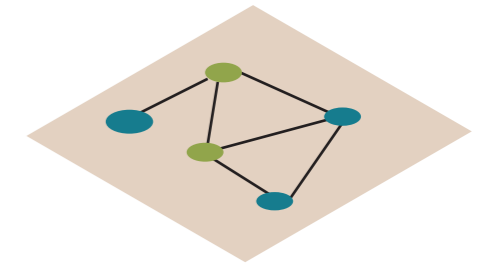
Attractor points
Connectivity
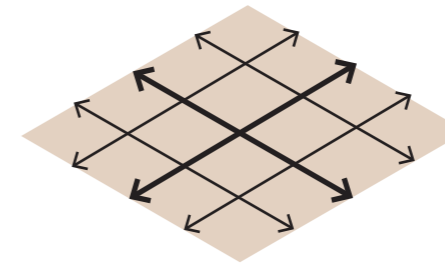
Making links and routing
Connectivity
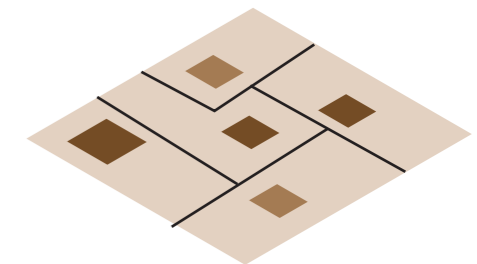
Local divisions
Modularity
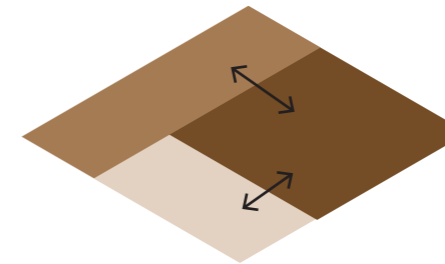
Functional edges
Polyvalency
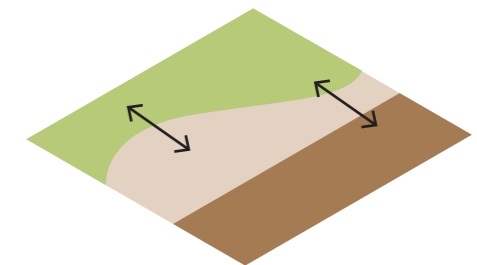
Activating natural edges
Connectivity
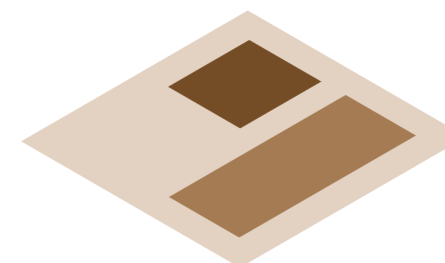
Agglomeration of spaces
Heterogeneity
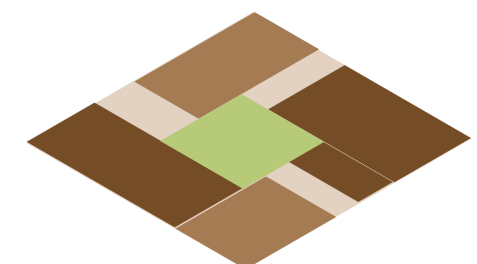
Spaces for collective use
Modularity

8.7 Strategic Actions
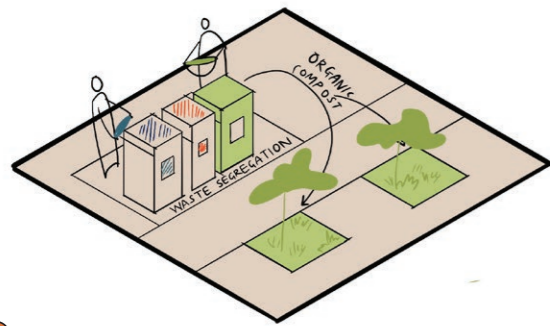
Facilitating waste collection and segregation

Avoid waste dumping in open grounds and along canal. Providing wet and dry segregation waste points along with waste composting for community gardens. Educate residents about using them.

Stakeholders:

TMC - Solid Waste Management
NGO
Youth groups
Residents
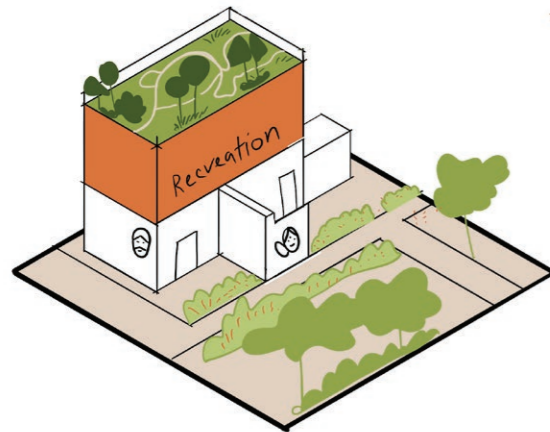
Provision of community toilets with additional facilities

To tackle open defecation and reduce walking distances to the toilet, create safe spaces around these areas by mixed-use facilities

Stakeholders:

TMC - Sewerage Department
Public Works Department
Community Development Department
Architect and urban designers
Private companies
NGO
Residents
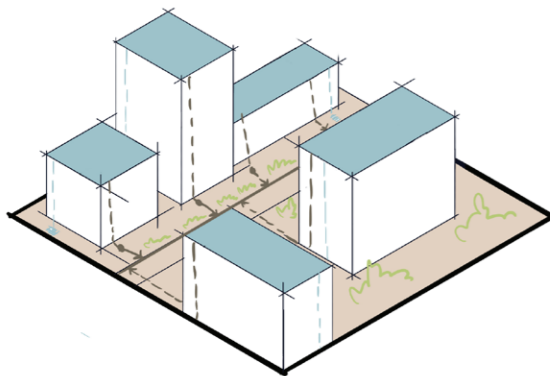
Laying sewerage network

Establishment of sewer lines or converting drainage line to sewer which allows households to build private toilet within them.

Stakeholders:

TMC -Sewerage Department
Ward Committee
NGO
Residents
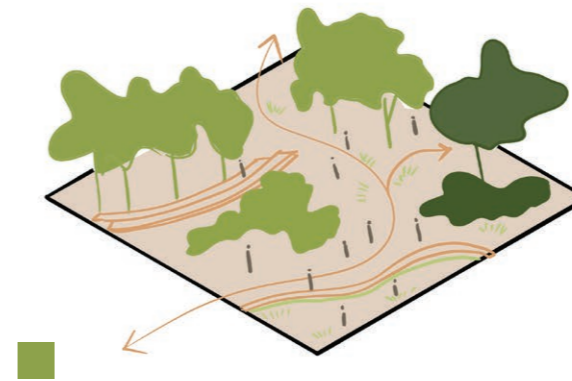
Create public squares and parks

Open spaces for all residents to interact, for children to play. Create green spaces improving ecology

Stakeholders:

TMC - Public Works Department
Garden Authority
Urban Designer, Landscape Architect
Private companies,
NGO,
Residents
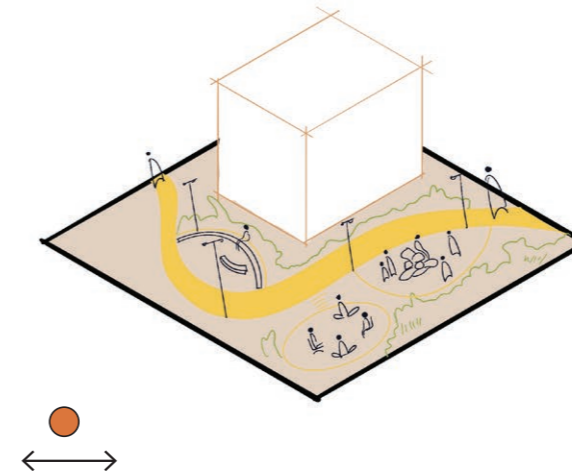
Activate Cultural spaces

Temples that extend into cultural spaces and enables public gatherings for festivals, a sense of community and belonging.

Stakeholders:

TMC - Public Works Department
Ward committee
NGO
Architect and urban designers
CBOs, FBOs
Residents
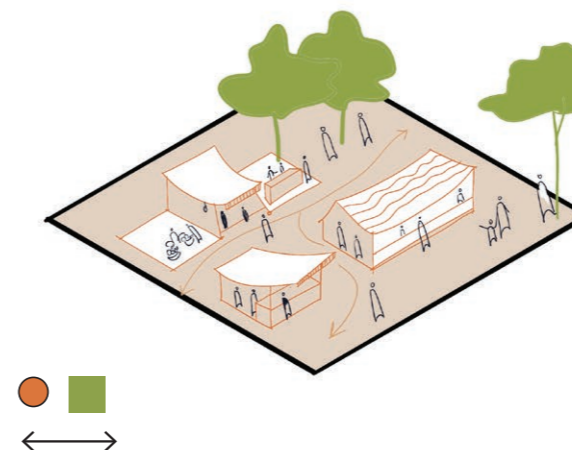
Facilitate space for markets and fairs

Driving a local economy and entrepreneurship with the provision of dedicated and convertible market spaces.

Stakeholders:

TMC - Public Works Department
Ward committee
Local businesses
Architect and urban designers
Vendors
NGO
CBOs
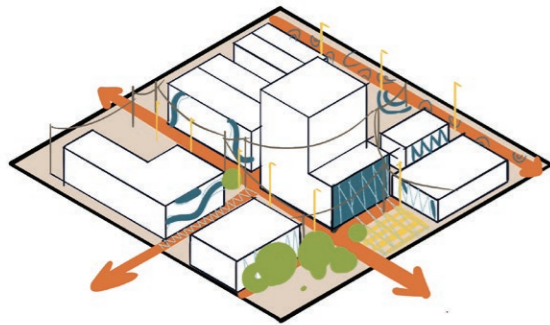
Improving streets and creating connections

Shortening commute time and creating alternative routes to destinations increases safety and liveability of the area.

Stakeholders:

TMC - Public Works Department
Ward committee
Youth groups
CBOs, FBOs
NGO
Residents
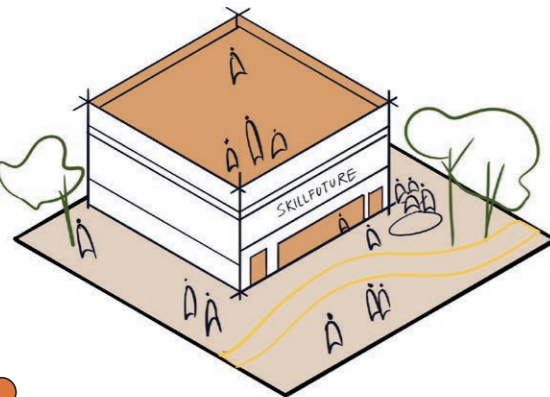
Create skill training centres

New and In demand skills required by new industries will enable individuals towards becoming self sufficient, independent and contributing members of the neighborhood.

Stakeholders:

Private companies
NGO
Architects and Urban designer
Research institutions
Youth groups
Residents
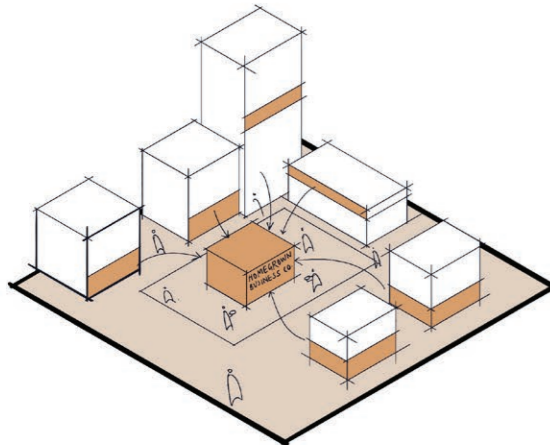
Provide platform for home-based industries

Creating identity for local-based industries by giving them platform to expand and collaborate with other businesses.

Stakeholders:

Local businesses
CBOs, SHGs
NGO
Youth groups
Residents
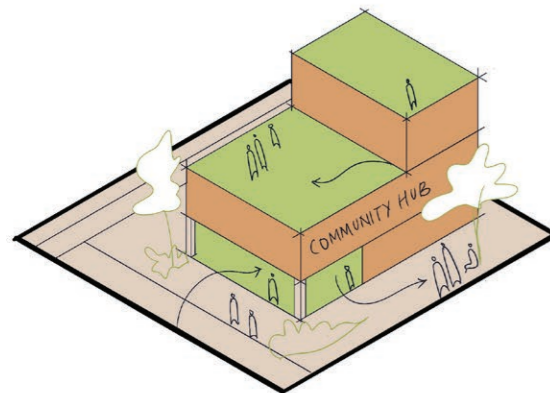
Build community hubs

A location that brings the community together by providing spaces for conducting meeting, celebrations and other community building activities.

Stakeholders:

Ward committee
Architects and urban designers
Youth groups
CBOs, FBOs
NGO
Residents
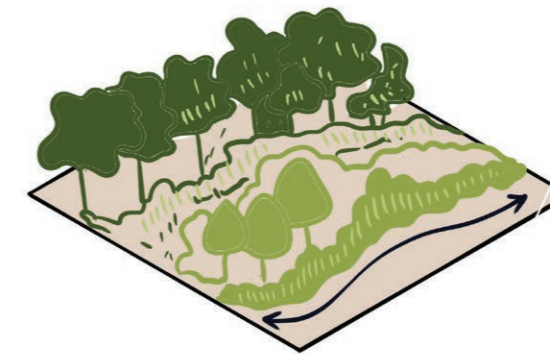
Create buffer areas near forest

Community gardens and food forests that function as a buffer will enable residents to give and take from the community at large while providing safety to the forest and its inhabitants.

Stakeholders:

Forest department
TMC - Garden Authority
Research Institutes
Landscape Architect
Youth groups
CBOs
NGO
Residents
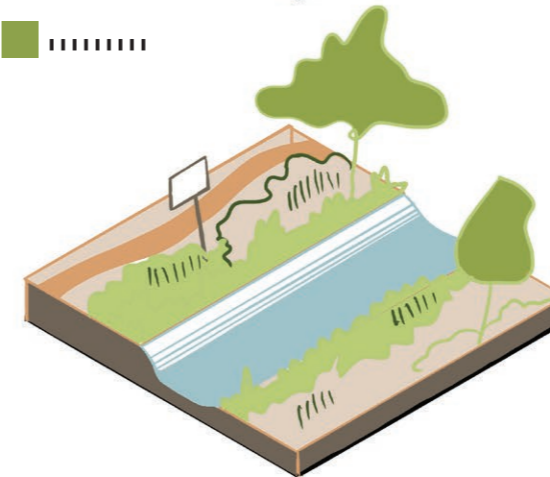
Canal revitalization

Cleaning of the existing canal will provide space for recreation, relaxation and place for informal gatherings. Educate the people not to dispose waste in the canal.

Stakeholders:

TMC - Public Works Department
Water department
Landscape Architect
Private companies
Youth groups
NGO
Residents
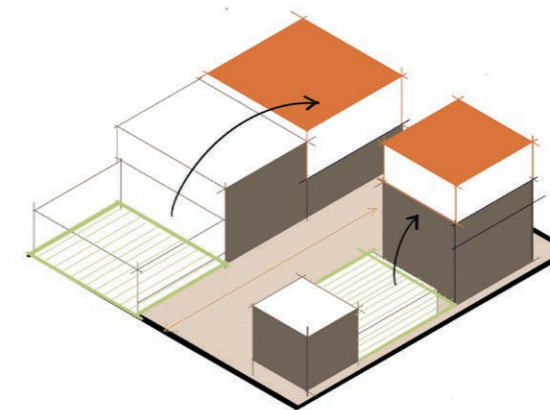
Restructuring and upgrading housing

Restructuring housing will provide opportunities to improve the streets, create public spaces and modern living spaces. Upgrading allows for experimentation with social housing and community living.

Stakeholders:

TMC - SRA
Private companies
Ward Committee
Architects and urban designers
CBO
NGO
Residents

In the next section, the strategic actions are used to make spatial designs using the elements where the requirements are derived from the residents in accordance with the guidelines established by the Smart Slum Upgradation Program. Below is the author's perspective on possible interventions in the selected site of Thane, India. In the next (Planning Operability) chapter, this is used as a communicative tool and to be identified by the urban designer along with the settlement dwellers.

Spatial Framework Layers

Nodes

- Cultural Node
- Living Node
- Service Node
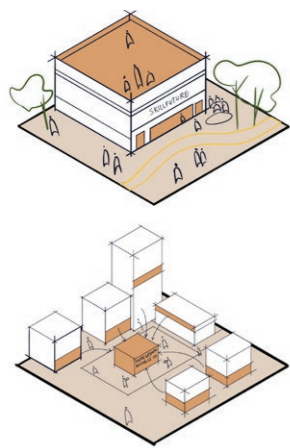
Nodes

0 M   50   100   200   400 M

Links

- Primary pedestrian network - strengthening existing links
- Multi-functional streets
- Commercial corridors

Nodes

Connection

0 M   50   100   200   400 M

Zones

- Multi-functional spaces
- Community square
- Densification/ Restructuring of housing zone

Open Spaces/ Squares

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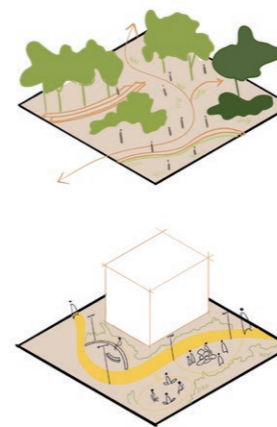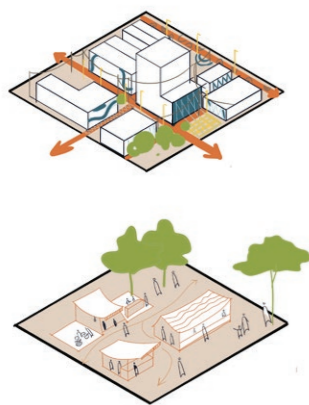
Edges

- Buffer area along natural boundaries of canal and forest
- Interacting with physical edges

Natural Edges

Canal edge

0 M   50   100   200   400 M
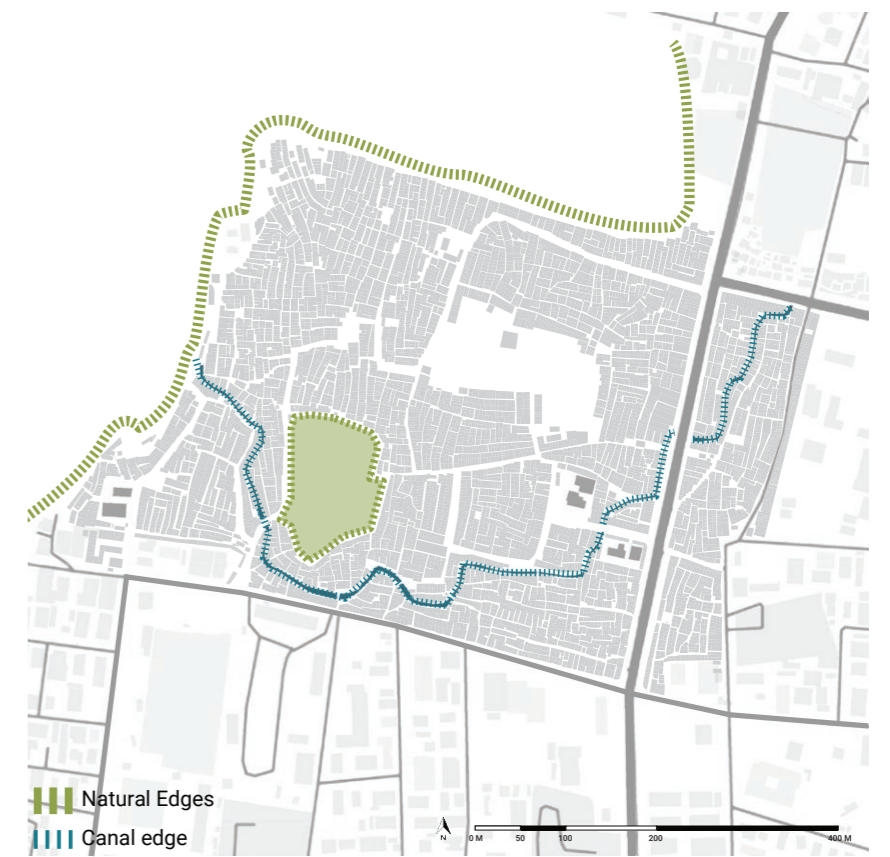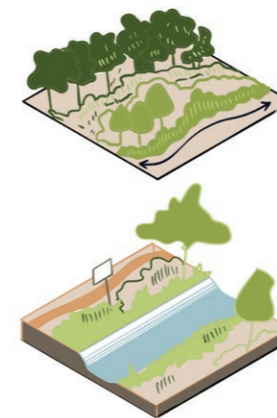
8.8 Spatial Vision

The spatial vision is formed using the combination of strategic actions, spatial elements and goals. The actions correspond to the goals, and the actions are influenced by the spatial framework - elements. Through the urban design concepts, the robustness of spatial vision contributes to the development of a resilient and an integrated system.

This is the author's interpretation of a spatial vision for the area. In the next (Planning Operability) chapter, this is used in the planning phase and to be build together by the urban designer along with the settlement dwellers.

Composition of temporal and long-term design projects
Heterogeneous space

Multifunctional public square
Polyvalent space

Accessibility to better streets and shorter routes
Connectivity

Grouping of housing clusters within neighbourhoods
Modularity

Legend

- ● Cultural, Living, Service Node
- ○ Nodes of integration with context
- ▮ Open spaces/ squares
- ⦀ Buffer areas with ecological boundaries of forest
- ⦀ Buffer areas along the canal
- ‹•••› Strengthen and create new links to improve connectivity of nodes
- ▮ Amenities
- ▮ Shops

N

0 M   50   100   200   400 M

Fig 76. Planning with the people

Source: https://un.se/en/work/incremental-housing-strategy/

9   Planning and Operability

9.1 Operationalization

After understanding the strategic framework, in order to put the process in action and create a collaborative approach, it is important to achieve the operational goals.

This section discusses three parts: Phasing, Process of transformation and Stakeholder engagement.

The overall phasing for achieving the overall goal of upgrading the slum in a smart inclusive way. The phasing is used in an reiterative manner as shown in the process of transformation. The stakeholder engagement defines the involvement in each phase and their role within the process.

Involving all stakeholders, especially residents of the informal area ensures to achieve procedural justice and ensures to provide them their right to the city. This also allows the people to become smart citizens by taking charge of the decision-making in the area for the type of development they desire to see in the area. As we have seen in the problem premise, the current programs are missing in their voices and their capacities. The overall plan

Social Empowerment

Inclusive process

conceives every single slum as the same. However, in Smart Slum Upgrading Program proposal, all the stakeholders need to be always directly involved because the local conditions are different in each slum. It is important to understand that each slum has its own set of local conditions and the plan needs to adapt accordingly. Hence, the stakeholders engagement and role needs to be understood more clearly in the operationalization of the proposal.

Short-term goals	Medium- term goals	Long-term goals
- Existing public spaces - Public toilet upgradation - Waste management - Improving existing roads	- Sewerage Network - Development of Park and amenities - Creating new road connections -Skill training centres	- Housing Improvement - Healthcare, school, other amenities

Table 6. Perceived duration of goals

Source: Drawn by Author

9.2 Phasing

The process to achieve any goal is done through four phases i.e. the activation phase, the planning phase, the Implementation phase and the evaluation phase. The phases are divided according to the sequence of actions which is required for each goal. The table below covers the scope of each phase.

Phase 1: Activation Phase (refer Fig 77 on page 138)

Smart Slum Upgrading program is initiated at the city level by Thane Municipal Corporation and a partnership with NGO is established. Selection of slums are made that can use an alternative method of upgradation This phase involves establishing trust within the community by empowering the existing social networks such as the Youth Groups, Community Based Organizations and a Neighborhood Council is elected by the different neighboring slums.

Phase 2: Planning and Design Phase (refer Fig 78 on page 139)

In this phase, the slum is mapped and enumerated using the help of people. In this case, it is already done by an NGO (Shelter Associates), however this data collection needs to be expanded. Meetings with the public body and residents are conducted to establish common goals. Co-design workshop is conducted within the neighborhood council and residents using the spatial framework as a tool to come up with spatial vision for the area. This is further adjusted by the neighborhood and the required finance fundraising and skill training for it is set up. This phase which involves people in decide what they want is usually lacking from most slum upgradation programs.

Phase 3: Implementation Phase (refer Fig 81 on page 140)

Phase 4: Evaluation and Monitoring Phase (refer Fig 84 on page 141)

Phase 1 Activation Phase	Phase 2 Planning and Design Phase	Phase 3 Implementation Phase	Phase 4 Evaluation and Monitoring Phase
Setting up the conditions for an alternative development process Mobilizing the community and developing capacity and trust	Co-creating a vision for the area along with multiple stakeholders	Execution of the design projects as per to attain the objectives	Monitoring the projects and maintenance by the community. To reflect and build upon the existing interventions and evaluate existing policy accordingly

Table 7. Phases of operation
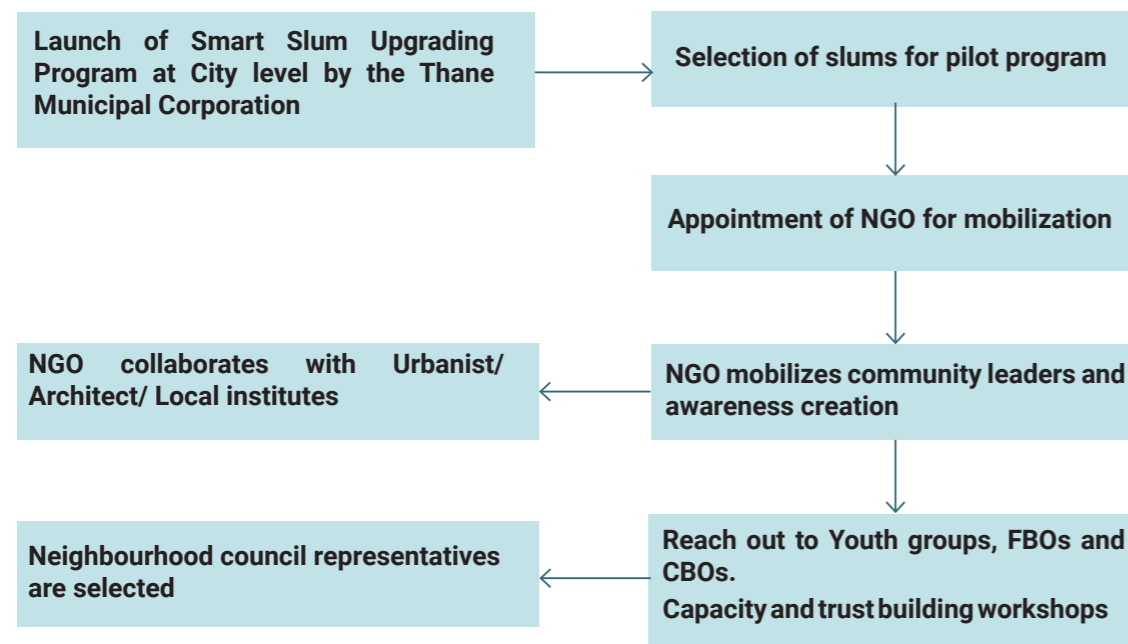
Source: Drawn by Author

Phase 1: Activation Phase

Fig 77. Phase 1 Order
Source: Drawn by Author

Actor	Role	Capacity
Thane Municipal Corporation	Program development	Implement schemes
Thane Smart City Limited (SPV)	Assist in selection of NGO	Defining the details of the scheme
Ward committee	Interact with NGO and neighbourhood representatives	Conducting public meetings
NGO	Develop strategy for awareness and mobilization	Determine mobilization methods
Youth groups, CBOs, FBOs	Organize activities to create community awareness and mobilization	Communicate with neighbourhood residents and members of the groups
Residents	Elect neighborhood representative	

Table 8. Phase 1: Actor's role and capacity
Source: Drawn by Author

Phase 2: Planning and Design Phase
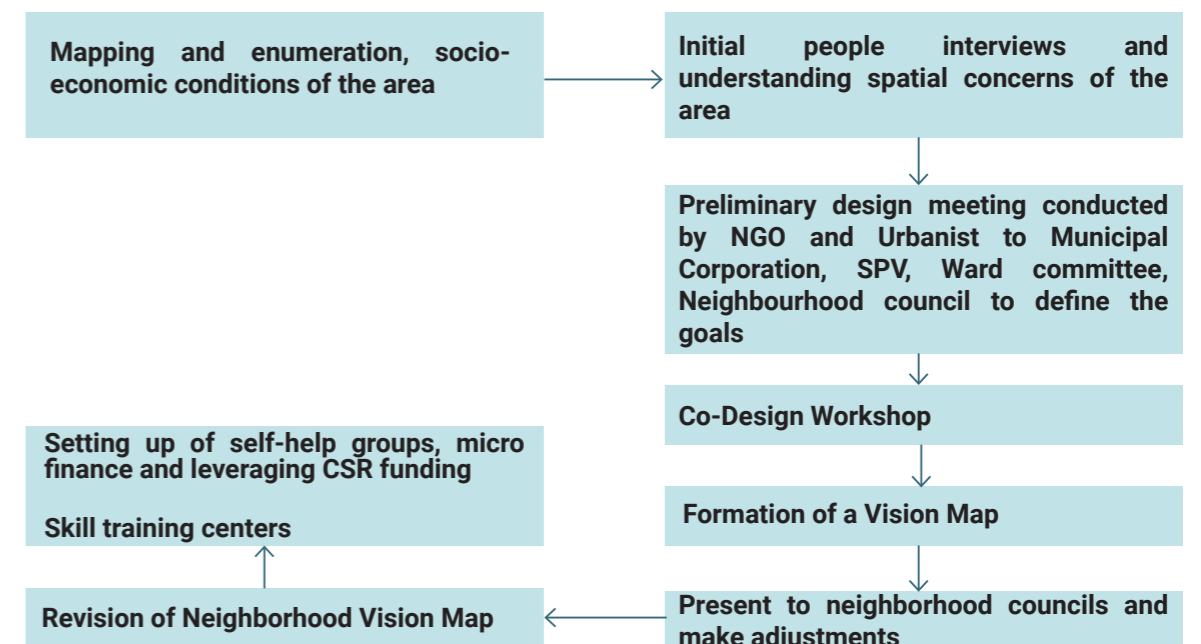
Fig 78. Phase 2 Order
Source: Drawn by Author

Actor	Role	Capacity
Thane Municipal Corporation	Review and approve the plans	Aligning goals with existing schemes and policies
Ward committee	Participates in vision plan formulation	Participates in vision plan formulation
Urbanist	Formulate the community objectives into vision map	Translate needs in spatial needs
Neighbourhood councils	Represent citizens opinions and requirements	Provide requirements and validate design
NGO	Conducting meeting with government and resident groups	Conduct people surveys, intermediate body
Residents	Present needs and engage in design process	Validate design with neighbourhood council

Table 9. Phase 2: Actor's role and capacity
Source: Drawn by Author

Phase 3: Implementation Phase

Self-initiated projects

↓

Raising community funds for improvement

↓

Implementation of Design projects

↓

Co-participation to implement the project (Social + Human Capital)

Fig 81. Phase 3 Order
Source: Drawn by Author
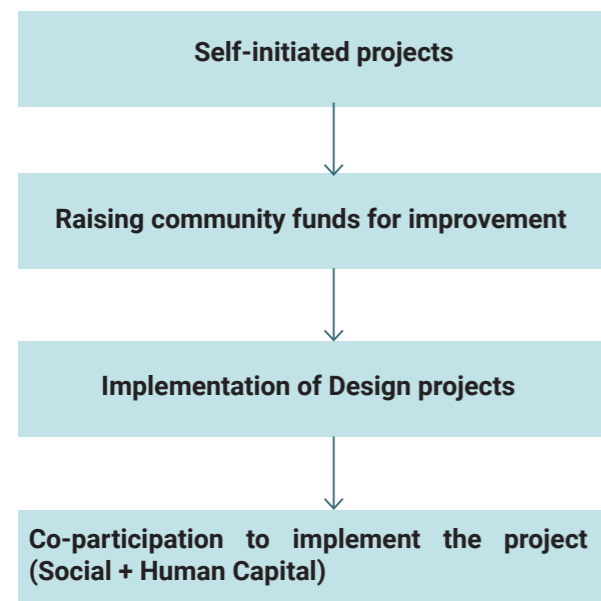
The implementation phase starts of by community initiated project such as the cleanliness drive or tree plantation which contribute towards long-term goals of better waste management and improving ecological connection. Through SCM funding, CSR (Corporate Social Responsibility) by private companies funding and self-raised community funds, the necessary infrastructure would be implemented. Contributing funds towards the project and also co-building the project would develop a sense of ownership for the community to own the project. Projects would be achieved through concept of placemaking and tactical urbanism.

Fig 80. Community Cleanup
Source: Community Design Agency

Fig 79. Planning with the community
Source: Community Design Agency

Phase 4: Monitoring and Evaluation Phase

Reflect and evaluate on the initial projects

↓

Satisfaction survey

↓

More independence to neighbourhood councils for next project initiation

↓

Future improvements for sustainable building, living and working spaces

Fig 84. Phase 4 Order
Source: Drawn by Author
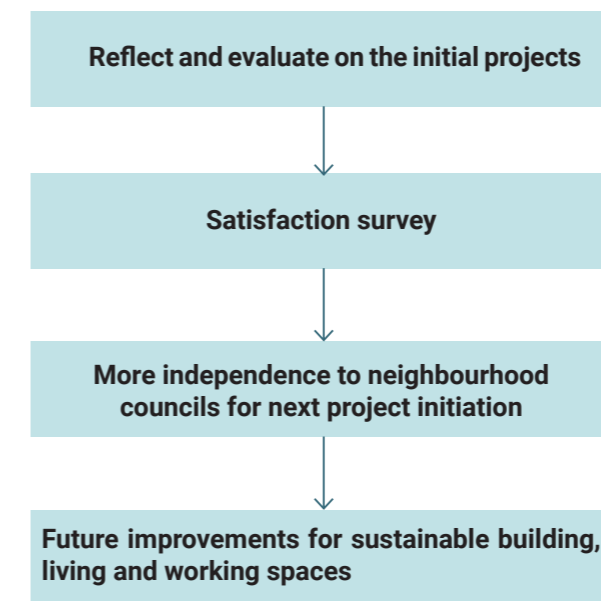
In the monitoring and evaluation phase, the community reflects on the project and understands the fulfillments and the gaps determined through the project. At the same time using this feedback loop through satisfaction survey, the planning for next project and achieving next goal is iterated.

Overtime, the government role moves from being the initiator towards providing service for plan approval and policy consultation and schemes. Thus, giving more power to community to operate independently for new type of developments within their settlement for long term goals such as better housing and having energy saving, water harvesting systems.

This is an important phase and often missed out of the current schemes and projects to understand and reflect upon the satisfaction from the design projects. Taking the feedback into consideration and building upon it for next goal is essential for a resilient system.

Fig 82. Planning with the community example
Source: CURE India

Fig 83. Playground spaces for children
Source: Anukruti Organization

9.3 Process of Transformation

The priorities as identified by the multiple stakeholders will be the way to define this evolutionary process and character

The transformation process is an iterative process where each goal undergoes revaluation at the end and feeds into the next goal. There are four phases to realizing each goal: Activation, Planning, Implementation, Evaluation Phase. The goals that meet the basic requirements will be addressed before moving on to the other needs.

The first goal will be the only goal that requires an activation phase where the stakeholders need to be mobilized and brought together to start the engagement process. From the second goal onwards, the first phase can be skipped. Phase four and phase two overlap in there in the diagram shown below. This happens because each proposal/ goal is built upon the previous goal and based on feedback and evaluation the spatial vision is redefined for the next goal. Hence, the evaluation phase and planning and design phase overlaps in the diagram.

According the Maslow's hierarchy of needs (refer Box 1. Fig 74 on page 120), the basic needs have to be addressed first before moving on to other higher level of needs, which forms the basis of setting up the evolutionary goals. The first goal is defined by the need for structuring the area with better street connectivity which is followed by provision of basic facilities such as waste management, community/ private toilet facilities and sewerage network. After forming the trust among the citizens based upon delivery of these basic necessities, expanding on

next goals of public space and squares to improve quality of life can be explored.

Improving socio-economic networks are also to be attained by having a platform for home-based industries, skill training centres to upgrade and improve job opportunities. This process can expand onto further goals such as upgradation of housing and community living housing based on this reiterative process.

Ease of Accessibility   **Facilitate Basic service**   **Provide Public space**   **Provide secondary needs**

Goal 1   **Goal 2**   **Goal 3**   **Goal 4**   **Future goals**

Evaluate   Evaluate   Evaluate   Evaluate

Prepare   Implement   Redefine   Implement   Redefine   Implement   Redefine   Implement

Phase 1   Phase 2   Phase 3   Phase 4 / Phase 2   Phase 3   Phase 2 / Phase 4   Phase 3   Phase 4 / Phase 2   Phase 3   Phase 4

Phase 1: Activation Phase

Phase 2: Planning Phase

Phase 3: Implementation Phase

Phase 4: Evaluation Phase

Fig 85. Process of Transformation

Source: Drawn by Author

9.4 Stakeholder Engagement

Formation of a Tri-partite partnership with the Government body, NGO and the community to achieve a collaborative planning

Tripartite Partnership
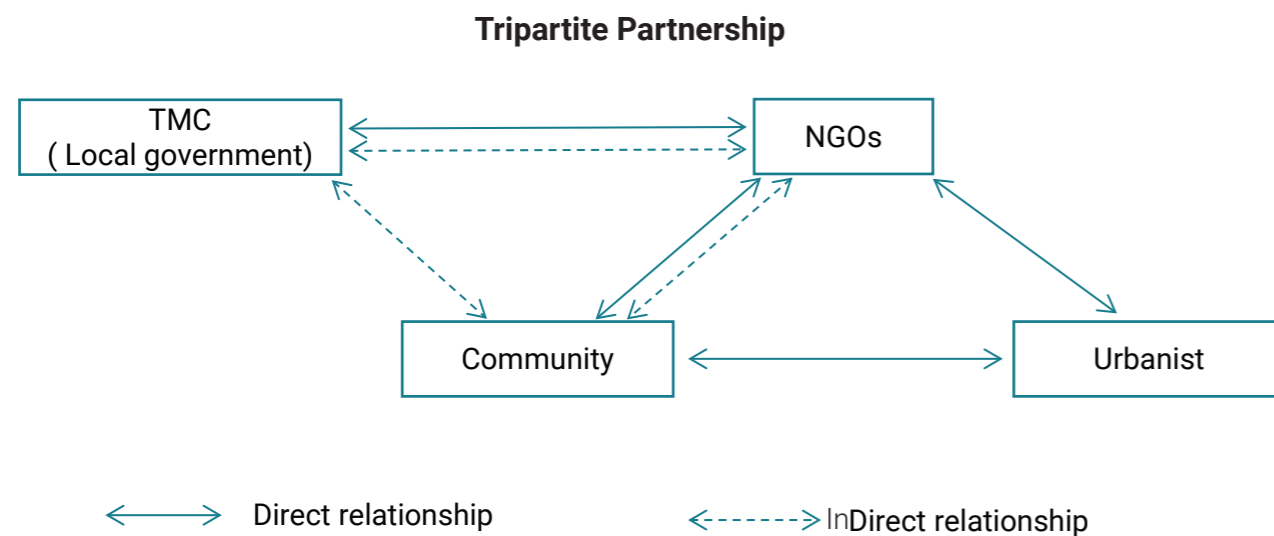
Fig 86. Tripartite partnership
Source: Adapted by Author, Trivedi, 2016

The proposed Smart Slum Upgradation Program will result in a paradigm shift in the power interest grid of the stakeholders as seen in Fig 87 and Fig 88. Furthermore, the role of the stakeholders in the planning and development has also changed due to the tri-partied relationship. This has been documented in Table 10. The change in the relationship matrix is visible between the conventional and proposed upgradation system. The community groups and residents share more responsibility at each phase of development making it a more collaborative approach compared to the top-down process.
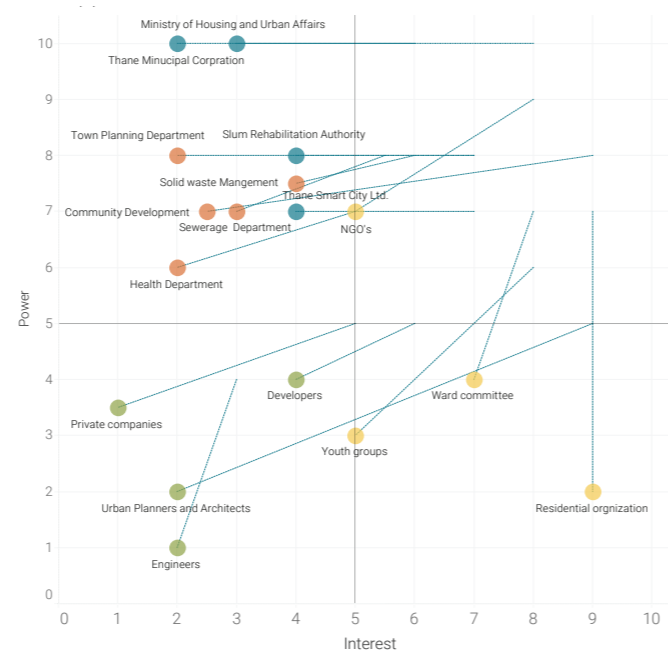
Fig 87. Existing - Power-Interest Matrix with dynamic shift
Source: Drawn by Author

Stakeholder responsibility matrix

Elements / Stakeholders	Conventional development								Proposed System							
	Planning	Implementation					Maintenance		Planning	Implementation					Maintenance	
	Settlement Planning	Finance provision	Physical Infrastructure	Community services	Housing redevelopment	Labour	Management	Labour	Settlement Planning	Finance provision	Physical Infrastructure	Community services	Housing redevelopment	Labour	Management	Labour
Local government	■	■	■	■	■				■	■	■	■			■	
Ward committee	■		■		■		■	■	■	■		■				
NGO				■					■	■		■		■		
Youth group, CBOs and FBOs												■		■	■	■
Residents									■		■	■	■	■		
Neighbourhood council									■	■	■	■		■	■	■
Urbanist									■		■					

Table 10. Stakeholder responsibility matrix
Source: Adapted by Author, UN-Habitat, 2014
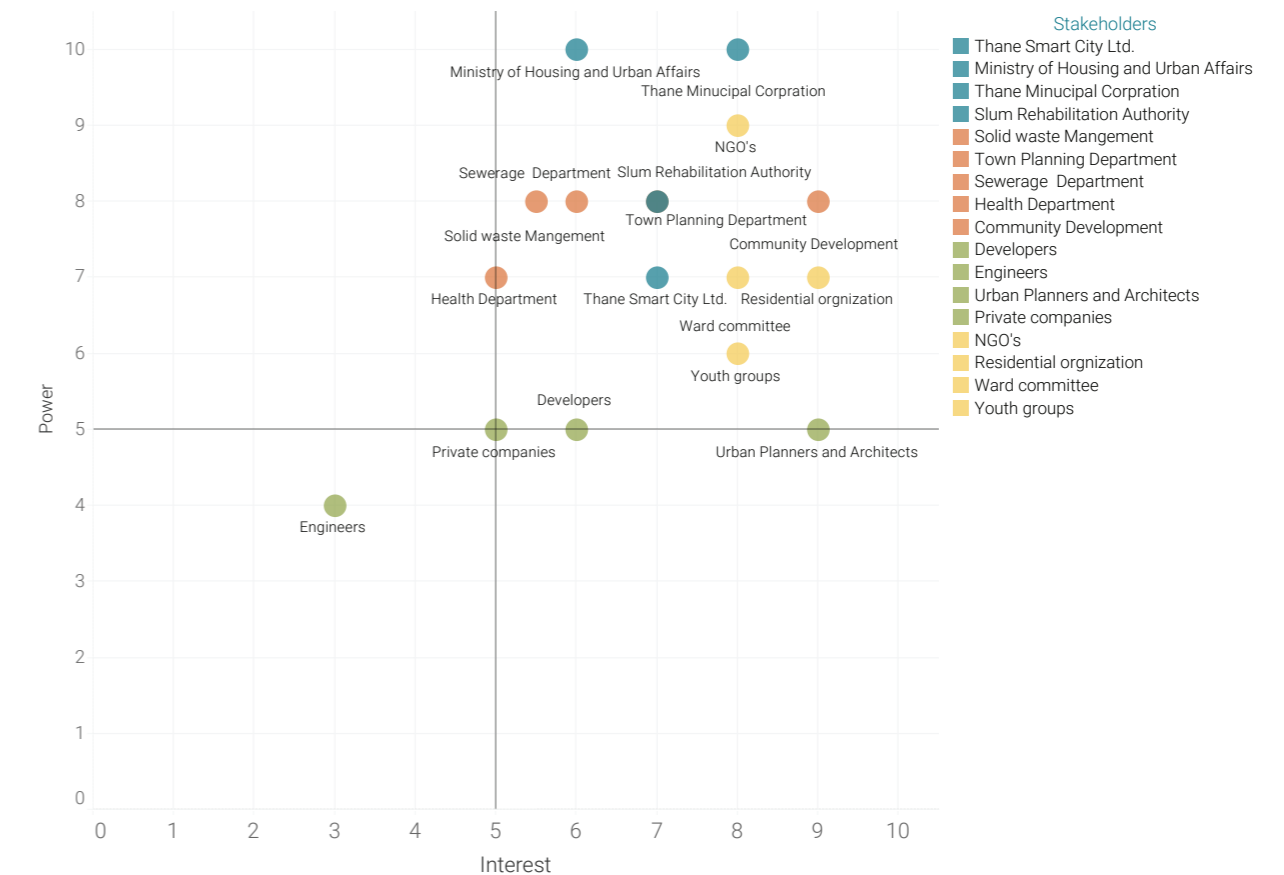
Fig 88. Proposed - Power-Interest Matrix
Source: Drawn by Author

Fig 89. Playground at Govandi

Source: https://www.anukruti.org/playground/urban-flower-govandi/

10 Local Scale Design

10.1   Local Scale Area Selection

To test the operability and the first step in designing a local scale area is to select an area and since all areas are not created equally the following criteria were used to select the area:

- Presence of active stakeholders

- Variation in spatial usage

- Hierarchy of streets

- Interaction with other areas

Based on the above criteria a area of 200 X 200m was chosen as it has the following features.

- The area has the influence of youth groups identified during site survey who can activate the residents in the early phases of the process.

- Access to an open ground and forest land.

- The main street goes along the area

- It lies at the intersection of two sub neighborhoods

- There are a wide variety of buildings from amenities to shops to houses.

In the next section, we will examine how some of the strategic goals can be developed in the selected area in an evolutionary manner.

Legend

🔴 Cultural, Living, Service Node

🟩 Open spaces/ squares

❚❚❚ Buffer areas with ecological boundaries of forest

◄•••► Strengthen and create new links to improve connectivity of nodes

🟫 Amenities

🟧 Shops

Fig 90. Selected Local Scale Area
Source: Drawn by Author

10.2   Development Process

| **Overall Planning** | | **Goal 1: Accessibility and Waste Management** | | |

| Activation Phase | Planning Phase | Refine Plans | Implementation Phase | Evaluation Phase |

Specific actors: Public Works Department
Solid waste Management Department

Policies: Swachh Bharat Abhyan, (Clean India)

2026

| **Goal 2: Public Space and Community hub** | | |

| Refine Plans | Implementation Phase | Evaluation Phase |

Specific actors: Garden Authority and Forest Department
Town planning department

1

Link

2

Edge   Zone

2029

| **Goal 3: Sewage Network and Toilets** | | |

| Refine Plans | Implementation Phase | Evaluation Phase |

Specific actors: Sewage Department

Policies: Swachh Bharat Abhyan, (Clean India)

3

Node

2031

| **Goal 4: Additional Amenities and Skill training centre** | | |

| Refine Plans | Implementation Phase | Evaluation Phase |

Specific actors: Community Development Department
Health department

Policies: Pradhan Mantri Kaushal Vikas Yojana (Skill Development)

2035

4

| **Goal 5: Housing restructuring and green corridors** | | |

| Refine Plans | Implementation Phase | Evaluation Phase |

Specific actors: Housing Corporations (SRA, MHADA), Garden Authority and Forest Department

Future Evolution of Goals

Policies: Housing for All, PMAY, Environmental Plan

5

Initially, the overall activation for the entire slum is conducted and planning is made at the neighborhood level along with the neighborhood council members.

Here, an example is demonstrated in the development process guided by the process of transformation (refer Fig 85 on page 142). In this case, the choice of decisions and goals set are made based on some assumptions which the people will prioritize for development. Important nodes and links are identified at an overall neighborhood level. These are then refined by the people to see which street links are the most suitable and implemented. In this case the temple and youth group node is connected to the main road by shorter distance. This also enables connection to the playground for children and all age groups to access it for different purposes. Also, the buffer area towards the national park is cultivated by the citizens. Existing youth groups locations are boosted as community hubs for co-design workshops.

Next, the sewerage network is laid out by first conducting its feasibility studies and then refining it with citizens. This allows people to have their own private toilets within the house, eliminating poor hygiene and creating safety for women and children. This is then followed by improving their socio-economic status by having vocational training centre and plat form for home-based industries. Addition of new amenities such as health clinic, library, school are also made. Once the neighborhood group feel confident and independent, they can develop their own community housing along this laid out structure and achieve smart city aligned goals such energy, and preserving ecology.

Fig 91. Development Process
Source: Drawn by Author

10.3   Local Scale Sections

LEGEND
- Nodes
- Open Spaces/ Squares
- Natural Edges
- Nallah edge
- Connection

0 M   50   100   200   400 M

REVITALISED CANAL   WALKWAY   SHADED SEATING   PARKING

| 1.85m | 4.50m | 5.15m | 3.00m | 1.50m |
| PATHWAY | CANAL | COMMUNITY GARDEN | PATHWAY | PARKING |
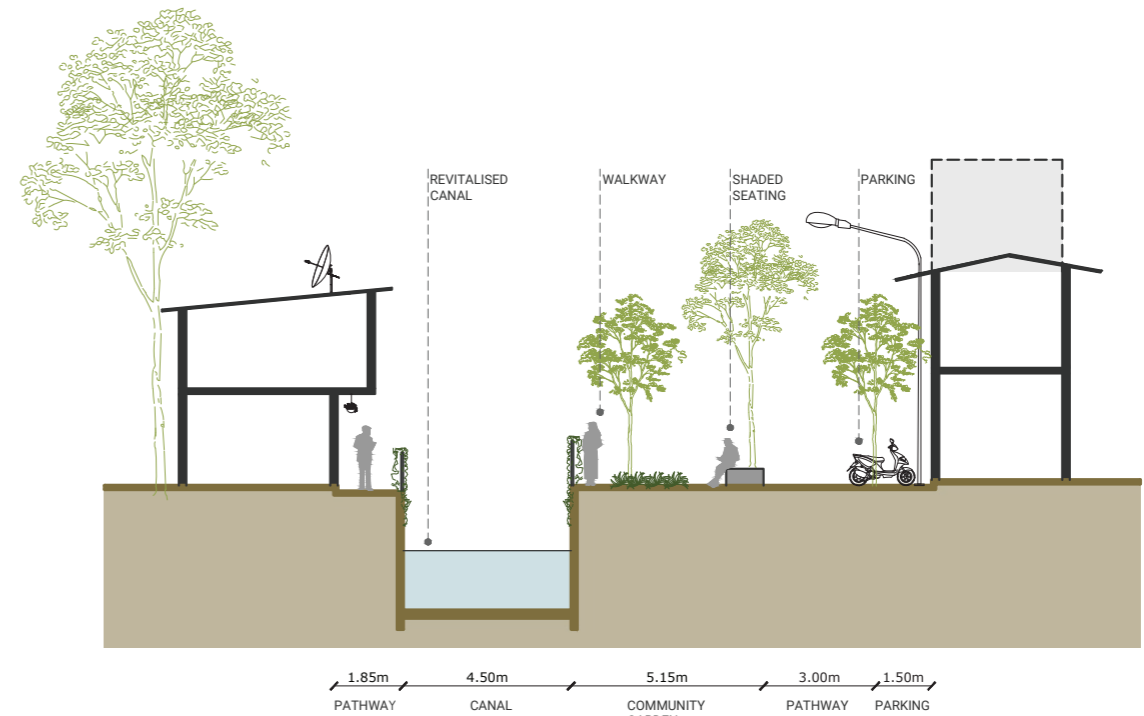
SECTION A

Smaller local scale interventions customized to local needs and demands and the spatial configuration of the slum. These are just possible projections but actual designs will be determined by the people themselves.

As you can see, in Section A the canal/ nallah is revitalized and adjacent space are improved to form community spaces . In Section B, the under-used groud is converted into a step-garden along with urban farming areas and multi-use public space. These will be further detailed along with dicussions with the people within the area.

Section C shows possible use of the roof space for recreational purpose. urban roof farm or for solar panel/ rain water harvesting. Finally, Section D displays densification option at wider streets and better utilization of street space for pedestrian use.

WIDER FOOTPATHS

TEMPLE COMPOUND

MULTI USE PUBLIC SPACE

SECTION B

WIDER
VERANDAH

SIT OUT/
VIEW DECK

URBAN
ROOF FARM

COLLECTIVE
ACTIVITY
SPACE

1.50m   3.50m   4.30m
VERANDAH   ROAD   SIT OUT

SECTION C

WIDER
FOOTPATHS

SHADED
SEATS

POSSIBLE
DENSIFICATION
PLAN

2.00m   4.00m   2.00m
FOOTPATH   ROAD   FOOTPATH

SECTION D

10.4   Interventions

Stepped garden along contours with amphitheatre, community garden

Multifunctional urban square for temporary markets, community fairs, sports playground

Revived old school as primary school and skill training centre

Festival space for community beside the temple

Youth group node

Temple

Fig 92. Plan showing open ground conceptual design
Source: Drawn by Author

BEFORE

AFTER

Densification and housing restructuring

Children's playschool + library

Community garden

Waste collection point

Canal rejuvenation

Public space

Fig 93. Community garden and Canal revitalization
Source: Drawn by Author

Community living housing

Amphitheatre

Marketspace

Playground

Fig 94. Multi-functional public square
Source: Drawn by Author

Fig. 95. Children playground in slum

11 Conclusions, Recommendations & Reflection

11.1   Conclusions

The project sets out to create a more inclusive and just smart urban paradigm by enabling the marginalized group in informal settlements the right to integrate within the context spatially and socially.

The idea of "smart" is redefined by the project with the focus on smart citizens being emphasized more backed by theories. This smartness essentially lies with the knowledge of people and developing using their knowledge is the originating idea of the smart slum. The right to good quality of life for the vulnerable society by using the in-built smartness of people is a way to define the new "smart". Smart City Mission acts as a leverage to initiate a continuous process of change in informal areas. The co-creation and co-production of space have higher chance of success rates then the current imposed schemes due to reduced conflicts with the citizens since their demands are acknowledged in the process. This type of process could require a relative shorter time and funding than the current proposals and could be executed with lesser budgets. This proposal enables the current social and economic networks to stay intact and in place to enforce the sense of belonging, identity and ownership.

The research questions have been answered throughout the thesis and are stated in a brief answer below:

The main question is answered by splitting up into different key components within the research and are developed further under the Peter Marcuse's critical planning theory which guides the sub-research questions recognizing the proposed Smart Slum Upgrading program as an evolutionary planning proceses to activate local agency.

Sub research questions

Analyze

SQ1: How have the urbanization process and urban planning policies including the smart city mission, influenced social and spatial segregation and inequalities in the city of Thane?

The understanding of urbanization process, policies and their gaps has been analyzed in Chapter 2 at a more global and national level and further narrowed down to the specific case of Thane in Chapter 6. In Thane, the type of private and market-oriented development has led to large parcels of development pockets and voids which has caused segregation.

Expose

SQ2: To what extent do the current urban planning policies including Smart City Mission meet the social and spatial needs of the dwellers of informal areas in Thane?

The profit-driven market for redeveloping the informal settlements creates a gap between understanding their demands and needs of the informal settlers to cater to them. The current and past redevelopment and upgradation policies misses the essential component of people participation and hence does not fulfill the required social and spatial demands by the people.

Propose

SQ3: What are the effective spatial strategies and design principles for informal area in-situ upgradation?

The "Smart Slum Upgrading Program" proposed is devised using a strategic framework that is guided by urban design concepts of resilience creating an adaptable and long-term process of sustainable and inclusive development. The spatial actions are

multi-scalar that makes it effective for long term. The strategic actions and urban design concepts come together to form a spatial framework which translates to a spatial vision.

Politicize

SQ4: How can collaborative planning based on community-based self-organization in informal settlements help to build a more inclusive and just smart city of Thane?

An inclusive and just smart city is achieved through creating a process that is people-centric and empowers the community to make their own decisions. This is enabled by institutionalizing and creating a dedicated governance structure which converges the various horizontal and vertical policies. These are understood across the different chapters and the operationalization process is mentioned as a step-by-step process of transformation.

SQ5: How can we judge the 'official' Smart City Mission and how should it be adjusted towards a Smart Slum Upgrading Program?

Th arbitrary nature of Smart City Mission which changes in each Indian city makes it difficult to judge. For the city of Thane, it can improve further on the participation level of slum dwellers in coming together to decide the type of neighborhood that they want. The process needs to be defined as per the proposal in this project and dedicated department needs to be setup within the SPV of Smart City to accommodate the Smart Slum Upgrading Program. integrate strategic framework in the smart city mission.

Main Research Question

How can a **strategic framework** using **collaborative approach** help to integrate **informal areas** within the **Smart City Mission** to achieve an **inclusive and just development** of Thane city, India?

The strategic framework designed for the approach called the Smart Slum Upgrading Program involves the co-ordination of various stakeholders especially the residents being at the centre. This combination of the top-down nature of smart city combined with the bottom-up "smart citizens" forms the basis of the collaborative planning approach. This helps the informal areas get integrated socially and spatially to provide socio-spatial justice.

11.2   Recommendations

To take this research a step further, it is important to integrate the strategic framework in the smart city mission at national level such that the Smart Slum Upgrading Program is transferable to other Indian cities. It is important to ask other cities to present projects which operationalize the strategic actions in informal settlements and learn from them. This means that other smart cities will be approached to identify slums where the strategic actions can be implemented and adapted to the local requirements when multiple settlements have been tested, the strategic actions can be refined to be more comprehensive and adaptable.

City governments should setup a participatory process that is beyond token-based approach by actually allowing them in co-creation process. City governments to use Smart City Mission technologies to map services and fill in the gaps in the network to serve the marginalized.

To ensure the overall progress of the marginalized groups, it is essential to acknowledge and support the local economies. The city development plans to incorporate the areas instead of leaving them void and use the strategic actions to introduce programmes to uplift the spaces.

At national level, policy and financial support to be provided specifically to the Smart Slum Upgradation Program and bring attention to informal settlements to create a equitable vision for cities. Subsidies and schemes for poverty, employment and housing security along with self-finance schemes to be set up to avoid solely depending on international sources of funding.

The Role of Urbanist

To facilitate the dialogue between city governments and other stakeholders. It is essential to provide an action plan for implementation depending on the local context. To design the participatory process of preparation and implementation of upgradation and urban renewal plans. It is the duty to always keep people informed about various aspects related to the project including good practices, alternative possible solutions, approaches, policies, programmes and availability of funds. Bridge the national, state and city scale initiatives for the benefit of the settlement and people. Encourage civil institutions to convince the marginalised populations to participate. The acknowledgment of the value of spatialized information and enabling the inhabitants to understand them is a sensitive and valued process that guarantees high level of transparency between the various stakeholders and building trust among in them.

The challenge of the role is to bring the different stakeholder interests together, integrate various spatial demands, negotiate conflicts and create a win-win situation for all.

Fig 96. SDG Goals for the project
Source: https://sdgs.un.org/goals

11.3   Reflection

Research and Design Components

The project started out with researching about understanding the Smart City Mission of India and how its processes essentially leave out informal processes. After much further research, it was discovered that essentially people and stakeholder participation is at the central idea of Smart City Mission, however the way it is conducted might not be the most effective. Informal settlements are essentially left to be developed as a top-down process and this results in places that are not fulfilling the demands of the people.

Hence, the core idea was to use Smart City Mission as a leverage to adapt the existing slum upgrading method into a more citizen engaging strategy to make more local adaptive development. Interviews and desk-based research was conducted to understand several nuances within the existing system. The strategic framework was formulated as a process of change to involve the people in the decision-making and co-production of space. A possible scenario was explored in order to understand how this Smart Slum upgrading program will be rolled out. This process design is proposed to be integrated with the existing policies and schemes.

Potential for Transferability

The informal settlement chosen in this project was a typical slum with characteristics which are observed commonly within other slums in the Thane city. This allows some sort of generalization of problems that can be possibility resolved using set of strategic actions that are guided by the principles of resilience for a long-term effect. The methodology and the way of conducting the program process can itself be transferred to other slum contexts within other cities having similar characteristics. This approach needs to be made at multiple slums and perceived as a city-wide slum upgradation to have a more coherent process. This approach can also be taken in other Global South countries, however institutional changes, cultural

appropriateness and physical conditions would comparatively be different.

Research Limitations

The research was limited due to COVID situation affecting the possibility of examining the site personally. This was overcome by conducting interviews online and understanding from the remote research team with the help of family and friends to gather on site data. The testing of the proposal was also not able to be conducted as a workshop on the ground in order to test the reactions of the people and establish a co-design process within the site.

Scientific Relevance

The project aims to add value to the knowledge of slum upgradation strategy. Currently there are several disconnected schemes that are present at the national and city level, however there is no coherent process that is been established to deliver as a platform between the various stakeholders and how to enable citizens to truly engage in the co-design process.

Societal Relevance

The project addresses the most vulnerable group who are not at all included as part of the city. This research enables them to have right to the city by extending their inclusion even within the decision-making process. It is a process that does not uproot them from their social and economical network and enables change and growth within the established fabric.

The projects corresponds to the Sustainable Development Goals of 1, 8, 10 and 11 which addresses poverty, decent work , economic growth, reduced inequalities and sustainable cities and communities.

Fig. 97. Informal Street Vendor
Source: https://theculturetrip.com/asia/india/articles/dharavi-more-than-asias-largest-slum/

12 References

12.1 References

Anand, A., Sreevatsan, A., & Taraporevala, P. (2018). An overview of the smart cities mission in India. SCM Policy Brief, August. http://cprindia.org/system/tdf/policy-briefs/SCM POLICY BRIEF 28th Aug.pdf?file=1&type=node&id=7162

Arabindoo, P. (2011). Rhetoric of the 'slum.' City, 15(6), 636−646. https://doi.org/10.1080/13604813.2011.609002

ASSINK, S., 2017. Who is the smart city for? University of Virginia. Available at: http://thrivingcities.com/blog/who-smart-city

Banks, N., Lombard, M., & Mitlin, D. (2020). Urban Informality as a Site of Critical Analysis. The Journal of Development Studies, 56(2), 223−238. https://doi.org/10.1080/00220388.2019.1577384

Bardhan, R., Sarkar, S., Jana, A., & Velaga, N. R. (2015). Mumbai slums since independence: Evaluating the policy outcomes. Habitat International, 50, 1−11. https://doi.org/10.1016/j.habitatint.2015.07.009

Bhadsavale, M., & Waingankar, S. (2018). Thane Smart City Report: A Part Of Smart Cities In Maharashtra Coalition. Right To The City As The Basis For Housing Rights Advocacy in Contemporary India.

Bhattacharya, S., Rathi, S., Patro, S. A., & Tepa, N. (2015). Reconceptualising Smart Cities: A Reference Framework for India. Center for Study of Science, Technology and Policy, September, 80. www.cstep.in

Bollier, D., 1998. How Smart Growth Can Stop Sprawl. In: Washington, DC: s.n.

Datta, A. (2015). New urban utopias of postcolonial India: 'Entrepreneurial urbanization' in Dholera smart city, Gujarat. Dialogues in Human Geography, 5(1), 3−22. https://doi.org/10.1177/2043820614565748

Datta, A. (2018). The digital turn in postcolonial urbanism: Smart citizenship in the making of India's 100 smart cities. Transactions of the Institute of British Geographers, 43(3), 405−419. https://doi.org/10.1111/tran.12225

Denis, E., Mukhopadhyay, P., & Zérah, M. H. (2012). Subaltern urbanisation in India. Economic and Political Weekly, 47(30), 52−62. https://doi.org/10.1007/978-81-322-3616-0

Echanove, M. (2013). Beyond the Informal: Reconceptualizing Mumbai's urban development. Max Planck Institute for the Study of Religious and Ethnic Diversity, 1−36.

Fainstein, S. S. (2006). Planning and the Just City. Conference on Searching for the Just City , GSAPP Columbia University. January 2006.4

Ghanam, R., El-Deep, A. (2021). Upgrading Urban Spaces in Slums as a Tool to achieve Social Sustainability (Making Slums Livable) - The Case Study of Meit-Elwan Slum - Kafr El Sheikh City - Egypt. (Dept. A. : Architecture). MEJ. Mansoura Engineering Journal, 46(2), 67-75. doi: 10.21608/bfemu.2021.175695

Government of India (2015) Smart Cities – Mission Statement and Guidelines. Ministry of Urban Development: New Delhi.

Harrison, C., & Donnelly, I. A. (2011). A theory of smart cities. 55th Annual Meeting of the International Society for the Systems Sciences 2011, 148, 521−535.

Harvey, D. (2008). The right to the city. New Left Review, 53, 23−40

Healey, P. (1996). The Communicative Turn in Planning Theory and its Implications for Spatial Strategy Formation. Environment and Planning B: Planning and Design, 23(2), 217−234. https://doi.org/10.1068/b230217

Hoelscher, K. (2016). The evolution of the smart cities agenda in India. https://doi.org/10.1177/2233865916632089

Housing and Land Rights Network. (2017). India's Smart Cities mission: Smart for whom? Cities for whom? 84. http://hlrn.org.in/documents/Smart_Cities_Report_2017.pdf

Housing and Land Rights Network. (2019). An Unrelenting National Crisis, Housing and Land Rights Network

India's Population Will Be 1.52 Billion by 2036, With 70% of Increase in Urban Areas. (n.d.), from https://thewire.in/government/india-population-growth-government-report-2036-projections-urban-migration

Kulshrestha, S. K. Urban Renewal in India Theory, Initiatives and Spatial Planning Strategies. SAGE, 2018.

Lefebvre, H. (1996 [1968]) 'The right to the city', in H. Lefebvre, Writings on Cities. Ed. and Trans. E. Kofman and E.

Lebas, pp. 63−184. Cambridge, MA: Blackwell.

Marcuse, P. (2009). From critical urban theory to the right to the city. City, 13(2−3), 185−197. https://doi.org/10.1080/13604810902982177

Mathur, R. (2009). STRUCTURING URBAN FRAGMENTS Case : Thane , Maharashtra. CEPT University.

Ministry of Urban Development. (2017). The Smart City Challenge Smart City Proposal : Thane (Issue 7).

Nangia, P., Gupta, K., & Tiwari, N. C. (1996). Emergence of slums: A case study of thane urban agglomeration. Indian Journal of Social Work, 57(4), 545−562.

NIJMAN, JAN 2015. India's Urban Future Views From the Slum. American Behavioral Scientist, 59, 406-423.

Rocco, R., & van, B. J. (Eds.). (2018). The routledge handbook on informal urbanization. ProQuest Ebook Central https://ebookcentral-proquest-com.tudelft.idm.oclc.org

Roy, A. (2007). Toward an Epistemology of Planning. 4363. https://doi.org/10.1080/01944360508976689

Roy, A. (2009). Why India cannot plan its cities: Informality, insurgence and the idiom of urbanization. Planning Theory, 8(1), 76−87. https://doi.org/10.1177/1473095208099299

Roy, A. (2011). Slumdog Cities: Rethinking Subaltern Urbanism. International Journal of Urban and Regional Research, 35(2), 223−238. https://doi.org/10.1111/j.1468-2427.2011.01051.x

Roy, S. (2016). The Smart City Paradigm in India: Issues and Challenges of Sustainability and Inclusiveness. Social Scientist, 44(5/6), 29.

Sarkar, A. (2017). Smart cities: a futuristic vision. Smart City J, 1-20.

Shelter Associates. (2017). Spatial Slum Information. https://app.shelter-associates.org/city::Thane

Soja, E. (2010) 'The city and spatial justice', in B. Bret, P. Gervais-Lambony, C. Hancock and F. Landy (eds) Justices et Injustices Spatiales, pp. 55−74. Paris: Presses Univeritaires de Paris Ouest.

Tan, S. Y., & Taeihagh, A. (2020). Smart city governance in developing countries: A systematic literature review.

ArXiv.

The Smart City Journal. (n.d.), from https://www.thesmartcityjournal.com/en/articles/smart-cities-futuristic-vision

Trivedi, N. (2016). Adopting collaborative planning for redevelopment of built environment as a means for capacity building of the urban poor. September. United Nations Millennium Project Task Force. (2006) 'Improving the Lives of Slum Dwellers: A Home in the City', New York: United Nations.

TUNAS, DEVISARI. 2008. The spatial economy in the urban informal settlement. TU Delft, Delft University of Technology.

UDRI - Urban Design Research Institute. (2018). Login-MUMBAI. http://www.loginmumbai.org/map.html

UN-Habitat (2003). The Challenge of Slums. Global Report on Human Settlements. London: Earthscan and UN-HABITAT.

UN-Habitat. (2014). A Practical Guide to Designing , Planning , and Executing Citywide Slum Upgrading Programmes.

United Nations Task Team. (2015). HABITAT III ISSUE PAPERS 22-INFORMAL SETTLEMENTS.

Willis, K. S. (2019). Whose Right to the Smart City? The Right to the Smart City, 27−41. https://doi.org/10.1108/978-1-78769-139-120191002

Fig 98. Street at Indira Nagar

Source: Author's image

13 Appendix

i. Glossary

TSCL - Thane Smart City Limited

TMC - Thane Municipal Corporation

MMRDA - Mumbai Metropolitan Region Development Authority

MIDC - Maharashtra Industrial Development Corporation

EWS - Economically Weaker Section

LIG - Low Income Group

Corporator - Ward Committee elected member of municipal body

CBO - Community Based Group

FBO - Faith Based Group

SHG - Self-help group

SRA - Slum Rehabilitation Authority

SPV - Special Purpose Vehicle

MLA - Member of Legislative Assembly

ULB - Urban Local Body

RAY – Rajiv Awas Yojana

PMAY – Pradhan Mantri Awas Yojana

EIUS - Environmental Improvement of Urban Slums

ILCS - Integrated Low Cost Sanitation

UBSP – Urban Basic Service Programme

NSDP - National Slum Development Program

VAMBAY – Valmiki Ambedkar Awas Yojana

JnNURM – Jawaharlal Nehru National Urban Renewal Mission

AHIP – Affordable Housing in Partnership

ISHUP – Interest Subsidy Scheme for Housing the Urban Poor

ii. List of Figures

iii. Theory Paper

Integrating informality in smart city model in India

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Abstract

Urban informality has been a common phenomenon and integral part of contemporary metropolitans and cities of the Global South. Informal economy forms almost half of India's GDP and 33-47% of urban population lives in informal settlements or slums. With the Smart Cities Mission launched in India in 2015, the adoption of ICT tools for governance and the internet access has mainly been the target focus of urban development. This paper addresses that it is an adoptive model mainly from the West, which has its shortfalls and fails to address the urban realms of Indian cities. The smart city developmental model has created rich urban enclaves with aspirations to become global city and has caused further disparities and inequalities. The research is interested in 'right to the city', bringing socio-spatial justice in growing smart cities and curb segregation and fragmentation in future city fabrics. This bridging of polarities is crucial under the vision of the country to become "smart" and inclusive. Healthy living environments and a good quality of life is essential for the social-ecological and socio-economic growth of the country. The paper explores an alternative potential planning approach which involves grassroot organization and participatory approach for better governance and involvement of all within this top-down model of smart city.

Keywords: informality, smart city, inclusivity, participatory approach, urban equity

Introduction

The high pace of urbanization in the Global South along with the growth of informality is at a point of crisis that needs to be addressed immediately. In the context of India, there have been policies to upgrade or redevelop the informal settlements since decades, however, little has been done compared to the sheer volume of informal urbanization in the country. Since 1990s with the neoliberal model of development, the urban transformation of cities has mainly been focused on economic growth and further privatization of developments which results in rehabilitation and evictions which are core strategies. This paper aims to understand the context of informality and how the current adopted policies for urbanization in India are further causing exclusive and inequitable cities. It briefly touches upon how new governance model is required in order to have more collaborative planning. The limitations of the scope of work are that it does not delve into the history of informality and urbanization processes, and mainly talks about the contemporary practices in the context of India.

The paper is divided into 4 sections which first discusses the different perspectives of informality, then how different urbanization policies have been adopted to tackle various aspects in Indian city, and evolution of smart city in India. Next, it draws upon the challenges and issues of current policies which effects informality and finally, the way forward towards a more inclusive and equitable approach of planning. The paper discusses the critical and emancipatory perspective of informality by Roy and Echanove to perceive it in a better light.

The paper tries to figure out how collaborative planning can possibly integrate informality in schemes like Smart City Mission in Indian cities and create an equitable model. Authors such as Willis and Datta provide a fresh perspective on looking at incorporating informality through better citizen participation in the existing urbanization models. I believe a thorough study needs to be done in order to understand the fabric, typology, networks of the chosen informal settlements and using the help of grassroot institutions and indigenous knowledge of the community itself, new forms of earning livelihood through new technology can help become part of smart city model. There is a discourse gap between informality and smart city which needs to be accepted and incorporated, to successfully achieve an inclusive and equitable urbanization model in developing countries. India can be a possible test-bed to explore the idea of 'right to the city' further.

Defining Informality

Informality has always been viewed through different perspectives as both derogatory and a complimentary term, more former than the latter. "The first perspective, more critical, sees informality predominantly in terms of political exclusion, inequality, and poverty. The second, the 'emancipatory perspective', frames urban informality as a practice that fosters autonomy, entrepreneurship, and social mobility." (Rocco, 2018). On one hand, it is perceived as a problematic unregulated and unplanned reality that must be addressed via regulation and on the other hand, it is their sheer independent existence as a joint community despite the economic, political and social exclusion.

Instead of understanding informality within a setting of certain communities; or sectors (housing/ labour markets); or an outcome related to legal status, it would be important to understand informality as a site of critical analysis. A multi-scalar perspective to explore patterns and processes at micro, meso and macro scales of the urban informality is required. (Banks et al., 2020) It happens due to the lack of regulation and allows for development via vernacular mediums.

Let us look at the example of informal settlements within informality and try to understand their presence in the urbanization process. The informal

settlements are often referred to as slums in the South Asian context. A slum is a 'a group of individuals living under the same roof lacking one or more of the following necessities: access to improved water, access to improved sanitation, sufficient living area, structural quality and durability of dwellings, and security of tenure' as defined by the United Nations Task Force in Improving the Lives of Slum Dwellers (2006). Settlements emerging outside the regulatory framework and development plan are typically referred to as 'unplanned' and 'informal' and sometimes 'illegal'.

Informality occurs due to gaps in policies and regulations that allows for their occurrence and not exactly a dichotomous term to the formal. Roy defines informality as "a state of deregulation, one where the ownership, use, and purpose of land cannot be fixed and mapped according to any prescribed set of regulations or the law" (Roy, 2009) She argues that informality is not a "bounded sector of unregulated work, enterprise and settlement", but rather believes that "legal norms and forms of regulation are in and of themselves permeated by the logic of informality" (2009). Hence, "India's planning regime is itself an informalized entity characterized by deregulation, ambiguity, and exception." (Roy, 2009).

In contrast to the critical perspective which mainly considers it as an outcome of inequality, the emancipatory perspective which Roy states by rethinking subaltern urbanism is that it "provides accounts of the slum as a terrain of habitation, livelihood, self-organization and politics." (2011) It is supported by the Echanove's theory of organically developed settlements. As he introduces the concept of "home-grown neighbourhoods: and "neighbourhoods in-formation" as a new way to look at slums and could be a critical point for "policy, planning and architectural engagements based on the recognition of local dynamics, developmental processes, and emerging forms" (Echanove, 2013). Informality now moves beyond its association to squatter settlements to being a

"generalized mode of metropolitan urbanization." (Roy, 2007) She also explains that informality has a certain organization logic, norms that governs the process of urban transformation itself. This is supported by Echanove's concept of "homegrown neighborhoods". The current way of upgrading slums and the focus on the physical environment is "aestheticization of poverty" (Roy, 2004, as cited in Roy, 2007) rather than upgrading livelihoods, incomes and political capacities. This leads to Henri Lefebvre's (1996) concept of "right to the city" which is at stake in urban informality today which is required to have a fair share of benefits from the ongoing urbanization processes and developments.

Finally, the important issues that needs to be tackled are "moving from land use to distributive justice, rethinking the object of development, and replacing best practice models with realist critique— are not just policy epistemologies for dealing with informality. Rather, they indicate that informality is an important epistemology for planning." (Roy, 2007) "It has linked India's urban crisis to the idiom, rather than the failure, of planning. In particular, it has identified informality as a key feature of this idiom such that Indian planning proceeds through systems of deregulation, unmapping, and exceptionalism." (Roy, 2009). A combined perspective of the critical and emancipatory needs to be taken into account to understand informality and how planning processes and deregulation can help with the existence of it. In order to place this
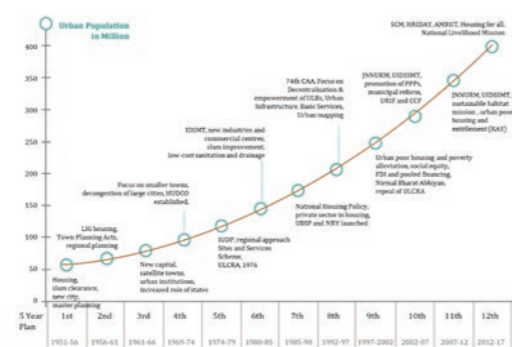

Figure 3: Urban-related Development Focus in India's Five Year Plans

Source: Various and CSTEP Analysis

understanding, we need to look at the urbanization processes that has evolved over time and how it has positioned for dealing with informality.

Urbanization in India

India is a young democratic country that has been adapting itself with several schemes to deal with the rapid urbanization in its cities. Post- independence till 2011, there are broadly three periods in which the course of India's urban policy can be classified (Batra, 2009, as cited in Bhattacharya et al., 2015).

The first phase between 1st to 3rd Five Year plan (Refer Fig. 1) were mainly towards housing provisions, slum clearance and rehabilitation which turned out to be a fragmented approach towards urban development. The master planning approach during this time resulted in expensive and low-density urban settlements.

The next phase from 4th to 6th Five Year Plans was moving away from slum clearance towards slum improvement and upgradation. The plan emphasized more on "balanced regional development and development of small and medium towns, while containing the growth of metropolitan cities, making land available for provisioning of services and urban poor housing, and control of land prices" (Bhattacharya et al., 2015). The postcolonial urban development policies dealt with the slum by either resettlement or upgradation which both resulted in an uninformed situation for the slum dweller itself. Slum rehabilitation through private developments emerged as a market-driven approach due to the changed political attitudes with the neoliberal economic reforms of the early 1990s.

The final phase i.e. from 7th to 11th Plan was accompanied by India's economic liberalization and a policy shift in urban sector was observed. "Some key developments during this period included the opening-up of the sector to private participation, participatory approach in city planning, strengthening the link between urban growth

and economic development and employment generation. An agenda for decentralization was pushed through the 74th CAA, seeking greater accountability for ULBs" and municipalities (Bhattacharya et al., 2015). In the 1990s, the Slum Redevelopment Scheme and then the Slum Rehabilitation Scheme were introduced. The latter scheme encouraged private builders to clear lands classified as slum and build high-rise buildings in which each family received a 225-square ft. unit. In exchange, the developer gets valuable 'transferable building rights' (TDR) on public land. Such schemes have led to a boom in land scams, corruption, and a toxic developer-government nexus. In addition, the quality of housing produced through this has been terrible and quickly deteriorating due to additional maintenance costs that cannot be afforded by the tenants. "Redeveloping 'slums' into high-rise residential housing will not magically turn the 'informal' into 'formal', nor will it bring social justice and equality. And it will certainly not transform socially marginalized and economically weak populations into middle-class citizens." (Echanove, 2013) There needs to be an alternative paradigm to systematically upgrade and improve the livelihoods of the marginalized people. In order to fast track the urbanization process, the changed financial regime, urban reform, and the desire to make cities 'world-class', India launched schemes like Jawaharlal Nehru National Urban Renewal Mission (JNNURM) in late 2000s. It had planning tools such as the City Development Plans which lacked to effectively link city growth plans to its spatial character. Also, the "use of template-based and over-simplified retrofitting city growth models resulted in less contextualized plan targets and generalized strategies" (Bhattacharya et al., 2015) leading to fragmented implementation and not achieving key agendas.

In 2015, with the new government taking position, they decided to introduce a bunch of new policies for urban development. The largest scheme was the Smart City Mission (SCM) by Government of India to create 100 smart cities in five years (by

2020) in order to improve quality of life in Indian cities. The SCM guidelines does aim to bring some convergence with other government schemes such as:

Atal Mission for Rejuvenation and Urban Transformation (AMRUT): An urban renewal programme targeting 500 cities in the country with provisions for upgradation and creation of physical infrastructure such as water supply, sewerage, drainage, transport, and green spaces.

Pradhan Mantri Awas Yojana (Housing for All– 2022): A scheme that aims to provide housing for EWS and LIG, with a target of 20 million houses in urban areas and 30 million houses in rural areas by the year 2022.

National Heritage City Development and Augmentation Yojana (HRIDAY): A scheme aimed at inclusive urban planning and conservation of 'heritage cities.'

The diverse efforts of various organizations by several actors needs to be streamlined and plays a critical role for sustainable urban development and moving forward with this mission smartly.

Evolution of Smart City Concept

Early visions (2000-2009)

In the late 1990s and early 2000s, the smart city concept emerged due to e-governance movements and partnership between technology companies and governments in Europe and United States. (Coe et al., 2001, as cited in Hoelscher, 2016). The best examples of retrofitted existing cities to become smart city include Barcelona and Amsterdam, as well as complete greenfield projects such as the Songdo in South Korea which a high-tech smart city and world's largest private real estate development.

In India, a shift towards urban e-governance was taking place in the early to mid-2000s. Information

and communication technologies (ICT) based solutions were offered to ULBs and municipalities by companies such as Samsung and Siemens to improve governance delivery practices, citizen participation, accountability, and transparency.

Proliferation of smart city imaginaries (2009-2014)

Instead of developing further the e-governance initiatives, the smart cities meant more of an infrastructure-led growth which involved building new/ greenfield cities to promote industrial settlements and Special Economic Zones (SEZs) for an industry-led urban growth and new urban spaces for emerging populations. Along the Delhi-Mumbai Industrial corridor (DMIC) in 2007, two greenfield cities I.e. Dholera and GIFT City were the first smart cities in India in the state of Gujarat. This process of new industrial towns and entrepreneurial urbanization (Datta, 2015) focuses on the economic driven growth, formulates explicit polices on urbanization and actively implements this new established discourse. This falls under the Special Investment Region (SIR) Act which was passed in Gujarat as a solution to develop large-scale development projects which are ideally industrial towns which have been tied with the smart cities discourse.

'100 new smart cities' (2014-2015)

With Modi becoming the Prime Minister and taking lessons as Chief Minister of Gujarat earlier, the smart cites sees a new discourse from being as SEZ for global investment for the urban elite to become more inclusive projects within existing cities. This was due to realization that 100 'new' smart cities were not feasible, affordable and politically possible. The shift in discourse tried to be engaging with more citizen participatory tools using the ICT and promote more 'inclusiveness' by involving marginalized groups. However, mechanisms of citizen engagement was poorly defined, and the idea of technologically driven urban growth remained for the smart city with the location being the existing

cities.

Smart City Mission (2015 – today)

The Smart City Mission (SCM) was launched in June 2015 to develop 100 smart cities with a funding of 4800 crore rupees (USD700 million) over the period of five years. The cities were chosen in a competition and revealed in about 4 rounds. The SCM started getting inclined towards its strategic goals which was mainly improvement in existing cities: city improvement (retrofitting), city renewal (redevelopment) and city extension (greenfield development) (GoI, 2015). As compared to earlier guidelines, the new SCM guidelines states that 'core infrastructure elements' and 'affordable housing, especially for the poor' and the cities will be evaluated on inclusiveness and how the poor with be benefitted (Hoelscher, 2016). However, this kind of development involves mainly the private sector or international organization for funding, that needs investor returns coming through commercial development and charging fees for services. Hence, the actual implementation of basic infrastructure and housing for the poor does not get realized due to the lack of investment returns in this kind of development. Another target of SCM is to have an inclusive citizen participation in planning processes. However, it has been setup at a national level platform such as the mygov.in which is a very large platform for a country so big and needs to be divided in further state and municipality level to truly incorporate the citizen voices. Also, the lack of access to internet and digital technology all over the country further marginalizes certain groups who cannot get access to 'right to participate'.

Challenges in Smart city paradigm

One of the major crises that physical urban planning is confronted with today is its inability to alleviate social issues such as poverty and exclusion (Healey, 2006, as cited in Echanove, 2013). Despite stating the idea of inclusiveness in the Smart City Mission guidelines, the smart city focuses on ICT

solution which are mainly applied top-down. It rarely addresses issues of social differences in existing cities. Also, the implementation of actual smart city projects has led to "the displacement of informal groups from urban space, displacement and spatial segregation through land-use planning, reinforcing digital divides, gender disparities, and exclusion from the economic benefits of development" (Willis, 2019). The Smart City program and the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) scheme does mention in its objectives about upgrading slums and alleviating poor people, however in the spatial implementation of these schemes, the effects are quite contrary and causing further gentrification. One of the biggest challenges is to incorporate the informality of the city in these developmental models. It is causing inequalities by causing 'enclave' based development that benefits private sector actors such as ICT companies and richer populations over others. In the strive to accomplish 'world-class' status for India cities through their slum-free propaganda, the evictions or resettlement of slums are not just about reducing poverty but rather deeming the poor as invisible.

The Smart City Mission mainly focuses on 'Area-based Development' (ABD) where the majority of the funding is reserved for a small area within the city. The idea was to develop certain areas as prototype projects within certain time and rest of the city will follow. However, this process of ABD could result in severe inequalities due to studies that indicate that over 80% of the city's SCM budget is being spent over ABDs that are about 2-7% of the entire area of the city. Rest of the city has less than 20% of the city SCM budget. It is further argued that the selected areas within the chosen cities are already well-developed and better serviced which can potentially worsen the existing disparities (Anand et al., 2018). There is a shift of power away from local democratic institutions and more towards state governments. Further it is exacerbated through mainly private investments in the city-level SCM governing body which weakens the democratic processes.

There are two ways of denying right to the smart city through spatial segregation, and exclusion from citizenship participation and benefit from the smart city as well. The more planning fails to recognize informal processes, Roy (2009) argues, the more it contributes to the sense of crisis. The acceptance of slums is denied as we can see in development plan of many cities in India, which leaves large patches of land blank and marking them as slum areas, making them unworthy or not being entitled to be mapped. Several cities are evicting slums, informal traders in the name of beautification of the city or 'cleaning' the city. Willis (2019) in her paper looks at how through automation and privatization of urban services, it drives out low paid and informal labour force; and through cleansing and expulsion from the street space of street hawkers by using a case study of city of Chennai in India. The idea of smart cleaning was also adopted by cities like Chandigarh which sold an imagined idea of sanitized city for the social and political elite, thereby widening the gap between the smart citizen and the subaltern citizen (Datta, 2018). "The persistent failure of planning or the splintering of cities through the privatization of planning all seem to be convincing and adequate explanations for the crisis that is the Indian city" (Roy, 2009). The failure of delivery of Smart city in an Indian context is due to the digital technologies that could not solve urban challenges and fail to enable local knowledge to better integrate them in the smart city planning. This needs to be changed by having a more inclusive and equitable approach towards planning for the smart cities.

A new planning approach

A collaborative planning approach which is inclusive, equitable and provides right to the city is required for a fair and just urbanization scheme. A 'top-down' planning approach like most of the schemes in India are giving a small group of elite and technocratic people to control the kind of acceptable urban form. In contrast, the 'bottom-up' planning approach is the radical decentralization of that process through production of form handed over to multiple local

actors, involved in planning their own spaces and coordinate with neighbors (Echanove, 2013).

"To be inclusive, it is necessary to adopt a democratic approach to city development and to explore the potential of connecting information technology with the marginalized sections of society, to enhance their access to employment, market, education, health, and help in building resilience against natural disasters" (Roy, 2016). The resettlement and rehabilitation schemes unlike seen before as projects of urban modernity, are now seen as intimidating the urban poor with new types of spatial injustices by disturbing their participation in the city's social production processes. As Arabindoo states that as the slums are carelessly resettled at sites of the metropolitan peripheries, "it is important to trace the new trajectory of their everyday networks and how this reshapes their marginality" (2011). Several examples shows that the possibility of grassroot organization and role of local government can create "more just and humane cities based on demand-driven, community-empowerment, incremental and participatory principles of development" (Roy, 2016).

A different kind of smart citizenship needs to be achieved that requires to be translated and vernacularized in the Indian context and talks from a difference space and positionality of the subaltern. It needs to be rethought from indigenous places and from the marginalized sections of the Global south. (Datta, 2018) As per the right to the city framework, it is important to make 'citizen-centric' smart cities and re-position their role in conception, development, and governance of the city. One such way to recognize the social capital of marginalized groups to involve in smart technology and governance models is by involving actors of civic-cyber space such as civic hacktivists, local associations, and longstanding community groups (Sadoway & Shekhar, 2014, as cited in Willis, 2018). Instead of viewing informality as a weakness, it can be used as an opportunity for "low-cost citizen sensing, crowdfunding platforms, open

data initiatives and repurposed social media-based sharing platforms" (Willis, 2018) which can be a "mode of production" within "sites of vibrant and entrepreneurial urbanism" (Roy, 2011).

Additionally, it is important to chart the topology of the urban poor whose criss-cross connections, flows and relations stretch across multiples physical spaces. In order to be more equitable, "the diversity and robustness of subaltern urbanization shows the myriad ways in which Indian citizens take their destiny into their own hands, often subverting patterns dictated from above. We are seeing spatial patterns emerge that represent an adaptive creativity that does not follow the logic of any canonical model" (Denis et al., 2012). Hence, it is important to understand the spatial implications of adopting a new approach of including informality in the future of smart city.

Conclusion

To conclude, the paper discusses informality and the current discourse of planning processes which is causing further disparities in Global South countries such as India. The smart city discourse is an adopted model to accelerate the economic growth of the country and has some basic issues with making it a human-centric and equitable model. There are several challenges as to why it fails to address the marginalized groups and certain neglected areas in the smart city developmental model. There lies an alternate planning approach to incorporate the marginalized communities in planning and such practices should be acknowledged and identified to make the Smart city model a fair and equitable model. This is discussed with authors such as Datta and Willis of how this vernacular smart citizen can establish a fresh perspective of Smart city by providing low-cost solutions and involving them more in the governance model. I think that there does lie a potential within informality that can be optimized to unleash the hidden capabilities that is required to develop a trulysmart city. There needs to be an

alternate definition to be developed for the word 'smart' in an Indian context and which addresses the subaltern and the postcolonial citizenship. Due to the broad topics of informality and smart city itself, the essay could not go in further depths of understanding the origin and history of the topics due to limitation of the extent of this paper. The paper sets the beginning tone to answer the research question of how a collaborative planning approach can help integrate informality in the smart city model in the context of Indian metropolitan city.

Bibliography

Anand, A., Sreevatsan, A., & Taraporevala, P. (2018). An overview of the smart cities mission in India. *SCM Policy Brief, August*. http://cprindia.org/system/tdf/policy-briefs/SCM POLICY BRIEF 28th Aug.pdf?file=1&type=node&id=7162

Arabindoo, P. (2011). Rhetoric of the 'slum.' *City*, *15*(6), 636–646. https://doi.org/10.1080/13604813.2011.609002

Banks, N., Lombard, M., & Mitlin, D. (2020). Urban Informality as a Site of Critical Analysis. *The Journal of Development Studies*, *56*(2), 223–238. https://doi.org/10.1080/00220388.2019.1577384

Bhattacharya, S., Rathi, S., Patro, S. A., & Tepa, N. (2015). Reconceptualising Smart Cities: A Reference Framework for India. *Center for Study of Science, Technology and Policy*, *September*, 80. www.cstep.in

Datta, A. (2015). New urban utopias of postcolonial India: 'Entrepreneurial urbanization' in Dholera smart city, Gujarat. *Dialogues in Human Geography*, *5*(1), 3–22. https://doi.org/10.1177/2043820614565748

Datta, A. (2018). The digital turn in postcolonial urbanism: Smart citizenship in the making of India's 100 smart cities. *Transactions of the Institute of British Geographers*, *43*(3), 405–419. https://doi.org/10.1111/tran.12225

iv. Interview Questions

Denis, E., Mukhopadhyay, P., & Zérah, M. H. (2012). Subaltern urbanisation in India. *Economic and Political Weekly*, *47*(30), 52–62. https://doi.org/10.1007/978-81-322-3616-0

Echanove, M. (2013). Beyond the Informal: Reconceptualizing Mumbai's urban development. *Max Planck Institute for the Study of Religious and Ethnic Diversity*, 1–36.

GoI (2015) Smart Cities – Mission Statement and Guidelines. Ministry of Urban Development: New Delhi.

Hoelscher, K. (2016). *The evolution of the smart cities agenda in India*. https://doi.org/10.1177/2233865916632089

Lefebvre, H. (1996). Writings on Cities. Oxford: Blackwell. Lefebvre,

Rocco, R., & van, B. J. (Eds.). (2018). *The routledge handbook on informal urbanization*. ProQuest Ebook Central https://ebookcentral-proquest-com.tudelft.idm.oclc.org

Roy, A. (2007). Toward an Epistemology of Planning. 4363. https://doi.org/10.1080/01944360508976689

Roy, A. (2011). Slumdog Cities: Rethinking Subaltern Urbanism. *International Journal of Urban and Regional Research*, *35*(2), 223–238. https://doi.org/10.1111/j.1468-2427.2011.01051.x

Roy, A. (2009). Why India cannot plan its cities: Informality, insurgence and the idiom of urbanization. *Planning Theory*, *8*(1), 76–87. https://doi.org/10.1177/1473095208099299

Roy, S. (2016). The Smart City Paradigm in India: Issues and Challenges of Sustainability and Inclusiveness. *Social Scientist*, *44*(5/6), 29. https://www.jstor.org/stable/24890283%0Ahttp://uoc.summon.serialssolutions.com/2.0.0/link/0/eLvHC

XMwjV3PS8MwFH7odvHib9E54YHgrXNrbJd6EVc2FEXmJl48jNikY-BSXe1h_70vTVthyPDcUhL65XsvL3nfB8DcVttZ4QTuBxRIJBNGPEV1mJLMF4KiC22oXRXxvPxx9fDIn3v8tWjqN5UC-7dLksyZWyaRKZp

United Nations Millennium Project Task Force. (2006) 'Improving the Lives of Slum Dwellers: A Home in the City', New York: United Nations.

Willis, K. S. (2019). Whose Right to the Smart City? *The Right to the Smart City*, 27–41. https://doi.org/10.1108/978-1-78769-139-120191002

Interview - Local Leader/ Corporator

Name: _____

Years in the Area: _____

Designation + Area: _____

1. What is your role in decision-making of the area development? Do all public initiatives or development in area need your approval or permission from Municipal corporation?

2. Do you co-ordinate with other leaders of the slum nearby since they share borders? How often do you have meetings?

3. Are there any plans or initiatives by TMC/ any other agency for slum improvement or redevelopment?

4. What are the slum improvement schemes already done and were there any budgets given by the government for it?

5. What do you think are the needs and demands of the community in the slum?

6. Do you know about the "Smart City Thane" project? If yes, what do you think about it? Should slums be also a part of this project?

7. Are there any collaborations with NGOs that have worked here for development of the slum?

8. What do you imagine as the future development of this area

Other Information:

Interview - Mitra/ Seva Mandal

Name of Mandal: _____

Name of Representative: _____

Area: _____

1. What role do you play in the community? What are the functions of the mandal?

2. What is the organization of the mandal? Any leader/ president or other positions? How can you become part of the mandal?

3. What are your initiatives for the community and do you get support from the surrounding community for your actions? Do you need any permission for authorities to bring about change?

4. What do you think are the needs/ demands and problems faced in the slum? Do you tell the government or corporator about it?

5. Can anyone participate in the events you organize? Outside people? Is it open to all?

6. Do you think you will be able to organize community meetings to improve the neighbourhood and help with organizing community participation for making decisions about improvement/development and space usage within the area?

7. Is it possible for the mandal to take responsibility of ownership and maintenance of certain public spaces?

8. What do you think is viewed as "Smart" by the community in the Smart City Thane context?

Other Information:

Interview Questions

For Residents of Indira Nagar Area

General Questions

- Age

- Gender

- Occupation

- Which area do you live?

- Since when do you live?

Problems

1. What are the top three problems faced living here?

1A. Arrange the above three problems in order of most urgent to least urgent

Involvement and Decision-making

2. Do you want to be involved in the planning or decision-making process of the above problems with the government?

2A. If yes, how would you like to be involved in it?

2B. At what level would you like to be involved?

Solutions

3. Which of these solution/ changes would you like to see in your area?

Responsibility and Contribution

4. Would you take responsibility of building and maintaining it by working for it ?

5. How much are you willing to pay contribution to improve the area?

Public space activities

6. What type of public space and activity would you like to have in your neighborhood? Mark top three

Support system

7. Do you get any help/ support from Mitra/ seva Mandal?

8. Do you get any help/ support from the corporator?

Accessibility

9. Which mode of transport you use within the area?

9.A. Which is the main mode of transport you use outside the area?

9B. Rate the area in terms of access to transport to the city

Smart City Awareness

10. Do you know about the Smart City Thane development program?

11. What is your perspective on smart city development? What do you think being smart means to you? How can your area become smart? Any ideas to share?

12. Do you like anything about the area? Any other suggestions/ concerns about the area