

Inclusive Slum Planning of Kolkata Municipal Corporation (KMC)

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List of Abbreviation

KMC - Kolkata Municipal Corporation
SDG - Sustainable Development Goals
GPS - Global Positioning System
GARMIN - Brand name for the GPS device used
SUDA - State Urban Development Agency
KMDA - Kolkata Metropolitan Development Authority
PCA - Principal Component Analysis
GIS - Geographic Information Systems
SPSS - Statistical Package for the Social Sciences
SWOT - Strengths, Weaknesses, Opportunities, and Threats
RS - Remote Sensing
VAMBAY – Valmiki Ambedkar Awaas Yojana
NSDP – National Slum Dwellers Programme
IAY – Indira Awaas Yojana
NBA – Nirmal Bharat Abhiyan
UBSP – Urban Basic Services for Poor
SJSRY – Swarna Jayanti Shahari Rozgar Yojana
JRY – Jawahar Rozgar Yojana
PMAY – Pradhan Mantri Awas Yojana
RAY – Rajiv Awas Yojana
LIG – Low-Income Group
EWS – Economically Weaker Section
MIG – Middle-Income Group
JNNURM – Jawaharlal Nehru National Urban Renewal Mission
BSUP – Basic Services for Urban Poor
IHSDP – Integrated Housing and Slum Development Programme
KEIP – Kolkata Environmental Improvement Project
ADB – Asian Development Bank
GWB – Government of West Bengal

Chapter 1: Introduction

Inclusivity fosters circumstances where persons from varied origins feel accepted, esteemed, and acknowledged. It emphasizes providing equitable treatment for all individuals, irrespective of their distinct characteristics or backgrounds. Inclusivity fundamentally involves acknowledging and valuing a community's varied identities and cultural heritages. Inclusivity cultivates a sense of belonging and engagement by encouraging active participation. Slum inclusion specifically tackles the difficulties encountered by slum residents, such as poverty and inadequate basic amenities, and strives to guarantee equitable opportunities and enhanced living conditions, to ensure equal rights and opportunities for all individuals.

1.1 Conceptual Framework

Inclusivity is adopting steps that ensure individuals with diverse backgrounds and identities feel accepted, valued, and considered in a certain environment (Smith, 2018). This entails creating an environment where everyone, regardless of their unique attributes or histories, feels a sense of inclusiveness and acknowledgment (Jones & Lee, 2020). Essentially, inclusivity refers to accepting a diverse range of individuals and ensuring equitable and impartial treatment for everyone (Johnson et al.). Essentially, inclusivity refers to the attribute of accepting a diverse range of individuals and ensuring equitable and impartial treatment for everyone (Johnson et al., 2019). The significance of inclusion lies in the imperative to recognize and appreciate the equitable standing of each individual (Brown, 2017). It is crucial to acknowledge and appreciate the many cultural backgrounds of individuals (Garcia, 2021). From this perspective, inclusion denotes the proactive involvement of all individuals (Robinson, 2016). Engaging in various activities fosters increased enjoyment and inclusivity among people (Davis & White, 2020). Engaging in various activities fosters an increased sense of joy and inclusivity among people (Davis & White, 2020). The term 'inclusive,' according to its dictionary definition, refers to the characteristic of including all individuals, components, or collectives without any kind of exclusion (Olsen, 2018). At its core, inclusivity can be defined as the quality of avoiding the exclusion of individuals, elements, or groups (Adams, 2019). Inclusiveness is the result of the inclusion process (Wilkins, 2020). Inclusion is the act of using diversity as a valuable asset to create a more inclusive environment (Thompson & Martinez, 2019). Inclusivity refers to a community's capacity to include all of its members and prevent the exclusion of any individual (Perez, 2017). Social inclusion is an ongoing effort aimed at enhancing the conditions in which individuals and groups participate in society (Wang & Kim, 2021). The goal is to improve the skills, opportunities, and self-respect of individuals who face difficulties due to their identity (Nguyen et al., 2018). Inclusion, as defined by Chen (2016), pertains to an individual's impression of being valued and integrated within their work environment and the broader social context. The concept of equality can be defined as the effort to provide fairness and guarantee equal opportunities for individuals to achieve success in their lives, regardless of their socio-cultural background or personal traits (Gomez, 2020).

In contrast, the notion of slum inclusion applies to the aim of promoting increased inclusivity and fairness in the living conditions of those residing in slum areas. Slums are

often characterized by high population density, informal housing arrangements lacking regulatory oversight, limited access to basic services, and heightened levels of poverty. In the contemporary context, the concept of inclusion aims to address these challenges and ensure fair and equal opportunities and rights for residents of slums, similar to those enjoyed by other individuals living in urban areas. The subsequent elements delineate many important constituents for fostering inclusion among slum communities:

- *Access to Basic Services-* One of the key objectives is to facilitate the provision of fundamental services, including but not limited to clean water, sanitation, healthcare, education, and power, to individuals residing in slum areas. Enhancing infrastructure and optimizing service delivery are crucial for elevating the quality of life.
- *Secure Land Tenure-* A significant number of individuals residing in slums experience a lack of reliable land tenure, resulting in housing insecurity and impeding progress in development. The establishment of secure land tenure guarantees that individuals possess lawful entitlements to their residences, enabling them to make investments towards enhancing their living circumstances.
- *Housing Upgrades-* Enhancing the quality of slum housing by the provision of improved materials, infrastructure, and services has the potential to substantially enhance the living conditions and safety of its inhabitants.
- *Community Participation-* The concept of inclusiveness entails the active involvement of slum populations in decision-making processes about urban development. It is imperative to facilitate the empowerment of people, enabling them to actively participate in the formulation of policies and the implementation of programs that directly impact their lives.
- *Income Generation and Employment-* The provision of chances for income creation and employment can facilitate the upliftment of slum dwellers from poverty and enhance their general standard of living.
- *Social Services-* Inclusive slum development necessitates the incorporation of social services such as healthcare, education, and community support to foster holistic well-being.
- *Safety and Security-* Improving the quality of life necessitates prioritizing the enhancement of safety and security measures in slum regions. This encompasses

the aspects of crime prevention, disaster readiness, and the establishment of a secure residential milieu.

- *Environmental Sustainability*- The implementation of sustainable practices inside slum regions has the potential to enhance living conditions and mitigate the environmental consequences associated with informal settlements.
- *Non-Discrimination*- The essential feature of inclusivity is addressing prejudice and social exclusion experienced by slum residents, which may be influenced by factors such as gender, ethnicity, or poverty.
- *Legal and Policy Frameworks*- The necessity lies in the creation or revision of legal and policy frameworks that facilitate the inclusion of slums. This may encompass initiatives such as land reform, urban planning, and regulatory measures aimed at fostering equitable urban development.

The achievement of inclusivity within slum areas is a multifaceted and continuous endeavor that necessitates collaboration among governmental bodies, local authorities, non-governmental organizations (NGOs), and the active engagement of the impacted populations. The overarching objective is to foster the development of urban settings that are characterized by fairness and equality, enabling slum inhabitants to experience an improved standard of living and equal access to opportunities available to other urban dwellers.

1.2 Background of the Study

The process of urbanization is seeing a continuous acceleration, exerting a significant influence on the city's trajectory toward global expansion. According to UNDP 2022, 50% of the global populace currently resides in urban areas, with forecasts indicating that by the year 2050, this figure will rise to 70%. The future is expected to witness an increase in population density within cities due to their pivotal role as hubs of economic activity. This phenomenon results in socioeconomic inequalities within urban areas. The city encompasses a range of economic activity, spanning from secondary to quaternary sectors, which are organized into distinct strata. There exists a stratification among individuals based on their income levels, resulting in distinct groups. The first group, referred to as the high-income group, surpasses the poverty line and possesses the means to independently access all essential services and amenities. The second group, known as the middle-income group, can access certain amenities independently while relying on government subsidies for the remainder. The predominant demographic consists of individuals residing in slums

who are employed as manual laborers within our households or places of business. The government's actions further intensified its underlying necessity. A significant number of individuals migrate to urban areas in search of employment opportunities, often finding themselves employed in subordinate positions. This influx of individuals has resulted in a rise in population density within slum areas. The residents of slums experience reduced access to shelter due to the illegality of their habitats and the compulsion to reside in such areas. Additionally, they lack adequate sanitation facilities, drainage systems, and hygiene practices. The water supply in these areas is severely deficient, with residents receiving only 3-4 hours of water supply per day. Furthermore, the quality of the available water is substandard, characterized by brackishness, thereby blurring the distinction between water used for daily household activities and drinking purposes. Moreover, the provision of electricity in these areas is unauthorized. Certain locations exhibit elevated crime rates, which also correspond to heightened concerns regarding female safety. Authorities have conducted investigations into numerous cases including acid attacks and instances of domestic violence. The present condition of the city's area characterized by a high concentration of black residents exhibits psychological and physical isolation, as well as social and cultural detachment from the more affluent and developed sector of the city. Within this particular framework, the term "inclusive city" pertains to the comprehensive integration of citizens across various dimensions, encompassing physical infrastructure, economic opportunities, mental well-being, social cohesion, and cultural diversity. Various approaches, governmental strategies, and initiatives, as well as effective administration stemming from sufficient education, can contribute to the mitigation of inequality or disparity (Dhyani, et al., 2018).

This study incorporated low-income slum residents by considering many criteria, including a) Temporal factors, b) Physical location (site) factors concerning the legal status, c) religious factors, and d) susceptibility to hazards.

The Kolkata Municipal Corporation (KMC) has successfully concluded the implementation of fundamental slum and inclusive urban planning, with a particular focus on select sustainable development initiatives. One of the goals outlined in Sustainable Development Aim 3, pertains to promoting good health and well-being. Additionally, the fourth aim focuses on ensuring access to quality education. Goal 6 pertains to the provision of safe drinking water and sanitation, while Goal 10 focuses on the reduction of inequality. Goal 15 encompasses a comprehensive policy framework aimed at promoting sustainable

land use practices, with a particular emphasis on the participation of slum populations. A comprehensive examination of the existing literature has been undertaken. The study work has culminated in the development of model designs that are aligned with the identified qualities and objectives.

1.3 Research Problem

Kolkata, a densely populated urban center with a population of over 1.49 million, has successfully transformed into a smart city. The driving force behind the efforts to transform slum populations into slum-free cities is the continuous growth of the economic population. However, it is important to note that this cannot be achieved without considering the implications of displacing the 1,409,721-slum population (based on the 2011 census). If these individuals are ejected from the city, it is likely to result in a significant disruption to the daily lives of the city's residents. Four problem statements are presented below to illustrate the study challenge and its connection to Kolkata (KMC).

Kolkata, henceforth referred to as KMC, is recognized as an unplanned urban development. Certain areas within the city exhibit affluence, while others have significant socio-economic disadvantages, resulting in a pronounced discrepancy in the provision of essential services. Addressing this social inequality necessitates the implementation of comprehensive policies for inclusive urban design. The advent of industrialization led to a significant rise in population across the entire nation.

- Slums in Kolkata are not merely conspicuous elements of a contemporary urban landscape but rather encompass specific regions that have persisted for over a century. Kolkata, the capital city of West Bengal, India, is home to a significant number of slums. A total of 3073 slums have been officially recognized inside the city. Additionally, other unregistered slums are dispersed across the 16 Boroughs and 144 Wards of Kolkata in a congested and haphazard manner. The predominant concentration of slums in Kolkata is observed in the eastern, mid-western, and central regions, respectively.
- Slums are widely regarded as highly undesirable areas for human habitation due to their high population density and unclean living conditions. The aforementioned time limit facilitates the management of flames arising from diverse sources, potential health hazards, and challenges related to cleanliness.

- Slums constitute a discernible characteristic of expanding urban areas, with Kolkata serving as a notable example. The slums in question are characterized by a significant absence of societal entitlements, including but not limited to education, secure housing, access to clean water, health services, and sanitation facilities. Consequently, specific slums were designated for further examination using purposeful selection and stratified random sampling.
- Slums constitute a discernible characteristic of expanding urban areas, with Kolkata serving as a notable example. The slums in question are characterized by a significant absence of societal entitlements, including but not limited to education, secure housing, access to clean water, health services, and sanitation facilities. Consequently, specific slums were designated for further examination using purposeful selection and stratified random sampling.

To tackle the matter of low-income settlements, namely those occupied by slum dwellers, a set of objectives has been formulated to foster inclusivity. These objectives are currently under discussion and subject to additional deliberation.

1.4 Research Questions

Several research inquiries have been posited to enhance credibility and substantiate the research endeavor. Consequently, even minor adjustments to the living conditions within these slums will not substantially resolve these concerns. substantially resolve these concerns. Certain inquiries may bring up subjects such as the people without shelter, the insufficiency of crucial services or the provision of much fewer necessary services, and disparities in economic conditions.

- What strategies may be employed to ensure that those residing in slums have access to a quality education while minimizing financial burden and maximizing educational outcomes?
- In what manner may those experiencing poverty get affordable housing that ensures adequate health and safety conditions, primarily by mitigating the prevalent risk of fire hazards within their communities?
- How can one effectively deliver essential services like health, sanitation, and economic opportunities, to slum residents at minimal cost to enhance their overall quality of life?

- What strategies can be implemented to ensure the preservation of female social security during all phases of development?
- What strategies may be employed to effectively implement government programs to maximize their reach and benefit a larger slum population?

1.5 Objectives

The objective of this research work has been divided into two ways a) Specific objective and b) Detailed objectives.

- a) Specific objective-* The primary aim of this study is to examine the disparities in access to secure, sanitary, and affordable housing among individuals residing in slums, as well as their access to fundamental urban amenities such as water, waste management, electricity, and safety. Additionally, the study seeks to explore the income levels of slum dwellers and propose inclusive policies that integrate them into the broader urban community, both economically and psychologically.
- b) Detailed objectives-* To justify the specific objective, several detailed objectives are taken into consideration. i) This study seeks to evaluate the varying degrees of inclusion in slums across distinct temporal zones of Kolkata to facilitate a comparative analysis. ii) Assess the degree of inclusiveness about the slum's legal standing in light of its location and circumstances. iii) Assess the level of inclusiveness concerning the various religious traditions. iv) a) To evaluate the degree of inclusion concerning the vulnerability of slums to fight fire hazards.

1.6 Selection of the Study Area

The Kolkata Municipal Corporation (KMC) has been selected as the focal point for investigating the region's objectives. The primary focus of this study is situated within the geographical coordinates of 22° 28 N to 22° 58 N and 88° 10 E to 88° 27 E, namely inside the delta region of the Ganga River. Kolkata has a land area of 205 square kilometers, with a relatively limited east-west span extending from the Hooghly River in the west to approximately the Eastern Metropolitan Bypass in the east, covering a distance of 9-10 kilometers (5.6–6.2 mi). Kolkata is situated in the lower Ganges Delta in eastern India, in a north-south direction along the eastern bank of the Hooghly River. The city's elevation ranges from 1.5 to 9 meters (5 to 30 feet). The region under consideration exhibits a populace of around 4.6 million individuals, accompanied by a daily influx of 60,000 individuals constituting the transient population. The population density within a certain area of one square kilometer is recorded as 24,252 individuals.

Before the year 2014, the city of Kolkata was geographically partitioned into a total of 15 boroughs and 141 wards. However, after 2014, the city underwent a reorganization increasing to 16 boroughs and 144 wards. Except for Wards 42, 45, and 87, most wards encompass a neighborhood characterized by substandard living conditions sometimes called slums. This categorizes each region as comprising both economically rich portions and somewhat disadvantaged sections. The comprehensive project has been successfully executed under the jurisdiction of the Kolkata Metropolitan Corporation (KMC),) jurisdiction, encompassing 16 administrative divisions and a total of 144 electoral wards. By specific criteria aligned with the core objectives, 14 Slum settlements have been identified for targeted interventions.

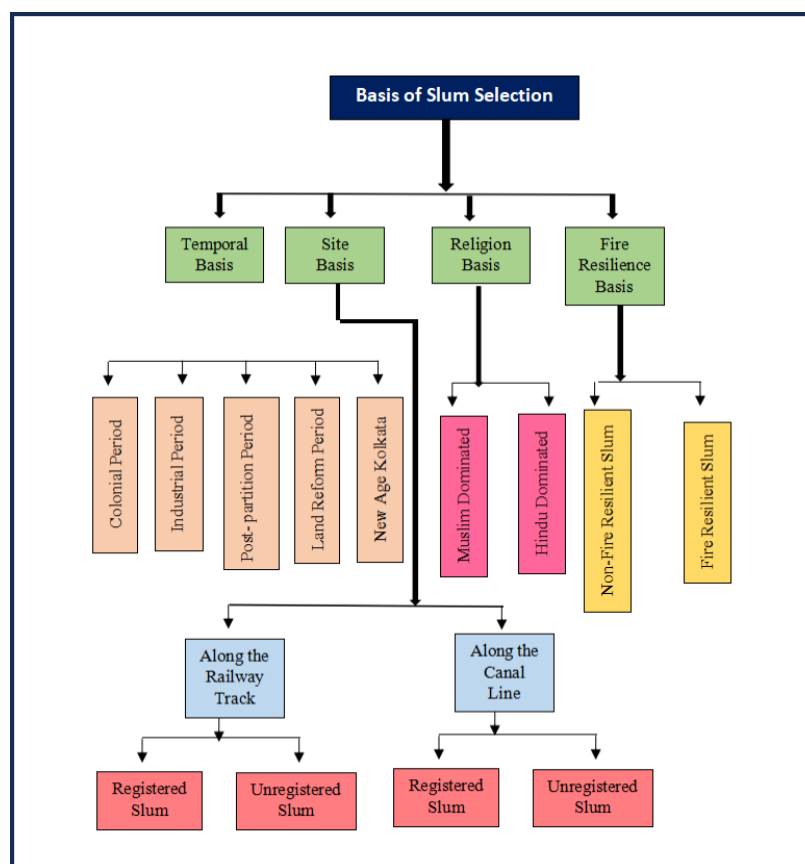


Figure 1.1: Basis of the Slum Selection

Source- Prepared by Researcher

The selection of slums for inclusiveness is primarily based on Four characteristics. These parameters include a) The Temporal Basis of Inclusiveness b) The Physical location (site) Basis of Inclusiveness c) The Role of Religion in Promoting Inclusiveness and d) The Role of Hazard Prone Factors in Promoting Inclusiveness.

Table 1.1: Selection of the Slums based on Classification

Serial No	Basis of Classification	Sub Basis of Classification	Slum Name	Borough Number	Ward Number	Specialty Details
1	Spatio-Temporal Basis	Colonial Period	9 -19 Baniatola Street Bustee, Ahiritola	2	19	Oldest slum cluster (Ghetto) of old native Bengal People
2		Industrial Period	New Tangra Lane, Chingri Ghata	7	58	Based on the Tannery Industry
3		Post-Partition or post-independence Period.	Baghajatin Colony Slum	10	99	Over 75% of the total population migrated from the Bengal (Bangladesh) East
4.		Post land Reform Period	Sahid Smrity Colony Bustee	12	109	Regarding Employment Necessity, Commuter Slum
5.		New Age Kolkata	Adhikary Para lane colony slum, Thakurpukur	16	144	Recently incorporated into the administrative boundaries of KMC, an old ghetto.
6a.	Physical location (site) Basis	Along the Canal Line	Narkel Danga Canal East Road Bustee	3	29	Registered Slum (Legalized)
6b.			Narkel Danga Canal West Road Bustee	3	29	Unregistered Slum (Illegal by State Government)
7a.	Physical location (site) Basis	Along the Railway Line	Panchanantala Bustee	8	90	Registered Slum (Legalized)
7b.			Madhobtala Lane Bustee	10	92	Unregistered Slum (Illegal by State Government)
8	Religion Basis	Muslim	Smith Hoe Lane Bustee	6	53	Muslim Populated Bustee Surrounded by Hindu Population
9		Hindu	Ata Bag Bustee	15	134	Hindu-populated Bustee Surrounded by Muslim population
10	Hazard Prone (Fire Hazard) Basis	Registered	Brace Bridge Slum	9	80	Fire non-resilience slum (Registered by State Government)
11		Unregistered	Topsia Slum	7	68	Fire non-resilience slum (Unregistered by State Government)
12		Registered to Unregistered	Basanti Colony slum	3	32	Affected by vulnerable fire hazards several times (Fire Resilient slum)

Source- Prepared by the Researcher

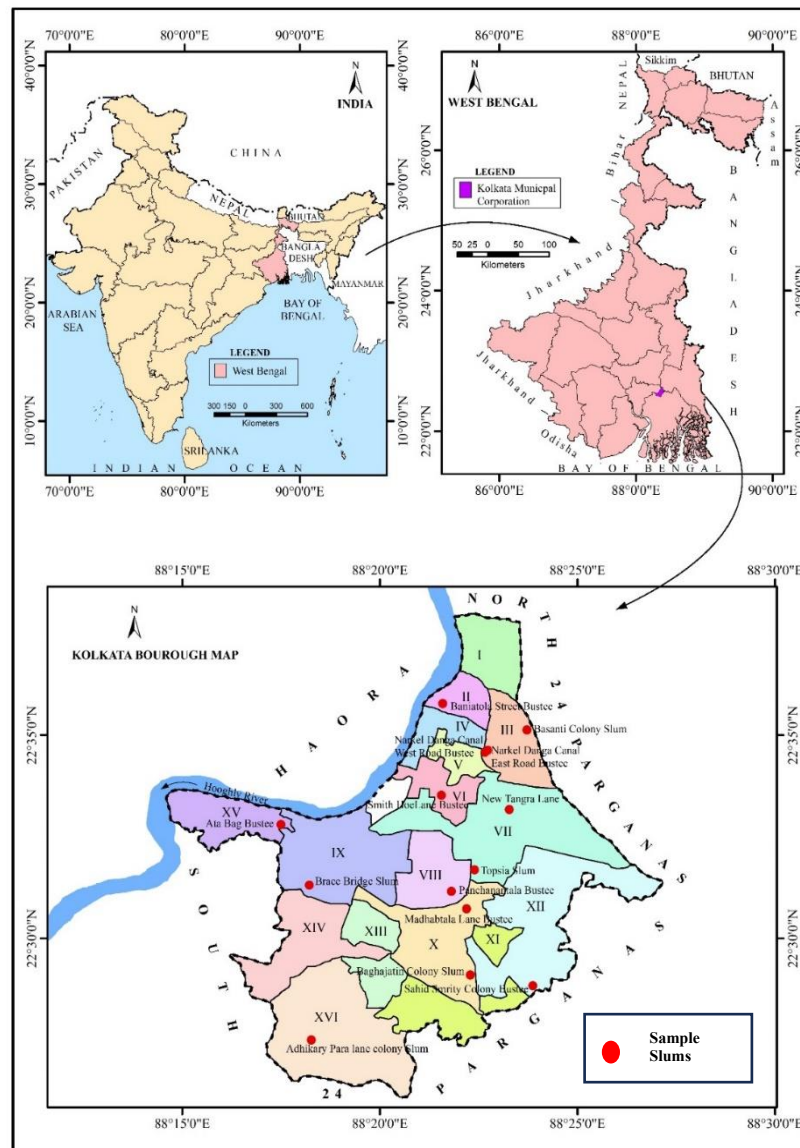


Figure 1.2: Selected slums for study area

Source- prepared by the Researcher

1.7 Research Methodology

The study "Inclusive Slum Planning for Kolkata" employs a comprehensive strategy that integrates qualitative and quantitative research methodologies. Initially, a comprehensive literature review was conducted to acquire knowledge on the existing theoretical frameworks, policies, and best practices related to inclusive urban planning and slum development. Following that, an extensive field investigation was carried out, utilizing qualitative research methods such as interviews, focus group discussions, and participatory observations among the slum communities of Kolkata. These strategies were designed to incorporate the diverse perspectives, needs, and objectives of individuals, local authorities, non-governmental organizations, and other stakeholders involved in the planning process.

Furthermore, quantitative surveys were undertaken to gather statistical information regarding socio-economic factors, housing conditions, availability of vital services, and community infrastructure in the slum areas. The utilization of both qualitative and quantitative data triangulation enabled the formation of a thorough understanding of the challenges faced by slum dwellers and the identification of essential factors required for the development of inclusive urban planning strategies tailored to the specific conditions of Kolkata. This methodology emphasizes a participatory and collaborative approach, ensuring that the community actively participates in decision-making processes to ensure sustainable and equitable development in the slum neighborhoods of the city. This study examines multiple characteristics for evaluating the quality of life in slums in Kolkata, encompassing education, healthcare, housing conditions, water and sanitation, disaster preparedness, and the administration of inexpensive rehabilitation homes. Additionally, it analyses the comprehensive administration of slums in Kolkata and the inclusive policies that have been put into effect for their benefit. Regarding this matter, the sampling method employed varies depending on the specific requirements. In general, a stratified random sampling approach is used for a portion of the slum, while purposive sampling is used to maximize representation. The slum area of KMC is divided into various categories, such as temporal trend zone-based slums, religion-based slums, physical location-based slums, legal status-based slums, fire hazard-based slums, and others. These specific characteristics were selected to evaluate the standard of living, level of access to amenities, and availability of necessities. The stratification was exclusively based on temporal trend zones, whilst the others were solely conducted to analyze the aforementioned data. For the slum population, a random selection of slum households is made using a random table, similar to how people are randomly chosen for perception surveys on different facilities, government and non-government support, and satisfaction levels with municipal services.

In addition to that, the following parameter-wise methodology has been discussed regarding Safe Housing to minimize fire accidents, Affordable Housing to improve housing infrastructure, Access to Basic Education for the Underprivileged to promote inclusion, Access to Affordable and Free Health Services and sanitation Facilities, and Access to Transport, Communication, and Basic Services for Slum Dwellers.

- *Access to basic education for the underprivileged to make them inclusive-*
Ensuring simple accessibility to all, especially the disadvantaged, is the primary

factor that significantly impacts the work's effectiveness in improving literacy rates. The specific sub-parameters related to this aspect are outlined in Table 1.2. Initially, a buffer zone map was generated to facilitate the identification of the educational facility near the selected slum area. Two issues have emerged in this situation: a) certain institutes are located at a specific distance from that particular area, and b) the cost is too high for the residents, as these initiatives are not funded by the government. Therefore, a comparative index has been created to assess the improvement in educational accessibility in each slum and to plan for future enhancements. Several NGOs and club associations have collected information regarding the upgrade. Likewise, the literacy map of the slums in Kolkata the Choropleth map, based on data from 2016, displays information about slums and education. Various cartographic techniques, such as pie charts, bar graphs, pyramids, and cylinders, have been employed to analyze literacy rates, the division of literacy between males and females, and literacy participation based on different categories. Efforts have been made to decrease dropout rates by analyzing new data and trends for the next decade. Additionally, the vocational training center in Kolkata has been mapped on a separate KMC Map using data from the Department of Technical Education Training and Skill Development Government of West Bengal. The percentage of vocational training among the total population has also been analyzed. A composite education indicator has been developed by incorporating literacy, vocational training, and dropout rates. Furthermore, a comparative analysis has been conducted among different slums.

Table 1.2: Parameter for ensuring access to fundamental education for residents of impoverished slums

<i>Parameters</i>	<i>Description</i>
Literacy Rate	Percentage and index values will be computed.
Vocational Training	The search is focused on calculating percentages, evaluating potential, and assessing the applicability of infrastructural advances.
Dropouts	The dropout rate can be determined as a percentage, and the reasons for the dropouts can be investigated.
Distance of primary and secondary from the slum area and comparative relation	The analysis has been conducted on a buffer zoning map and an assessment of its effectiveness has been generated.
Status of literacy	A comparison has been made between literate and illiterate individuals based on their proportion of qualifying status.

- *Affordable Housing in terms of Housing Infrastructure* - The second crucial criterion for achieving affordable and healthy housing is the relocation of housing from the unsanitary city center to the surrounding urban areas or within the central city itself. This allows residents to have access to necessary amenities while also improving their living conditions. The specific sub-criteria for this objective have been outlined in Table number -1.3 and 1.4, starting with the improvement of infrastructure in slum households. Subsequently, the Abashan Yojana underwent evaluation with the support of PMAY and the State Government, utilizing the location quotient method to analyze various boroughs/wards of Kolkata (KMC).

Table 1.3: Parameter for affordable housing in terms of housing infrastructure

<i>Parameters</i>	<i>Description</i>
Site suitability Planning	An inclusive model for planning slums could be developed through the process of relocating and rehabilitating the residents.
Government Policy	An assessment is conducted to evaluate the extent to which the past and current governmental policy has been implemented, and the findings are summarized with appropriate validation.
Ideal Planning	An exemplary planning framework for inclusive slums.
Crowding Index	The Crowding Index is a quantitative metric employed in social sciences, specifically in urban planning, to evaluate the degree of overcrowding or density within a residential area.
Typology of Building	A Typology of Buildings is a system used to categorize distinct structures based on their qualities, functions, architectural styles, or purposes.

Table 1.4: Parameter for water accessibility in terms of housing infrastructure

<i>Parameters</i>	<i>Description</i>
Water Quality Class	Assessments will be developed based on the division into 4 classes.
Water accessibility	A comparative buffer zone map has been created to determine the water sources and the corresponding impact areas.
Duration of water	The duration and time of water availability will be documented to track the water consumption of the residents of slums.

- *Access to affordable and free health services and sanitation facilities* - The third most important parameter of the work is determined by analyzing various sub-parameters (Table 1.5 and 1.6). To assess this parameter, the buffer map location of hospitals and health centers was plotted to determine the current accessibility. A composite index was then created, considering factors such as the prevalence rate of chronic diseases, frequency of general diseases, percentage of underweight children at birth, maternal age at first delivery, medical expenses per household,

and the health condition of the dwellers. Comparative analysis was conducted using the ranking method. The subsequent health policies at the state and national level for the underprivileged population of Kolkata were examined, and an assessment was made on the extent of their effectiveness. At last, a risk zone assessment map of Kolkata has been created using data on slum facilities. The ranking weight stress score tool has been used to demonstrate the stress levels in each borough. Finally, the SWOT analysis and prospects for the affordability of hospitals and health services have been examined using the pie, bar, and Choropleth techniques.

The government has determined the density of government-sponsored service latrines and sanitary latrines for sanitation facilities using slum data, categorized by borough and selected slums. Additionally, the density of drains and the frequency of garbage cleaning have been displayed through borough-wise zonation density maps and cartographic diagrams.

Table 1.5: Parameter for access to affordable and free health service

<i>Parameters</i>	<i>Description</i>
Prevalence Rate	The discussion will focus on the calculation of health indicators in terms of percentages, as well as the comparison and evaluation of health infrastructure.
Frequency of General Diseases	The structure will be divided into four sections and a class rank will be established.
Underweight children at birth	The reason and the technique of mitigation will be addressed in terms of percentage calculation.
Maternal Age	A demographic group will be formed based on age, and a study will be conducted to compare the mortality rate of women based on maternal age. Additionally, the study will examine the effects on the birth weight of underweight infants.
Medical Expenses	The expenses have been allocated into different zones and a comparative analysis will be conducted.
Distance of health facilities from the selected slum	A buffer zone map has been created to illustrate the impact of increasing distance on slum dwellers.

Table 1.6: Parameter for access to affordable and free sanitation facilities

<i>Parameters</i>	<i>Description</i>
Garbage Clearance	Students will be classified into distinct classes, and the ultimate weighting will be allocated according to these classifications.
Presence of Toilet facilities	GPS technology has been employed to accurately track the locations of public restrooms and standard latrines. This novel technique seeks to advance the concept of sanitation.
Condition of drainage	An inspection has been conducted to assess the cleanliness of the facilities and the state of the drainage system.

- *Access to Economic Activities* - The ability of slum residents to participate in economic activities is frequently hindered by a range of socio-economic problems and scarce resources, which adversely affect their means of making a living. The absence of formal employment prospects, insufficient infrastructure, and limited availability of essential services impede economic progress in these marginalized communities. A significant number of residents in slums are involved in informal or precarious occupations within their immediate vicinity as a result of limited access to formal employment prospects, resulting in low levels of income and insecure means of subsistence. Furthermore, insufficient transit infrastructure and restricted entry to marketplaces or commercial hubs further hinder the citizens' capacity to engage in wider economic endeavors. Efforts to improve economic opportunities in slums typically involve initiatives focused on enhancing access to skills training, microfinance, entrepreneurship programs, and infrastructural development. These initiatives aim to empower residents and establish avenues for economic inclusion and sustainable livelihoods in these marginalized urban areas.

Table 1.7: Parameter for access to economic activities

<i>Parameters</i>	<i>Description</i>
Income Level	The average income of those living in slums has been calculated.
No. of Earning Members/Household	A calculation has been made to determine the ratio of individuals who earn income inside each home.
No. of Dependents/Household	A calculation has been made to determine the ratio of dependent individuals per home.
BPL (percent)	According to official government registration, the number of individuals living below the poverty line has been computed.

- *Access to Transportation and Communication*- Enhancing the accessibility of transport, communication, and essential services for disadvantaged residents of slums Transportation, communication, and basic services are the primary determinants. a) The categorization and dimensions of roadways in the slum area, including their proximity to the nearest paved main roads; b) The presence or absence of connectivity in the slum area to modern communication mediums such as newspapers, telephones, televisions, radios, or any other means of communication; c) The water service situation, including the quality, quantity of wells, pipes, and other water sources within or outside the premises, as well as the duration of water availability. The four criteria were broken into smaller categories, and a combined index was developed for the specific slum area and the entire Kolkata slum region, using a weighted index to build a density map based on

different zones within the borough. Exploration of new transport, communication, and basic services plans has finally been undertaken with promising prospects.

- *Safe Housing regarding reducing Fire Accidents-* This is one of the earliest. When determining work parameters, five variables are taken into account: proximity to a water supply, presence of emergency exits, average distance to the nearest fire brigade, inability to access roads during a fire, and condition of electrical wiring. The data for these parameters was obtained from the Bustee unnayan department at KMC. The data was then organized into groups and the sub-parameters were described in a table. Choropleth zonation maps were created for each entity.

Subsequently, by utilizing these five parameters, a combined fire index map and a combined housing infrastructure map were generated, followed by the development of a ranking algorithm, ultimately leading to the creation of the fire vulnerability map. The data presented is derived from the 2016 KMC data, as defined in the database. GIS mapping technologies were employed to thoroughly map and visualize the source zone of fire in the chosen slum, along with five fire factors including distance and accessibility from the selected location. Ultimately, a SWOC study was conducted to evaluate the impact value and potential issues of the slum.

Table 1.8: Parameter Table for Safe Housing in Terms of Reducing Fire Accidents

<i>Parameters</i>	<i>Description</i>
Fire Hazard Controlling parameters	The proximity to the water, the availability of an emergency exit, the distance from the nearest fire brigade, the lack of accessibility to roads during a fire hazard, and the condition of electricity have all been considered in the preparation of a vulnerability index.
Composite Index of Living conditions	The three issues to be examined are living conditions, types of roofs, and types of houses.
Distance Between Two House	A comprehensive urban mapping project has been devised to accurately depict the locations and boundaries of slum areas.
Various mitigation aspects	Multiple weighted indices will be created.

The methodology of the thesis is outlined chapter by chapter, accompanied by a flowchart to enhance understanding and clarity.

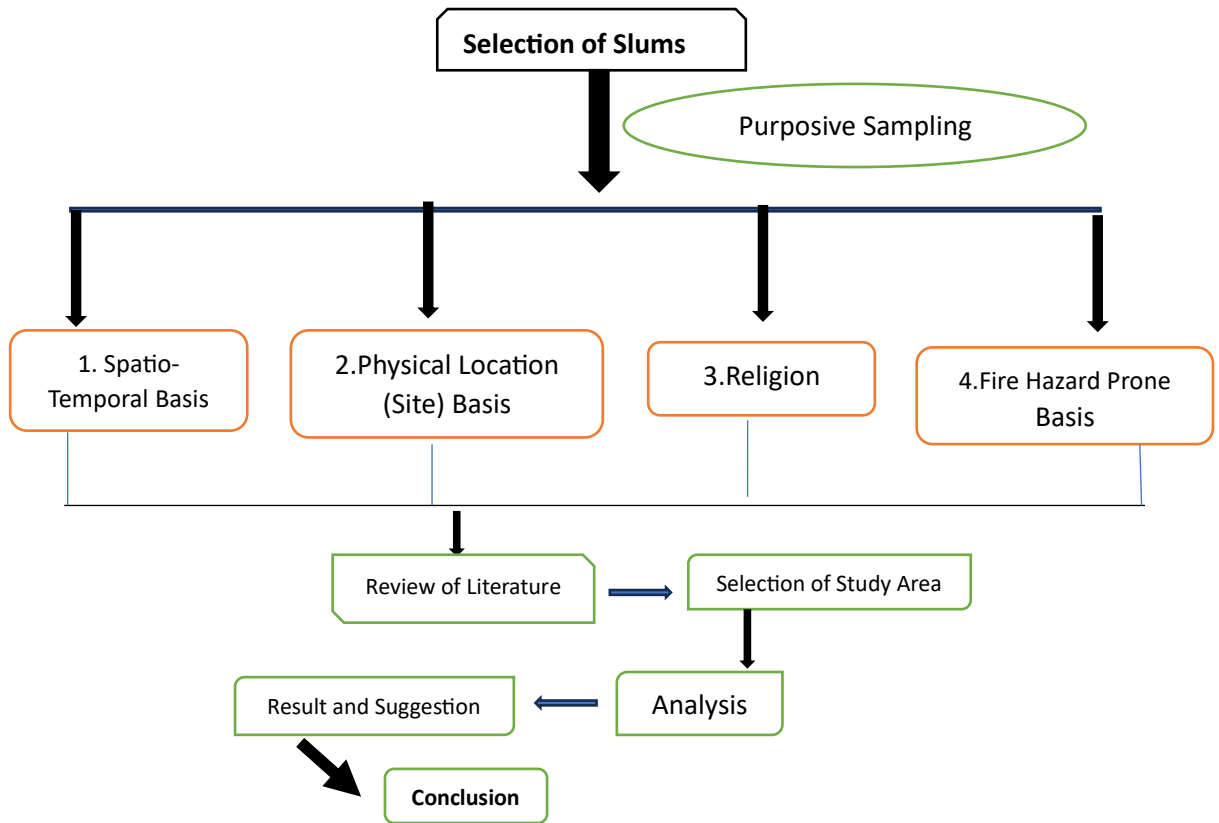


Figure 1.3: Methodological Flow Chart of the Entire Thesis

Source- Prepared by Researcher

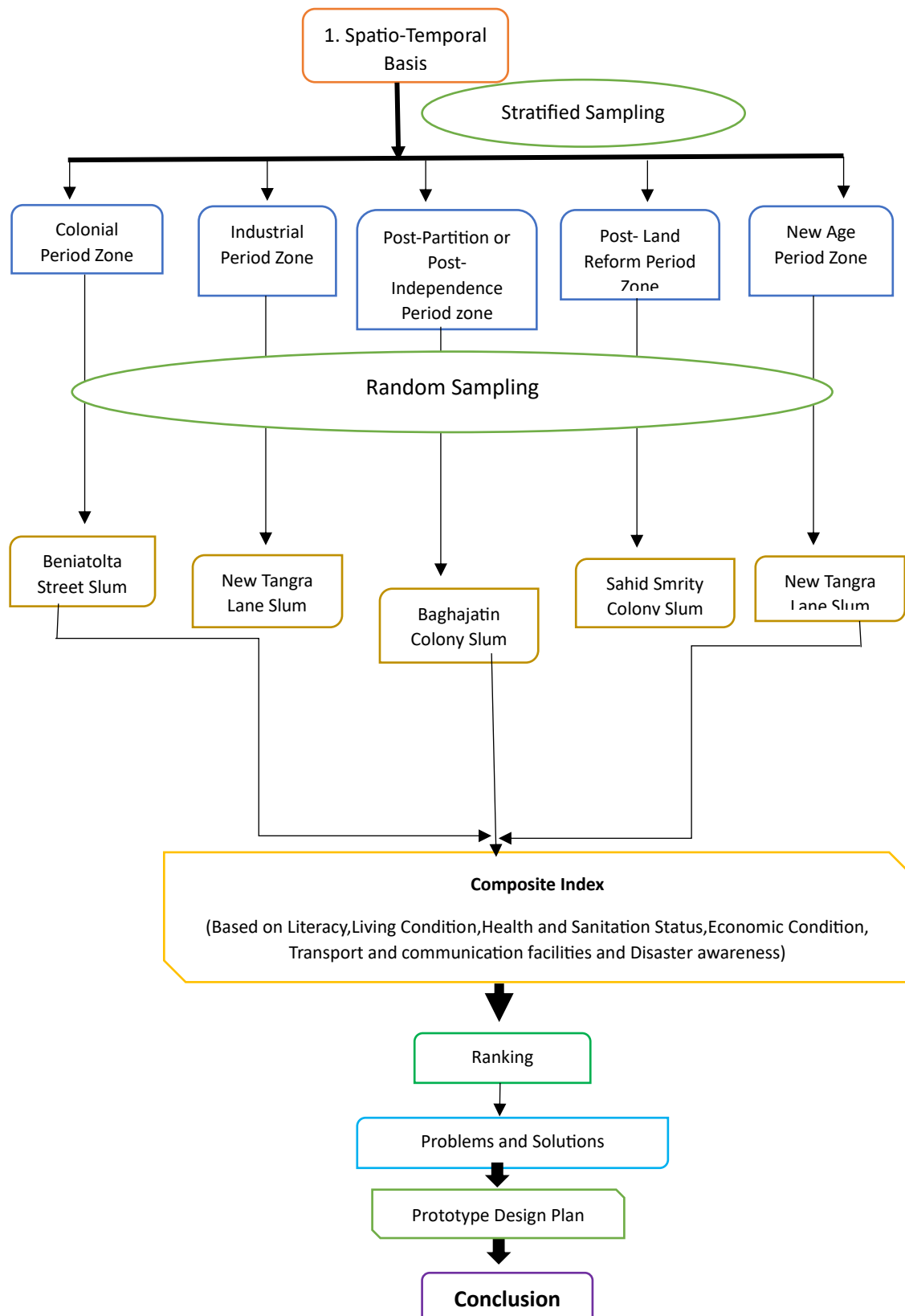


Figure 1.4: Methodological Flow Chart for Chapter IV

Source- Prepared by Researcher

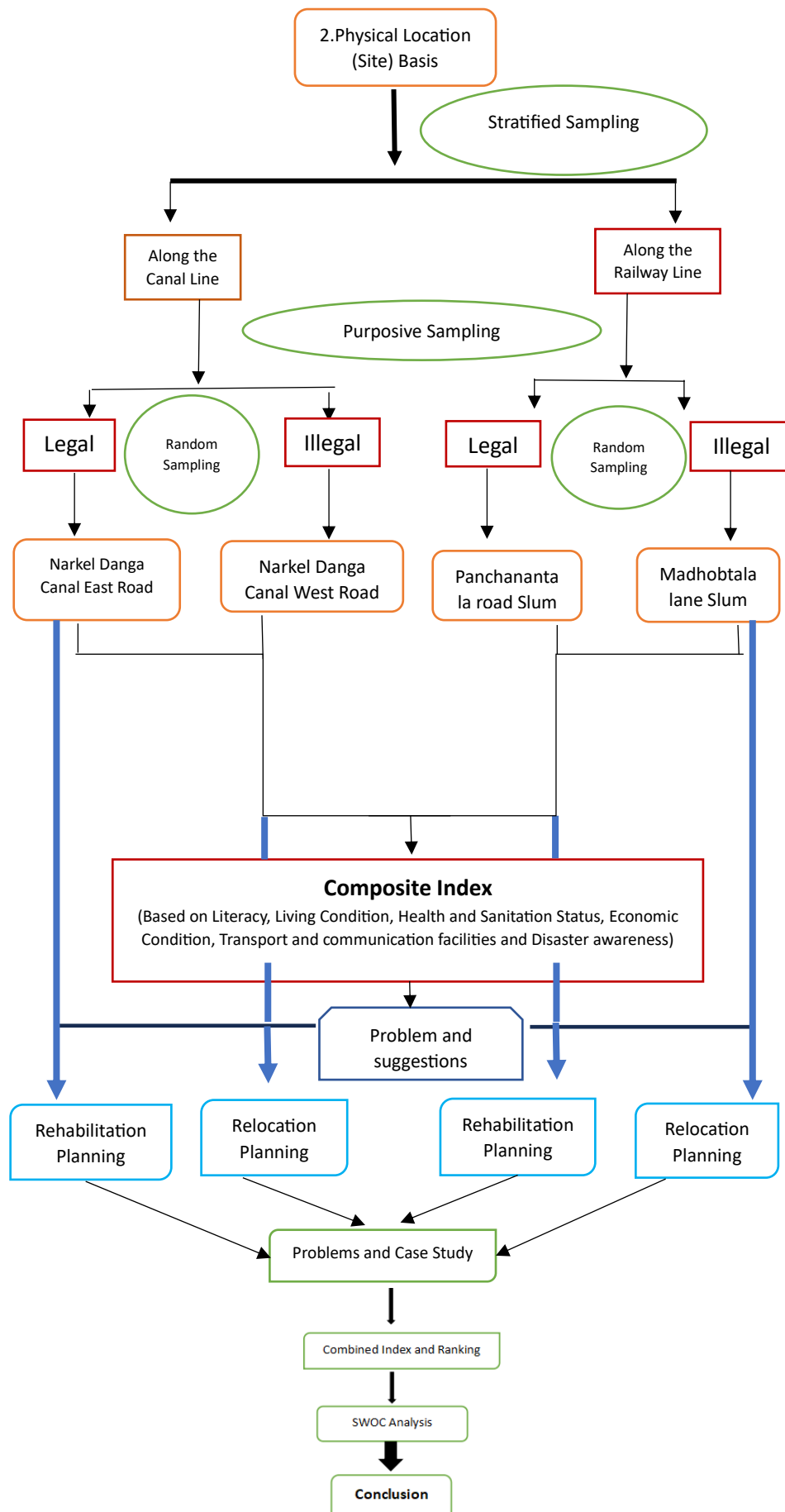


Figure 1.5: Methodological Flow Chart of Chapter V

Source- Prepared by Researcher

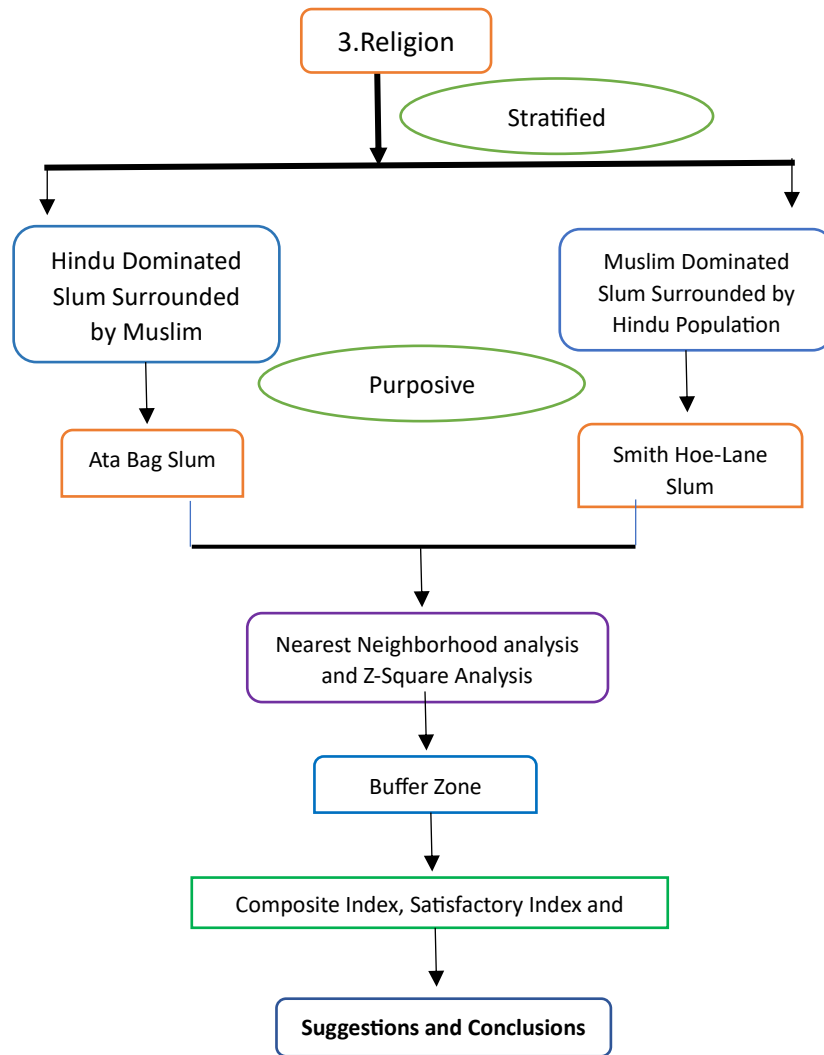


Figure 1.6: Methodological Flow Chart of Chapter VI

Source- Prepared by Researcher

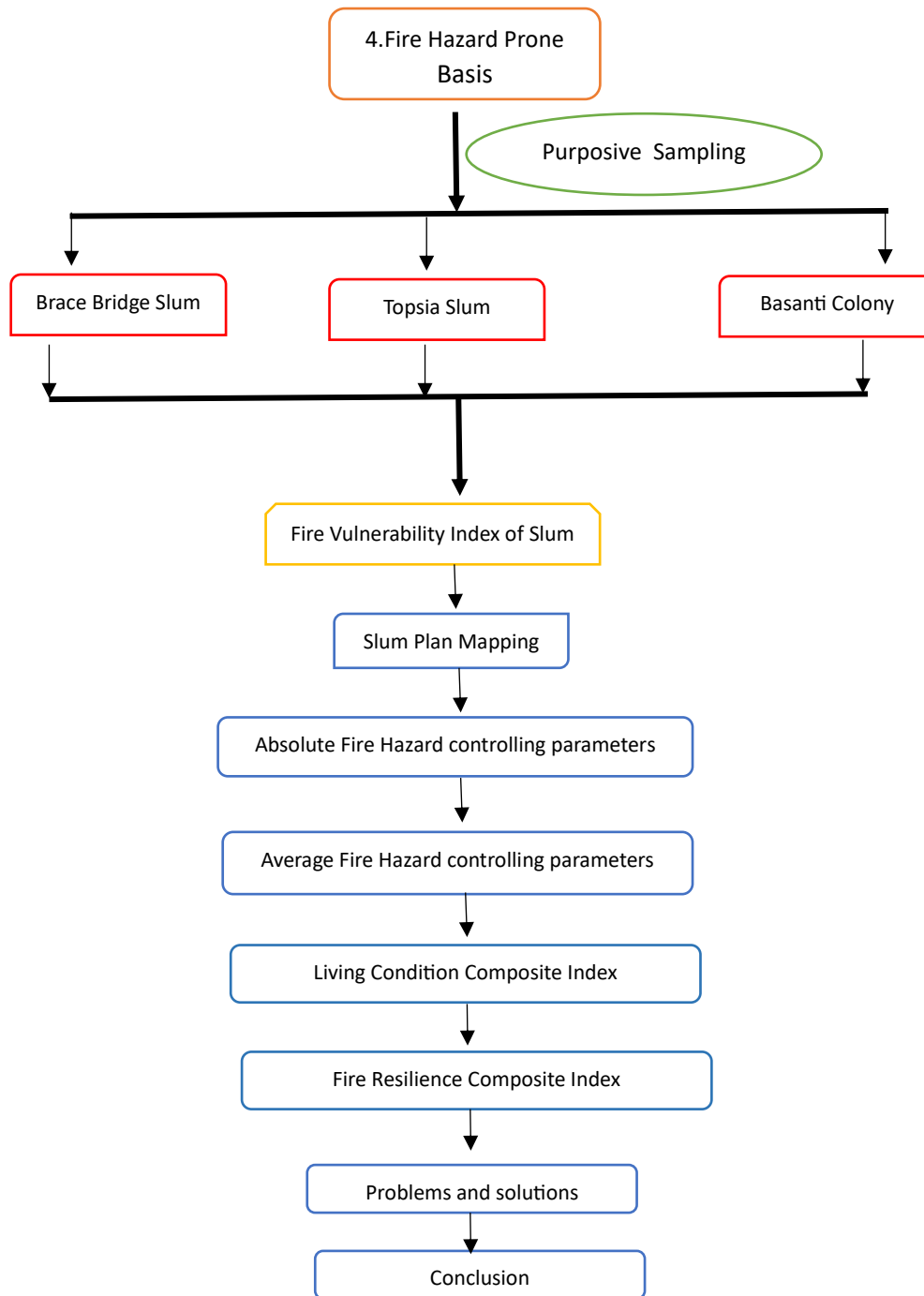


Figure 1.7: Methodological Flow Chart of Chapter- VII

Source- Prepared by Researcher

1.8 Sources of Data and Tools

Data sources are categorized as *primary data*, which is obtained from many sources listed below.

- A GPS survey was carried out using the GARMIN GPS map 76CSx to record every single location of the slum, educational institute (primary school, secondary school), hospital, health centers, fire stations, local sources of emergency services, and any other important identical spaces of land use and land cover features, green spaces, water bodies, cleaning centers, and so on.
- Field verification, also known as ground truth, has been conducted in every ward of each slum to determine the structure of land use and land cover.
- A questionnaire study was conducted to collect socioeconomic data and people's impressions of basic amenities such as water supply, security, sanitation, education, and health facilities in different slums. The survey used sampling and interviews. In addition to the home survey, schools, hospitals, and health centers are also assessed, however solely in terms of quantity without considering the quality.
- A micro-level focused group discussion was carried out to perform a more in-depth analysis.
- A measuring tape has been utilized to determine the different distances between things in and around impoverished areas.

Data sources are categorized as Secondary data, which is obtained from many sources discussed below.

In addition, the researcher obtained official data on slums from 2021 and maps of Kolkata from various sources, including the Kolkata Municipal Corporation Bustee Unnayan department, the Ward office of the selected slum in the chosen area, the Borough office of the selected slum in the chosen area, the State Urban Development Agency (SUDA), the Kolkata Metropolitan Development Authority (KMDA), and the Department of Technical Education Training and Skill Development of the Government of West Bengal.

The research on a slum in the present-day condition is based on data from 2021 until now. The city of Kolkata has undergone significant changes over time, particularly in terms of its approach to inclusivity and sustainability. The purpose of this study is to compare different slum areas and ensure that they are provided with a comprehensive and sustainable quality of life. This includes addressing various goals such as water supply,

education, health, and more, within the evolving framework and definition of the Kolkata Municipal Corporation (KMC) areas. Heterogeneous data has been utilized to categorize information by dividing it into several parameters and completing each parameter with its respective sub-divisions.

1.9 Sample Design

Sample design is a pre-established approach for selecting individuals to represent a broader group. The technique refers to the specific approach that a researcher would employ to choose a sample. The procedure for establishing the sample size, or the quantity of components to be selected from the population, is derived logically from the sample design process. Therefore, the sample design is predetermined before the collection of data. The researcher must carefully choose sample design strategies from the available options that will produce valid and valuable data for their investigation.

The word "sample size" refers to the quantity of objects that will be selected at random from the complete population. Optimal size is finding the perfect balance between being excessively large or excessively small. Ensuring the efficiency, representativeness, reliability, and versatility of a sample is crucial. When establishing the size of a research sample, it is crucial to consider the significant aspects of the study. A sample size ranging from 5-20% of the population in each slum has been selected to accommodate time limitations. The presence of a variation in sample sizes is due to the diverse populations in different slum areas. In the smaller slums with a low population, 20 % of the sample has been included. However, in slums with a population above 2500 people, only 15% of the sample size has been taken into account. Similar efforts have been made to include a larger portion of the individual slum population.

1.10 Data Processing and Analysis

After careful consideration, the aforementioned data was reduced to homogenous groups to get a meaningful association. All of the gathered data has been organized for further computation and analysis using appropriate statistical and GIS techniques.

The Municipal Database is used for slum data analysis and slum characteristics. The draft municipal development plan and civic status are the primary sources of fundamental information and statistics for these research regions. Statistical methods such as Principal Component Analysis (PCA), T-test-test, and so on are used as needed. Spatial maps of changing land use and land cover in Kolkata (KMC) are created; socioeconomic factors

are created using GIS techniques based on ward-wise slum data, main sample household survey, GPS tagging, and satellite imagery. These socioeconomic characteristics go through frequency distribution and multivariate analysis.

All slum data are divided into some socio-economic parameter tables, which are further subdivided into semi-parameters; based on this, a reference index has been prepared, in which both numerical and non-numerical classes are chosen to rank according to need; finally, a composite rank index has been prepared to compare all slum parameters together and conclude slum ranking as per development. For the fire hazard, ward-wise fire vulnerability metrics were collected across Kolkata (KMC), and Choropleth maps were created. Finally, using SPSS software with KMC fire hazard data (2016), a ranking order was created for Kolkata, and a Choropleth map was created. These are for quantitative and qualitative analysis. SWOT analysis has been performed. The scope of the research on quality of life, i.e., the fundamental standard of living and satisfaction with municipal services, is broad. Recent governmental efforts such as smart cities, inclusive city planning, and sustainability in all aspects are emphasized with critical analysis, and appropriate urban models applied to the study regions are recommended.

Remote sensing (RS) and Geographical Information Systems (GIS) have been used to examine the existence of vital facilities or services such as health care, educational institutions, water supplies, and sanitation services. Finally, a slum distribution map and recovery marking area have been prepared for the KMC area, and new planned rehabilitation areas have been shown for the KMDA areas, as well as a metropolitan city plan based on all of these problems and prospects to make the city inclusive in all dimensions, particularly economically and mentally, where slum people, middle-income group people, and higher income group people can stay fit.

1.11 Organization of the Chapters

In a thesis, a conceptual framework serves as a comprehensive plan, delineating the theoretical basis and organization on which research is constructed. It consists of a network of interrelated concepts, theories, and ideas that guide the design and analysis of the study. This framework offers a lucid comprehension of the study problem by establishing the context and precisely describing the important variables. It aids researchers in formulating their study by providing a clear plan for gathering, analyzing, and interpreting data. Incorporating established theories and concepts, influences the research technique,

facilitating the development of hypotheses and providing a systematic framework for addressing the research issues. The conceptual framework serves as a foundation for the investigation, connecting it to existing information and improving its logical consistency and credibility. Further in this text, the framework specifics are addressed chapter by chapter.

- *Chapter I:* The first part thoroughly explores the theoretical basis of the study, including important terms, the research problem, clearly stated research questions, overall study objectives, and the specific area of investigation. The considerations about the design of a study, which include the methods used to collect data, the complexities involved in selecting a sample, and the specification of research tools for gathering both quantitative and qualitative primary data, are crucial. This section provides more details on the intended data analysis techniques, statistical approaches, order of chapters, and a clear recognition of research limits and limitations, promoting a comprehensive comprehension of the study's structure and methodology.
- *Chapter II:* Chapter Two provides a review of the Literature on the Inclusive City Concept, exploring its various forms in global, national, and local research. This analysis examines the methods of incorporating squatter groups into society, emphasizing important socioeconomic issues such as ensuring safety from home fires, improving access to healthcare, ensuring affordability, and addressing the urgent requirement for universal, high-quality primary education. The discussion revolves around enabling affordable access to essential urban services, such as transit, communication, and healthcare, for people living in slums. Furthermore, it examines the chronological growth of the Kolkata Foundation and highlights the crucial importance of psychological acceptance in Slum Inclusion. A comparative study is conducted to examine inclusion based on factors such as location, religion, resident status, and the establishment of fire-resistant slum communities. This analysis contributes to the discussion on practices that promote inclusion.
- *Chapter III:* The third chapter, titled "*Evolution of Inclusive Slum Planning in Kolkata: A Historical Perspective*" provides a thorough examination of the socio-temporal expansion of Kolkata, documenting its development from the colonial era to the present day. This historical expedition explores the extensive history of Kolkata, tracing its evolution from a colonial center to the dynamic metropolis it

currently embodies. The chapter provides a thorough account of the distribution of slums in each of the 100 wards of the Kolkata Municipal Corporation (KMC) region in 1966. It offers insights into the spatial concentration and density of these settlements during that period. It compares this with a revised examination of the distribution and density of slums in each ward throughout the extended 144 wards in 2022, offering a detailed comprehension of the evolving urban environment and population characteristics. In addition, the chapter provides a critical assessment of several slum planning initiatives aimed at promoting inclusivity in Kolkata. This chapter provides a comprehensive view of the development of slum settlements, including their historical context, analysis of current data, and urban planning strategies. It examines the spatial distribution of these settlements, changes in population density over time, and the city's efforts to create a more inclusive urban environment.

- *Chapter IV:* The fourth chapter, titled "*Inclusivity among Slums Developed over Different Periods in Kolkata Covering Five Zones*" provides a detailed analysis that focuses on evaluating slum communities based on their facilities. This analysis utilizes a complex rating system. This entails a comprehensive evaluation of educational amenities, housing circumstances, health and sanitation provisions, economic prospects, transportation, and communication infrastructure, as well as disaster readiness measures, resulting in the creation of a composite index. In addition, the chapter thoroughly examines the process of mapping buffer zones, including a detailed analysis of the geographical arrangement and demarcation of these regions of the slum communities. A rating index is created by using a composite assessment, which allows for a systematic comparison of various slum neighborhoods. The chapter explores the obstacles that hinder inclusivity inside these settlements, going beyond simple assessment and uncovering the intrinsic problems. Furthermore, it proposes planning strategies that are specifically customized to improve inclusion in wards occupied by slums. This chapter combines various evaluation methodologies to determine the boundaries of buffer zones, identify challenges, and develop strategic plans. It not only provides a detailed overview of the amenities in slums but also offers a roadmap for addressing their limitations and promoting inclusiveness in these urban areas.

- *Chapter V:* The fifth chapter, titled "*Physical Location (Site) as Basis for Inclusion of Slums*" presents a thorough examination that utilizes a methodical ranking system to evaluate slum communities. This evaluation is based on the presence of essential amenities such as educational facilities, housing conditions, health and sanitation services, economic opportunities, transportation, communication infrastructure, and disaster preparedness. This chapter provides detailed and precise plans for rehabilitating and relocating different slum clusters. It specifically focuses on cases such as the Panchanan Tala Road Slum in Dhakuria, which is a registered slum located along the railway line, and the Narkel Danga Canal East Road Slum, another registered slum situated along the canal line. In addition, it provides relocation plans for informal settlements such as Madhobtala Bustee in Dhakuria and Narkel Danga Canal West Road Bustee, taking into account their specific positions adjacent to railway and canal routes. In addition, the chapter utilizes a Strengths, Weaknesses, Opportunities, and Challenges (SWOC) analysis to gain a thorough comprehension of the conditions in these slums and present strategic suggestions for enhancement. This chapter provides a strategic guide for inclusive urban planning in diverse slum locations. It integrates rankings, specific case studies, relocation and rehabilitation plans, and a thorough SWOC analysis. The aim is to pave the way for holistic and sustainable improvements within these communities.
- *Chapter VI:* The sixth chapter, titled "*Religion as a Basis for Inclusiveness in the Slums*" conducts a thorough analysis that specifically examines the religious factors that impact the level of inclusivity in slum communities. The buffer zoning maps for Ata Bag Slum, located in Borough No-15, Ward No-134, are provided. The slum is situated in an area largely inhabited by Muslims. The chapter provides an in-depth examination of Nearest Neighborhood Analysis and Z-Square Analysis, specifically comparing Ata Bag Slum with nearby Hindu and bi-religion slums. It examines Smith Hoe Lane, a Muslim slum located in Borough No-6, Ward No-53, which is surrounded by a Hindu population. This examination includes a detailed analysis of the adjacent neighborhoods and a comparison of the Hindu and Muslim slums in the vicinity using adjacent Neighborhood Analysis and Z-Square Analysis. In addition, the chapter assesses the lack of access to infrastructure and analyses the satisfaction index and composite satisfied index,

offering a detailed depiction of the living circumstances in these slums. The text identifies current issues and provides strategic recommendations to improve diversity, manage religious dynamics, and resolve infrastructure limitations. This chapter provides a comprehensive approach to understanding and addressing the issues of religiously inspired inclusivity in diverse slum communities. It combines various mapping approaches, comparative studies, satisfaction measures, and problem-solving tactics to serve as a crucial tool for improvement.

- *Chapter VII:* In the seventh chapter, titled "*Fire Hazard Proneness as Basis of Inclusion of Slums*" a thorough investigation is conducted by interconnecting the historical context of slums and studies on resilience design about the hazards of fire. This study conducts a thorough analysis of the fire risk and vulnerability in Kolkata, with a specific emphasis on strategies used in slum communities. The Kolkata Municipal Corporation monitors and evaluates several parameters in this assessment, including the proximity to water supplies, the presence of emergency exits, the distance from fire brigade stations, and the road accessibility during fire danger. In addition, the chapter computes the Vulnerability Index of Slums and aims to map areas inside slums that are fireproof, by considering both absolute and average criteria for controlling fire hazards. In addition, it creates indexes such as the Living Condition Composite Index and Fire Resilience Composite Index, which offer a comprehensive perspective on the resilience of slums in the face of fire disasters. The chapter ends with comprehensive strategies and a SWOC analysis designed to enhance readiness and resilience in these susceptible communities. This chapter provides a comprehensive analysis of fire risks, mapping, formulation of indices, and strategic actions. It serves as a reliable guide for improving fire hazard resistance and promoting inclusive urban planning in slum communities.
- *Chapter VIII:* The eighth chapter, titled "*Economic Resilience of Slums during COVID-19*" conducts a thorough examination to comprehend the various factors that influenced the economic resilience of slum populations during the difficult circumstances of the COVID-19 pandemic. The report provides a comprehensive analysis of the specific conditions and difficulties encountered by the slums in Kolkata during the beginning of the pandemic in February 2020. The chapter thereafter narrows its focus to a single case study centered around Adhikary Para

Colony Bustee. The objective is to analyze the economic dynamics, vulnerabilities, coping mechanisms, and resilience methods employed by this particular slum community in response to the unprecedented catastrophe. The economic resilience of these settlements is assessed by examining many factors such as economic activities, resource accessibility, government assistance, social networks, and community efforts. This chapter offers valuable insights into the economic resilience, challenges, and adaptive strategies employed by marginalized communities in Kolkata's slums during the pandemic. Examining a specific case within the broader context provides a nuanced understanding crucial for future policy interventions and support mechanisms in similar global crises.

- *Chapter IX:* The ninth chapter, titled "*Findings and Suggestions*" presents a thorough analysis of research findings regarding the integration of slums in Kolkata. The text examines and combines research results from different aspects, including spatial-temporal factors, religious impacts, susceptibility to fire hazards, and economic adaptability in times of crises such as COVID-19. This section presents essential insights, demonstrating effective strategies and emphasizing areas that require quick attention. The text provides practical recommendations, with a focus on improving infrastructure, promoting social fairness, empowering the economy, building resilience to hazards, and implementing community-led initiatives. This chapter provides practical suggestions, serving as a guide for policymakers and urban planners to promote more inclusive and sustainable development of slums in Kolkata.
- *Chapter X:* The tenth chapter, titled "*Conclusion*" summarizes the core findings of the comprehensive research, consolidating key insights obtained throughout the study. This statement emphasizes the importance of including inclusive urban design to tackle the complex issues present in the slum settlements of Kolkata. The conclusion highlights the importance of comprehensive solutions and emphasizes the necessity for cooperation among stakeholders, policymakers, and communities. The text emphasizes the importance of specific actions to address several aspects of inclusion, such as spatial dynamics, socio-economic inequality, and disaster resilience. In essence, the chapter emphasizes the need for sustainable and people-centered strategies to promote a fair and inclusive urban environment in the slums

of Kolkata. This would lead to significant improvements in living conditions and bring about transformative change.

1.12 Limitation of the Study

The research on "Inclusive Slum Planning in Kolkata" offers a thorough examination of several aspects related to urban inclusion. However, it has certain limitations that are inherent in the research scope and methods. Firstly, the study's applicability to a wider population may be limited because it specifically focuses on the slum environments in Kolkata. The findings may not have generalizability to other cities or locations with unique socio-economic, cultural, and geographical characteristics. Furthermore, the theory heavily depends on secondary data sources and may lack the profoundness and intricacy that primary data collection methods could offer. This constraint could have an adverse influence on the nuanced comprehension of local viewpoints and the intricate details at the grassroots level, which are essential for successful planning. Furthermore, the research may fail to consider the ever-changing characteristics of slum communities and their increasing requirements, due to the dynamic nature of urban environments. The study's chronological scope may have limitations, especially regarding the swift transformations happening in metropolitan settings, which could make certain conclusions obsolete. Moreover, limitations in obtaining extensive data, particularly about certain sensitive factors such as religious dynamics or informal economic activity in slums, could restrict the thesis's level of detail and precision. Finally, the thesis provides suggestions, but the practicality and flexibility of implementing them in the intricate administrative and political systems of urban administration may present unaddressed issues within the research's scope. These limitations highlight the necessity for future studies to utilise a broader range of research methods, incorporate the collection of original data, adopt longitudinal approaches, and take into account various urban contexts. This will improve the comprehensiveness and practicality of inclusive slum planning strategies, extending their applicability beyond Kolkata.

References:

- Adams, R. (2019). *Inclusive Environments: Strategies for Diversity and Equality*. Publisher.
- Brown, A. (2017). The Value of Inclusion: Acknowledging Equal Status. *Journal of Social Equality*, 14(3), 112-130.
- Census of India 2011 - West Bengal - Series 20 - Part XII B - District Census Handbook, Kolkata, Reference ID DH_2011_1916_PART_B_DCHB_KOLKATA, Producer(s)- Directorate of Census Operations, West Bengal. CREATED ON- Oct 19, 2022
- Census of India 2011 - West Bengal - Series 20 - Part XII B - District Census Handbook, Kolkata, Reference ID DH_2011_1916_PART_B_DCHB_KOLKATA, Producer(s)- Directorate of Census Operations, West Bengal. CREATED ON- Oct 19, 2022
- Chen, S. (2016). *Understanding Professional Inclusion**. Social Work Press.
- Davis, K., & White, B. (2020). *Diversity Activities: Enhancing Pleasure and Inclusiveness*. Academic Publications.
- Dhyani, S., Lahoti, S., Khare, S., Pujari, P., & Verma, P. (2018). Ecosystem-based Disaster Risk Reduction approaches (EbDRR) as a prerequisite for the inclusive urban transformation of Nagpur City, India. *International journal of disaster risk reduction*, 32, 95-105. <https://doi.org/10.1016/j.ijdrr.2018.01.018>
- Dhyani, S., Lahoti, S., Khare, S., Pujari, P., & Verma, P. (2018). Ecosystem-based Disaster Risk Reduction approaches (EbDRR) as a prerequisite for the inclusive urban transformation of Nagpur City, India. *International journal of disaster risk reduction*, 32, 95-105. <https://doi.org/10.1016/j.ijdrr.2018.01.018>
- Garcia, M. (2021). Cultural Backgrounds and Inclusion. *Cultural Studies Journal*, 28(2), 45-58.
- Ghose A.2007, *Communication System in Colonial Calcutta (1690-1857)* ISBN 81-875000-34-4 (HB),abc Publication, first published in India, by Ajoy Bhattacharya, acb publications, P757, Block-A, Lake Town, Kolkata 700 089, Phone: 2521 5643 E-mail: acb20@rediffmail.com
- Ghose A.2007, *Communication System in Colonial Calcutta (1690-1857)* ISBN 81-875000-34-4 (HB),abc Publication, first published in India, by Ajoy Bhattacharya, acb publications, P757, Block-A, Lake Town, Kolkata 700 089, Phone: 2521 5643 E-mail: acb20@rediffmail.com

- Gomez, P. (2020). *Equality Beyond Heritage: Equitable Prospects for Success*. Equality Publishing.
- India Today, August 24, 2018, 14:14 India today. [in/education-today/gk-current-affairs/story/when-Kolkata-began-as-Calcutta-the-history-of-the-first-capital-of-British-India-1322194-2018-08-24](https://www.indiatoday.in/education-today/gk-current-affairs/story/when-Kolkata-began-as-Calcutta-the-history-of-the-first-capital-of-British-India-1322194-2018-08-24).
- India Today, August 24, 2018, 14:14 [India today. in/education-today/gk-current-affairs/story/when-Kolkata-began-as-Calcutta-the-history-of-the-first-capital-of-British-India-1322194-2018-08-24](https://www.indiatoday.in/education-today/gk-current-affairs/story/when-Kolkata-began-as-Calcutta-the-history-of-the-first-capital-of-British-India-1322194-2018-08-24).
- Johnson, L., et al. (2019). Ensuring Fair Treatment: Inclusiveness in Society. *Social Dynamics*, 25(4), 321-335.
- Jones, E., & Lee, T. (2020). *Recognizing Diversity: Essential for Inclusivity*. Inclusion Press.
- KMC Official Website 2018, <https://www.kmcgov.in/KMCPortal/jsp/KMCPortalHome1.jsp>
- KMC Official Website 2018, <https://www.kmcgov.in/KMCPortal/jsp/KMCPortalHome1.jsp>
- KMC Portal Basic Statistics (2018c): www.kmcgov.in/KMCPortal/jsp/BasicStatistics.jsp Kolkata Municipal Corporation (2011a): Slum Fire Hazard Parameters and Civic Status, Kolkata: Slum Department, KMC.
- KMC Portal Basic Statistics (2018c): www.kmcgov.in/KMCPortal/jsp/BasicStatistics.jsp Kolkata Municipal Corporation (2011a): Slum Fire Hazard Parameters and Civic Status, Kolkata: Slum Department, KMC.
- Kolkata Municipal Corporation (2018b): Ward Office Data Collection Centre KMC, Kolkata: Slum Department.
- Kolkata Municipal Corporation (2018b): Ward Office Data Collection Centre KMC, Kolkata: Slum Department.
- Kundu, N., & Chakraborty, A. (2017). Dependence on ecosystem goods and services: a case study on East Kolkata Wetlands, West Bengal, India. *Wetland science: perspectives from South Asia*, 381-405. Online ISBN 978-81-322-3715-0, Print ISBN-978-81-322-3713-6, https://doi.org/10.1007/978-81-322-3715-0_20
- Kundu, N., & Chakraborty, A. (2017). Dependence on ecosystem goods and services: a case study on East Kolkata Wetlands, West Bengal, India. *Wetland science: perspectives from South Asia*, 381-405. Online ISBN 978-81-322-3715-0, Print ISBN-978-81-322-3713-6, https://doi.org/10.1007/978-81-322-3715-0_20

- Nguyen, H., et al. (2018). Enhancing Opportunities: Advancing Social Inclusion. *Social Progress Review*, 10(1), 78-92.
- Olsen, J. (2018). *Inclusive Dictionary Definitions*. Lexicon Publishers.
- Perez, R. (2017). Mitigating Exclusion in Communities. *Community Development Journal*, 35(6), 201-215.
- Robinson, P. (2016). Active Engagement in Inclusion Practices. *Inclusive Strategies Quarterly*, 7(2), 87-101.
- Smith, J. (2018). *Measures for Acceptance and Consideration*. Policy Press.
- Thompson, M., & Martinez, S. (2019). Utilizing Diversity for Inclusive Atmospheres. *Diversity Dynamics*, 12(3), 150-165.
- UNDP Annual Report 2022, <https://www.undp.org/publications/undp-annual-report-2022>
- Wang, Y., & Kim, S. (2021). Improving Social Engagement: A Continuous Endeavor. *Social Engagement Review*, 18(4), 240-255.
- Wilkins, Q. (2020). Outcomes of Inclusion: Understanding the State of Inclusiveness. *Inclusion Studies*, 22(1), 12-28.

Chapter 2: Review of Literature

A literature review analyses published works within a certain subject area sometimes limited to a given period. A literature review typically includes a structured presentation summarizing and synthesizing materials. A summary provides a concise outline of important information from the source, whereas a synthesis entails reorganizing or reshaping this content. It can give a new viewpoint on current material or combine novel interpretations with traditional ones. This chapter tracks the intellectual progress of the area, emphasizing important ideas. The literature review evaluates sources and suggests the most current or pertinent ones according to the situation.

Conducting a comprehensive evaluation of the existing literature is imperative to ascertain the research lacuna between the completed work related to this study and the outstanding research and determine the methodology and objectives. The identified gaps and resultant objectives serve as the fundamental avenues that the study will pursue.

2.1 The Literature Review has been done under the following sub topics:

2.1.1 Inclusive City Concept

2.1.2 International Studies on Inclusive Cities

2.1.3 National Research on Inclusive Cities

2.1.4 Micro and Empirical Research on Inclusive Studies

2.1.5 Inclusion in Slums

2.1.6 Social Factors of Inclusion: Concept and Studies

2.1.1 The Inclusive City Concept

The management of an inclusive city is a novel concept. The swift evolution of technology is inducing a unidimensional societal shift, wherein the affluent are amassing more wealth while the underprivileged are being further marginalized, resulting in exclusion. Inclusivity refers to the act of narrowing the socioeconomic divide by offering crucial resources that cater to the physical and emotional well-being of both affluent and underprivileged individuals. According to Tracada E. (2015), the incorporation of all residents in long-term planning and development is a crucial aspect of creating inclusive cities. Therefore, they must provide scholarly information to formulate strategies and evaluate planning efficacy by participating in dialogues and municipal governance. Inclusive cities are characterized by the provision of safe and affordable housing for a majority of low-income and lower-middle-class residents, along with access to essential services such as communication connectivity, proper water and power supply, education, and security measures for women, among other amenities. Housing affordability is a prevalent global concern as a significant proportion of the populace in numerous countries experiences unaffordable housing (Tsenkova & French, 2011). As per the World Bank (2016), financial inclusion denotes the provision of affordable and functional financial products and services, including but not limited to transactions, payments, savings, loans, and insurance, that cater to the requirements of individuals and businesses. The delivery of such services should be conducted responsibly and sustainably. The provision of transactional accounts facilitates the ability of individuals to engage in saving, transferring,

and receiving funds, thereby fostering the advancement of financial inclusivity. The "Universal Financial Access 2020 Programme" initiated by the World Bank Group endeavors to facilitate access to a "Transaction A/C" for global citizens, thereby enabling them to avail themselves of a wider range of financial resources.

2.1.2 International Studies on Inclusive Cities

Several international journals have been reviewed to develop cost-effective housing solutions in Kolkata and its surrounding areas. Several global nations and regions have addressed the issue and provided valuable recommendations. In his work titled "*The Inclusive City: Building a More Accessible Urban Environment Through Inclusive Design*," Hanson J. (2004) discusses the challenges faced by the UK's administration in providing convenient access to the city center, owing to inadequate management practices. The escalation in population has resulted in unsanitary living conditions, health complications, and food scarcity. The increasing costs and limited availability of land have resulted in a significant portion of the population being unable to attain adequate housing. The proposed plan for the United Kingdom aimed to provide extensive access to the city center from all dimensions of the city via roadways and railways, thereby rendering it both affordable and attainable for elderly individuals to reside within the country. In leading the "*Inclusive City: Place-Based Innovation for a Bounded Planet*," Hambleton R. (2014) devised a comprehensive urban plan with a focus on inclusivity. He utilized government initiatives and policies that were designed to benefit the public. The author emphasized the importance of the government prioritizing inclusion and sustainability to prevent the exploitation of a region's finite potential. The individual prioritized the enhancement of accessibility through the utilization of various transportation modes such as highways, trains, and other means to interconnect numerous locations and facilitate the ease of access to all areas. The greater the accessibility, the more evenly distributed the land value of different locations would be, as no particular area would exhibit high density or low occupancy. The project was partitioned into four distinct phases. The individual initially identified the problem at hand, followed by an analysis of the region's leadership, demographics, aspirations, educational attainment, and related factors. Subsequently, the individual considered relevant experiences before devising a comprehensive strategy that encompassed global and national perspectives on education. All four dimensions indicate that households and other entities are affordable. In "*Creating the Inclusive City*," Pineda V.S. (2020) introduced the notion of the new urban wave reform, which explores how an

urban area can modify its boundary limitations, collect data, and devise a novel model or blueprint that is both inclusive and up-to-date. The literary work in question pertained to issues related to human growth and maturation. Modifications in urbanization perspectives can be influenced by cross-sectional changes at the board level. His idea was motivated by the social exclusion disparities that exist between individuals of high and low socioeconomic status. The implementation of integrated urban design is expected to yield benefits for Saudi Arabia, the United Arab Emirates, and Dubai. The measure mitigated the problem of population density and improved the accessibility of middle-class families. Georgette J. et al. (2005) examined the topic of inclusive city planning and strategy in their work titled "*Social Innovation and Civil Society in Urban Governance: Strategies for an Inclusive City.*" The author observed that the attainment of economic growth necessitates robust commerce, communication, industry, and other related services. The presence of such amenities tends to draw a significant number of individuals, thereby contributing to an increase in population density and exacerbating the scarcity of food and housing within the city. However, there is a noticeable decrease in the population of migratory zones. An urban area that exhibits both pull and push factors is characterized by inequality. The development of inclusive cities is a crucial aspect of urban planning. It involves the implementation of policies and strategies that aim to ensure that all members of the community, regardless of their background or identity, have equal access to resources and opportunities. Inclusive cities prioritize the needs of marginalized groups, such as people with disabilities, low-income households, and ethnic minorities, and strive to create a sense of belonging and social cohesion among all residents. Achieving inclusive cities requires collaboration between government, civil society, and private sector actors, as well as a commitment to ongoing evaluation and adaptation of policies and practices. The publication titled "*Women's Safety and the Right to the City*" authored by Whitzman C. et al. in 2013 addresses the issue of safety for women in urban areas and their right to access and utilize public spaces without fear of harm or violence. The individual in question conducted professional activities across multiple continents, including Asia, Africa, Latin America, North America, and Europe. The speaker discussed the topic of women's rights. The author posits that facilitating economic assistance to underprivileged individuals or offering necessary amenities to foster inclusivity is crucial in promoting emotional and physical comfort among women. The book is divided into two sections, which address the issues of women's underdevelopment and their ability to overcome challenges. The individual offered a critique of the social retrogression and disposition of the location,

followed by a series of proposed solutions and forthcoming endeavors. She contemplated the concept of female empowerment. Anttiroiko A.V. et al. (2020) present a framework for an inclusive city in their work titled "*The Inclusive City: The Philosophy and Practice of Building Shared Urban Prosperity*." The author argues that social and economic marginalization leads to significant psychological harm for a considerable number of individuals. The implementation of inclusion could potentially provide a solution to this issue. The individual in question accorded precedence to governmental policies and initiatives, as he posits that individuals are deficient in the requisite skills and financial resources to independently modify technology. According to the speaker, it is necessary to transition from a focus on citizens' rights to a focus on value creation, which involves establishing a partnership with urban economic development. This approach has the potential to facilitate ideation, enhance resource allocation, and broaden opportunities. According to Espino N.A. (2015), the deficiency of social inclusion in modern urban structures is causing a shift in the approach to city design. In the publication "*Building the Inclusive City: Theory and Practice for Tackling Urban*," the author argues that this phenomenon is having a significant impact on the paradigm of city design. Banana E. et al. (2015) presented a novel perspective on sustainability and inclusion in their work titled "*Co-producing inclusive city-wide sanitation strategies: lessons from Chinhoyi, Zimbabwe*." The individuals conducted their work in various locations including Chinhoyi in Zimbabwe, Kitwe in Zambia, Blantyre in Malawi, and Dar es Salaam in Tanzania. The community in Chinhoyi, Zimbabwe, made significant efforts to implement positive modifications in society, to promote growth and achieve complete sanitation and hygiene in the disadvantaged city. The government also assisted Roy A.'s (2013) publication titled "*Slum-free Cities of the Asian Century: Postcolonial Governance and Fair Development*" which provides an in-depth analysis of the concept of a slum-free city. The author delineated Asian nations, with a particular focus on Mumbai, where a distinct economic divide exists between the affluent region and the Dharavi slum, the latter of which perpetually hinders the progress of the former. This urban center exhibits a marked disparity between the privileged and underprivileged, with the former enjoying a plethora of amenities while the latter struggle to make ends meet. According to the author, technology has the potential to promote inclusivity in certain nations, but governments and researchers need to establish clear guidelines for managing this technology. In their study, Siltanen et al. (2015) proposed various options for cities with a predominantly female population. The proposed endeavor entails an experiment in prefigurative feminist

organizing aimed at fostering a more equitable and inclusive urban environment. The experiment conducted by the individual in question focused on female control within an urban setting and demonstrated the potential for women to effectively manage their requirements in the future. The individual asserted that the female organization intentionally anticipates and opposes the local state. The article titled "*Mixing Pop-up Urbanism with Participatory Technologies: Challenges and Possibilities for Inclusive City Building*" by Fredericks J. et al. (2018) explores the impact of citizen engagement on urbanization. The techniques proposed were contextual, transient, and participative discourse localization. A preliminary blueprint was formulated to investigate the advantages of employing multiple engagement channels to expand the participation of individuals in the process of urban development. Alessandria F. (2016) demonstrated in his publication titled "*Inclusive City: Tactics, Experiences, and Recommendations*" the strategies for constructing an inclusive city that incorporates marginalized groups such as immigrants, elderly individuals, and those with disabilities. The partial success of urban design planning was attributed to the adoption of his work in Italy.

2.1.3 National Research on Inclusive Cities

Ahmad S. et al. (2016) acknowledged the significance of mobility alternatives in promoting sustainability and inclusivity within urban areas. The presentation highlights the role of socio-cultural factors in the absence of inclusivity. Nagpur, one of the rapidly growing cities in India, is facing an infrastructure problem due to uncontrolled building and swift development. The absence of a comprehensive plan for infrastructure development has resulted in swift urban expansion, thereby posing a significant threat to the urban green infrastructure of the city. The citation provided refers to a scholarly work authored by Dhyani S. et al. in the year 2018. The individual elucidated their utilization of environmental and engineering technologies in constructing a city that is both inclusive and sustainable. The study conducted by Ahmad S. et al. (2018) analyzed the indicators of Sustainable Development Goal 11 in both Germany and India. According to his statement, urban areas play a crucial role in the implementation of worldwide environmental tactics. According to Grimm N.B et al. (2008), urban areas are significant sources of carbon dioxide emissions and are considered environmental hotspots. The phenomenon of global urbanization is characterized by an increase in both population and urbanization. The attainment of ambitious global sustainability goals that do not take into account metropolitan areas appears to be destined for failure. The UN's New Urban Agenda (UN-

Habitat 2016) underscores the necessity of significant alterations in urban development patterns (Sethi M. et al., 2015). The urban transitions towards sustainability, which are characterized by paradigm shifts, exemplify the norms of urban development. According to the United Nations Secretary-General Ban Ki-Moon, the battle for sustainability will be either won or lost in urban areas. One of the Sustainable Development Goals (SDGs), also referred to as Global Goals by the United Nations in 2015, places a particular emphasis on urban areas. This goal, known as Goal 11, aims to ensure that cities and human settlements are inclusive, safe, resilient, and sustainable as part of the 2030 Agenda. The achievement of additional objectives is contingent upon the location of cities. The first and fourth Sustainable Development Goals, namely "End poverty in all its forms everywhere" and "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for everyone," respectively, should encompass the issue of urban poverty and the availability of learning opportunities. As per the SDG zero draught, it has been observed that a significant proportion of the 169 objectives of the 17 SDGs, namely 21 percent, can solely be accomplished with the involvement of urban stakeholders. Additionally, 24 percent of the objectives require execution in collaboration with urban stakeholders, while 20 percent necessitate a more distinct focus on urban stakeholders, as per Misselwitz et al.'s research in 2015. This chapter's primary focus is on Goal 11, even though cities have a cross-cutting nature for other Sustainable Development Goals (SDGs). The authors Koch F. et al. (2018) conducted a study that delved into the fundamental principles of worldwide sustainability policies amidst the COVID-19 pandemic and examined the impact of urbanization, migration, and inclusive city policies in India. The study also proposed a novel theoretical framework. The participation of slum residents in Pune towards the creation of inclusive cities was emphasized by Sen S. et al. in 2003. According to his perspective, the deficiency of Pune's urban planning lies in its failure to integrate the underprivileged population into mainstream initiatives. The Pune Slum Census ultimately augmented the database of communities and implemented a geographic information system (GIS)-oriented approach to urban planning within the city. This webpage pertains to the census conducted in the slums of Pune. According to Sivaramakrishnan et al. (2005), there is a migration of people towards urban centers that have been developed with industrial and infrastructure investments in developed countries. The implementation of macro policies at the state and municipal levels has facilitated the relocation of slums and squatters from affluent urban areas. Kundu D. et al. (2009)

observed that there was an expedited segmentation process, which brought to light the intra-urban disparities.

2.1.4 Micro and Empirical Research on Inclusive Studies

Haque I. et al. (2019) described the notion of a smart city and also presented a concise illustration of how inclusivity can be achieved in such a city. The study conducted by the authors showcases the correlation between economic and infrastructural development, land-use planning, civic amenity provision, and housing management in the creation of smart and inclusive urban areas. The present study focuses on the unstructured urban expansion of Kolkata and the endeavors of the governmental and municipal bodies to maintain the city's sustainability. According to Sengupta U. (2013), the process of economic liberalization is exerting an impact on the patterns of urban land development in India. Through state-led land development initiatives, the Salt Lake and Newtown regions underwent a significant transformation while maintaining an inclusive environment. New Town can be characterized as a quasi-market scenario that has been influenced by the monopolistic state, an inadequately structured private sector, the lack of civic entities, and the restricted availability of land and housing for the underprivileged. Chakrabarti A. et al. (2021) assert that the urban governance in Kolkata, a city situated in the Global South, has been characterized by political maneuvering that has marginalized migrants. The authors further contend that several policies and infrastructural developments have undergone modifications as a result of the frequent changes in political leadership in the city. The study employed narrative analysis, theme network analysis, and validation data analysis techniques. The examination of inclusive practices and the analysis of ethnographic survey data reveal that migrants possess only limited rights. The present study scrutinizes plausible forthcoming scenarios concerning the living conditions of migrants and assesses their influence on the realization of Sustainable Development Goal 11, which pertains to the establishment of inclusive cities by 2030. This evaluation is conducted by analyzing the recent patterns of development. Ghose A. (2007) provided a succinct overview of the Communication System in Colonial Calcutta (1690-1857), highlighting the provision of colonial amenities in response to the needs of the populace and the impact of population growth on communication channels. This served as a preliminary indication of the adoption of inclusive practices and a shift in the demographic composition. The Calcutta Plan of Action for Children 1995, as published by the Government of West Bengal, delineated policies and long-term initiatives aimed at

promoting children's education, health (both mental and physical), strata-wise development, and inclusion.

2.1.5 Inclusion in Slums

According to Islam J. et al. (2021), a significant proportion of the urban population is comprised of slums. Therefore, urban expansion may yield benefits for slums. The rise in the population of urban areas indicates a significant expansion of urbanization. However, the examination of 100 slum dwellings in Topsia (Ward no. 66) of KMC presents a bleak portrayal of the land tenure status, housing type, cooking fuel, in-house toilet facilities, waste disposal, and other related factors, as reported by the families. Despite the significant role that slums play in the urban population, there has been a lack of adequate development initiatives aimed at improving their living standards, economic opportunities, and social welfare. To achieve sustainable urban expansion, national and state governments must implement diverse development strategies.

In 2014, the Organization for Participatory Research in Asia espoused a comparable concept regarding individuals residing in slums. The report highlights that inhabitants of informal settlements contribute positively to the urban economy and lifestyle, despite a limited number of negative impacts. The significance of their productive economic role is underscored by their indispensable contribution to urban GDP and the difficulty in finding suitable replacements for their jobs. Nevertheless, a significant proportion of these informal settlements are deficient in even the most rudimentary amenities. The study investigated the current conditions and situation of households residing in informal settlements in the metropolitan area of Kolkata. Additionally, it compared their expenditures with the average expenses incurred by slum dwellers across India. The denizens of urban slums in Kolkata allocated a significant proportion of their budget, specifically 52.81 percent, towards food, which surpasses the national average of 46.77 percent. The slums of Kolkata exhibit a higher expenditure on education in comparison to the national average of 6.12 percent. The electricity tariff in Kolkata slums is 7.02 percent, which is higher than the national average of 4.45 percent. The residents of Kolkata's slums tend to purchase only essential items. The study conducted by Bakshi S. (2013) scrutinized the historical, current, and prospective conditions of five slums located in Kolkata and four others situated on its periphery. The researcher investigates the emergence and incorporation of slums into the urban landscape, examining the factors and circumstances that contributed to their visibility. This study examines the quality of life of children living

in slums and its impact on their livelihoods. However, it is possible that in the future, there may be indications of socio-economic advancement in the slums. Basu & Basu (2016) highlighted the importance of three main development-related challenges for the future: urban infrastructure development, housing, and empowering the urban poor.

According to Ramaswamy V. (2008), there has been an observed occurrence of unauthorized construction of makeshift dwellings in slum areas due to the inability of Thika renters to expand their structures over the past 15 years, resulting in issues of overcrowding. The quality of water and sanitation remains a persistent challenge for the community. The government of West Bengal has put forth a proposal to construct multi-story edifices on tenancy properties in Calcutta now Kolkata as a measure to mitigate the issue of slum squatting. However, the author expresses concerns regarding the potential challenges associated with the transfer of land to private developers and the implications for the inhabitants of slum areas. According to Schenk W. Collin's (2010) account, Kolkata exhibits a distinctive range of slum typologies. According to the author's assertion, the slums within the city harbor numerous concealed facets that are attributable to destitution and disorder. The author employed a categorization scheme based on historical causal factors, ethnic composition, and patterns of slum policy to gain insight into the nature of slums. The author has delved into an analysis of the impact of colonial and post-independence policies, religious beliefs, and political ideologies on the proliferation of slums. According to Kundu N. (2003), the insufficiency of urban economic development in mitigating poverty is evidenced by the emergence of slums in Kolkata. The government has prioritized welfare and habitat enhancements in diverse poverty alleviation initiatives; however, establishing a correlation between these enhancements and the productivity and income of the urban poor has proven challenging. Urban poverty has continued to persist as a result of various factors such as increased unemployment and poor productivity in the informal sector, squatting in overcrowded slums, congestion, encroachment on public space, as well as water and air pollution. Additionally, the degradation of infrastructure and services has contributed to this phenomenon. Siddiqui M.K.A (1969) provided a depiction of the living conditions in the slums of Calcutta during the post-independence era. The essay presented an analysis of the social hierarchy, employment patterns, and residential arrangements of individuals residing in impoverished urban areas. The author emphasized the primary challenges that individuals residing in slums encounter when attempting to refurbish their dwellings to render them suitable for habitation. The current

situation in Kolkata is characterized by persistent social and political obstacles, such as inter-group conflicts, political party interventions, and Thika tenancy regulations, which have persisted for a period of approximately four to five decades. Consequently, there has been no improvement in the standard of living of individuals residing in slums. According to Gerometta J. et al. (2005), contemporary urban areas are characterized by socioeconomic segregation and social exclusion. The Fordist economic model has resulted in challenges concerning welfare systems in various countries. Municipal governments must implement novel administrative frameworks to alleviate the adverse impacts of economic, social, and political restructuring. The present article aims to analyze the participation of civil society in the recently implemented urban governance frameworks, to mitigate social exclusion. The present study scrutinizes the participation of civil society in the reform of urban governance. According to Bhandari S. et al. (2015) proposition, civil society has the potential to facilitate the development of more cohesive urban areas and governance structures that foster their integration. The precise contribution of civil society in the restoration of governance relations remains ambiguous, despite its acknowledgment. Despite the ambiguous role of civic society. Due to the aforementioned limitations, it is imperative to establish a democratic governance framework that operates at multiple scales and fosters open discourse among the public, as well as promotes recommendations for the social economy.

2.1.6 Social Factors of Inclusion: Concept and Studies

The existence of informal settlements in developing countries raises questions about the effectiveness of inclusive urbanization initiatives. This study considers the social factors that contribute to the inclusion of slum dwellers. These factors include the provision of safe, healthy, affordable, and fire-resistant housing, as well as accessible and affordable education, free and affordable health care, and sanitation services. Additionally, fundamental urban utilities and infrastructure, such as transportation, communication, and basic services, are essential for the inclusion of slum dwellers.

2.1.6.a Safe, Healthy, Affordable, and Fire-Resistant Households

The hazard of fire poses a significant threat to individuals residing in slum areas. India With the exception of Kolkata, each major urban center, such as Mumbai, Delhi, Chennai, and Pune, experiences a comparable problem annually, resulting in the destruction of numerous residences and loss of life. According to Cohen O. et al. (2013), the

configuration of slums may lead to heightened risks of fire hazards. Maximum Informal settlements are densely populated areas characterized by the presence of makeshift or partially constructed dwellings. Fire-control deficiencies have resulted in a significant proportion of India's slum population, approximately 87.64 percent, being exposed to fire threats since birth. Affordable, secure, and healthful housing mitigates the likelihood of such hazards and fatalities. The perception of "affordability" is influenced by an individual's goals. Affordability is determined by an individual's income. Approximately 33 percent of an individual's annual income may be allocated towards housing rental expenses or debt repayment. As evidenced by cultural norms, the accessibility of goods and services is contingent upon an individual's socioeconomic status. The categorization of income groups by the RBI can be utilized as a means of assessing household affordability within both the national and state contexts (Litman T., 2016).

The RBI categorizes income groups based on individual income (2018).

Section with the Lowest Economic Status (EWS), Up to 3 lakh rupees

LIG 3-6 lakhs

6-12 lakhs in the Middle-Income Group (MIG-I).

12-18 lakhs in the Middle-Income Group (MIG-II)

More than 18 lakhs in the higher income group.

In the context of both banks RBI and World Bank, we can roughly state India's affordability index will be published.

Section with the Lowest Economic Status (EWS)-up to a lakh

The group with Low Income (LIG) ₹ 1-2 lakhs

2-4 lakhs in the Middle-Income Group (MIG-I).

The group with a Middle Income (MIG-II) ₹ 4-6 lakhs

More than 6 lakhs in the higher income group

A secure residential environment is characterized by a low incidence or absence of criminal activities. The aforementioned information is within the purview of the local law enforcement agency. Cities, boroughs, and wards with lower rates of crime, including incidents such as female violence, murder, pickpocketing, acid attacks, and sexual harassment, are associated with safer homes. In such areas, women are more likely to feel secure and experience fewer instances of physical and emotional harm, including harassment and bullying. A dwelling that promotes physical and mental well-being is considered to be a conducive environment for maintaining good health. The rapid progression of technology should not come at the expense of environmental degradation.

With proper planning, it is possible to establish a small garden on the rooftop of a building, on the ground in a colony, in parks, green zones, and through social afforestation initiatives aimed at safeguarding the environment and promoting human health. This can result in a positive outcome, as the fresh oxygen generated can have a beneficial impact on one's mental well-being. This dwelling designed with health in mind aims to mitigate the risk of various illnesses such as mental depression, cardiac problems, asthma, and others. The present work constitutes a thorough investigation of the relevant literature pertaining to the aforementioned matter. The citation "Islam J. et al. 2015" is indicative of an academic reference.

The urban sustainability of slum settlements in Chittagong City, Bangladesh was investigated by Uddin N. in 2018. The present study aims to evaluate the urban sustainability of slum settlements in Bangladesh, with a specific focus on Chittagong City. The study highlights the adverse impact of overcrowding on the well-being of slum dwellers, leading to human hazards and reduced life expectancy. The sustainability of urban livelihoods is threatened by these challenges. The author recommends that the government should provide assistance to improve the quality of livelihoods in these areas. The conflagration that occurred in the Delhi Slum resulted in harm to the environment, destruction of property, and deterioration of living conditions. It is imperative to establish sustainable strategies for disaster management that foster self-reliance and self-sufficiency within the affected communities across various levels and sectors. The recognition of ownership among slum residents is promptly acknowledged, and appropriate housing is provided through government programs. Chaturvedi P. K. et al. (2016). Gopalan k. et al. (2015) have reported that a number of nations are addressing the issue of affordable housing. India is facing a significant housing deficit, with an estimated 18 million dwellings required to meet the current demand. It is noteworthy that 99 percent of this shortage is concentrated in impoverished regions. The present study has delineated the concept of affordable housing in both the Indian and global contexts, scrutinized the shortcomings of the diverse definitions of affordable housing, identified the entities and organizations accountable for formulating and executing affordable housing policies within the state, analyzed the prospects and obstacles associated with affordable housing, and extracted insights from the international practices in this domain. According to Tiwari P. et al. (2016), a lack of government involvement in policy and program design has resulted in housing issues in India. These issues arise as a result of unplanned urbanization,

economic inequality, poverty, illiteracy, and unemployment. The aforementioned issues led to a housing crisis in 2011 that affected a population of 51 million individuals. India has implemented laws, initiatives, and institutions to mitigate the issue of housing scarcity for a considerable period of time, however, their efficacy has been limited. In order to address the housing deficit in India, it is imperative to recognize housing as a constitutional entitlement, tackle land title disputes and claims, secure sufficient financial resources for affordable housing initiatives, devise effective mechanisms to render housing affordable for all income brackets, and surmount market fragmentation. The individual posits that India has the potential to leverage its extensive housing architecture comprising of agencies, norms, and market systems, provided they are adequately resourced, to facilitate the provision of housing for all. Based on Malaysian belief, residence constitutes the costliest investment for a household (Samad D. et al., 2017). The significance of the nation's economy and society is acknowledged by the UN Universal Declaration of Human Rights. Despite the differences between established and emerging cities, both face challenges in providing affordable housing for individuals with low- and middle-income. The research conducted by the individual in question indicates that the matter of affordable housing is a policy concern of global significance, with Malaysia being no exception. The escalation of housing unit costs has outpaced the increase in incomes, while housing policies have predominantly focused on stimulating demand, leading to an unresponsive supply sector. The individual's research is centered on the topic of affordable housing concerns in Malaysia. The individual's professional portfolio encompasses the creation of the Malaysian Map of Affordability and the development of housing strategies with a global scope, aimed at providing guidance to policymakers in Malaysia. In order to cater to the housing requirements of individuals based on their location, budget, and target demographic, it is imperative to implement supply-oriented initiatives in Malaysia in the short and medium run. Long-term solutions on the demand side are necessary for addressing this issue. The convergence of balance and affordability is imperative for optimal outcomes. Dobson (2017) posits that the implementation of new global urban, poverty-reduction, and climate change commitments is fraught with significant challenges for contributors, given the staggering statistic of one billion individuals residing in slums, and the projected threefold increase by 2050. In the African context, urbanization is frequently accompanied by the expansion of slums, which exacerbates persistent inequality and impoverishment. This, in turn, leads to the accumulation of multidimensional risks, which pose a threat to the continent's ability to fulfill new

commitments and maintain previous achievements. This essay by a practitioner posits that community-driven slum upgrading is an underutilized and underfunded approach for enhancing urban risk reduction and resilience-building. The proposition posits that the presence of structured communities may facilitate the implementation of resilient development strategies in African urban centers.

Ahmed A. et al. (2020) discussed the Bangladesh Fire Service and Civil Defense's response to 170 fires that occurred in informal settlements in Bangladesh in 2016, as reported by Rudd (2018). In the context of Bangladesh, the terms "slum" and "fire" are considered synonymous. In December 2016, conflagrations in the Karail and Saattola slums destroyed approximately 700 residences. Unfortunately, both public and private entities tend to disregard these potential hazards. The ambiguous nature of land ownership and restricted property rights among slum inhabitants serve as limiting factors. Assistance provided to infrastructure in the aftermath of a disaster. Professionals in the built environment are unable to utilize spatial design as a means of mitigating hazards or improving conditions in impoverished urban areas. A pilot project was conducted by a study team comprising volunteer architects, planners, engineers, and students from various Bangladeshi universities. The project aimed to assist individuals affected by fire in the Karail and Saattola slums by implementing the "Build Back Better" philosophy, which aims to counter the prevalent mentality. The author's distinct professional background sheds light on the process of revitalizing impoverished areas following instances of conflagration. The proposal suggests the implementation of housing reconstruction and a comprehensive master plan that includes an enhanced road network to enhance the safety and fire resistance of densely populated slum communities. According to a risk analysis conducted by the Kolkata Municipal Corporation (KMC), the implementation of measures such as heightened awareness, preparedness, prompt response, adequate training, capacity building, and a robust technical legal framework can serve to mitigate the risks posed by fire incidents. Subsequently, a particular section of the study focused on an unregistered slum located in Kolkata that is prone to frequent fires, leading to the reconstruction of cheap pucca houses with government assistance. However, it is noteworthy that these houses have not yet been certified as fire-resistant. The authors of the study conducted by Walls et al. (2017) proposed a structural settlement approach aimed at mitigating the risks of fire incidents and minimizing the associated damages to both human life and property. The study of fire engineering in the context of sustainable slums. The author of the article

addressed several key factors, including height, ventilation, fire-resistant architecture, and space, in order to mitigate the risk of a catastrophic event. Arup (2018) posits that technical issues are sometimes overshadowed by social and cultural concerns, which have not been adequately resolved.

2.1.6.b Affordable and Accessible Education

The concept of affordability is subject to individual interpretation. The interpretation of the term "affordable" varies among families living in poverty and those belonging to the high-income bracket. Despite the entitlement to education for every Indian child, there exists a disparity in its attainment. Similar to other communities, Indians aspire to provide their children with higher education. A viable approach involves providing a high-quality education at an affordable cost to households by means of tuition subsidies facilitated by governmental assistance. The 2017-18 all-India survey report was released by the National Statistical Office. According to the survey results, 10.6 percent of individuals in India who are over the age of 15 possess graduate degrees. The prevalence of this condition is reported to be 5.7 percent in rural areas of India, with a higher prevalence of 8.3 percent observed among the female population. According to the 2011 Census, the proportion of graduates within the corresponding age cohort was 8.2 percent. The affordability of goods and services is influenced by various factors such as community, religion, and caste. Despite the provision of government subsidies for higher education, a significant proportion of individuals residing in slum areas are unable to access basic education as a result of financial constraints. The present document incorporates a comprehensive analysis of existing literature.

In 2008, the Consultative Forum of the National Council for Special Education (NCSE) engaged in a discourse on inclusive education as part of its efforts to address the objectives outlined in its Declaration of Strategy 2008-2011. The Consultation Forum was established by the Education for People with Exceptional Educational Needs (EPSEN) Act of 2004 with the purpose of providing guidance to the Council on its responsibilities. The Forum was solicited to provide input on the definition and principles of inclusive education for children with special educational needs (SEN) as outlined in the EPSEN Act. The Forum convened on multiple occasions to deliberate upon the matter and authorized a comprehensive review of literature on inclusive education for children with special educational needs (SEN) to bolster its efforts and contextualize them within a worldwide

framework. The literature on inclusion, contemporary definitions, and ideas and methods for inclusive education were synthesized in the review (Winter et al., 2010).

This highlights the significance of accessible education, disparities in community and religious education, and the importance of public consciousness. According to Husain Z. (2005), the conservative Muslim culture is responsible for the low literacy rate observed in the Muslim community. Drawing from a field study conducted among slum dwellers in specific districts of Kolkata, the author posited that the economic circumstances and fluctuations in the job market offer a distinct perspective on the cost-benefit analysis of education. In addition, he provided counsel on the expenses and constituents of education, the process of selecting educational establishments and modalities, gender-based bias, attrition rates, and juvenile employment. Aggarwal et al. (2003) conducted a study titled "Learning Achievement of Slum Children in Delhi," wherein they compared the academic performance of children residing in slums who attended either government-operated or privately operated unregistered schools. The present study examined the disparities in mean percentage achievement scores for language and mathematics among Grade I and Grade IV students, both within and between schools. This study aims to investigate potential variations in academic performance among students of comparable socioeconomic status in both government and unregistered schools. The primary means utilized by the educational institutions were their infrastructure, faculty members, and ancillary resources. The families of children residing in slums were subjected to examination. The study also investigated household factors, school surroundings, and amenities within the designated areas. The limitations of these determinants and learning outcomes are also subject to examination. The academic performance of children residing in slums has been subject to scrutiny, thus necessitating the provision of educational institutions equipped with sufficient infrastructure, qualified educators, and adequate teaching and learning resources. The learning outcomes of schools under varying management structures may differ, despite similar environmental conditions. Additionally, there may be variations in academic performance among children residing in slum areas across different schools. The significance of this research lies in the fact that the pedagogical approaches and attributes of schools situated in urban slums have not been thoroughly investigated. The report ultimately suggests enhancing the educational opportunities for children living in slum areas. The prevalence of religion-based educational disparity in India, particularly in slum areas, and the overall underperformance

of Indian Muslims in academic settings can be attributed to cultural beliefs and knowledge. The study by Alam S.M. et al. (2007) has highlighted the interdependence of Muslim literacy and education within a broader spatial framework. It has been suggested that there is no singular, linear approach to understanding religious disparities in literacy and education, as these disparities may arise from individual actions as well as larger societal structures. According to Choudhury A. (2006), there has been a rise in literacy rates in India. However, the issue of school dropouts continues to be a persistent problem, detracting from an otherwise commendable achievement. The findings of his analysis indicate a decrease in dropout rates; however, the rates still persist at a level that warrants attention. Although gender differences have decreased, the rates of females still exceed those of males. The phenomenon of dropping out has garnered global attention and has been the subject of extensive research in order to identify its underlying causes. The interrelationships among the components in the northeastern region are currently undetermined. Furthermore, the study investigates the impact of household responsibilities and parental attachment on the decision to drop out of school.

2.1.6.c. Free and Affordable Health Care and Sanitation Services

Affordability is influenced by factors such as income, expenditure, and the value of products and services. The perception of healthcare affordability is predominantly subjective. The concept encompasses the allocation of financial resources, revenue generation, and subjective assessments regarding the relationship between the worth of a given item and its associated cost. In contrast to other essential commodities, healthcare expenditure is characterized by significant disparities, with demand or necessity fluctuating considerably among individuals and over time in response to changes in health status. The discourse surrounding the affordability of healthcare in Kolkata is frequently characterized by a lack of clarity with regard to factors such as pricing, insurance coverage, and out-of-pocket expenditures. Previous entries on the same topic: The escalation of healthcare expenses is a contributing factor to the increase in health insurance premiums, while the customary decrease in the required out-of-pocket cost-sharing, such as deductibles, co-payments, and coinsurance, is observed. Banerjee, A. (2022). The costs in question exhibit significant diversity and are subject to varying experiences among individuals and households across different temporal contexts. A limited number of individuals possess the financial means to cover their healthcare expenses through personal funds. However, the extent to which they are inclined to purchase insurance is

contingent upon their financial risk aversion and assets. The fundamental principle of insurance is to transform unforeseen risks into foreseeable premiums. For a significant number of individuals with persistent medical conditions, health insurance serves the purpose of covering anticipated high expenditures rather than safeguarding against unexpected risks. The government must furnish slum inhabitants with all-encompassing and cost-free services, while also making crucial determinations regarding individuals susceptible to escalating healthcare expenses, identifying problematic areas, and devising policies that may prove beneficial. A literature review has been conducted to address the need for health and sanitation facilities and to facilitate future planning. According to Cutter et al. (2010), there may exist disparities in the management of sanitation facilities when comparing those of lower socioeconomic status to those of higher socioeconomic status.

The accessibility of healthcare services at a fundamental level. According to Banerjee et al. (2012), the most challenging aspect of implementing primary healthcare concepts is attaining universal access to healthcare. The populations residing in rural and urban slums experience limited access to healthcare services. The individual in question espoused the implementation of a government-funded healthcare system that would be accessible to all members of society, particularly those living in impoverished conditions, such as those residing in the slums of Kolkata, India. Marimuthu P. et al. (2016) emphasized the impact of heightened urbanization, the desire for improved living standards, and work-related push-pull factors. The migration of rural populations to urban areas is influenced by educational opportunities and policy modifications, despite the availability of advanced public health services, particularly tertiary care facilities, which low-income urban residents do not fully utilize. The researcher employed secondary data sourced from the National Family Health Survey-III about Delhi, Hyderabad, Mumbai, Kolkata, and Chennai to examine the phenomenon of underutilization of public health services in slum areas and to draw comparisons with non-slum regions. The study exclusively utilized the Census of India and NFHS-III slum data. The findings indicate that a significant proportion of households in Mumbai's slums rely on public taps or yard-piped water for their water supply, with a reported percentage exceeding 90 percent. In contrast, Hyderabad's water supply appears to be comparatively better, while Chennai's access to water is limited. A notable proportion of households, specifically 11.4 percent, lack awareness regarding their toilet drainage. There is a significant variation in the toilet facilities across different cities

($p = 0.001$). Upon comparing the prevalence rates of open defecation in five urban centers, it was observed that Delhi and Hyderabad exhibit similar proportions ($P > 0.05$) ranging from 75 percent to 79 percent. Conversely, Kolkata and Chennai demonstrate high proportions exceeding 95 percent, whereas Mumbai displays a median percentage of 89.6. In areas adjacent to Delhi, a significant proportion of the slum-dwelling populace, ranging from 40 percent to 45 percent, perceives government hospitals to have extended waiting periods and substandard service quality. The study conducted by Gupta I. et al. in 2015 assessed the health status and healthcare accessibility of the urban poor population in India. The study incorporated primary survey data obtained from a sample of 2000 households located in four urban areas of India, comprising a total of 10,929 individuals. The results of summary statistics and regressions conducted through the use of STATA software indicated that government facilities and services are deficient. Additionally, there is a notable inclination towards private health facilities, which is attributed to the perception that they offer high-quality services. The high costs associated with both public and private facilities were also identified as significant concerns. In her econometric study of acute illness, she identified deficiencies in hygiene, waste management, and potable water. The researcher's findings indicate that swift government intervention is necessary in response to the vulnerability of the urban poor and the lack of accessible healthcare services provided by the government. According to Sau A. (2017), the process of urbanization in India has resulted in the emergence of slums within urban areas. The present study evaluated the provision of potable water and sanitation facilities in a slum area of Kolkata, where all households were reported to have access to these amenities. He recommended enhancing the sanitation conditions of the slum. Mukherjee S. et al. (2020) examined the issue of water scarcity among individuals residing in slum areas. According to Mukherjee S. et al. (2020), the provision of water security is imperative for various purposes such as drinking, food production, and cleaning, as well as for the promotion of human and environmental health. As per the 2011 Census, 17.4 percent of households residing in urban areas of India are situated in slum areas. The study's findings indicate that the increasing populace in these regions poses a challenge to the provision of fundamental urban water, sanitation, and hygiene (WaSH) amenities. The issue of addressing perceived sensitivity to contaminated water and poor sanitation will be tackled as a result of social marginalization. The present study evaluated the conditions of water, sanitation, and hygiene in the slums of Kolkata as recorded in the 2011 Census. According to census data and a household survey, it has been identified that certain areas in Kolkata are deficient in

terms of access to sanitation facilities and related supplies. The slum washing services in Kolkata encounter challenges pertaining to the quality, quantity, and consistency of water. In addition, individuals residing in slums exhibit inadequate upkeep of current sanitation amenities, such as latrines, and experience insufficient allocation of sustainable water resources on a per capita basis. The study examines the correlation between physical and social factors that contribute to vulnerability and deprivation in relation to access to basic drinking water in underserved areas, taking into account variables such as gender, religion, and knowledge. Das K. (2009) reports that in urban India, the preservation of access to essential services has been given precedence by civic authorities. The author emphasized the significance of agency and access to fundamental amenities such as potable water and sanitation in Kolkata, India. The city's burgeoning urban populace has exerted substantial strain on these crucial services. The availability of fundamental amenities has exhibited discrepancies throughout the urban area, indicating inadequate administration by the local government. The issue of water supply has not been a concern. The prioritization of aging infrastructure and overburdened drainage and sewer systems has impeded the overall progress of sanitation efforts within the city. The implementation of decentralized governance has the potential to enhance the efficacy of local democratic decision-making. However, it is important to note that the provision of fundamental services is ultimately influenced by the dynamics of metropolitan government. The author's research demonstrates that the study's empirical foundation is derived from both qualitative and quantitative data obtained from the Kolkata Municipal Corporation (KMC), local newspapers, and consultations with residents and civic body representatives in specific regions. The findings indicate that regardless of the local political culture and urban governance, the underprivileged segment of the urban population had inferior access to services.

2.1.6.d Fundamental Urban Utilities and Infrastructure, Such as Transportation, Communication, and Basic Services.

This study examines the provision of four fundamental amenities to assess the extent of facilities available to slum dwellers in comparison to individuals from more advantaged backgrounds. The primary objective of this study is to engage individuals residing in impoverished urban areas in the broader social fabric by providing them with appropriate amenities. The slum in question possesses four distinct facilities, namely transportation, communication, and water supply. Transportation pertains to the internal and external road

structure, including the nature of the road surface, its dimensions, and proximity to the nearest high road. Communication encompasses the degree of connectivity between the slum and the outside world through various media such as newspapers, radio, telephone, and television. Lastly, while there are numerous free services available, many residents of slum areas are unable to access high-quality water supply due to financial constraints. The present study centered on the subject of management to optimize potential and implement inclusion policy. The research employed various methodologies and conducted a comprehensive review of national and international literature. A multitude of authors have produced written works on this subject matter. The study conducted by Edelman B. et al. (2006) investigated how individuals residing in slum areas obtain fundamental necessities. The researcher demonstrated that political connections have an impact on the percentage of slums in Indian states, the reported proportion of slums, and the availability of basic utilities. As per the findings of political economics, the results of his survey conducted during 2004-05 indicate that political engagement has a positive impact on the acquisition of land tenure and access to fundamental amenities in slum areas. The logit model is utilized to examine social networks and individual characteristics to discern elements of political interaction. The imperative of political accessibility is paramount for the sustenance of society; however, the political exploitation of impoverished urban areas serves to perpetuate the precariousness of slum inhabitants. The article posits that robust social networks can aid low-income households in circumventing a state of low equilibrium. However, in other Asian nations, political connections appear to be of lesser significance. Alternatively, implementing practical measures may enhance the circumstances of these economically disadvantaged households. Mitra A. (2012) outlines that fundamental urban amenities encompass a range of services such as water supply, sanitation, waste disposal, drainage, road infrastructure, electricity, housing, and additional services. The researcher investigates the essential services and amenities available in Class I towns with a population of 100,000 and Class VI towns with a population of 5,000 in the state of West Bengal. The quantification of access to fundamental urban services and amenities is achieved through a composite index based on census data. The aforementioned construct is comprised of three distinct domains, namely assets, basic amenities, and housing quality, each of which is operationalized by a set of 14 representative indicators. The researcher employed principal component analysis to diminish dimensions and allocate weight to component domains. The results indicated that towns situated in and around the Kolkata megacity exhibit comparatively superior access

to and availability of fundamental urban services and amenities. This finding is highly pertinent to the present work guideline and highlights the contrast between towns within the Kolkata Metropolitan Area (KMA) and those outside of it in West Bengal. The identification of spatial gaps within urban areas about fundamental urban services and amenities has facilitated the development of strategies and policies aimed at promoting inclusive urban environments. Ray B. (2017) argues that the process of urbanization in India was not primarily driven by a strong economic foundation of cities, but rather by the distress and destitution experienced in rural regions, which resulted in a significant influx of rural migrants into urban centers. After 1941, there was a notable increase in urbanization, culminating in a figure of 31.16 percent of the populace in 2011. Megacities and cities classified as Class I are the primary focal points of the process of urbanization. The process of urbanization in India can be characterized as pseudo-urbanization, wherein a large urban center is developed without the necessary infrastructure to support it. The phenomenon of migration and pseudo-urbanization has led to a rise in the population of impoverished migrants in urban areas, resulting in adverse consequences such as destitution, indigence, joblessness, subjugation, the swift proliferation of shantytowns, and a deterioration in the standard of urban living. Slums are typically characterized by inadequate infrastructure, substandard living conditions, socioeconomic disadvantage, compromised health, hygiene, and safety and security. The assessment of living conditions was conducted in the slums of Kolkata Municipal Corporation. As of 2021, the living conditions of individuals residing in slums have not exhibited any significant improvement, despite the various initiatives undertaken by the government. The present article elucidates the reasons behind the inadequacy of amenities and infrastructure in urban areas.

2.2 Research Gap

A research gap refers to an unresolved question or issue that has not been addressed by prior studies or research in a particular field. Thus, through a systematic analysis of the research objective and research questions, coupled with the utilization of a survey and literature review, the primary research gap has been discerned. Previous research has revealed the necessity of an inclusive city and has identified the underlying factors and associated benefits. Numerous studies have demonstrated the potential for slums to be integrated into the urban planning of rapidly developing cities. However, the implementation of such planning requires consideration of various parameters, including

temporal, religious, site situation, authorization, and resilience models. Despite the existence of these parameters, comprehensive planning for slums has yet to be realized. This study involves the development of multiple model plans, utilizing real-life examples from Kolkata, aimed at promoting greater inclusivity of slums within society. In addition to the identification of a planning model, the optimal slum model has been discerned from among the various slums.

2.3 Significance of the Study

The literature review primarily encompasses studies that focus on various aspects such as the contemporary economic scenario, women's empowerment, the socioeconomic status of individuals residing in slums, policies and guidelines for slum upgradation, and the assessment of educational conditions, along with corresponding recommendations. However, there appears to be a deficiency in the proposed approach to incorporate slums into the prominent urban areas adjacent to them and furnish the necessary amenities required for sustenance. This research endeavor aims to enhance the inclusivity of slums by taking into account several factors, including the temporal expansion of slums' urban location basis, physical location basis, religious basis, registration basis, and fire safety foundation. A comparative analysis is conducted among all the slums to ascertain the one that exhibits the highest degree of hospitality. Furthermore, the design of future amenity models has been accomplished by considering the present conditions of the selected slums.

References

- Aggarwal, Y., & Chugh, S. (2003), *learning achievement of slum children in Delhi*. Operations Research and Systems Management Unit, National Institute of Educational Planning and Administration, New Delhi, November 2003
<http://www.sciencedirect.com/science/article/pii/S0264275120313123>
- Ahmad S., Jose A Puppim de Oliveira,(2016) Determinants of urban mobility in India: Lessons for promoting sustainable and inclusive urban transportation in developing countries, *Elsevier: Transport Policy*, Volume 50, 2016, Pages 106-114, ISSN 0967-070X,
<https://doi.org/10.1016/j.tranpol.2016.04.014>.
<https://www.sciencedirect.com/science/article/pii/S0967070X16302189>
- Ahmad S., & de Oliveira, J. A. P. (2018): Determinants of urban mobility in India: Lessons for promoting sustainable and inclusive urban transportation in developing countries. *Elsevier: Transport Policy*, Volume Number- 50, August 2016 Page 106-114.<https://doi.org/10.1016/j.tranpol.2016.04.014>
- Ahmed A., & Subrina, S. (2020). Small Changes with Big Impacts: Mitigating Fire Risks through Small Interventions in Informal Settlements of Dhaka City, Bangladesh. In External Interventions for Disaster Risk Reduction. *Springer: External Interventions for Disaster Risk Reduction*, Singapore. Vol- 27 August 2020 pp. 135-148, DOI: 10.1007/978-981-15-4948-9_8 https://link.springer.com/chapter/10.1007/978-981-15-4948-9_8
- Alam, M. S., & Raju, S. (2007). Contextualizing inter-, intra-religious and gendered literacy and educational disparities in Rural Bihar. *Economic and political weekly*, Vol. 42, No. 18 (May 5-11, 2007), pp. 1613-1622 (10 pages). <https://www.jstor.org/stable/4419545>
- Alessandria, F. (2016). Inclusive city, strategies, experiences, and guidelines. *Elsevier: Procedia-Social and Behavioral Sciences*, volume 223, 10 June 2016, Pages 6-10.
<https://doi.org/10.1016/j.sbspro.2016.05.274>
- Anttiroiko A V., de Jong, M. (2020). The Inclusive City: The Theory and Practice of Creating Shared Urban Prosperity. (n.p.): *Springer International Publishing*. Edition Number1 ISBN: 978-3-030-61365-5, DOI <https://doi.org/10.1007/978-3-030-61365-5>,
<https://link.springer.com/book/10.1007/978-3-030-61365-5>
- Arup (2018): A Framework for Fire Safety in Informal Settlements,
https://reliefweb.int/sites/reliefweb.int/files/resources/FS_in_Informal_Settlements_2018.pdf doi, 31.12.2020.

- Bakshi, S. (2013). The Slums of Kolkata: A truth we know and a truth we don't see. kolkata: unpublished report. page-36-38.
https://www.academia.edu/32530194/The_Slums_of_Kolkata
- Banana, E., Chitekwe-Biti, B., & Walnycki, A. (2015). Co-producing inclusive city-wide sanitation strategies: lessons from Chinhoyi, Zimbabwe. *SAGE Journals: Environment and Urbanization* Article Number-27(1), March 9, 2015, Page-35–54.
<https://doi.org/10.1177/0956247815569683>
- Banerjee A., Bhawalkar J. S., Jadhav S. L., Rathod, H., & Khedkar, D. T. (2012). Access to health services among slum dwellers in an industrial township and surrounding rural areas: a rapid epidemiological assessment. *Journal of family medicine and primary care*, Article Number-1 volume-1, 2012 Jan-Jun, PMID: PMC3893946, Page-20. Doi: 10.4103/2249-4863.94444, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3893946/>
- Banerjee,A,(2022) Kolkata: The City and Urban Fire Resilience. Available at SSRN: <https://ssrn.com/abstract=4102927>, 7 May 2022, <http://dx.doi.org/10.2139/ssrn.4102927>.
- Basu M., & Basu (2016), S. Socio-economic condition of the slums in Kolkata: A case study of ward no: 82 International Journal of Humanities & Social Science Studies (IJHSSS) A Peer-Reviewed Bi-monthly Bi-lingual Research Journal ISSN: 2349-6959 (Online), ISSN: 2349-6711 (Print) Volume-III, Issue-II, September 2016, Page No. 141-151 Published by Scholar Publications, Karimganj, Assam, India, 788711 Website: <http://www.ijhsss.com>
- Bhandari, S., Sarma, P. S., & Thankappan, K. R. (2015). Adherence to antihypertensive treatment and its determinants among urban slum dwellers in Kolkata, India. *Asia Pacific Journal of Public Health*, 27(2), NP 74-NP84.
<https://doi.org/10.1177%2F1010539511423568>
- Calcutta plan of Action for Children 1995 Report Government of west Bengal. First Print 1996, Page 95-112, <https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/3982>
- Chakrabarti A., Tiwari R., & Banerji H. (2021). Migrants' Narratives on Urban Governance: A Case from Kolkata, a City of the Global South. *Sustainability*, 22 December 2020 / Revised: 8 January 2021 / Accepted: 11 January 2021 / Published: 19 January 2021 Article Number -13 Volume Number-2, page- 1009. <https://doi.org/10.3390/su13021009>
- Chaturvedi P. K., Kumar, S., Kumar, P., & Prasad, S. P. (2016). Ocular ischemic syndrome: A rare cause of postoperative visual loss following coronary artery bypass graft (CABG) surgery. *Medical Journal Armed Forces India*, 72, S123-S125.
<https://doi.org/10.1016/j.mjafi.2015.11.013>

- Choudhury, A. (2006). Revisiting dropouts: Old issues, fresh perspectives. *Economic and Political Weekly*, Article Number-41, Vol. No. 51, (Dec. 23-29, 2006), pp. 5257-5263 (7 pages). <https://www.jstor.org/stable/4419056>
- Cohen O., Leykin D. and Lahad M. (2013): The conjoint community resiliency assessment measure as a baseline for profiling and predicting community resilience for emergencies', *Technological Forecasting & Social Change*. Elsevier Inc., vol-80(9), pp. 1732 –1741. doi: 31.12.2020. <https://doi.org/10.1016/j.techfore.2012.12.009>
- Cutter S. L., Burton C. G. and Emrich C. T. (2010) 'Disaster Resilience Indicators for Benchmarking Baseline Conditions', *Journal of Homeland Security and Emergency Management*, vol-7(1). Article no-51 doi: 10.2202/1547 -7355.1732. <https://doi.org/10.2202/1547-7355.1732>
- Das K. (2009). Agency and access under decentralized governance: water supply and sanitation in Kolkata city. *Ahmedabad: Gujarat Institute of Development Research*. Number-191, February-2009, ISBN 81-89023-51-9. <http://gidr.ac.in/pdf/WP-191.pdf>
- Dhyani S., Lahoti S., Khare S., Pujari P., Verma P.(2018) Ecosystem-based Disaster Risk Reduction approaches (EbDRR) as a prerequisite for the inclusive urban transformation of Nagpur City, India, *Elsevier: International Journal of Disaster Risk Reduction*, Volume 32, December 2018, Pages 95-105, ISSN 2212-4209, <https://doi.org/10.1016/j.ijdr.2018.01.018>
- Dobson S. (2017). Community-driven pathways for implementation of global urban resilience goals in Africa. *Elsevier: International journal of disaster risk reduction*, Volume-26, December 2017 Page- 78-84. ISSN 2212-4209, <https://doi.org/10.1016/j.ijdr.2017.09.028>
- Edelman B., & Mitra, A. (2006). Slum dwellers 'access to basic amenities: the role of political contact, its determinants and adverse effects. *In Review of Urban & Regional Development Studies: Journal of the Applied Regional Science Conference*, 02 March 2006, Article Number- 18, Volume No. 1, pp. 25-40. Melbourne, Australia: Blackwell Publishing Asia. <https://doi.org/10.1111/j.1467-940X.2006.00109.x>
- Espino N. A. (2015). *Building the inclusive city: theory and practice for confronting urban segregation*. Routledge: *Journal of Urban Affairs*, Volume 39, 2017 - Issue 7, Pages 1021-1022, Published online: 11 May 2017, <https://doi.org/10.1111/juaf.12305>
- Fredericks, J., Hespanhol, L., Parker, C., Zhou, D., & Tomitsch, M. (2018). Blending pop-up urbanism and participatory technologies: Challenges and opportunities for inclusive city

making. *Elsevier: City, culture and society*, volume-12, Pages- 44-53. ISSN: 2159-8371 (Online); 1041-5718 <https://doi.org/10.1016/j.ccs.2017.06.005>.

Georgette, J., Haussermann, H., & Longo, G. (2005). Social innovation and civil society in urban governance: Strategies for an inclusive city. *Urban studies*, 42(11), 2007-2021. <https://doi.org/10.1080/00420980500279851>

Gerometta, J., Haussermann, H., & Longo, G. (2005). Social innovation and civil society in urban governance: Strategies for an inclusive city. *SAGE Journals: Urban studies*, Volume-42, Issue-11, 2007-2021. First Published October 1, 2005 <https://doi.org/10.1080/00420980500279851>

Ghose A. 2007, *Communication System in Colonial Calcutta (1690-1857)* ISBN 81-875000-34-4 (HB), abc Publication, first published in India, by Ajoy Bhattacharya, abc publications, P757, Block-A, Lake Town, Kolkata 700 089, Phone: 2521 5643 E-mail: acb20@rediffmail.com, <https://doi.org/10.1177/0019464615588431>

Gopalan, K., & Venkataraman, M. (2015). Affordable housing: Policy and practice in India. *IIMB Management Review*, Volume-27 Issue-2, June 2015 Page-129-140. ISSN 0970-3896, <https://doi.org/10.1016/j.iimb.2015.03.003>

Grimm, N. B., Faeth, S. H., Golubiewski, N. E., Redman, C. L., Wu, J., Bai, X., & Briggs, J. M. (2008). Global change and the ecology of cities. *science*, 319(5864), 756-760. <https://www.science.org/doi/full/10.1126/science.1150195>

Gupta, I., & Guin, P. (2015). Health status and access to health services in Indian slums. *Health, Scientific Research* Volume Number- 07 Issue Number-.02, (2015), Article ID: 54128, 10 pages7 (02), 245. <http://creativecommons.org/licenses/by/4.0/>

Habitat, U. N. (2016). *World Cities Report 2016: Urbanization and Development–Emerging Futures*. Publisher: UN-Habitat. https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Habitat%2C+U.+N.+%282016%29.+World+Cities+Report+2016%3A+Urbanization+and+Development%28%20%29+Emerging+Futures.+Publisher%3A+UN-Habitat.&btnG=

Hambleton, R. (2014). *Leading the inclusive city: Place-based innovation for a bounded planet*. Policy Press. Policy Press, 2014 ISBN 1447304985, 9781447304982 page-416 , First published in Great Britain in 2015 by, Policy Press North American office:, University of Bristol Policy Press, 1-9 Old Park Hill c/o The University of Chicago Press, Bristol BS2 8BB 1427 East 60th Street, UK Chicago, IL 60637, USA, www.press.uchicago.edu. [file:///C:/Users/user/Downloads/978-1-4473-0498-2-front-1%20\(2\).pdf](file:///C:/Users/user/Downloads/978-1-4473-0498-2-front-1%20(2).pdf)

- Hanson, J. (2004). The inclusive city: delivering a more accessible urban environment through inclusive design. In: (Proceedings) RICS Cobra 2004 International Construction Conference: responding to change.: York, UK. *UCL Discovery*, OAI, 7:29:01 16th May 2007, <https://discovery.ucl.ac.uk/id/eprint/3351>
- Haque, I., Mehta, S., & Kumar, A. (2019). Towards sustainable and inclusive cities: The case of Kolkata (No. 83). ORF Special Report. , March 2019, Observer Research Foundation. ISBN 978-93-88262-98-9. Haraprasad Chattopadhyay, a K.P. Bagchi & Company, 1990 - Calcutta (India) – 127, <https://doi.org/10.1016/j.jum.2018.03.002>. <https://www.sciencedirect.com/science/article/pii/S2226585617301279> Marsh to Township East of Calcutta, 1990).
- Husain, Z. (2005). Analyzing demand for primary education: Muslim slum dwellers of Kolkata. *JSTOR: Economic and Political Weekly*, Volume Number- 40, Number- 2, Jan. 8-14, 2005, pp. 137-147 (11 pages),
- Islam, J., & Walkerden, G. (2015). How Bonding and Bridging Networks Contribute to Disaster Resilience and Recovery on the Bangladeshi Coast. *International Journal of Disaster Risk Reduction*, vol-10, page-281–291, December-2014. <https://doi.org/10.1016/j.ijdrr.2014.09.016>
- Islam, J., Ali, M. J., & Mithun, S. (2021). Slums in India: making sense of place in urban planning. *GeoJournal*, 1-16. *GeoJournal* volume 87, pages 1913–1928 (2022), Published: 02 January 2021, <https://doi.org/10.1007/s10708-020-10357-3>
- Koch, F., & Ahmad, S. (2018). How to measure progress toward an inclusive, safe, resilient, and sustainable city? Reflections on applying the indicators of sustainable development goal 11 in Germany and India. In *Urban Transformations*. Springer, Cham. FUCI, volume 10, 21 June 2017, pp. 77-90, Online ISBN 978-3-319-59324-1, DOI https://doi.org/10.1007/978-3-319-59324-1_5
- Kundu D. And Samantha D., (2009) Redefining the Inclusive Urban Agenda in India, *JSTOR: Economic and Political Weekly*, Volume Number- 46, Issue No. 5, January 29-February 4, 2011), pp. 55-63 (9 pages), <https://www.jstor.org/stable/27918090>
- Kundu N. (2003). Exclusionary urbanization in Asia: A macro-overview. *Economic and Political Weekly*, 48-58. Vol. 44, No. 48 (NOVEMBER 28-DECEMBER 4, 2009), pp. 48-58 (11 pages) <https://www.jstor.org/stable/25663837>
- Litman, T. (2016). Affordable-accessible housing in a dynamic city. Why and How to Increase Affordable Housing in Accessible Neighborhoods, 25 June 2021, Victoria, BC: Victoria Transport Policy Institute. https://vtpi.org/aff_acc_hou.pdf

- Marimuthu, P., Rao, G. N., Sharma, M. K., & Pandian, R. D. (2016). Perceptions on public health facilities by slum dwellers in the Metropolitan Cities of India. *Health*, Volume Number-8, Issue Number-1, Page-93-97. ISSN Online: 1949-5005, <https://www.scirp.org/journal/health>
- Mitra, A. (2012). Insights into inclusive growth, employment and wellbeing in India. *Springer Science & Business Media*. ISBN 978-81-322-0656-9, Doi-10.1007/978-81-322-0656-9, pp 134-138, [https://books.google.co.in/books?hl=en&lr=&id=uD3AJNwOsEgC&oi=fnd&pg=PR3&dq=Mitra,+A.+\(2012\).+Insights+into+inclusive+growth,+employment+and+wellbeing+in+India.+Springer+Science+%26+Business+Media.+ISBN+978-81-322-0656-9,+Doi-10.1007/978-81-322-0656-9,+pp+134-138&ots=NQtIVUYe_Q&sig=8MJJoQS8kaU_6UUJHDdyY_brsyji&redir_esc=y#v=onepage&q&f=false](https://books.google.co.in/books?hl=en&lr=&id=uD3AJNwOsEgC&oi=fnd&pg=PR3&dq=Mitra,+A.+(2012).+Insights+into+inclusive+growth,+employment+and+wellbeing+in+India.+Springer+Science+%26+Business+Media.+ISBN+978-81-322-0656-9,+Doi-10.1007/978-81-322-0656-9,+pp+134-138&ots=NQtIVUYe_Q&sig=8MJJoQS8kaU_6UUJHDdyY_brsyji&redir_esc=y#v=onepage&q&f=false)
- Misselwitz, B., et. al. (2015). Lactose intolerance in adults: biological mechanism and dietary management. *Nutrients*, 7(9), 8020-8035. <https://www.mdpi.com/2072-6643/7/9/5380>
- Mukherjee, S., Sundberg, T., & Schütt, B. (2020). Assessment of water security in socially excluded areas in Kolkata, India: An approach focusing on water, sanitation and hygiene. *MDPI: Water*, Received: 21 January 2020 / Revised: 29 February 2020 / Accepted: 2 March 2020 / Published: 8 March 2020 Volume Number-12, Issue Number-3, page Number- 746. <https://doi.org/10.3390/w12030746>
- Pineda, V. S. (2020). Building the Inclusive City. Germany: *Springer International Publishing.Procedia-Social and Behavioral Sciences*, Cham, 2020 Volume Number-223, Page Number-6-10. DOI 10.1007/978-3-030-32988-4, <http://library.oapen.org/handle/20.500.12657/22843>
- Ramaswamy, V. (2008) Basti redevelopment in Kolkata, *Economic and Political Weekly*, ISSN (Print) - 0012-9976 | ISSN (Online) - 2349-8846 43(38), pp. 25–26. <https://www.epw.in/journal/2008/38/commentary/basti-redevelopment-kolkata.html>
- Ray, B. (2017). Quality of life in selected slums of Kolkata: A step forward in the era of pseudo-urbanization. *The International Journal of Justice and Sustainability*, Received 20 Oct 2015, Accepted 17 Jun 2016, Published online: 08 Jul 2016 Local Environment, Volume Number-22, Issue Number-3, pages-365-387. <https://doi.org/10.1080/13549839.2016.1205571>
- Roy, A. (2013). Slum-free cities of the Asian century: Postcolonial government and the project of inclusive growth. *Singapore Journal of Tropical Geography*, 24 December 2013

Volume Number – 35, Issue Number-1, Page Number-136-150.

<https://doi.org/10.1111/sjtg.12047>

- Samad, D., Zainon, N., Rahim, F. A. M., & Lou, E. (2017). Malaysian affordability housing policies revisited. *Open House International Journal*, ISSN: 0168-2601 Article publication date: 1 March 2017, Volume Number-42, Issue Number-1, <https://www.emerald.com/insight/publication/issn/0168-2601/vol/42/iss/1>
- Sau, A. (2017). A study on water supply and sanitation at a slum in Kolkata. *International Journal of Medical Science and Public Health*, July 01, 2016; Accepted: November 14, 2017, Volume Number-6, Issue-3, and Page-634-638. https://www.researchgate.net/profile/Arkaprabha-Sau/publication/312009006_A_study_on_water_supply_and_sanitation_at_a_slum_in_Kolkata/links/5bbca1c94585159e8d8f4a9d/A-study-on-water-supply-and-sanitation-at-a-slum-in-Kolkata.pdf
- Schenk, W. C. (2010). Slum diversity in Kolkata. *Columbia undergraduate journal of south Asian studies*, 1(2), 91-108. <http://www.columbia.edu/cu/cujas/Volume%20I/Issue%20II/W%20Collin%20Schenk%20-%20Slum%20Diversity.pdf>
- Sen S., Hobson J., Joshi P., (2003) The Pune Slum Census: creating a socio-economic and spatial information base on a GIS for integrated and inclusive city development, Elsevier: Habitat International, Volume 27, Issue 4,2003, Pages 595-611, ISSN 0197-3975, [https://doi.org/10.1016/S0197-3975\(03\)00007-9](https://doi.org/10.1016/S0197-3975(03)00007-9).
- Sengupta, U. (2013). Inclusive Development? A State-Led Land Development Model in New Town, Kolkata. *SAGE: Environment and Planning C: Government and Policy*, January 1, 2013 Volume Number-31, Issue Number-2, Page-357–376. <https://doi.org/10.1068/c1103>
- Sethi, M., & de Oliveira, J. P. (2015). From global ‘North–South’ to local ‘Urban–Rural’: A shifting paradigm in climate governance?. *Urban Climate*, 14, 529-543. <https://doi.org/10.1016/j.uclim.2015.09.009>
- Siddiqui, M. K. A. (1969). Life in the Slums of Calcutta: Some Aspects. *Economic and Political Weekly*, 1917-1921. Vol. 4, No. 50 (December 13, 1969), pp. 1917, 1919-1921 (4 pages) <https://www.jstor.org/stable/40740133>
- Siltanen, J., Klodawsky, F., & Andrew, C. (2015). “This is how I want to live my life”: An Experiment in Prefigurative Feminist Organizing for a More Equitable and Inclusive

- City. *Antipode: A Radical Journal of Geography*, 14 April 2014, Volume Number-47, Issue Number-1, Page-260-279. <https://doi.org/10.1111/anti.12092>
- Sivaramakrishnan, Dong, X., Hong, Z., M., Mahfouz, M., & Verma, D. P. S. (2005). Callose synthase (CalS5) is required for exine formation during microgametogenesis and for pollen viability in Arabidopsis. *The Plant Journal*, 42(3), 315-328. <https://onlinelibrary.wiley.com/doi/full/10.1111/j.1365-313X.2005.02379.x>
- Tiwari, P., & Rao, J. (April 20, 2016). Housing markets and housing policies in India. SSRN: ADBI Working Paper 565, Available at SSRN: <https://ssrn.com/abstract=2767342> or <http://dx.doi.org/10.2139/ssrn.2767342>, Date Written: April 20, 2016, 35 Pages. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2767342
- Tracada, Eleni. (2015). Smart Economy in Smart Cities, Springer: *Advances in 21st Century Human Settlements*, Singapore, Edition Number1, Pages 323-328, ISBN: 978-981-10-1610-3, DOI-<https://doi.org/10.1007/978-981-10-1610-3> https://www.researchgate.net/post/what_is_the_Idea_of_inclusive_cities_and_how_it_is_related_to_the_smart_cities_Any_references_or_examples/5551bfff5dbbbd2c288b466d/citation/download.-*
- Tsenkova, S., & French, M. (2011). Affordable land and housing in Europe and North America. United Nations Human Settlements Programme. Volume 9, 2016 - Issue 3, Pages 322-326 | Published online: 06 Oct 2016, <https://doi.org/10.1080/17535069.2016.1240514>
- Uddin N,(2018) Assessing urban sustainability of slum settlements in Bangladesh: Evidence from Chittagong city, *Journal of Urban Management*, Volume 7, Issue 1, 2018, Pages 32-42, ISSN 2226-5856, https://www.researchgate.net/publication/323877720_Assessing_urban_sustainability_of_slum_settlements_in_Bangladesh_Evidence_from_Chittagong_city
- UNESCAP 2014, p. 1, Rudd 2018 subsequently added, correctly, that this battle "will be won or lost by cities". https://researchgate.net/publication/331383897_Life_Cycle_Insights_for_Creating_Sustainable_Cities
- Walls R., Zweig P. (2017) Towards sustainable slums: understanding fire engineering in informal settlements. In: Bahei-El-Din Y., Hassan M. (eds) *Advanced Technologies for Sustainable Systems. Lecture Notes in Networks and Systems*, vol 4. Springer, Cham 22 October 2016, Online ISBN-978-3-319-48725-0 DOI-https://doi.org/10.1007/978-3-319-48725-0_10, https://doi.org/10.1007/978-3-319-48725-0_10

- Whitzman, C., Legacy C., Andrew C. (2013). Building Inclusive Cities: Women's Safety and the Right to the City. United Kingdom: Routledge. 2013 ISBN - 0415628156, 9780415628150, pages-216
https://www.google.co.in/search?tbo=p&tbm=bks&q=bibliogroup:%22Online+access+with+subscription:+Proquest+Ebook+Central%22&source=gbs_metadata_r&cad=7
- Winter, E., & O'Raw, P. (2010). Literature review of the principles and practices relating to inclusive education for children with special educational needs. National Council for Special Education. Trim, Northern Ireland. https://ncse.ie/wp-content/uploads/2014/10/NCSE_Inclusion.pdf
- World Bank (2016): India Vulnerability of Kolkata Metropolitan Area to Increased Precipitation in a Changing Climate, Report No. 53282-IN, pp 10.
<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/160411468269379264/india-vulnerability-of-kolkata-metropolitan-area-to-increased-precipitation-in-a-changing-climate>.

Chapter 3: Evolution of Inclusive Slum Planning in Kolkata: A Historical Perspective

Kolkata's history as a metropolis that includes slum planning is closely connected to its socio-economic progress and initiatives for urban development. Around its colonial history, Kolkata has faced the challenges of poverty and the proliferation of informal settlements, forming several slum communities around the city. Nevertheless, after gaining independence deliberate and organized actions were initiated to promote inclusive planning for slums. Diverse governmental and non-governmental organizations have launched initiatives to enhance the living conditions of individuals residing in slums, by granting them access to fundamental amenities, healthcare, and education. In recent years, Kolkata has observed novel strategies for reconstructing slums, focusing on promoting community involvement and empowerment. Presently, the city serves as evidence of continuous efforts to establish inclusive urban areas, where residents of slums are not excluded but are essential to the city's structure, adding to its variety and ability to recover.

3.1 Genesis of Slum in Kolkata

Calcutta, presently renamed as Kolkata (after,2001), has experienced substantial changes since August 24, 1686, under the context of the British Raj (Chaudhuri S.,1990). During this particular moment, Job Charnak initially made a declaration on his position as the founder of Calcutta, a statement that was later disputed (India Today, Aug 24, 2018). The initiation of a comprehensive expedition for Calcutta followed.

The primary motivation for individuals to establish residency in this region was predominantly driven by the prospect of engaging in riverfront commercial activities. During the era of British colonial rule known as the British Raj, a "white town" emerged as a fast-developing settlement mostly focused on trade (Lubell H. et al.,1974). This settlement was predominantly located in the Chowringhee and Dalhousie Square areas. Simultaneously, individuals hailing from the historical Indian city of "Old Calcutta" commenced the process of establishing settlements in the present-day region recognized as "North Calcutta" or "Old Calcutta" (Figure 3.1). This area was commonly referred to as the "Babu class area" by the inhabitants of that era. The individuals commonly referred to as members of the "Babu" class were individuals belonging to the "Jaminder" caste (A landowner of significant magnitude possessing complete proprietary entitlements) who once had landed estates (Lubell H. et al.,1974). Many of these regions' past inhabitants sustained their livelihoods by engaging in the practices of 'khajna' (Khajna refers to the land revenue tax that is required to be paid by the landowner.) and 'patta' (A land patta is an official document issued by the Government of India that contains comprehensive information about the property owner. Pattas, also known as "Record of Rights," serve as admissible evidence in the event of a disagreement.) during British governance and Jaminder's rule (Bose N.K.,1964). Over time, the practice of Jaminder fell into disuse, and upon India's independence, the Indian government declared these territories as 'Thika' land (Land given by the owner to another person for cultivation on rent for a fixed amount and period). In the year 1850, an important development occurred in the city of Kolkata. This marked the first instance in which the entire city, including a land area of 20 square kilometers and accommodating a population of 229,700 individuals, was partitioned into 18 distinct administrative divisions known as wards (Racine J.'s 1990; Plate 3.a). This division was carried out under the oversight of a magistrate, who assumed responsibility for the management and governance of each ward. The implementation of this measure aimed to enhance the accessibility and management of governmental facilities. The

establishment of this settlement commenced at Bag Bazaar in the northern region, Gorkie Sadan in the southern region, Fort William in the western region adjacent to the Ganga River, and Sealdah station on the eastern boundary (Racine J.'s 1990; Plate 3.a). The historical epoch characterized by colonization is sometimes denoted as the *Period of Colonization* (Figure 3.1).

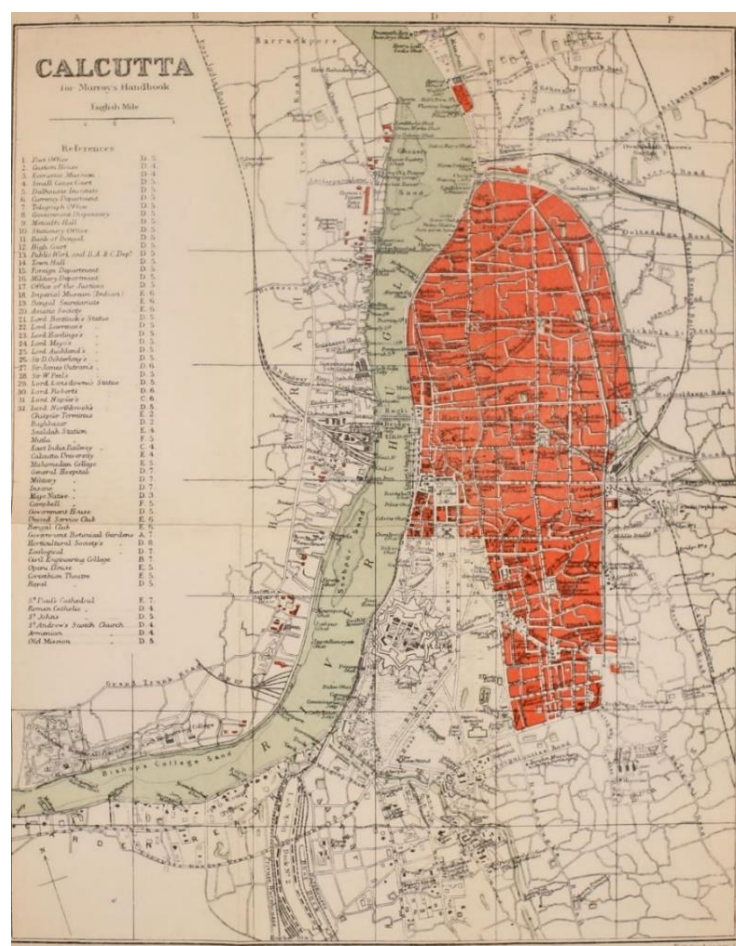


Plate 3.a: Colonial Period Map of Calcutta (Presently Kolkata) with 18 wards, 1850

Source: https://upload.wikimedia.org/wikipedia/commons/a/ac/1911_Map_of_Kolkata_West_Bengal_India.jpg

During the mid-19th century, Kolkata experienced the influence of industrial advancements, leading to the emergence of a distinct demographic group that settled in Calcutta and its surrounding colonized region. This population was mostly associated with the jute, textile, and chemical sectors. Koolootola, Mechuabazar, Burra Bazar, and Bow Bazar constituted the primary commercial centers and residential neighborhoods of Kolkata at that period. In contrast, Beniapur, Ballygunge, Alipore, and Theatre Road zones represented the city's less densely inhabited regions, which were seeing industrial

growth (Bose N.K.,1964). Commencing in the mid-1850s and persisting into the 1900s, there was an incremental and consistent increase in the urban population. In the year 1901, the population of the city had reached a record-breaking figure of 847,796 individuals. To enhance administrative effectiveness, the city's land area of 53 square kilometers was divided into 25 wards (Bose N.K.,1964; Plate 3.b). The aforementioned wards extended from Bag Bazaar located in the northern part of the city to Khiddirpore situated in the southern region, encompassing Armenian Street. During this period, a significant number of marginalized workers and laborers resided in makeshift dwellings commonly referred to as slums. Currently encompassing portions of boroughs 7, 8, and 9, these areas continued to be recognized as government-owned land or inhabited by the Bustee population, as designated by the KMC (Figure 3.1). The subsequent industrialization phase is commonly known as the *Industrial Settlement Period* (Figure 3.1).

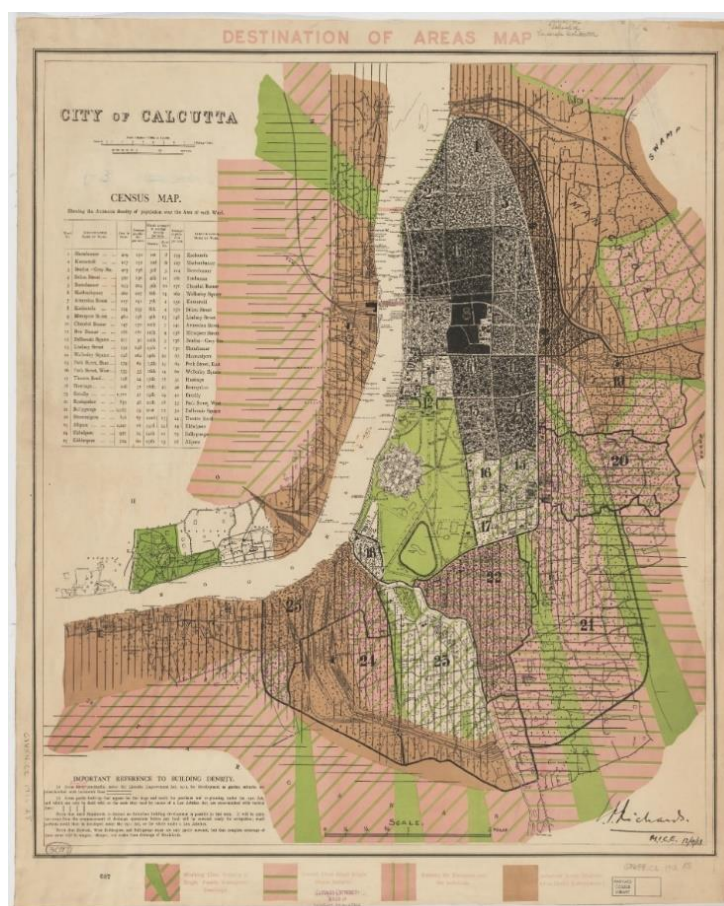


Plate 3.b: Industrial Period Map of Calcutta (Presently Kolkata) with 25 wards,1913
Source: Harvard University School of Architecture (Destination of Areas Map), <https://curiosity.lib.harvard.edu/scanned-maps/catalog/44-990114901360203941>

Following the partition of India in 1947, which included the division of Bengal, a significant influx of refugees from Bangladesh occurred, resulting in their hasty settlement

in an unplanned manner. These settlements were predominantly concentrated in the vicinity of industrial regions, with certain locations experiencing overlapping settlement patterns. This event transpired during the partition of India, which encompassed the region of Bengal, including East Bengal. A significant portion of the populace had started to assemble in a region commonly referred to as the Bengal "Ghetto," encompassing localities such as Bikromgrah, Bijoygrah, Baghajatin, and New Alipore, among others. The Sahapur Colony in New Alipore was originally founded as a sahapur camp, with its initial population comprising an unregistered crowd (Mitra A.,1977). Subsequently, in 1953, the recently established Indian government enacted "Act No. 44 of 1954, Displaced People (Compensation and Rehabilitation) Act, 1954," which granted a 99-year leasehold tenure (contractual ownership) of the land, accompanied with certain governmental benefits (Lubell H. et al,1974). In the year 1953, the city of Kolkata underwent an expansion, resulting in an increased size of 104 square kilometers. As part of this expansion, the city was divided into a total of 80 wards (Lubell H. et al,1974; Plate 3.c.1). Subsequently, in 1971, following the attainment of independence by Bangladesh, the wards underwent a process of renumbering. Due to a burgeoning population and challenging circumstances, the aforementioned 104 square kilometer region was once more partitioned into 100 distinct administrative divisions, known as wards (Lubell H. et al,1974; Plate 3.c.2). The aforementioned action was undertaken for an identical rationale as previously stated, wherein the management of refugees was predicated on property ownership. Tollygunge, Dhakuria, Ballygunge, Beniapukur, Behala, Park Street, Kalighat, Bhawanipur, and Alipore, alongside Park Circus, have autonomously established separate administrative divisions through the process of ward division, so separating from their respective parent regions (Bose N.K.,1964; Figure 3.1). The establishment of this settlement commenced in Cossi Pore, situated in the northern region, and extended towards Jadavpur, situated in the southern region. Subsequently, it proceeded in a westerly direction towards Khiddirpore, situated on the western side, and ultimately in an easterly direction towards Tangra, situated on the eastern side (Bose N.K.,1964). This particular era of settlement is commonly known as either the *Post-Partition or Post-Independence Period* (Figure 3.1).

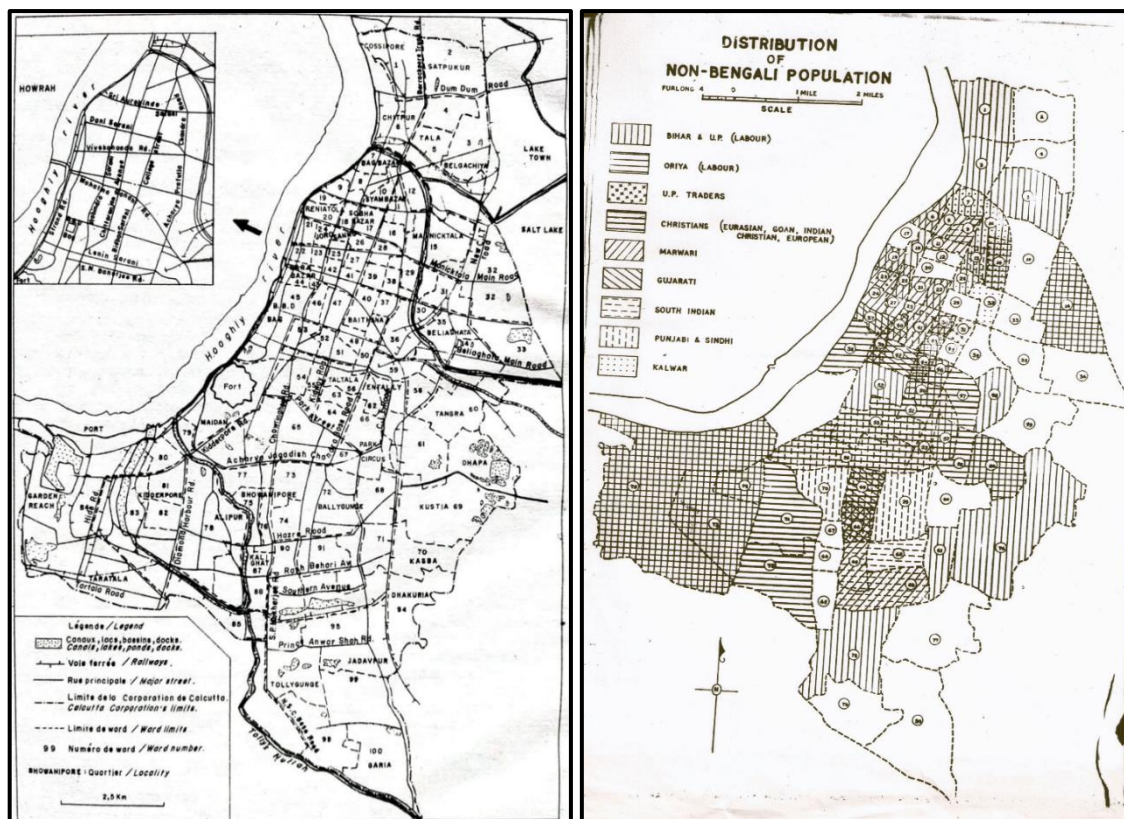


Plate 3.c.1: Post-Partition or Post-Independence Map of Calcutta with 80 wards (Presently Kolkata),1953

Plate 3.c.2: Post-Partition or Post-Independence Map of Calcutta with 100 wards (Presently Kolkata),1971

3.c.1 Source: Bose N.K.,1964 (Calcutta- A Social Survey)

3. c.2 Source: The Metropolitan District and the Urban Agglomeration of Calcutta in 1981

During the period spanning from 1978 to 1979, the administration of the "left front" introduced a notable land reform initiative referred to as "Operation Barga" or "Jomi Jar Langol Tar." (Ghosh S.,1990). During this procedure, the government undertook the expropriation of surplus land from Jaminder and other affluent individuals, redistributing this land to marginalized laborers who had previously engaged in prolonged agricultural labor inside the estates of the wealthy. Subsequently, this parcel of land was officially designated as residential land under the name 'Thika' (*Land given by the owner to another person for cultivation on rent for a fixed amount and period*). The aforementioned process commenced in 1978 and persisted until its culmination in 1981, indicating a rather brief duration (Ghosh S.,1990). A sizable populace characterized by restlessness and economic hardship had enrolled indiscriminately, without regard to caste, culture, or religion. To enhance the efficacy of municipal governance, the Kolkata Municipal Corporation (KMC) implemented a subdivision of Kolkata into 141 wards and 15 boroughs in the year 1981 (Dasgupta B. et al.,1991; Plate-3. d). The expansion of Kolkata's total area to 187 square

kilometers was facilitated by the inclusion of a portion of Borough 7, along with the complete incorporation of Boroughs 11, 12, 13, 14, and 15. The recently developed expansion of Kolkata, known as Cossipore, spans from Thakurpukur and Akra in the western region to the Basanti highway in the eastern region (Dasgupta B. et al.,1991; Plate 3.d). The commencement of the event took place in the northern region, while its conclusion occurred in the southern region. The purpose of this extension was to cater to individuals with urban conveniences and integrate them into the city zone, as well as to oversee individuals through municipal administration. This historical era is commonly referred to as the *Land Reform Period* (Figure 3.1).

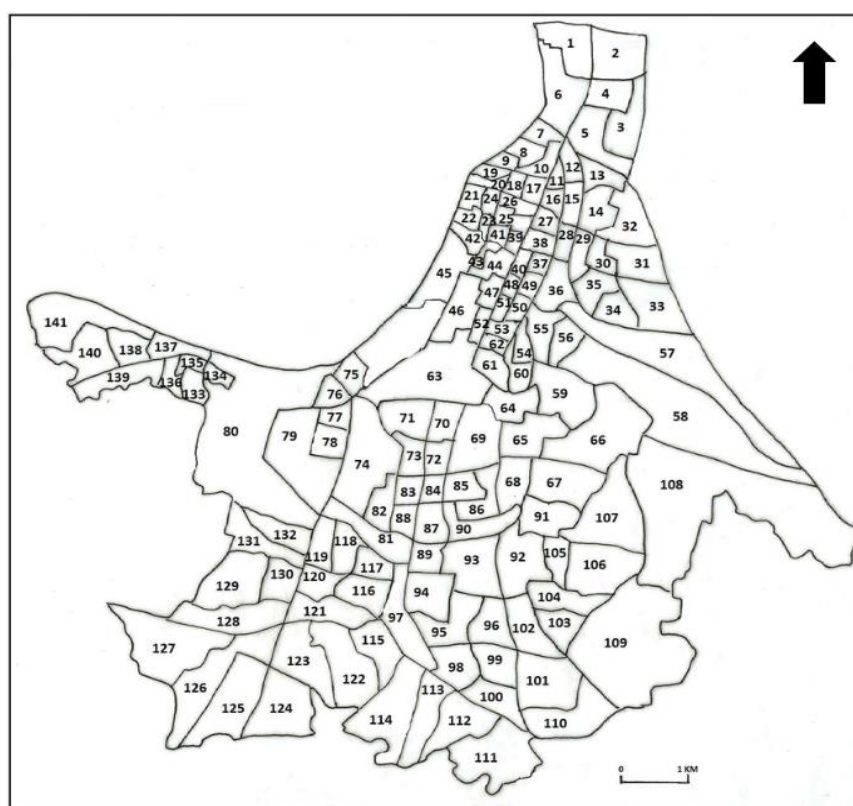


Plate 3. d: Post Land Reform Period Kolkata with 141 wards, 1981

Source: Kolkata Municipal Corporation and Its Wards - Census of India 2001

The duration of the land reform period was extended for an additional 34 years. In 2014, the Chief Minister of West Bengal at that time added a new borough consisting of three new wards (16th borough with 142, 143, and 144 wards), as shown in plate 3.e. This expansion aimed to provide accommodation for a significant influx of immigrant populations seeking employment opportunities. The initial inhabitants of this area began to settle here around the early 1960s. These lands were also classified as 'Thika' land (Land

given by the owner to another person for cultivation on rent for a fixed amount and period), and for a limited duration, the occupants were granted land tenure rights until subsequent legislation was enacted, which did not confer permanent land ownership. However, the current condition of Kolkata in the year 2021 is reflective of this stage. The geographical area under consideration spans from Cossi pore in the northern region to Joka in the southern region, and from Akra in the western region to Basanti highway in the eastern region (Plate 3.e). This particular stage of Kolkata encompasses the aforementioned boundaries, extending from Cossi Pore in the north to Joka in the south. The aggregate land area comprising Kolkata measures 204.5 square kilometers. The current urban configuration of Kolkata can be characterized as a contemporary iteration of the city, commonly referred to as *New Age Kolkata*. (Figure 3.1)

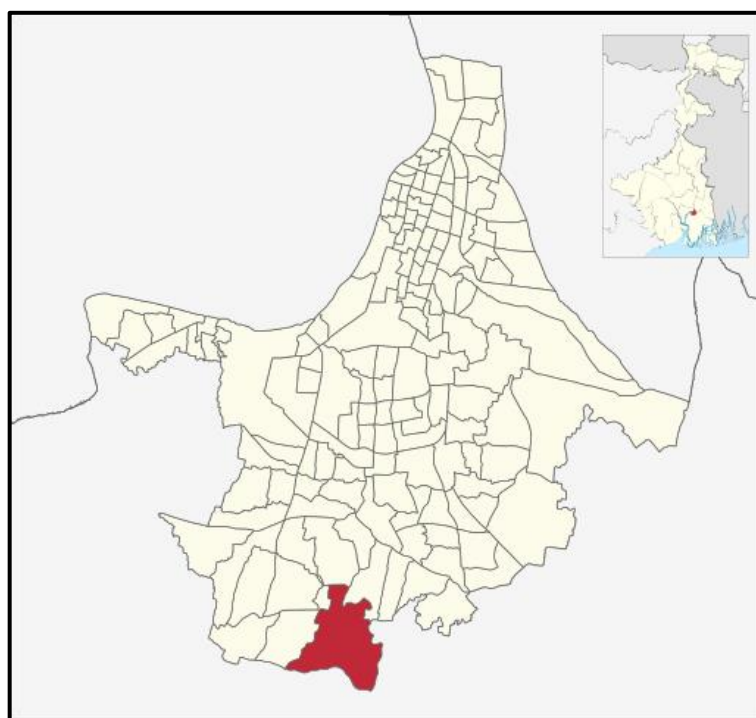


Plate 3. e: Present status of New Age Kolkata with 144 wards,2015

Source: Kolkata Municipal Corporation website,2020

3.2 Early Information on Slum Inclusiveness

Throughout the colonial period to the New Age period, Kolkata has consistently demonstrated its capacity for inclusion by accommodating diverse populations within its boundaries. The initial emergence of the trend can be observed during the colonial era when Kolkata, originally established as a British colony with a relatively small population, began to experience an increase in inhabitants. In response to the growing need for accommodating the rising population, the British government initiated the development of

essential infrastructure such as water sources, street lights, schools, drainage systems, trash bins, and healthcare centers in the city. Following the advent of industrialization, various industries such as jute mills, small iron industries, and tanning industries attracted a significant influx of individuals from areas surrounding Kolkata. Consequently, a spatial constraint emerged as these individuals faced challenges in commuting daily between their workplaces and homes. As a result, they opted to reside near the Kolkata region. However, due to the limited availability of suitable accommodations, they were compelled to settle along roadsides and in makeshift dwellings lacking essential amenities such as toilets, water sources, and drainage systems. The phenomenon resulted in the simultaneous occurrence of congestion and unsanitary conditions within the urban area. The aforementioned period facilitated the inclusive accommodation of individuals, resulting in a simultaneous enhancement of work efficiency in the Kolkata region. Additionally, it expanded its reach by incorporating 25 wards, as previously noted. This administrative division was established to accommodate individuals and offer various amenities. Each ward was overseen by a distinct administrative leader responsible for effectively managing the facilities, ensuring discipline, and preventing mismanagement and corruption. Following the partition of India and East Pakistan in 1947, a significant influx of migrant individuals seeking refuge occurred in Kolkata and various locations within West Bengal. Due to the pre-existing population density in Kolkata, these refugees established temporary settlements in the vicinity of industrial zones. During that particular period, there was a lack of essential amenities such as sanitary infrastructure, educational institutions, drainage systems, adequate healthcare services, economic opportunities, access to electricity, housing provisions, and various other necessities. The aforementioned factors resulted in a state of total congestion and heightened activity in all sectors of the city. To address the disorganized circumstances faced by the residents, the municipal government expanded the provision of public facilities by enlarging the geographical boundaries to encompass 80 more wards. Furthermore, they incorporated these residents into the city region by granting them access to leased land. At this juncture, the administration continued to grapple with the formidable issues posed by population pressure.

To enhance operational efficiency, the authority strategically divided the jurisdiction into 100 wards. During this temporal progression, a significant influx of migrant individuals continued to occur. Consequently, Kolkata emerged as a prominent economic center, attracting a substantial number of people from Odisha, Bihar, and Jharkhand who sought economic opportunities. As a result, the city experienced a persistent increase in population

density. These efforts have significantly contributed to the successful integration of these populations by expanding the city's infrastructure and services. As a result, these individuals and the extended areas are being incorporated into the city by establishing 141 wards. After the year 2014, Kolkata saw 34 years during which it underwent an expansion to accommodate a larger population and provide urban facilities. This expansion resulted in the city being divided into 144 wards, a configuration that remains unchanged to this day. It may be said that Kolkata made efforts to incorporate its residents mainly the poor into the city, and this endeavor is depicted in Table 3.1 and Figure 3.1 also the zone and ward-wise slum density has been shown in Figure 3.2

Table 3.1: Socio-Temporal Extension of Kolkata (KMC Region) since from Colonial Period to New-Age Kolkata.

<i>Name of the Period</i>	<i>Year of Genesis</i>	<i>Area in Square kilometers</i>	<i>Total Population</i>	<i>Number of Wards</i>
Colonized Period	1850	20	229700	18
Industrial Period	1901	53	847,796	25
The Post-partition or Post-independence Period	1953 and 1971	104	4,966,000 and 7,488,000	80 and 100
Post land reform Period	1981	187	9,289,000	141
Present or New Age Kolkata	2014	204.5	14,338,000	144

Source- Prepared by the Researcher

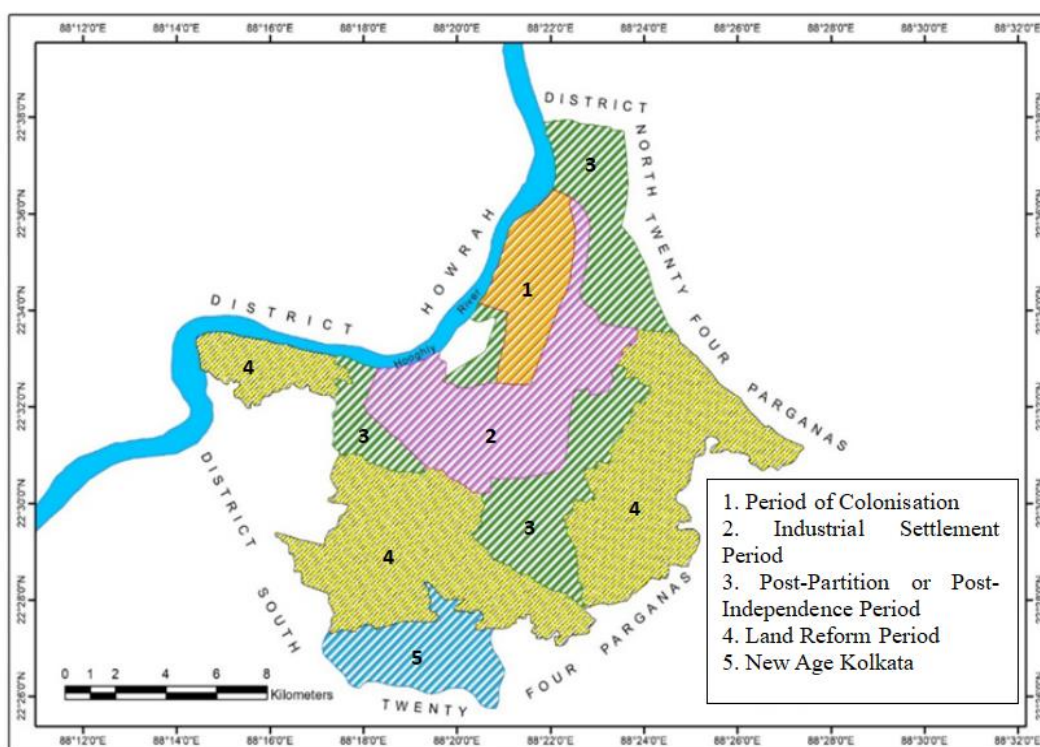


Figure 3.1: Socio-Temporal Extension of Kolkata (KMC Region) since from Colonial Period to New-Age Kolkata.

Source- Prepared by the Researcher

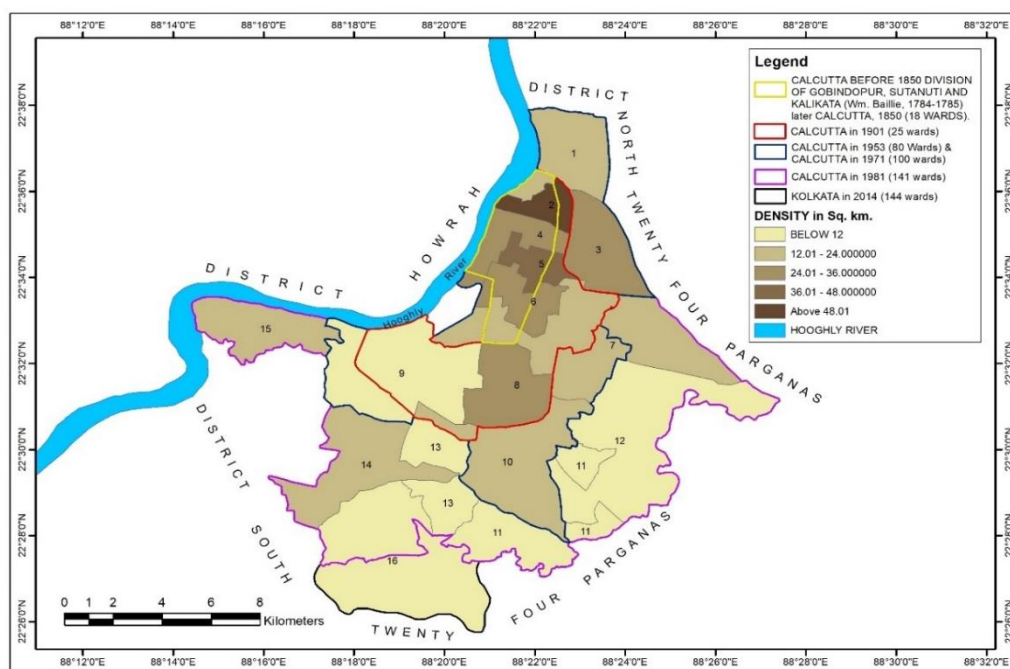


Figure 3.2: Ward and Zonation wise Slum Density of Kolkata (2022)

Source- Kolkata Slum Development Authority (2022)

3.3 The Phrases of Slum Inclusiveness Policies in Kolkata

Kolkata has witnessed the proliferation of numerous slums from the colonial era to the present. The coexistence of slums and the Posh City community presents numerous physical and psychological obstacles. The concept of slums is well rooted in history and has long been a subject of study and analysis. In the city of Kolkata, an estimated population of over 5 million individuals resides in impoverished settlements, commonly called bustees, characterized by substandard living conditions (Chakrabarti, A.,2021). Additionally, an additional quarter million individuals are found to be living directly on the streets, further exacerbating the issue of urban poverty within the region. The influx of immigrants after the Partition in 1947 and the Bangladesh War in 1971 further intensified the housing predicament in Kolkata (Bose, N.K,1964). The marshy terrain facilitated the construction of huts and the division of living spaces, resulting in the accommodation of several individuals into apartments resembling a densely populated bus, thus giving origin to the term "bustee" (Chattopadhyay H.,1990). In the vicinity of an inactive body of water, 600 individuals resided in rudimentary dwellings constructed from thatched materials within impoverished urban areas. The most impoverished urban areas are characterized by extensive accumulations of refuse and sporadic instances of deceased individuals, both of which are often cleared by laborers who conduct numerous rounds for this purpose (Chattopadhyay H.,1990).

Upon the Communists' assumption of power in Kolkata in 1977, there was a certain degree of support provided to the destitute population, albeit limited in scope (Bagchi A.1987). The municipal administration of Kolkata initiated a comprehensive urban sanitation campaign in the early 1990s intending to foster an environment conducive to attracting foreign direct investment. The shanties underwent destruction, the disposal of waste through incineration took place at power plants, individuals engaging in public spitting and urination faced penalties, and the operation of rickshaws and trucks emitting excessive smoke was outlawed. The government has made notable advancements in urban sanitation through its promotion of citizen engagement in a collective endeavor to improve the cleanliness of streets, enhance road infrastructure, implement waste recycling measures, ensure the purification of drinking water, and construct sanitary facilities (Chattopadhyay H.,1990).

Historically, the demographic composition of the homeless population in Kolkata has predominantly consisted of Bangladeshi immigrants and individuals from rural areas who are grappling with poverty and seeking employment opportunities. A significant influx of male individuals migrated from rural areas to Kolkata in pursuit of employment opportunities, resulting in a gender imbalance where the male population outnumbered the female population by a ratio of three to two within the city. The individuals were employed in various occupations such as factory workers, manual laborers, or rickshaw operators.

A significant number of individuals residing in Kolkata sometimes engage in street activities due to the cramped living conditions prevalent in their residences. These dwellings often consist of rooms comparable in size to an ordinary American bedroom, accommodating as many as 16 individuals who sleep on the floor. A significant portion of the homeless population in Kolkata comprises landless farmers hailing from the rural regions of Bengal. These individuals express a sense of relief upon arriving in Kolkata since it provides them with the prospect of securing a livelihood.

Additionally, a new highway was created connecting the airport to the surrounding areas. In 1966, the Ford Foundation, the World Bank, and the World Health Organization collaborated on a comprehensive strategy to reconstruct Kolkata (Bagchi A.1987). However, because of financial constraints, the implementation of this plan was not feasible. Between the years 1966 and 2022, the slum population in Kolkata experienced a notable growth of one million individuals (Bagchi A.1987). Concurrently, the whole area occupied by slums expanded by around 5.11% in terms of hectares (Table 3.2 and 3.3). Figure 3.3 illustrates the spatial distribution of slums within the KMC ward for the year 1966, while Figure 3.4 provides information on the density of slums across different wards.

The map illustrates four distinct zones that have been delineated based on the varying concentrations of slum areas. Wards 1, 58, 59, and 60 have the highest concentration of inhabited slum areas, spanning over an area of more than 30,000 hectares. Conversely, the western and south-central regions of the KMC demonstrate the lowest slum density, including less than 10,000 hectares. Furthermore, Table 3.2 illustrates the ten boroughs and 100 wards, highlighting the areas with sufficient population density characterized by the presence of slums. In the year 1966, the total land area of KMC (Kolkata Municipal Corporation) was recorded as 10148.69 hectares. Among this, there was a specific portion of land of 1260.45 hectares that was inhabited by slums, as indicated in Table 3.2. This slum-occupied area accounted for approximately 12.42% of the total land area. The diagram presented in Figure 3.3 illustrates the visual representation of the data.

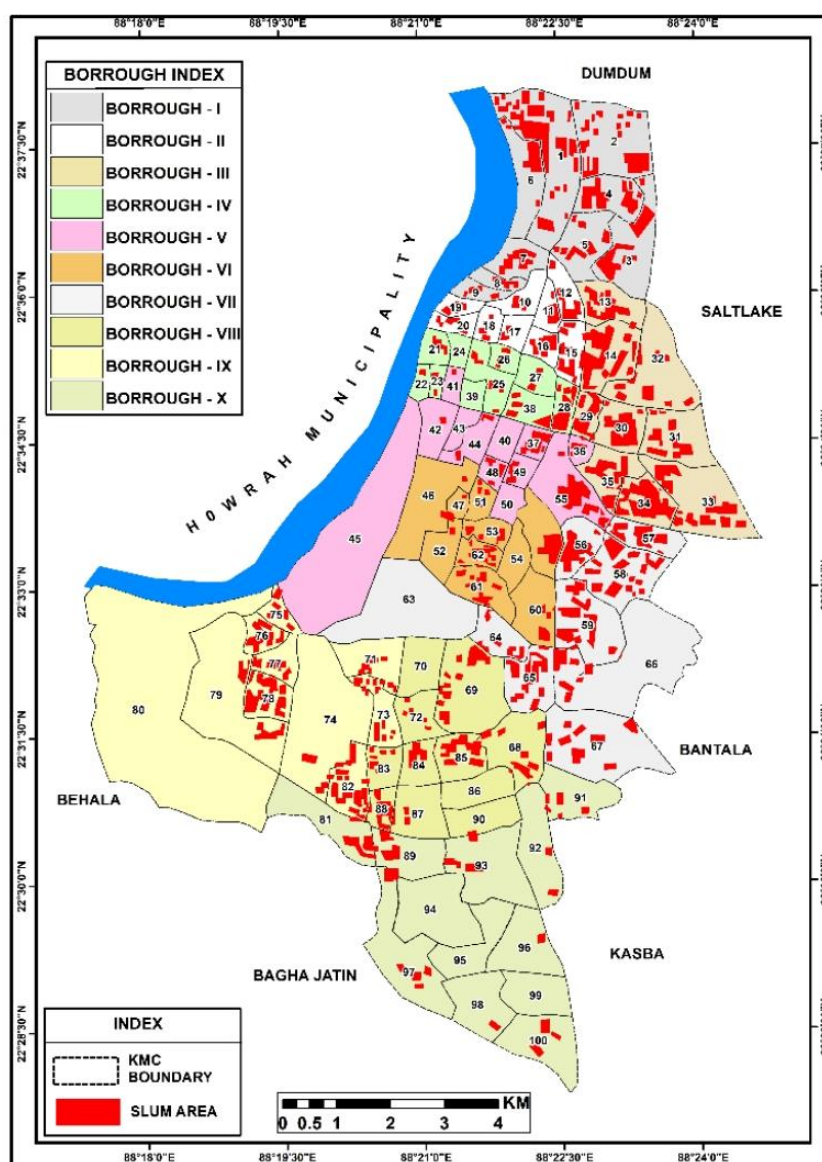


Figure 3.3: Ward-wise Location of Slums (100 wards of the KMC area), 1966

Data Source- Basic Development plan, C.M.P.O,1966

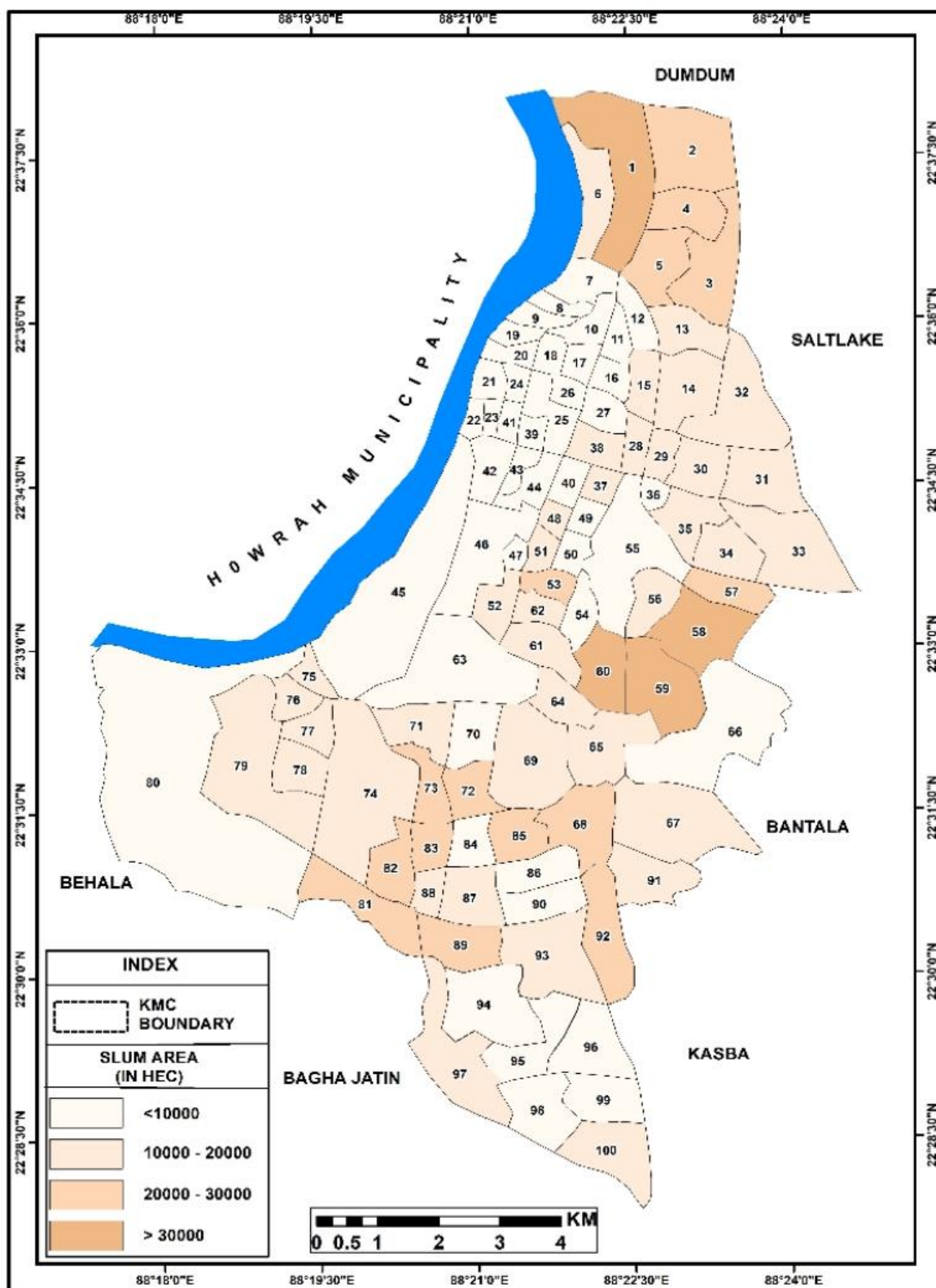


Figure 3.4: Ward wise Density of Slums (100 wards of the KMC area), 1966

Data Source- Basic Development plan, C.M.P.O,1966

Table 3.2: Ward-wise Slum Area Calculation (Hectares),1966

<i>Ward Number</i>	<i>Slum Area (ha)</i>	<i>Ward Number</i>	<i>Slum Area (ha)</i>	<i>Ward Number</i>	<i>Slum Area (ha)</i>	<i>Ward Number</i>	<i>Slum Area (ha)</i>
1	31.22	27	7.21	53	22.36	79	11.85
2	28.12	28	10.2	54	0	80	0
3	21.54	29	11.85	55	5.32	81	23.1
4	22.88	30	15.2	56	16.36	82	29.99
5	21.1	31	14.32	57	29.58	83	25.8
6	18.21	32	12.87	58	33.22	84	8.5
7	5.5	33	16.96	59	31.54	85	20.88
8	8.4	34	18.32	60	33.1	86	0.98
9	8.45	35	15.39	61	13.87	87	10.1
10	8.22	36	7.69	62	19.58	88	18.7
11	9.65	37	12.36	63	0	89	30
12	8.98	38	12.33	64	17.1	90	9.58
13	10.66	39	0	65	16.22	91	17.9
14	11.88	40	0	66	5.69	92	23.8
15	10.58	41	5.39	67	15.22	93	15.2
16	9.23	42	6.25	68	26.55	94	0
17	6.8	43	0	69	16.33	95	0
18	7.5	44	6.98	70	0	96	5.3
19	7.21	45	0	71	16.66	97	15.26
20	6.54	46	7.36	72	21	98	7.69
21	6.22	47	6.58	73	26	99	0
22	5.3	48	12.55	74	18.11	100	8.69
23	6.25	49	9.25	75	13.88	Total Slum Area 1260.45	
24	0	50	0	76	19.77	Total KMC Area 10148.69	
25	9.69	51	15.37	77	10.87	<i>The percentage of the slum area in the total KMC area is 12.42</i>	
26	8.25	52	13	78	12.99		

Data Source- Basic Development plan, C.M.P.O,1966

The escalation of conflict in Bangladesh resulted in a notable surge in immigration from Bangladesh after 1966. As a consequence, a considerable number of individuals sought occupational opportunities in Kolkata, ultimately settling in slum areas due to the exorbitant cost of living and limited housing availability. During 1977-78, a significant land reform initiative was implemented, which entailed a substantial acquisition of property to improve the socioeconomic conditions of the impoverished population. Consequently, numerous individuals took up residence on these estates, assuming the status of Thika colony landholders. By 1981, the city of Kolkata experienced rapid

expansion in its administrative divisions, resulting in the establishment of 141 wards. This growth was facilitated by the inclusion of people from adjacent districts into the authority of the Kolkata Municipal Corporation (KMC).

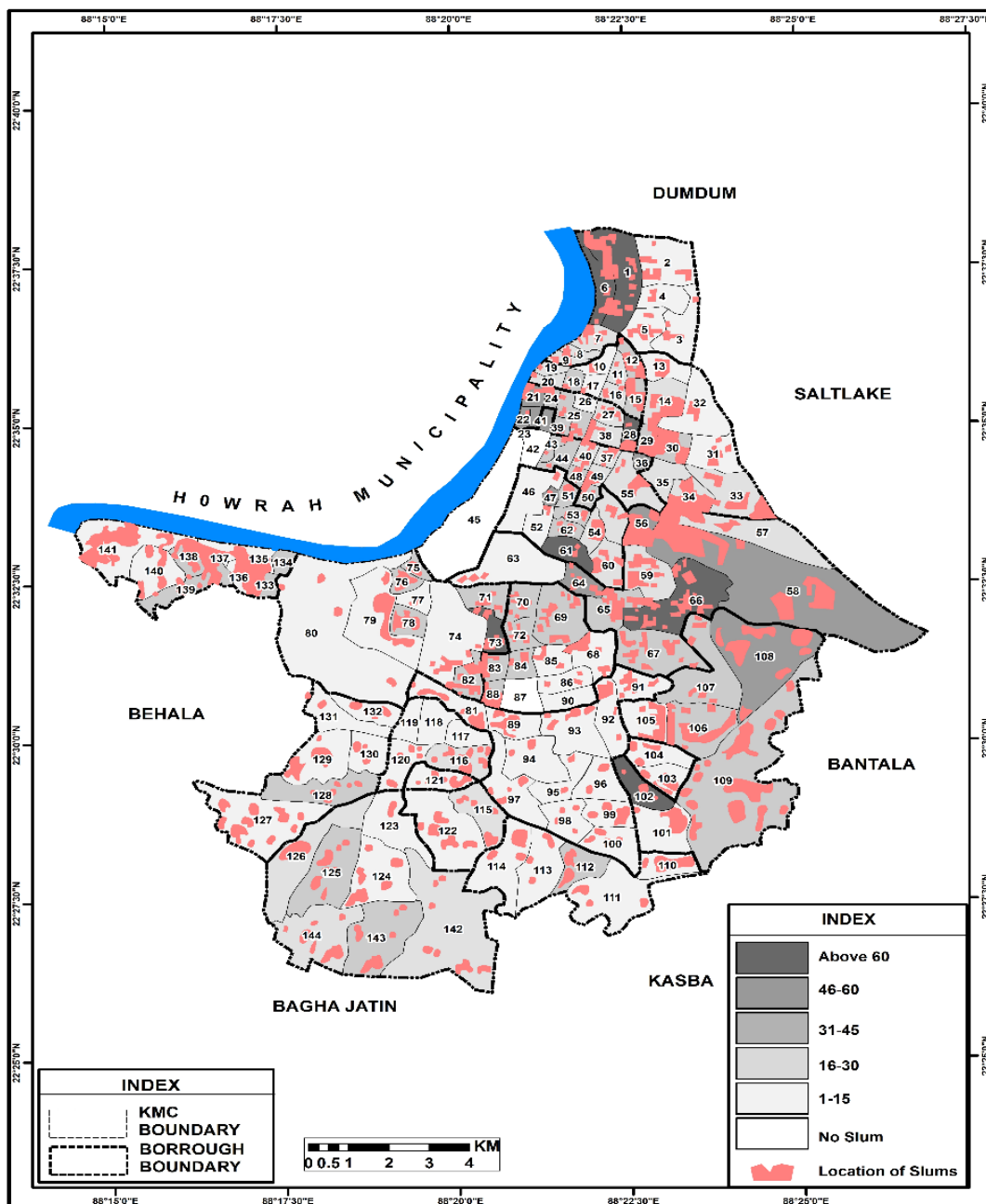


Figure 3.5: Ward-wise Slum Location and Density (144 wards),2018.

Data Source- Basic Development plan, C.M.P.O,2018

Subsequently, the population residing in slums has experienced rapid growth characterized by an exponential increase. Figure 3.5 illustrates the distribution of slums across different wards in the year 2022. The density of slum-occupied areas may be found in Table 3.3.

Table 3.3: Ward-wise Slum Area Calculation (Hectares),2018

Ward Number	Slum Area (ha)	Ward Number	Slum Area (ha)	Ward Number	Slum Area (ha)	Ward Number	Slum Area (ha)
1	28.99	37	12.36	73	20.86	109	185.47
2	29.86	38	16.74	74	26.04	110	37.95
3	13.62	39	3.93	75	10.12	111	35.62
4	6.57	40	16.65	76	19.46	112	24.05
5	24.56	41	1.28	77	4.07	113	15.51
6	28.99	42	0	78	23.74	114	28.59
7	18.29	43	4.5	79	57.86	115	22.21
8	4.85	44	3.6	80	10.26	116	35.39
9	9.68	45	0	81	30.12	117	0
10	3.56	46	3.3	82	32.12	118	0
11	8.56	47	5.58	83	26.32	119	0
12	22.69	48	7.99	84	10.62	120	23.21
13	23.96	49	10.77	85	15.2	121	25.47
14	51.36	50	7.4	86	7.04	122	41.94
15	24.25	51	10.47	87	0	123	7.4
16	7.59	52	3.82	88	22.17	124	43.15
17	2.65	53	9.95	89	27.25	125	34.48
18	4.35	54	19.03	90	0	126	31.42
19	1.64	55	31.69	91	22.52	127	68.6
20	2.32	56	46.85	92	19.19	128	18.55
21	12.54	57	47.98	93	20.08	129	40.05
22	1.28	58	216.77	94	8.59	130	12.52
23	2.33	59	46.96	95	8.59	131	4.24
24	10.08	60	23.99	96	13.54	132	15.96
25	16.42	61	6.04	97	14.85	133	14.25
26	0	62	10.08	98	9.85	134	0
27	9.2	63	9.5	99	28.55	135	29.69
28	12.56	64	12.98	100	14.52	136	30.25
29	23.11	65	43.25	101	34.52	137	28.95
30	49.08	66	71.54	102	10.98	138	36.52
31	15.34	67	47.03	103	26.59	139	39.98
32	14.51	68	28.79	104	39.98	140	52.32
33	54.86	69	33.96	105	40.08	141	85.45
34	60.42	70	14.48	106	80.31	142	35.02
35	0	71	12.87	107	16.55	143	32.05
36	0	72	12.64	108	93.36	144	34.04
Total Slum Area 3471.04	Total KMC Area 19801.25			The percentage of the slum area in the total KMC area is 17.53			

Data Source- Basic Development plan, C.M.P.O,2018

3.4 Inclusive Slum Planning Measures: India

Two national projects, namely the Valmiki Ambedkar Awaaz Yojana (VAMBAY) and the National Slum Dwellers Programme (NSDP), primarily focus on urban areas and are implemented in partnership with the respective state governments. The Indira Awaas Yojana, the third national initiative, is a government program to provide housing in slum areas. The Valmiki Ambedkar Awaas Yojana (VAMBAY), initiated in 2001, primarily emphasizes housing provisions for the urban underprivileged (Kumar P.,2011). Within the Nirmal Bharat Abhiyan (NBA) program, a portion of the overall allocation, specifically 20%, is designated for the development of community sanitation facilities (John P.,2019). In contrast, the National Slum Development Programme (NSDP), introduced in 1996, offers financial resources for the enhancement of physical and community infrastructure, alongside the improvement of housing conditions. The utilization of community structures established under the Urban Basic Services for Poor (UBSP) and subsequently under the Swarna Jayanti Shahari Rozgar Yojana (SJSRY), as well as the Indira Awaas Yojana (IAY), which was initially introduced in 1985 as a sub-scheme of Jawahar Rozgar Yojana (JRY) before transitioning into an independent scheme in 1996, is employed. The program provides comprehensive financial assistance to those residing in slum areas who are economically disadvantaged, specifically to construct residential dwellings (Askari & Gupta, 2016). This comprehensive literature review examines the topic of slum planning, highlighting that Kolkata, Mumbai (Sheth et al., 2009), Delhi (Chalana & Rishi, 2015), and other highly populated cities characterized by dense slum settlements share comparable strategies for relocation and reintegration. The strategies used thus far have demonstrated a certain degree of effectiveness, primarily targeting fundamental utilities (Vaid & Evans, 2017), health-related issues (Askari & Gupta, 2016), and the involvement of women in daily activities.

In addition, there are other policies about the redevelopment and relocation of urban slums in India. Over multiple decades, there have been notable transformations in both societal perspectives towards slums and the objectives pursued by different projects. The demolition of slums was a prevalent practice in the early stages, as it was perceived that they posed obstacles to the broader objectives of urban development (Edwin T.,2019).

However, it is important to note that slums have gradually gained recognition as residential areas primarily inhabited by individuals facing economic disadvantages within urban settings. Consequently, many policies have been formulated to improve and ensure the provision of fundamental amenities to establish habitable conditions within slum areas for

their inhabitants. The objective of the Pradhan Mantri Awas Yojana (PMAY), initiated in 2015 and subsequently renamed the Rajiv Awas Yojana (RAY), is to eliminate the presence of slums within the Indian subcontinent by the year 2022 (Barot, P,2022). The objective of the approach is to enhance the affordability and availability of housing for those residing in metropolitan regions who come from economically disadvantaged families. The original proposal entailed the development of over one billion residences to accommodate low-income households. However, subsequent analysis revealed substantial disparities in housing demand across different states, leading to a revision of the goal number to one billion dwellings. Initially, the program was established to facilitate the provision of cost-effective housing options to individuals belonging to low-income groups (LIG) and the Economically Weaker Section (EWS). Nevertheless, in the year 2017, the program underwent modifications to encompass middle-income groups (MIG) alongside the previously included low-income groups (LIG) and economically weaker sections (EWS). The program encompasses various components, namely slum rehabilitation, affordable housing facilitated by credit-related subsidy, affordable housing in partnership, and subsidy for beneficiary-led housing. The grantees have the option to utilize each of the aforementioned parts of the program (Davis, K.,2020).

The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was a notable endeavor to promote urban transformations and address infrastructure needs. The objective of this initiative was to actively engage the community in these procedures. The segment of the plan that focused on the provision of fundamental services to the urban underprivileged aimed to address the concerns faced by residents living in slums. The two sub-missions assigned to the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) were the Basic Services for Urban Poor (BSUP) and the Integrated Housing and Slum Development Programme (IHSDP). The primary objective of the preceding project was to facilitate the integration of slum areas by implementing a range of programs to provide homes, vital services, and various municipal amenities. Each of these submissions addressed concerns about the accessibility of affordable water and sanitation services, as well as the provision of secure sleeping accommodations. Nevertheless, the JNNURM study failed to address the relocation of slum residents to improved housing units, despite its focus on the living conditions of these individuals (Housing and Land Rights Network program Report,2014).

The implementation of the Rajiv Awas Yojana (RAY), which is the route undertaken by the federal government, occurred in two distinct phases. Nevertheless, the implementation

of the Rajiv Awas Yojana (RAY) resulted in the reversal of all the gains that had been achieved under JNNURM. The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) successfully tackled issues related to housing, essential services, and various civic facilities. In contrast, the Rajiv Awas Yojana (RAY) failed to incorporate these concerns, and the implementation of its requirements remained insufficient. The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) effectively tackled these challenges (Singh P. et al.2014).

RAY proposed a strategy centered on the implementation of rehabilitation and upgrading activities within the current slum areas as the preferable approach for instigating change. The relocation of slum people was also regarded as a fundamental component of slum redevelopment. To achieve this objective, a variety of intervention strategies were employed, including the provision of newly constructed housing, the implementation of incremental housing initiatives, and the establishment of rental housing options. Consequently, RAY provided an extensive analysis of the procedures involved in the resettlement of individuals residing in impoverished urban areas. The Prime Minister's Afforestation and Home Scheme (PMAY) maintains its focus on offering subsidies and improving home development, which implies a prioritization of relocation efforts. Nevertheless, it is evident that this approach fails to adequately address the facets of the enhancement of sanitation and living conditions within the preexisting slum areas (Piel G.,2014)

The previously listed programs faced criticism due to the substandard condition of the housing units that were constructed. The transfer of slum residents was rendered ineffective as the quality of the homes provided was far worse than that of the slum dwellings. A significant proportion of these residences lacked sanitary amenities and failed to meet the requirements for fundamental infrastructure (Singh S. et Al.,2013).

Policy documents at the state level, such as the Delhi Slum and JJ Rehabilitation Policy 2015, have committed to ensuring the previous rehabilitation of slum people before the demolition of any slums situated within the state of Delhi (Delhi Urban Shelter Improvement Board Report,2016). Slum demolition is a prevalent aspect of numerous development initiatives implemented by the Delhi State government, to facilitate urban progress alongside slum rehabilitation efforts. Nevertheless, the inadequate execution and insufficient availability of suitable housing units persistently result in the homelessness of a significant proportion of individuals residing in slums. The inclusion of slum removal is a characteristic observed in numerous development initiatives. The Karnataka Affordable

Housing Policy of 2016 was designed to enhance the living standards of individuals belonging to the low-income group by ensuring the availability of affordable housing options for all (Kolappan B.,2016). This policy emphasizes the potential role of private developers in facilitating the provision of affordable housing through the construction and redevelopment of structures (Masta et. al., 2013). The policy was formulated to enhance the quality of life for those belonging to the low-income demographic. The achievement of this objective has been realized due to the government's implementation of incentives for private entities.

3.5 Inclusive Slum Planning Measures: Kolkata

Kolkata, the capital city of West Bengal, is considered to be among the ten largest urban agglomerations globally, as reported by Sengupta U. (2013). It is noteworthy that around one-third of the current population of Kolkata resides in slum areas. The rehabilitation of canal bank slums in Kolkata was undertaken as part of the Kolkata Environmental Improvement Project (KEIP), which received support from various stakeholders including the Asian Development Bank (ADB), the Government of West Bengal (GWB), and the Kolkata Municipal Corporation (KMC) and Kolkata Metropolitan Development Authority (KMDA) (Askari & Gupta, 2016). According to the West Bengal Slum Areas (Improvement and Clearance) Act of 1972, it is stipulated that the construction of new huts or structures, as well as significant modifications or alterations to existing huts or structures, within slum areas, is prohibited without prior written permission from the designated authority. This permission must be obtained by the prescribed procedures and is subject to any general or specific conditions imposed by the designated authority. According to Bardhan et al. (2015), the city of Kolkata is home to a total of 2011 registered slums and an additional 3,500 unregistered slums. These slums are distributed among 16 Boroughs and 144 Wards. According to the World Bank (2011), India has implemented several notable initiatives aimed at rehabilitating and eradicating slums, encompassing three federal schemes and two state-level undertakings. The majority of slums in Kolkata and its surrounding areas were predominantly dependent on the initial two initiatives, namely the Valmiki Ambedkar Awas Yojana (VAMBAY) and the National Slum Development Programme (NSDP) until they transitioned to the Basic Services for Urban Poor (BSUP) and Banglar Bari programs after the year 2017 (The Economic Times, May 06, 2017).

References

- Amaresh Bagchi (1987), Planning for Metropolitan Development: Calcutta's Basic Development Plan, 1966-86: A Post-Mortem, *Economic and Political Weekly*, Vol. 22, No. 14 (Apr. 4, 1987), pp. 597-601, <https://www.jstor.org/stable/4376875>
- Ashok Mitra, (1977) 'Calcutta Diary' Paranjay Guha Thakurta publisher; First Edition 1977, Revised ed. edition (30 September 2014) ISBN-10: -ISBN ,9384439223 13: -978 .pp-56 ,9384439224 <https://www.abebooks.com/9780714630823/Calcutta-Diary-Mitra-Ashok-0714630829/plp>
- Askari, M. H., & Gupta, K. (2016). Changes in socioeconomic and health condition of rehabilitated slum dwellers in Kolkata, West Bengal. *International Journal of Human Capital in Urban Management*, nt. J. Hum. Capital Urban Manage., 1(2): 117-122, Spring 2016 DOI: 10.22034/ijhcum.2016.01.02.005
- Bardhan, R., Sarkar, S., Jana, A., & Velaga, N. R. (2015). Mumbai slums since independence: Evaluating the policy outcomes. *Habitat International*, 50, 1-11. Received 8 May 2015, Revised 24 June 2015, Accepted 16 July 2015, Available online 24 July 2015, Version of Record 24 July 2015. <https://doi.org/10.1016/j.habitatint.2015.07.009>.
- Barot, P. Pradhan Mantri Awas Yojana (PMAY) Scheme-an Emerging Prospect of Affordable Housing in India. Pradhan Mantri Awas Yojana (Urban)- PMAY (U) The Challenge of Relocating Urban Slums: The Impact of Program,2022.
- Biplab Dasgupta (1991), *European Trade and Colonial Conquest: Volume 1 and II*, Anthem South Asian Studies Publishers; Republishing edition-2005 pp-104 and 256-259, ISBN-10: : ISBN-13 ,1843310295 1843310297-978 https://books.google.co.in/books/about/European_Trade_and_Colonial_Conquest.html?id=YRRnRK81EYEC&redir_esc=y
- Bose, N.K Calcutta: 1964- a social survey review by: Nitish R. De, printed in India by s. R. Krishnan at Inland Printers, Victoria Mills Building, Gamdevi Road, Bombay - 7, and published by s. P. Lalvani, Lalvani Publishing House, 210 Dr. D. N. Road, Bombay 1, published in 1965 <https://www.jstor.org/stable/27760884>
- Chakrabarti, A., Tiwari, R., & Banerji, H. (2021). Migrants' Narratives on Urban Governance: A Case from Kolkata, a City of the Global South. *Sustainability*, 22 December 2020 / Revised: 8 January 2021 / Accepted: 11 January 2021 / Published: 19 January 2021 Article Number -13 Volume Number-2, page- 1009. <https://doi.org/10.3390/su13021009>.

- Chalana, M., & Rishi, S. (2015). *Twilight in Delhi: The failure of slum rehabilitation programs in creating a healthier city. Transforming Distressed Global Communities: Making Inclusive, Safe, Resilient and Sustainable Cities*, 245–264. Edition 1st Edition First Published 2015, Routledge, Pages 20, eBook ISBN 9781315550121.
- Chaudhuri S. 1990 *Calcutta: The Living City Vol I The past and Vol II: The present and future*, ISBN- 13: 978-0-19-563696-3 and ISBN-13:978-0-19-563697-0
- Davis, K. (2020). “The Urbanization of the Human Population”: Scientific American (1965). In *The City Reader* (pp. 19-30). Routledge. 7th edition eBook ISBN 9780429261732
- Delhi Urban Shelter Improvement Board Report, 2016, Govt. of NCT of Delhi, Delhi Slum & JJ Rehabilitation and Relocation Policy, 2015 <https://delhishelterboard.in/main/wp-content/uploads/2012/01/Policy-2015.pdf>
- Edwin T. (2019), *Migrants seem to prefer neighboring States for livelihood*, The Hindu Business line, Retrieved from: www.thehindubusinessline.com.
- Haraprasad Chattopadhyay, K.P. Bagchi & Company, 1990 *Marsh to Township East of Calcutta*, 1990). pp-127
- Calcutta (India) <https://doi.org/10.1016/j.jum.2018.03.002>. <https://www.sciencedirect.com/science/article/pii/S2226585617301279>
- Housing And Land Rights Network (2014), *Forced to the Fringes: Disasters of ‘Resettlement’ in India. Report Three. Vashi Naka, Mumbai*, Housing and Land Rights Network, New Delhi. India- Urban Slums Survey, July 2008-June 2009, NSS 65th Round, National Data Archive Office of the Registrar General & Census Commissioner India Today Web Desk, New Delhi, Updated: Aug 24, 2018 14:14 IST.
- Jean Racine (1990), *Calcutta 1981, The city, its crisis, and the debate on urban planning and development, Metropolitan District and the Urban Agglomeration of Calcutta in 1981*, Institute Français de Pondichéry, Concept Publishing New Delhi, 9791036549779, DOI: 10.4000/books.ifp.5143, PP-321
<http://books.openedition.org/ifp/docannexe/image/5416/img-1.jpg>
- John P. (2019), *In 10 years, 79% rise in migration to Gujarat’s urban areas*, The Times of India, Retrieved from: www.timesofindia.indiatimes.com.
- Kolappan B. (2016), *What drives urbanization in Tamil Nadu and Karnataka*, The Hindu, Retrieved from: www.thehindu.com.
- Kolkata Municipal Corporation and Its Wards Source: Census of India 2001, Kolkata District

Handbook. Kolkata Metropolitan Development Corporation. (2007). City development plan of Kolkata. Retrieved from http://jnnurm.nic.in/wp-content/uploads/2010/12/Kolkata_CH-I1-17.pdf.

Kumar P. (2011) Slums in India: Results from Census, 2011, Research Article, Praveen Kumar, Assistant Professor, Department of Geography, K.L.P. College, Rewari, Haryana, India, Open Science

Lubell H., 1974. "Urbanisation and employment; insights from a series of case studies of third world metropolitan cities," ILO Working Papers 991598933402676, International Labor Organization. RePEc: ilo:ilowps:991598933402676, http://www.ilo.org/public/libdoc/ilo/1974/74B09_837.pdf

Masta, Dinesh Kumar, Naik, Gopal and Mukherjee, Kanchan, The Challenge of Relocating Urban Slums: The Impact of Program Governance on Its Acceptance (November 1, 2013). IIM Bangalore Research Paper No. 429, Available at SSRN: <https://ssrn.com/abstract=2346785> or <http://dx.doi.org/10.2139/ssrn.2346785>

Old map of Calcutta, West Bengal India, Image from page 200 of "A handbook for travelers in India, Burma, and Ceylon." Publication year: 1911 Title: A handbook for travelers in India, Burma, and Ceylon. Year: 1911 (1910s) Authors: John Murray (Firm) Subjects: India -- Guidebooks Burma -- Guidebooks Sri Lanka -- Guidebooks Publisher: London: J. Murray Calcutta: Thacker, Spink, & Co. Date 29 July 2014, 18:11 https://commons.wikimedia.org/wiki/File:1911_Map_of_Kolkata_West_Bengal_India.jpg
https://upload.wikimedia.org/wikipedia/commons/a/ac/1911_Map_of_Kolkata_West_Bengal_India.jpg

Piel G. (2014), *The Urbanization of Poverty Worldwide*, Challenge 40 (1), 58-68. Planning Commission of India (2014), *Gini Coefficient of Distribution of Rajiv Awas Yojana, Scheme Guidelines, 2013-2022*, Ministry of Housing & Urban Poverty Alleviation, Government of India.

Richards, E. P., (1913), Harvard University School of Architecture (Destination of Areas Map), City planning--India--Kolkata—Maps, Kolkata (India)—Maps, Kolkata (India)--Population—Maps, Shows areas of planned redevelopment and drainage. Includes index, note, legend of class dwellings, and census "map" (i.e., chart). Printed signature: E.P. Richards, M.I.C.E., 12/9/13. Electronic reproduction. Cambridge, Mass.: Harvard Geospatial Library, 2010. Georeferenced image for use in a GIS., Harvard Map Collection digital maps, 990114901360203941 <https://curiosity.lib.harvard.edu/scanned->

[maps/catalog/44-990114901360203941](https://doi.org/10.1068/c1103)

Sengupta, U. (2013). Inclusive Development? A State-Led Land Development Model in New Town, Kolkata. *SAGE: Environment and Planning C: Government and Policy*, January 1, 2013 Volume Number-31, Issue Number-2, Page-357–376.

<https://doi.org/10.1068/c1103>.

Sheth, A.Z., Velaga, N.R. and Price, A.D.F., 2009. Slum rehabilitation in the context of urban sustainability: a case study of Mumbai, India. In: Proceedings of SUE-MoT: 2nd International Conference on Whole Life Urban Sustainability and its Assessment, 22-24th April, Loughborough, UK. <https://dspace.lboro.ac.uk/2134/5818>

Singh P., Singh B. (2014), *Structure and Pattern of Urbanisation in Punjab: A Macro Level Analysis*, Journal of Punjab Studies 21 (1), 69-89.

Singh S., Singh D. (2013), *Urbanism vs Urbanization in Haryana: A Regional Analysis*, International Journal of Environment, Ecology, Family and Urban Studies 3 (5), 11-22.

Siddhartha Ghosh (1990), *Kaler Sahar Kolkata*, Ananda Publishers Pvt. Limited, pp-46 and 89-92. ISBN 8170669529, 9788170669524

https://books.google.co.in/books/about/Kaler_Sahar_Kolkata.html?id=WwpPPgAACAAJ&redir_esc=y

The Economics Times, (2015), May 6th Modified Guidelines for Jawaharlal Nehru National Urban Renewal Mission (Jnnurm) Sub-Mission On Basic Services To The Urban Poor (Bsup) Report, Government Of India, Ministry Of Housing And Urban Poverty alleviation, New Delhi, DVRao, Consultant, UMRG. <http://delhishelterboard.in/main/>.

Vaid, U., & Evans, G. W. (2017). Housing quality and health: An evaluation of slum rehabilitation in India. *Environment and Behavior*, 49(7), 771–790.

<https://doi.org/10.1177/0013916516667975>

World Bank (2011), *Urbanization beyond municipal boundaries: nurturing metropolitan economies and connecting peri-urban areas in India*, The World Bank, Washington.

Chapter 4: Inclusivity among Slums developed over Different Periods in Kolkata Covering five Zones

The spatial-temporal development of Kolkata delineates the city's transformation from its colonial inception in 1686 to its present condition in 2022. This expansion is divided into five distinct periods: Colonial, Industrial, Post-Independence, Land-Reform, and New Age. The study examines Kolkata's development, focusing on issues like overpopulation and insufficient infrastructure, especially in the aftermath of the split. Various urban planning initiatives were executed, encompassing housing, health, education, and connectivity, to address population expansion. The city's evolution, shaped by migration and socio-economic variables, demonstrates continuous efforts to equilibrate population density, infrastructure, and inclusion. Significant theoretical frameworks and publications have influenced Kolkata's urban planning methodology.

4.1 Introduction

The Spatial-Temporal expansion of Kolkata refers to its extension from the colonial time of Job Charnock in 1686 to the present day. Kolkata has undergone multiple divisions throughout numerous years due to various reasons, as previously stated in Chapter 3. This areal expansion encompasses five distinct periods: a) the Colonial Period Zone, b) the Industrial Period Zone, c) the Post-Independence or Partition Period Zone, d) the Land-Reform Period Zone, and e) the New Age Period Zone. The expansion of Kolkata has been the subject of multiple predictions. Since its inception, there has been a proliferation of scientific and government publications about this planning endeavor. The study focuses on West Bengal's strategy to restore stability following the division of the Calcutta Metropolitan District's Basic Development Plan spanning from 1966 to 1986. Calcutta served as India's largest metropolis before the emergence of Mumbai and Delhi. Chennai (formerly known as Madras), Ahmedabad, Bangalore, Hyderabad, and Pune were relatively small urban centers. In response to a projected increase in population in 1961, various programs were implemented to address the issue of post-separation overcrowding. These activities encompassed housing, health, education, and connectivity, to mitigate the anticipated rise in population density. According to Haraprasad Chattopadhyay, "From Marsh to Township East of Calcutta" in 1990, there were plans to transform the East Calcutta Salt Lake into a residential development. During the 1990s, a significant influx of individuals migrated to Calcutta in search of employment opportunities due to the partition, hence necessitating careful consideration of urban planning strategies for the city's interior. In 1990, Chaudhuri S. introduced a theoretical framework known as the "internal city concept," which involves dividing urban areas into distinct functioning zones to provide residents with suitable housing options and promote a conducive environment for healthy living. In "Calcutta (1965)", Sam S. investigates the urban environment of Kolkata. The financial condition of the city had significant challenges during the decades of the 1960s and 1970s. Lubell et al. (1974) provided a concise analysis of Calcutta's strategy and its prospective significance in terms of its capacity to emerge as a financial hub. The authors also explored the potential economic benefits that would accompany the city's growth, particularly Calcutta's urban development and employment prospects. The absence of urban planning resulted in the development of wetland conversion, residential zone planning, CBD design, and the establishment of highways and trains connecting the CBD to other regions. In Racine J.'s (1990) publication titled "Calcutta 1981, The City Its

Crisis and Debate: An Urban Planning and Development," an analysis was conducted on the social and urban infrastructure of the city. In his seminal work published in 1965, Nirmal Kumar Bose conducts a comprehensive sociological and morphological analysis of Kolkata, focusing on its many wards, spanning the period from 1911 to 1961. The primary objective of this study is to investigate the phenomenon of land conversion inside the city. In his work titled "Calcutta: 1964," Bose N.K. (1964) provides a sociological analysis of the sustainability and inclusivity of Kolkata. This literary work demonstrates that the utilization of land during the period from 1911 to 1961 was primarily influenced by the needs and desires of the human population. Between the years 1911 and 1961, the urban landscape of Kolkata underwent significant modifications to accommodate the expanding population and fulfill the demands for various services. The book titled "Kolkata Diary" (1977) authored by Ashok Mitra provides a comprehensive account of the social and cultural history of Calcutta during the 1960s and 1970s. Dasgupta Biplob et. Al. (1991) provided a comprehensive analysis of the morphological structure of Kolkata, spanning from the city center to the surrounding metropolitan zone, to shed light on potential future urbanization trends. The children's plan created by the state of West Bengal in 1995 incorporated provisions for the development of mental resilience and spatial awareness among children. Siddhartha Ghosh (1990), R Bhattacharya (1991), and A.K. Roy (1901) emphasized the significance of urban planning and the need for urban areas to handle growing populations, while also considering the city's characteristics and historical development. In his work, Nitish Ranjan Roy (1986) provided a concise overview of Calcutta, acknowledging its potential limitations in terms of comprehensiveness while highlighting its relevance for demographic estimates and planning purposes.

To evaluate the level of inclusivity in different slums over different periods, a stratified random sample technique was used to choose one slum from each time zone. This chapter comprises three sections. The *first section* examines the current condition of the slums in terms of their amenities. The *second section* focuses on identifying the specific problems faced by each slum that hinder their inclusivity. The *third section* discusses the overall planning of the ward, with a particular emphasis on designing it in a way that promotes inclusivity for low-income settlements or slums within the ward boundaries. The precise geographical locations of the slums have been examined further in detail and documented in Table 4.1 and Figure 4.1, providing a comprehensive account of these areas.

Table 4.1: Details of the Selected Slum

Slum Name	Baniatola Street Slum	New Tangra Lane Slum	Baghajatin Colony Slum	Sahid Smrity Colony Slum	Adhikary Para Lane Colony Slum
Premises No.	9 To 19	1 and 2 Dhapa Road Lane	21a-29a H Block Lane	2-102 Sahid Smrity Lane	2-29 Daspara, Thakurpukur,
Name of Street / Road/Lane adjacent to Bustee	Baniatola Street	New Tangra Rd	Bagha Jatin H-Bock Lane	Sahid Smrity Colony Lane	Mukundas pally, Thakurpukur Road,
Name of Bustee local Name Registered or No.	Baniatola Ahiritola	Tangra, Park Circus	Baghajatin	Buderhat, Nayabad	Adhikary Para Thakurpukur
Postal Zone No.	700006	700015	700092	700094	700104
Approx. area of Bustee in Square Meters	7,775.00	33,634.75	21,073.62	87,065.00	3629.12
Total No. of Families	192	476	125	1,799	76
Total nos. of Dwellers	1,042	2,749	599	7,157	457
Total No. of Structures	71	119	118	690	36

Source- Civic Status of Kolkata Municipal Corporation, 2022

4.1.a Colonial Period Zone:

9-19 Baniatola Street Slum, Ahiritola, Borough 2, Ward No. 19 – This slum is positioned along the banks of the Ganga River at coordinates 22°35’51.25” N, 88°21’25.11” E. The geographical boundaries of this region consist of Maharshi Dinendra Road to the west, Nather Bagan Street to the southwest, Baniatola Street to the south and southeastern areas, and Sovabazar Street to the east. The longitudinal extent of the slum measures 245.91 meters in the north-south direction, while the latitudinal extent measures 256.32 meters in the east-west direction. This specific ghetto may be characterized as the principal residential zone for members of the ‘Bene’ socioeconomic stratum, which consists of lower-level business-class individuals.

4.1.b Industrial Period Zone:

New Tangra Lane Slum, Chingri Ghata Lane, Borough 7, Ward No. 58 – This slum is situated at coordinates 22°33’10.19” N, 88°23’16.52” E, within the park circus area. It is bordered by Paymental Garden Lane to the south, New Tangra Lane to the southwest, Chingri Ghata Lane to the west, Debendra Chandra Dey Road to the north, and Matheswartala Road to the east. The length of the slum is 154.32 meters and the width of the slum is 136.63 meters. The fundamental emphasis of this locality centers around the creation of a slum settlement that predominantly serves the Tannery and food-packing sectors.

4.1.c Post-Independence or Post-Partition Period Zone:

Baghajatin Colony Slum, Borough 10, Ward No. 81- This slum is situated at 22°29'1.33" N, 88°22'30.20" E within the Baghajatin Area. It is bordered by Baghajatin Station Road on the North, Raja Subodh Chandra Mallick Road on the East, Military Road on the South, and Sree Colony on the West. The Length of this slum is 56.3 meters and the width of the slum is 68.2 meters. The primary inhabitants of this urban area consist predominantly of individuals from the Bangladeshi refugee community. Initially, the location in question served as a refugee camp, but with time it transformed and evolved into a settlement characterized by substandard living conditions, commonly referred to as a land slum region.

4.1.d Post Land Reform Period Zone:

Sahid Smrity Colony Slum, Borough 12, Ward No. 109 – This slum is located at coordinates 22°28'50.15" N, 88° 23'52.36" E in and around Panchasayar, Baghajatin Area. It is situated specifically surrounded by Panchasayar Lake 1 and 2 to the south, Jadavpur University Lake and a housing society udyan to the west, Buderhat Lake to the east, Nayabad to the southeast, and Mukundapur to the north. The region in question is linked to adjacent lanes of the Panchasayar main road in the southern section, as well as the Eastern Metropolitan Bypass in the western vicinity. The length of the slum is 596.07 meters and the width of the slum is 245.48 meters. Following the implementation of Operation Barga in 1978, a colony was established wherein 508 plots were allocated to individuals who are currently referred to as the residents of the Sahid Smrity colony slum.

4.1.e New-Age Kolkata Period Zone:

Adhikary Para Lane Slum, Thakurpukur, Borough 16, Ward No. 144 – This slum is located at coordinates 22°27'33.44" N, 88°18'33.19" E in Thakurpukur area. It is situated specifically surrounded by James Long Sarani Road on the West, Senpara Road on the East and North, and Adhikary Para Road on the South. The length of the slum is 171.26 meters and the width is 93.6 meters. Before the city of Kolkata expanded in 2014, this area was not controlled by the Kolkata Municipal Corporation but was a part of the Gram Panchayet Maheshtala CD block Area (Mishra S.V.,2018). The owner has a 99-year lease on these plots of property in the Thika Slum. Formerly these people were mostly engaged in agriculture, the residents of this slum have modified their work culture to include construction, real estate betting, grocery store workers, automobile drivers, rikshaw

pullers, house servants, vegetable dealers, and other assorted occupations. From 2010, however, economic workers have shifted their attention to the medical services sector, as Thakurpukur has developed into south Kolkata's primary medical hub.

The sample size for the study ranges from 5% to 10% of the total population, using random sampling. The breakdown of the sampled populations is as follows:

- **Baniatola Street Slum:** Total population of 1,042, with a 10% sample size of 105.
- **New Tangra Lane Slum:** Total population of 2,749, with a 10% sample size of 275.
- **Baghajatin Colony Slum:** Total population of 599, with a 10% sample size of 60.
- **Sahid Smrity Colony Slum:** Total population of 7,157, with a 5% sample size of 358.
- **Adhikary Para Lane Colony Slum:** Total population of 457, with a 10% sample size of 46.

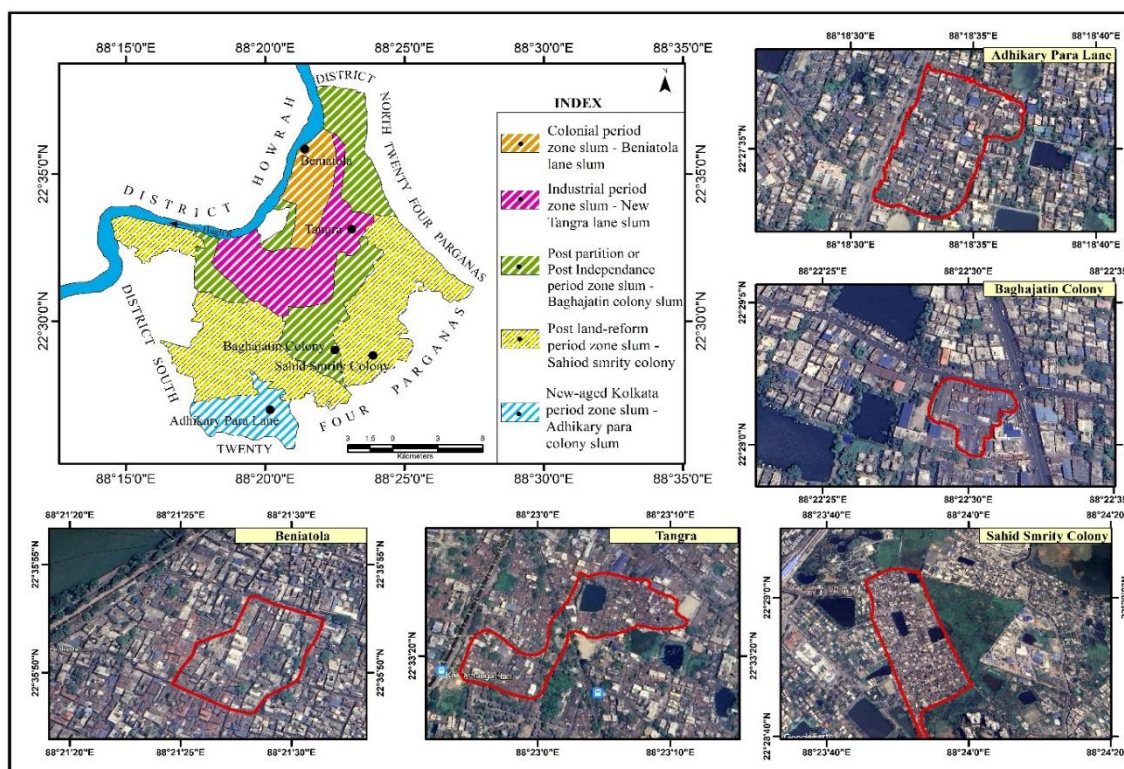


Figure 4.1: Location Map of the Selected Slums

Source-Prepared by Researcher

4.2 Section-I: Ranking of the Slums Based on Amenities Available

The amenities provided in both slums were evaluated based on their educational facilities, housing, health and sanitation, economic, transportation & and communication facilities,

and disaster preparedness, and a composite index was developed to determine the status of the slums.

4.2 a. Educational facilities

Inclusive education is often regarded as the most efficacious approach for providing equitable access to education, fostering learning, and facilitating the acquisition of essential competencies requisite for achieving success. In inclusive education, a core tenet dictates that the enrollment of all pupils in educational institutions is a fundamental value.

In the realm of education, this analysis mostly focuses on the comparison of various slum areas. The Baniatola slum for discussion in this study is the oldest colonial-period slum within Kolkata, in comparison to the other slums that have been chosen for analysis. The literacy percentage observed in the slum is 79.35 percent (Table 4.2). This data suggests a significant level of educational awareness inside the specific slum. Within proximity of 300 meters from the slum, there are two primary schools, while an additional primary school is located within a distance of 500 meters. These educational institutions are frequented by the majority of slum residents to educate their children (Figure 4.2). In contrast, there are three secondary schools located within a 300-meter radius, as well as an additional secondary school situated within a 500-meter radius of the slum area (Figure 4.3). Among these four educational institutions, two schools are entirely designated for female students. According to the data presented in Figure 4.4, the slum under consideration has a total population of 827 literate individuals, while 215 individuals are classified as illiterate. Furthermore, it is seen that the male literacy rate, which stands at 56.51 percent, is comparatively higher than the female literacy rate of 43.49 percent across all levels of schooling, namely primary, secondary, and higher secondary (KMC, 2021). The average dropout rate inside this particular slum is 10.39 (Table 4.2), revealing that the dropout rate among females surpasses that of males. This discrepancy can be attributed to the higher focus placed by males in this slum on education and economic activities compared to their female counterparts. Consequently, upon the completion of basic education, females are constrained to remain within the confines of their households instead of engaging in activities outside the home. There exist multiple vocational training centers that cater specifically to ladies, offering courses in areas such as sewing and painting. These centers serve as platforms for female residents to acquire skills that enable

them to support their economic endeavors. Approximately 9.76% of females have a vocational inclination in this particular context (Table 4.2).

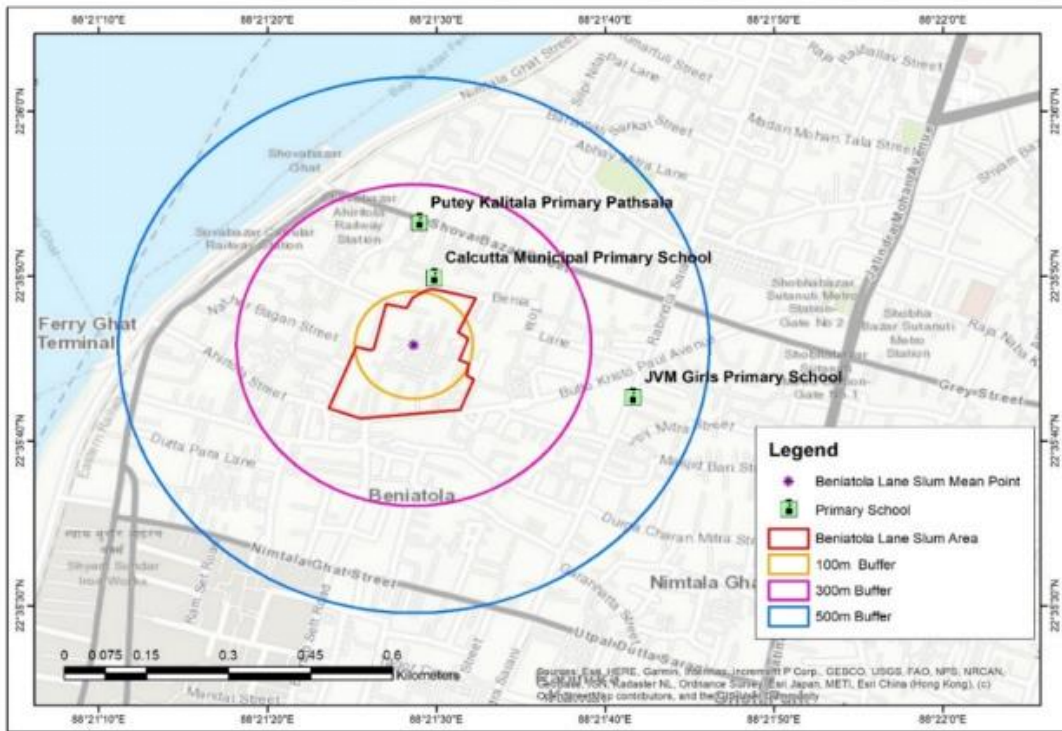


Figure 4.2: Location of Primary School accessed by Baniatola Street Slum Dwellers
 Source- Prepared by Researcher, Primary Survey, August, 2021

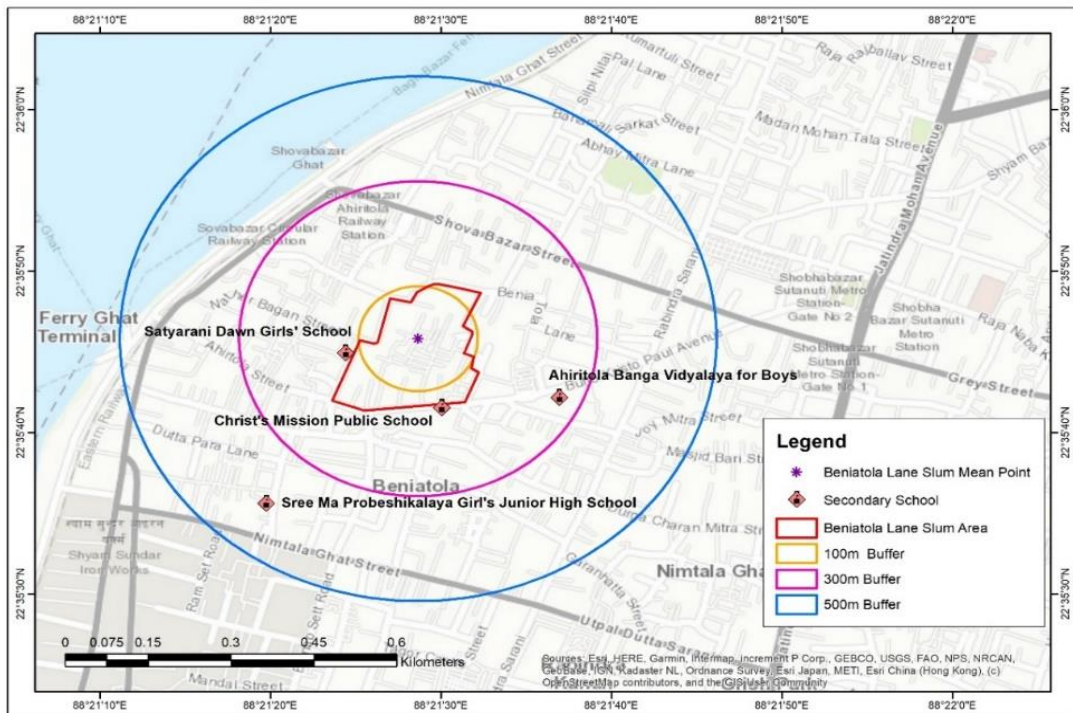


Figure 4.3: Location of Secondary School accessed by Baniatola Street Slum Dwellers
 Source- Prepared by Researcher, Primary Survey, August, 2021

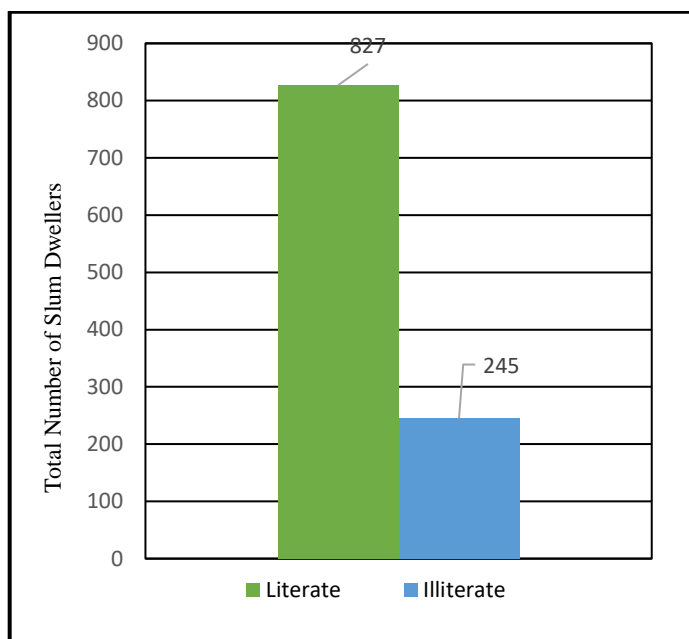


Figure 4.4: Status of Literacy among Baniatola Bustee, Ahiritola Dwellers

Source- Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021

The second slum chosen for examination in this research is the industrial-era slum named New Tangra Lane Slum. According to Table 4.2, the recorded literacy rate in the slum area is 53.43 percent. The primary school is situated near the slum, with a spatial closeness of approximately 300 meters. Furthermore, it is worth noting that there is an additional primary school located within a proximity of 400 meters, and a third primary school can be found within a radius of 500 meters (Figure 4.5). A significant portion of slum residents commonly attend the educational institutions in question to provide education to their children. In contrast, four secondary schools are placed within a 1000-meter radius, in addition to two more secondary schools situated within a 1500-meter radius from the slum neighborhood (Figure 4.6). Among the six educational institutions under discussion, it is noteworthy that two are government-aided schools, whereas the remaining four are privately held establishments renowned for their comparatively elevated tuition fees. The phenomenon can be ascribed to parents initially enrolling their children in private schools, which subsequently poses a financial strain, hindering their capacity to maintain ongoing education in these institutions. Furthermore, it is noteworthy that a considerable proportion of female students opt to quit their educational pursuits subsequent to the completion of secondary school due to economic problems of family and religious limitations. Therefore, the dropout rates reported in this particular context exhibit a considerable magnitude, especially amounting to 12.36 percent as indicated in Table 4.2. Based on the diagram

depicted in Figure 4.7, this slum in question comprises a population of 1469 persons who possess literacy skills, whereas 1280 individuals are categorized as lacking literacy proficiency. Moreover, it is evident that the literacy rate among males, currently at 78.15 percent, surpasses the corresponding percentage among females, which stands at 21.85 percent, throughout all educational tiers, including primary, secondary, and upper secondary levels (KMC, 2021). The observed gap can be ascribed to the greater emphasis placed by males residing in this slum area on educational pursuits and economic endeavors, in contrast to their female counterparts. As a result, following the attainment of primary school, women are compelled to confine themselves to domestic settings rather than participate in extramural endeavors. Several vocational training centers are specifically designed to appeal to the male population, providing courses in various fields such as automobile mechanics, electronics activities, and leather technology. These centers function as platforms for male inhabitants to gain skills that facilitate their ability to sustain their economic pursuits. According to the data shown in Table 4.2, it can be observed that around 8.45 percent of males have a vocational training tendency within the specific slum area.

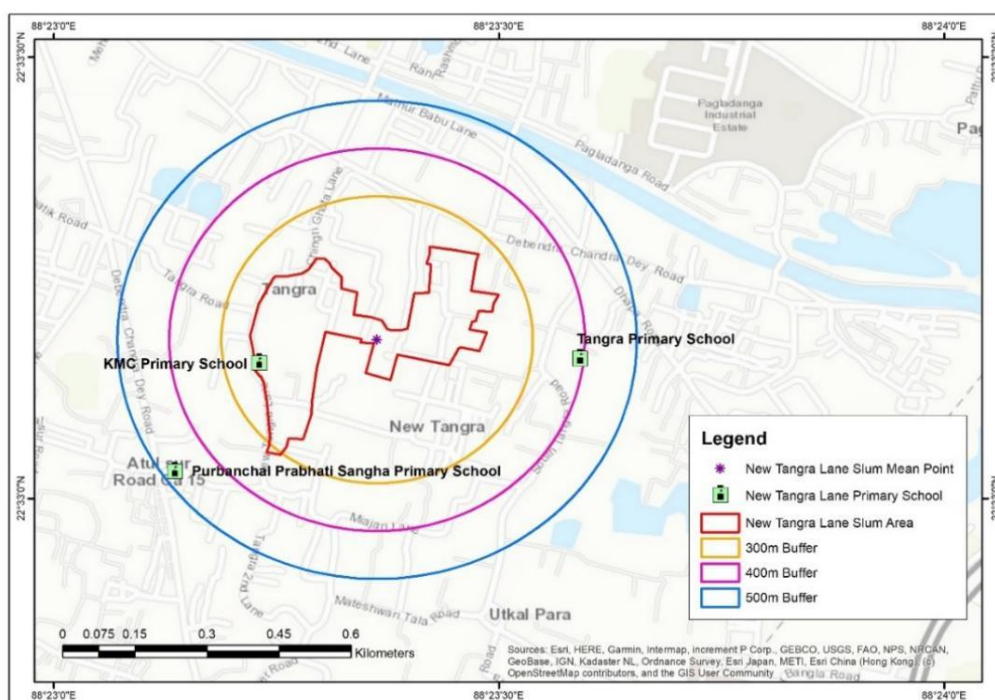


Figure 4.5: Location of Primary School accessed by New Tangra Lane Slum Dwellers

Source- Prepared by Researcher, Primary Survey, August, 2021

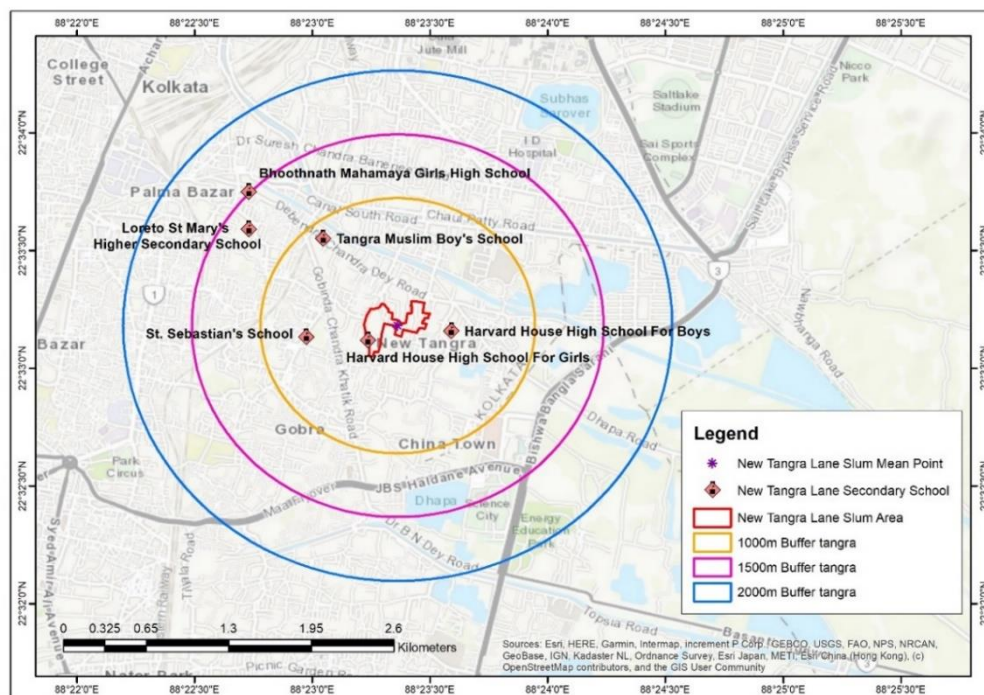


Figure 4.6: Location of Secondary School accessed by New Tangra Lane Slum Dwellers
 Source- Prepared by Researcher, Primary Survey, August, 2021

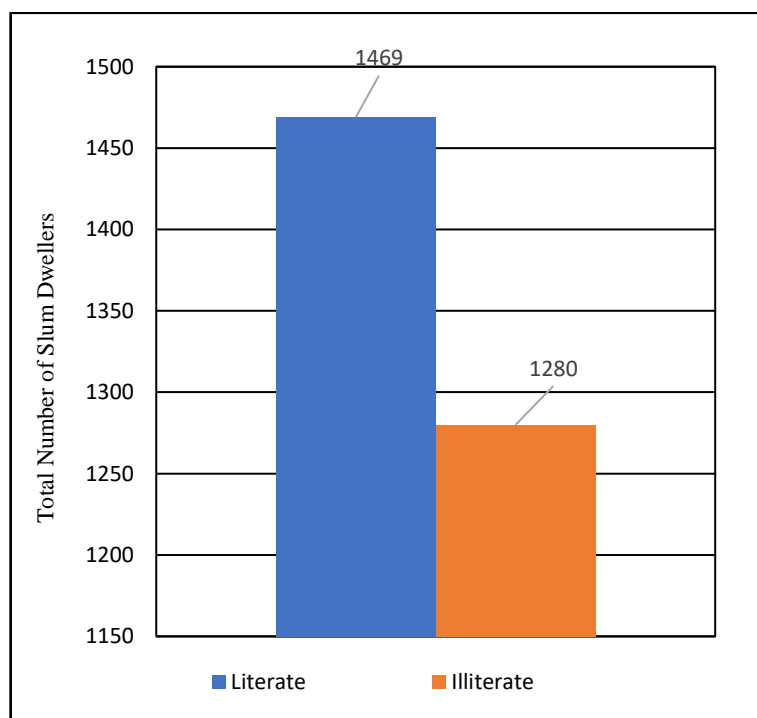


Figure 4.7: Status of Literacy among New Tangra Lane Slum Dwellers
 Source- Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021

The third slum selected for analysis in this study is the slum that emerged after the partition or independence period, specifically picked for observation is Baghajatin Colony Slum. Table 4.2 indicates that the documented literacy rate in the slum area is 86.32 percent. The

research findings indicate a substantial degree of extensive knowledge and comprehension of education inside the particular slum region. The two primary schools are located near the slum, with a spatial distance of around 500 meters. In addition, it is important to mention that there are three other primary schools situated at a distance of 1000 meters, and one primary school may be found within a radius of 1500 meters (Figure 4.8). A substantial proportion of slum dwellers frequently attend educational institutions to ensure their children receive education, as these schools are known for their high level of satisfaction. By contrast, there are three secondary schools located within a 500-meter radius of the slum neighborhood. Additionally, there are two more secondary schools situated within a 1000-meter radius, and three more secondary schools within a 1500-meter radius (Figure 4.9). All eight educational institutions being mentioned are government-aided schools, which are mostly utilized by slum dwellers for their children's education. The situation can be attributed to parents initially enrolling their children in these government schools, which later results in no financial burden, impeding their ability to continue studying in these institutions. Moreover, it is worth mentioning that a significant percentage of female students choose not to discontinue their educational endeavors once they finish secondary school because their families are aware of the importance of education. Hence, the dropout rates observed in this specific scenario demonstrate a significant scale, particularly reaching 6.25 percent as stated in Table 4.2. According to the diagram shown in Figure 4.10, the slum being discussed has a population of 517 literate people, while 82 individuals are considered to be illiterate. Furthermore, the literacy rate among boys and girls is nearly equal throughout all educational levels, including primary, secondary, and upper-secondary levels (KMC, 2021). The observed equality can be attributed to the increased focus on educational awareness on education and social equality, irrespective of gender.

Several vocational training centers cater primarily to male persons, offering courses in disciplines like vehicle mechanics and electronics, while giving hand and craft labor courses for ladies. These centers provide venues for both male and female residents to acquire skills that enhance their capacity to sustain their economic endeavors. Based on the statistics presented in Table 4.2, it is evident that around 10.36 percent of individuals living in slums exhibit a vocational inclination within the particular slum area.

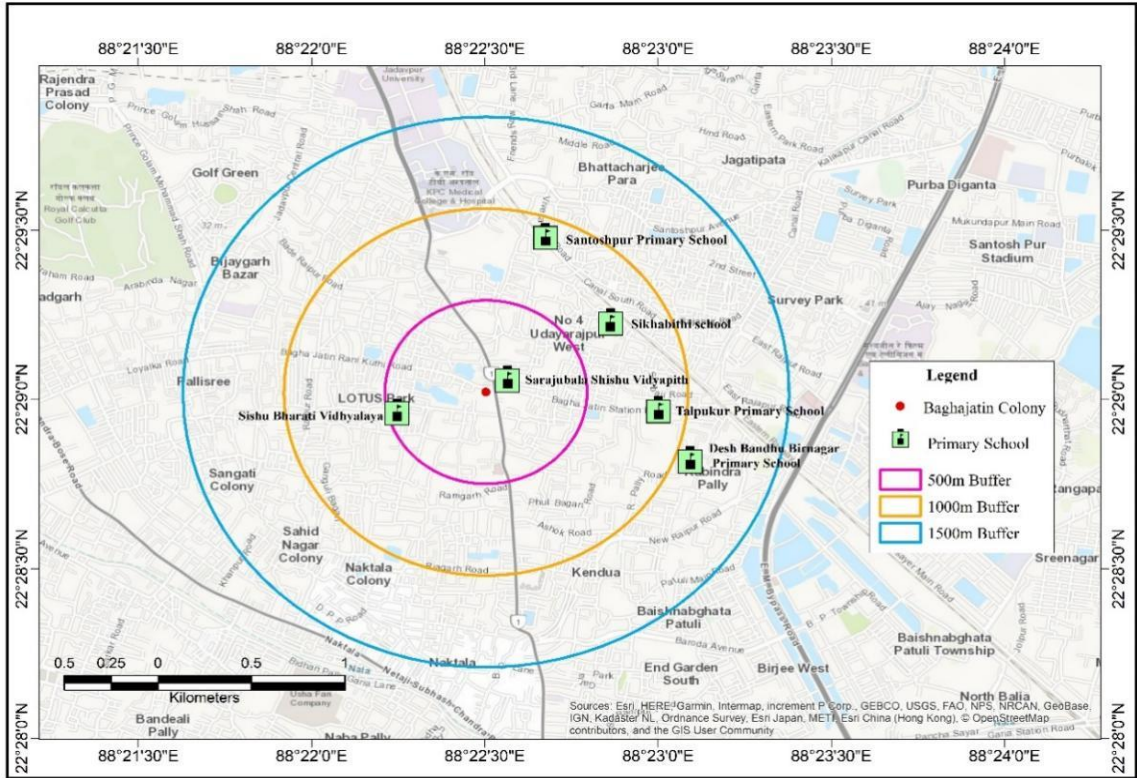


Figure 4.8: Location of Primary School accessed by Baghajatin Colony Slum Dwellers
 Source- Prepared by Researcher, Primary Survey, August, 2021

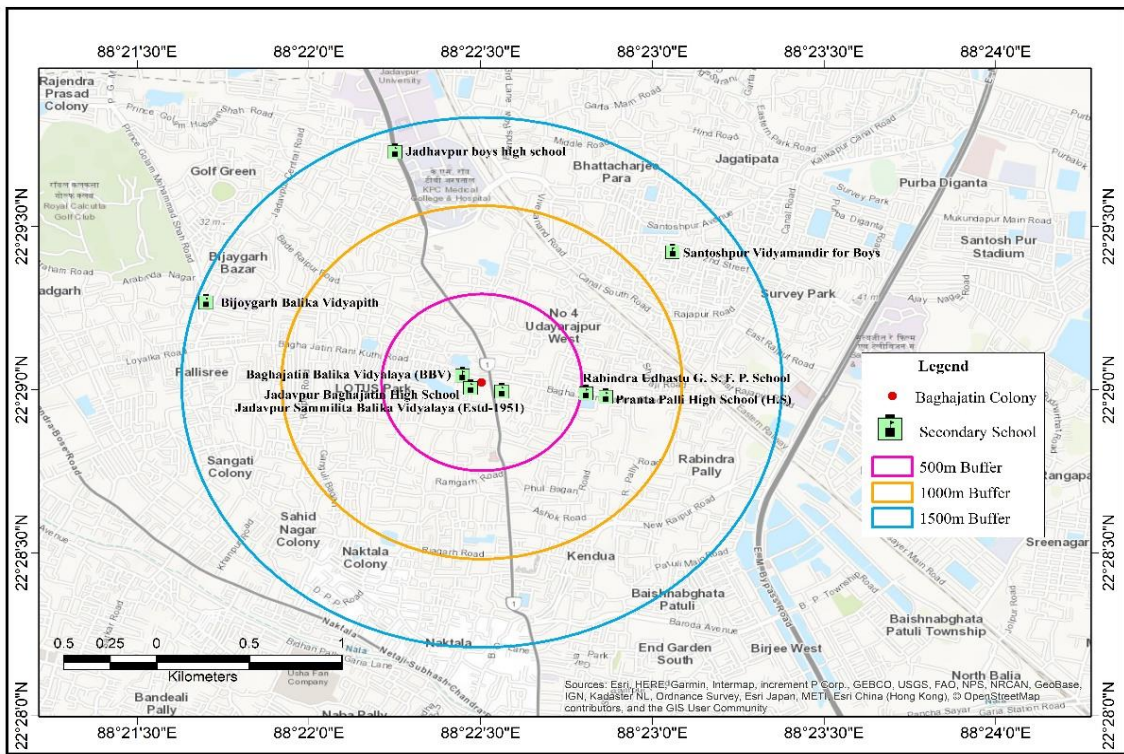


Figure 4.9: Location of Secondary School accessed by Baghajatin Colony Slum Dwellers
 Source- Prepared by Researcher, Primary Survey, August, 2021

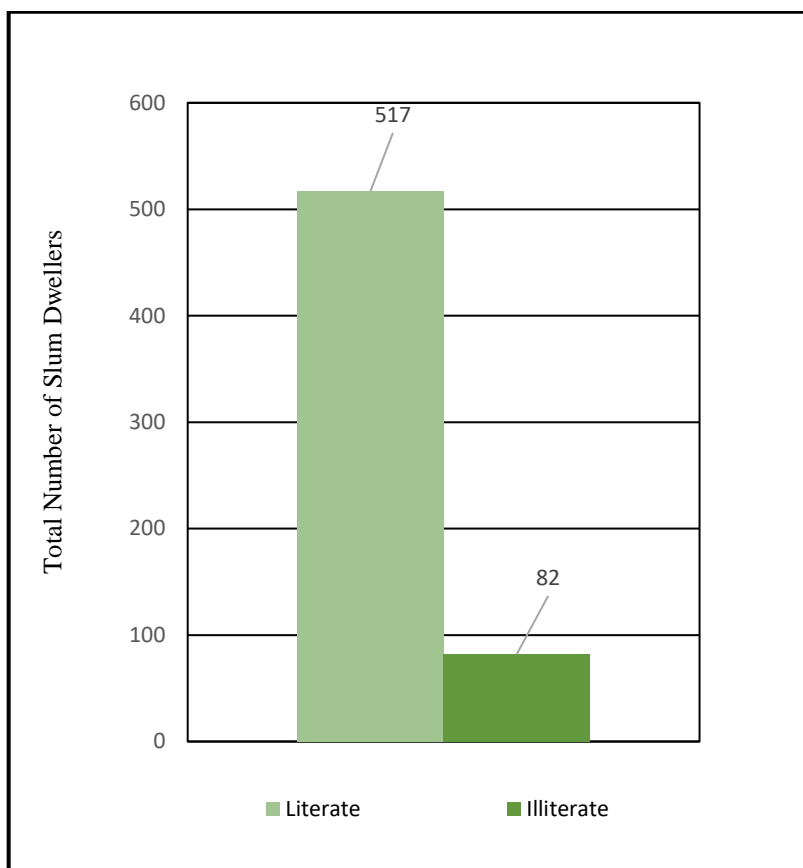


Figure 4.10: Status of Literacy among Baghajatin Colony Slum Dwellers

Source- Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021

The fourth slum for discussion in this study is the post-land-reform period slum within Kolkata, for analysis named Sahis Smrity Colony Slum. The literacy percentage observed in the slum is 47.88 percent (Table 4.2). This data suggests a significant level of educational unawareness inside the specific slum. In the vicinity of the slum, there exists a sole primary school within a 500-meter radius. Furthermore, an additional five primary schools are situated within a 1500-meter distance, while four primary schools are found within a 2500-meter radius of the slum (Figure 4.11). The primary school located within a 500-meter radius is the primary educational facility accessed by the majority of Slum dwellers, primarily due to its convenient proximity. However, it is worth noting that a portion of the dwellers also avail themselves of the opportunity to attend nine more schools, driven by a desire for higher-quality education. In contrast, there is one secondary school located within a 1000-meter radius, five additional secondary schools within a 2000-meter radius, and four additional secondary schools within a 3000-meter radius of the slum area (Figure 4.12). Among the nine educational institutions under consideration,

it is noteworthy that three of them exclusively cater to male students, while two schools are exclusively designated for female students. The remaining schools, however, follow a co-educational model, accommodating both male and female students. The nearest educational institution in proximity to the slum, within a radius of 1000 meters, is a privately owned co-educational school. While it is conveniently accessible for residents of the slum, it poses financial challenges due to its high cost. Consequently, individuals who initially enrolled in school but subsequently dropped out owing to factors such as geographical distance or financial constraints. In this particular scenario, it is evident that the low level of educational awareness among slum residents contributes to a low enrollment ratio. Females are more likely to discontinue their education due to financial constraints that prevent them from traveling to access inexpensive educational opportunities. Similarly, boys are compelled to drop out of school due to economic challenges faced by their families. There is a higher rate of females dropping out than boys in this slum, with an overall dropout rate of 8.69% (Table 4.2). Based on the data depicted in Figure 4.13, the slum being examined comprises 3427 literate individuals, whereas 3730 individuals are categorized as illiterate. Moreover, it is evident that the literacy rate among males, currently at 69.32 percent, surpasses the literacy rate among females, which stands at 30.68 percent, across all educational stages, including elementary, secondary, and upper secondary (KMC, 2021). Several vocational training centers provide education and training opportunities for both males and girls, encompassing a diverse range of courses including sewing, painting, vehicle mechanics, and other related fields. These centers function as platforms for inhabitants, regardless of gender, to gain skills that empower them to contribute to their economic pursuits. According to the data shown in Table 4.2, it can be observed that around 4.34 percent of females exhibit a vocational inclination within the specific setting under consideration.

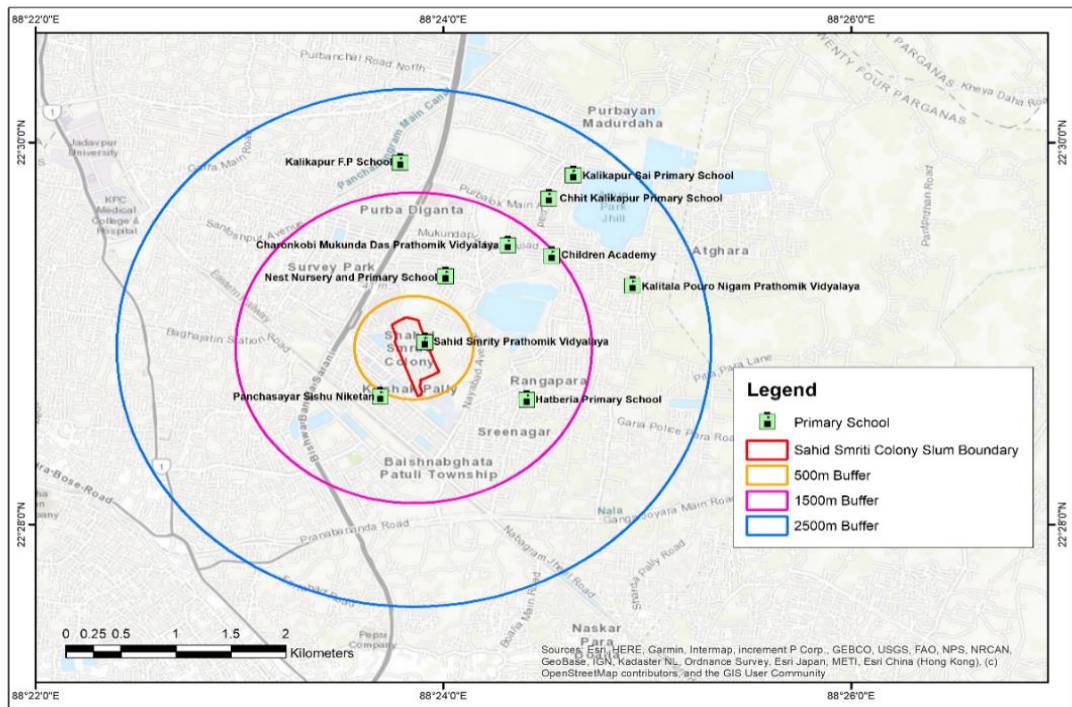


Figure 4.11: Location of Primary School accessed by Sahid Smriti Colony Slum Dwellers
 Source- Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021

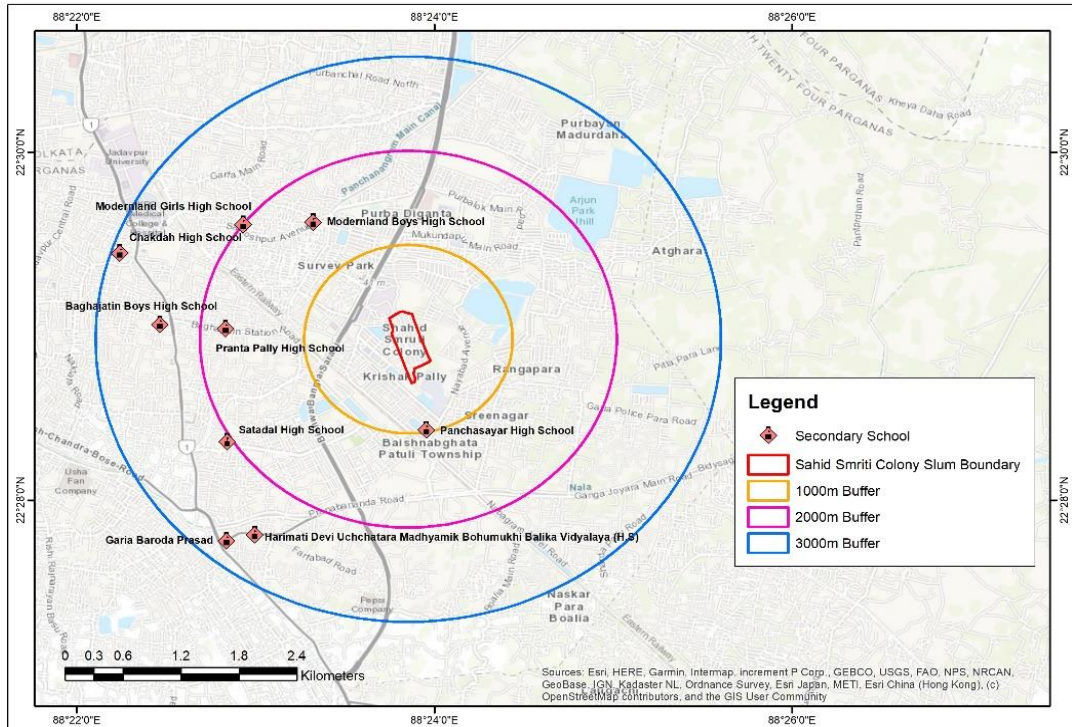


Figure 4.12: Location of Secondary School accessed by Sahid Smriti Colony Slum Dwellers
 Source- Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021

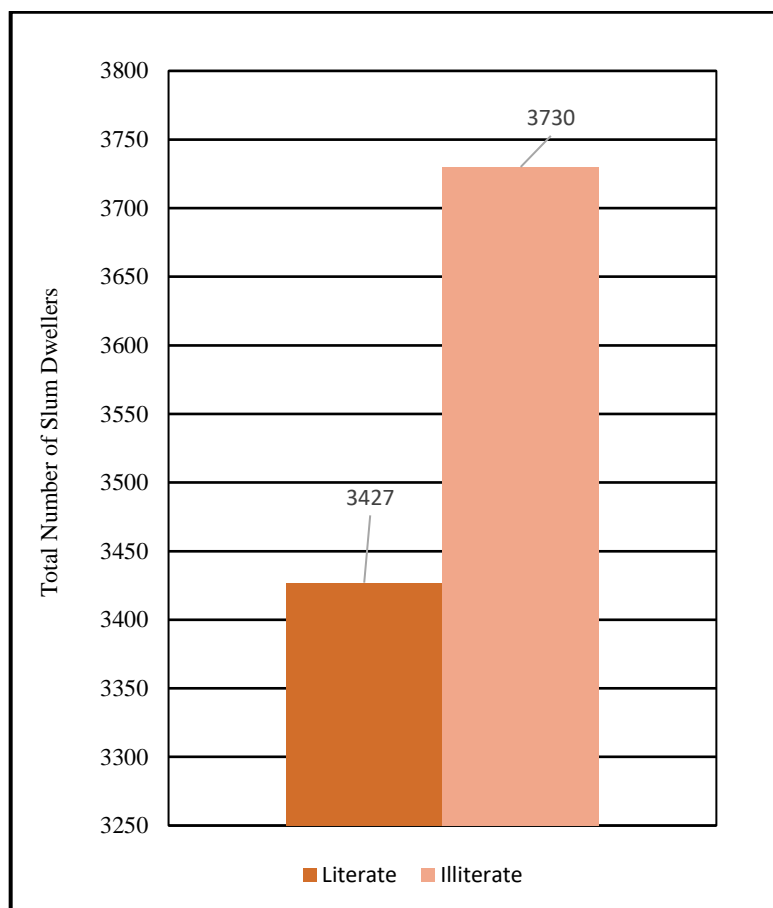
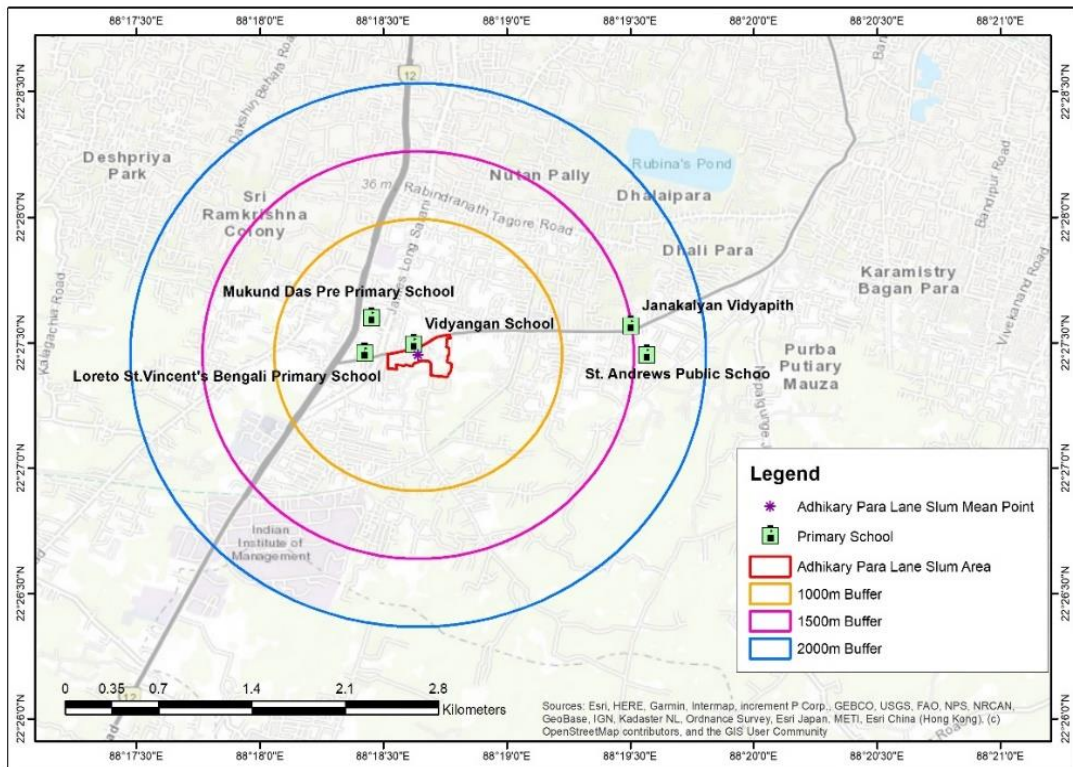


Figure 4.13: Status of Literacy among Sahid Smrity Colony Slum Dwellers

Source- Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021

The focus of this study is the New Age-era slum located in Kolkata, which will be examined and named as Adhikary Para Slum. The data presented in Table 4.2 indicates that the literacy rate in the slum is 41.25 percent. The research suggests a notable lack of knowledge of education within the particular slum area. Within a 1000-meter radius of the slum, there are three elementary schools located nearby. Moreover, an additional primary school is located within a distance of 1500 meters, and another primary school could also be found within a radius of 2000 meters from the slum (see Figure 4.14). The primary educational institution that is most commonly utilized by Slum Dwellers is a government-aided primary school situated within a 1000-meter radius. This preference is mostly attributed to its handy accessibility and affordable nature. However, many individuals who possess a strong understanding of the value of quality education opt to enroll their children in two alternative private schools. Additionally, some individuals also prefer a school located within a 1500-meter radius due to its historical significance as the oldest

educational institution in the vicinity (see Figure 4.14). In contrast, there exist three institutes located within a radius of 1000 meters, one within a radius of 3000 meters, and an additional one within a radius of 5000 meters from the slum area. Among the five educational institutions being evaluated, two are Government-aided girls' schools located at distances of approximately 1000 meters and 5000 meters respectively. Additionally, two Government-aided boys' schools are situated within distances of 1000 meters and 3000 meters respectively. Lastly, there is a co-educational English medium private school within a 1000-meter radius of the slum. The majority of individuals residing in slums have access to the nearest governmental boys' and girls' schools mostly because of their close vicinity. This is primarily owing to their inability to finance private co-educational schools as a result of economic constraints (Figure 4.15). Consequently, individuals who initially enrolled in school but subsequently dropped out owing to reasons such as financial constraints and lack of awareness or passion. A considerable portion of the population commenced their income-generation endeavors at a young age by means of vocational training and employment in occupations that offer relatively modest remuneration. There is a higher rate of males dropping out than females in this slum, with an overall dropout rate of 21.36 percent (Table 4.2). Based on the data depicted in Figure 4.16, the slum being examined comprises a population of 189 literate individuals, whereas 268 individuals are categorized as illiterate. Moreover, it is evident that the literacy rate among males, currently at 30.25 percent, surpasses the literacy rate among females, which stands at 69.75 percent, across all educational stages, including elementary, secondary, and upper secondary (KMC, 2021). Several vocational training institutes provide education and training possibilities for both males and girls, including a varied variety of courses including pathology assistant, medical helper, electrical workers, etc. related sectors. These centers function as platforms for inhabitants, regardless of gender, to gain skills that empower them to contribute to their economic pursuits. According to the data shown in Table 4.2, it can be observed that around 5.60 percent of females exhibit a vocational inclination within the specific setting under consideration.



4.14: Location of Primary School accessed by Adhikary Para Lane Colony Slum Dwellers
 Source- Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021

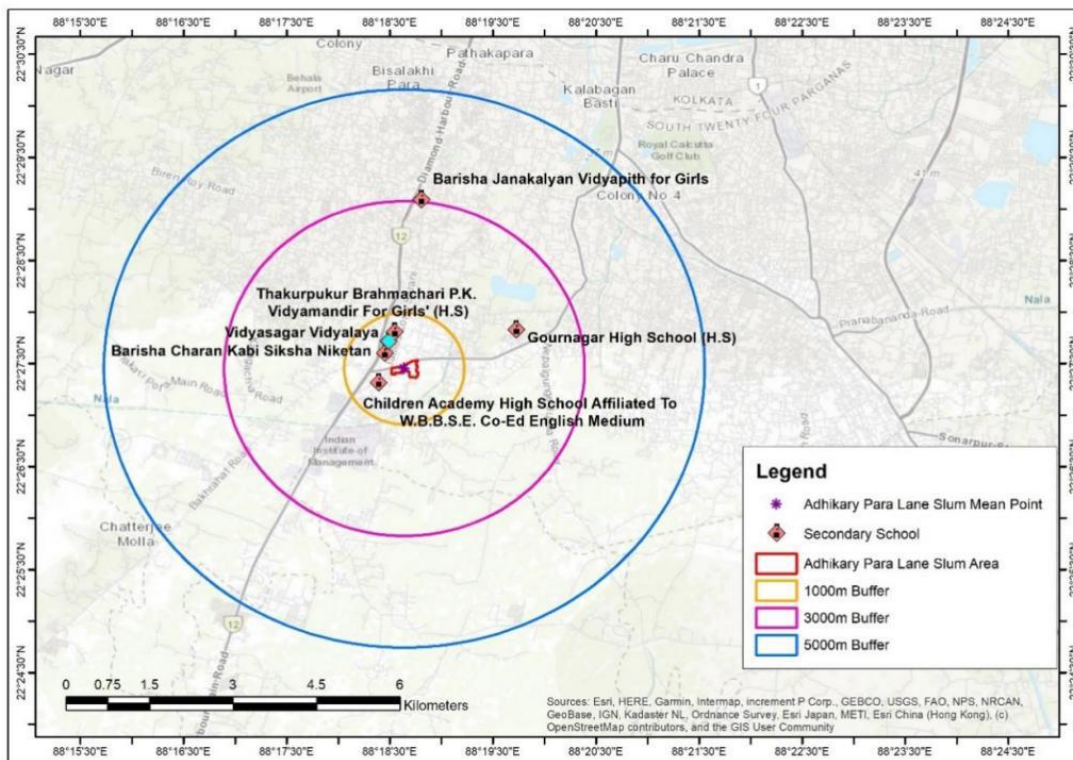


Figure 4.15: Location of Secondary School accessed by Adhikary Para Lane Colony Slum Dwellers
 Source- Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021

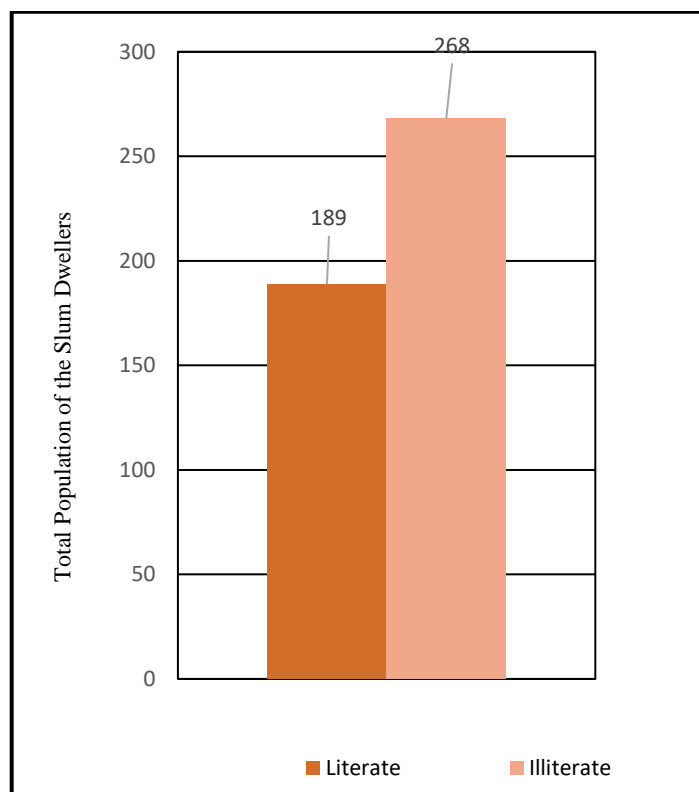


Figure 4.16: Status of Literacy among Adhikary Para Lane Colony Slum Dwellers

Source- Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021

A composite index has been constructed (Table 4.2) to assess the level of inclusivity and access to educational facilities in the five selected slums. This index takes into account many literacy indicators, such as literacy rate, vocational training, and average dropouts. By analyzing these parameters, we can determine which slums are receiving greater educational opportunities. According to the average composite index presented in Table 4.2, Baghajatin Colony Slum (Post-Independence or Post-Partition Period Zone) is ranked first and is the most inclusive among all the slums. Baniatola Street Slum (Colonial Period Zone) is ranked second, followed by New Tangra Lane Slum (Industrial Period Zone) in third place. Sahid Smriti Slum (Post Land Reform Period Zone) is ranked fourth, while Adhikary Para Colony Slum (New-Age Kolkata Period Zone) is ranked fifth or last, indicating lower levels of inclusivity.

Table No 4.2: Comparison of the Literacy Index Among all the slums

Serial No.	Name of the Slum	Literacy Rate	Rank	Vocational Training in Percentage	Rank	Average Dropouts in Percentage	Rank	Composite Index of Literacy	Average Composite Index of Literacy
1.	Baniatola Street Slum	79.35	2	9.76	2	10.39	3	7	2.33
2.	New Tangra Lane Slum	53.43	3	8.45	3	12.36	4	10	3.33
3.	Baghajatin Colony Slum	86.32	1	10.36	1	6.25	1	3	1
4.	Sahid Smriti Slum	47.88	4	4.34	5	8.69	2	11	3.67
5.	Adhikary Para Colony Slum	41.25	5	5.6	4	21.36	5	14	4.67

Sources-Computed by Researcher, Primary Survey, August, 2021

4.2.b Living Condition Facilities

The Inclusive Living methodology involves doing a thorough assessment of housing design, which goes beyond mere physical modifications. It also considers the significance of housing in facilitating social engagement, cultivating interpersonal connections, and resolving structural barriers associated with aging in one's dwelling.

The examination of living circumstances in slums offers valuable insights into the phenomenon of urban poverty, given that slums are commonly characterized by inadequate housing conditions and insufficient physical infrastructure. This debate focuses on the individual examination and analysis of the housing conditions within the chosen slum.

The Baniatola Street Slum structure, which originates from the colonial era, primarily consists of durable materials usually known as 'pucca'. According to Table 4.3, the average crowding index, measured in terms of persons per room, for this particular structure is 2.45. Based on the data shown in Table 4.3, it is evident that a considerable percentage of homes, exactly 69.29 percent, had a designated kitchen area inside their premises that is only used for culinary activities. In contrast, a significant proportion of persons, specifically 30.71 percent, do not possess a kitchen within their dwelling and hence rely on alternative cooking methods outside of their homes. According to available data, a significant proportion of individuals living in slum areas, specifically 72.6 percent, have been reported to have access to the 'Ujjwala' yojana Gas service. Nevertheless, it is important to acknowledge that a significant proportion of individuals residing in slums, namely 27.40 percent, do not have access to liquefied petroleum gas (LPG) within their

families. Consequently, these individuals are unable to take advantage of any governmental programs aimed at providing LPG for their daily cooking needs, as indicated in Table 4.3. As a result, these individuals are driven to depend on kerosene oil or wood as alternate sources of fuel. On the contrary, this specific slum does not face any obstacles related to the availability of safe drinking water. The utilization of fresh, purified potable water sourced from the Tala Tank water purifier is widespread, and the water provision demonstrates a notable degree of sufficiency (Table 4.3).

The Industrial Period denotes a notable epoch in human history marked by the extensive implementation of industrialization and the consequent shift of societies from agrarian to industrial economies. The primary composition of the New Tangra Lane Slum predominantly comprises durable construction materials commonly referred to as "pucca". The crowding index of the structure is 4.14, suggesting a rather elevated degree of crowding as indicated in Table 4.3. Based on the data provided in Table 4.3, it is apparent that a significant proportion of households, specifically 15.31 percent, have a dedicated kitchen space inside their premises exclusively utilized for culinary purposes. In contrast, a substantial majority of residents, precisely 84.69 percent, lack a kitchen within their place of abode and so depend on cooking facilities situated outside of their residences. According to research findings, it has been observed that around 49.36 percent of residents residing in slum regions have been able to avail the benefits of the 'Ujjwala' yojana Gas service. However, it is crucial to recognize that a considerable percentage of individuals living in slums, precisely 50.64 percent, do not have access to liquefied petroleum gas (LPG) within their households (Table 4.3). As a result, these individuals are unable to access any government initiatives that try to facilitate the availability of liquefied petroleum gas (LPG) for their daily cooking requirements. Conversely, the aforementioned slum encounters substantial challenges in terms of acquiring access to potable water. The use of brackish water obtained from the Tanga overhead water tank, which is intrinsically lacking in freshness, is followed by a notable inadequacy in the level of water supply (Table 4.3).

The Baghajatin Colony Slum building, which dates back to the post-Independence era, mostly comprises robust construction materials commonly referred to as 'pucca'. The crowding index of the structure is 1.89, indicating a moderately crowded condition (Table 4.3). The examination of the data shown in Table 4.3 indicates that a considerable percentage of households, exactly 98.35 percent, had a distinct area in their residences that

is only designated for cooking activities. In contrast, a significant majority of inhabitants, namely 1.65 percent, do not have a kitchen within their place of residence and therefore rely on cooking facilities located outside of their dwellings. According to a survey, a substantial percentage of individuals, particularly 93.58 percent, residing in slum areas were found to have access to the 'Ujjwala' yojana Gas service. Nevertheless, it is imperative to acknowledge that a significant proportion of individuals residing in impoverished urban areas, specifically 6.42 percent as indicated in Table 4.3, lack the means to get liquefied petroleum gas (LPG) for household use. Consequently, these persons face a lack of access to governmental efforts aimed at facilitating the provision of LPG for their daily cooking needs. In contrast, the previously stated slum faces significant obstacles in obtaining access to safe drinking water. The use of brackish water acquired from the municipal water supply, which inherently lacks freshness, has been determined to be sufficient according to the existing sources (Table 4.3).

The Sahid Smriti Colony Slum structure, which originated in the aftermath of land reform, primarily consists of semi-permanent construction materials often known as 'Semi-pucca'. The structure's crowding index is 3.14, indicating a comparatively elevated level of crowding (Table 4.3). The examination of the data presented in Table 4.3 indicates that a notable percentage of households, particularly 26.25 percent, own a distinct area within their residences that is only designated for cooking activities. In contrast, a significant majority of the population, specifically 73.75 percent, do not have a kitchen within their place of residence. As a result, they rely on cooking facilities located outside of their houses. According to a survey, a notable percentage of individuals, particularly 56.21 percent, living in slum areas were found to have access to the 'Ujjwala' yojana Gas service. Nevertheless, it is imperative to acknowledge that a significant proportion of individuals residing in impoverished urban areas, specifically 43.79 percent, lack access to home liquefied petroleum gas (LPG) as indicated in Table 4.3. Consequently, these persons face a lack of access to governmental efforts aimed at facilitating the provision of LPG for their everyday cooking needs. In contrast, the previously stated slum faces significant obstacles in obtaining access to safe drinking water. The use of brackish water (as indicated in Table 4.3) was sourced from the municipal tap water provided by the government. The tap water is received from a nearby purification pumping station located within a 3-kilometer radius. However, the tap water inherently lacks freshness, and the entire slum area only has access to three water sources, as depicted in Figure 4.17.

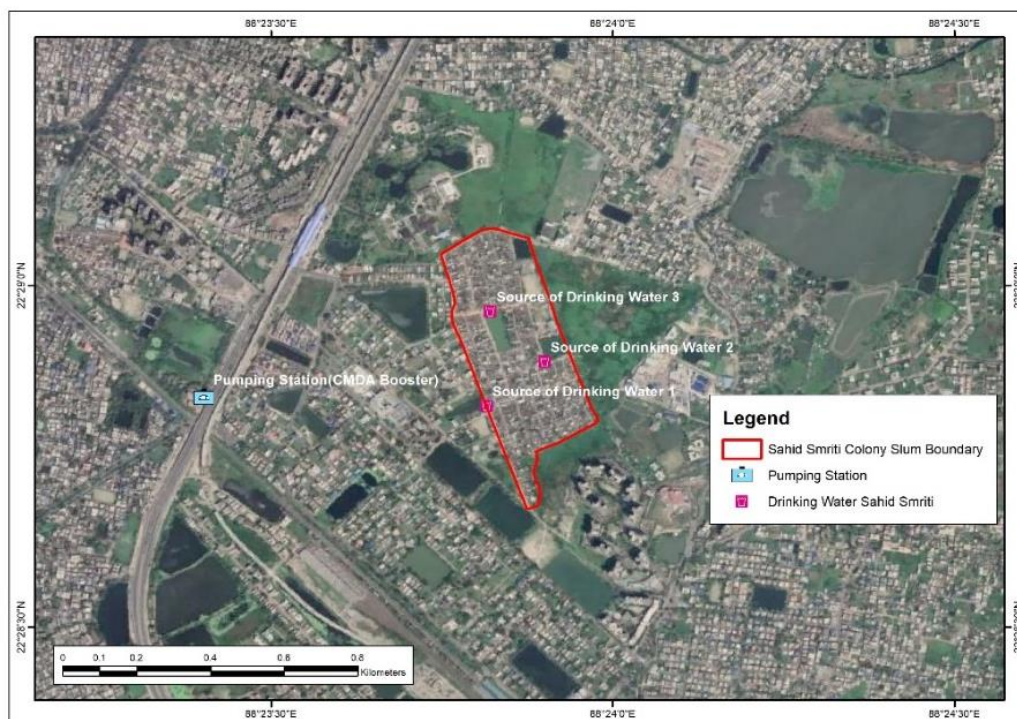


Figure 4.17: Sources of Drinking Water in Sahid Smriti Colony Slum

Sources-Primary Survey, August, 2021

The Adhikary Para Colony Slum building, which was incorporated into the KMC Area after 2014 during the expansion of the KMC Zone in the New Age Kolkata era, primarily consists of semi-permanent construction materials often known as 'Semi-pucca'. The crowding index of the structure is 3.89, indicating a comparatively elevated degree of crowding (Table 4.3). The examination of the data presented in Table 4.3 indicates that a notable percentage of households, precisely 56.89 percent, own a designated area within their residences that is solely used for cooking activities. In contrast, a significant majority of the population, specifically 43.11 percent, do not have a kitchen within their residence. Consequently, they rely on cooking facilities located outside of their residences. According to a survey, a considerable percentage of individuals, particularly 64.12 percent, living in slum areas were found to have access to the 'ujjwala' yojana Gas service. Nevertheless, it is imperative to acknowledge that a significant proportion of individuals residing in impoverished urban areas, specifically 35.88 percent as indicated in Table 4.3, lack the means to get liquefied petroleum gas (LPG) for household use. Consequently, these persons face a lack of access to governmental efforts aimed at facilitating the provision of liquefied petroleum gas (LPG) for their daily cooking needs. In contrast, the previously stated slum has substantial availability of drinkable water. The utilization of Semi-Fresh water (Table 4.3) was acquired from the municipal tap water provided by the

government, which is sourced from a nearby purified pumping station located within a distance of 1 kilometer. Additionally, there are many water sources available throughout the entirety of the slum area.

A composite indicator has been developed (Table 4.3) to evaluate the degree of inclusiveness regarding the Living Conditions of the five chosen slums. This index incorporates various factors related to living conditions, including the Crowding Index, House Type, Water Quality, Households with Inhouse Kitchens, and Households with LPG accessibility. Through the analysis of these indicators, it is possible to ascertain the slums that are experiencing more favorable living conditions. Based on the composite index provided in Table 4.3, Baghajatin Colony Slum (Post-Independence or Post-Partition Period Zone) holds the top rank, indicating that it exhibits the highest level of inclusivity among all the slums. In terms of ranking, Baniatola Street Slum (Colonial Period Zone), holds the second position, while Adhikary Para Colony Slum (New-Age Kolkata Period Zone), occupies the third place. The Sahid Smriti Slum (Post Land Reform Period Zone), holds the fourth position in terms of ranking, whilst the New Tangra Lane Slum (Industrial Period Zone), is placed fifth or last, suggesting comparatively lower levels of inclusion.

Table No 4.3: Comparison of the Living Conditions Index Among all the slums

Serial No.	Name of the Slum	Crowding Index	Rank	House Type	Rank	Water Quality	Rank	Households with Inhouse Kitchens in Percentage	Rank	Households with LPG in Percentage	Rank	Composite Index of Living Conditions	Average Composite Index of Living Conditions
1	Baniatola Street Slum	2.45	2	Pucca	1	Fresh	1	69.29	2	72.6	2	8	1.6
2	New Tangra Lane Slum	4.14	5	Pucca	1	Brackish	3	15.31	5	49.36	5	19	3.8
3	Baghajatin Colony Slum	1.89	1	Pucca	1	Brackish	3	98.35	1	93.58	1	7	1.4
4	Sahid Smriti Colony Slum	3.14	3	Semi Pucca	2	Brackish	3	26.25	4	56.21	4	16	3.2
5	Adhikary Para Colony Slum	3.89	4	Semi pucca	2	Semi-Fresh	2	56.8	3	64.12	3	14	2.8

Sources-Computed by Researcher, Primary Survey, August,2021

4.2. c. Health Care and Sanitation Facilities

The fundamental principles of inclusive health consist of two primary principles: the achievement of equitable and unbiased accessibility, and the attainment of comprehensive involvement. Equitable access refers to the provision of essential services and resources that are essential for individuals to attain optimal health outcomes. The present study examines the health conditions prevalent in various slum areas of Kolkata, including the Colonial Period Zone, Industrial Period Zone, Post-Independence or Post-Partition Period Zone, Post Land Reform Period Zone, and New-Age Kolkata Period Zone. Each of these zones will be explored individually in terms of their health status.

The health status of Baniatola Street Slum (Colonial Period Zone) is determined by several characteristics as outlined below. The frequency of garbage clearance in the slum area is high (Every day), resulting in a relatively clean environment that minimizes the risk of disease transmission (Table 4.4). Nevertheless, often-encountered maladies such as pyrexia, rhinorrhea, bronchitis, seasonal infections, and viral pyrexia persist every week, resulting in an average monthly expenditure of 700 rupees (Table 4.4). Within a 5000-meter radius of the slum, numerous cost-effective healthcare providers offer individuals the opportunity to receive treatment for chronic ailments (Figure 4.18).

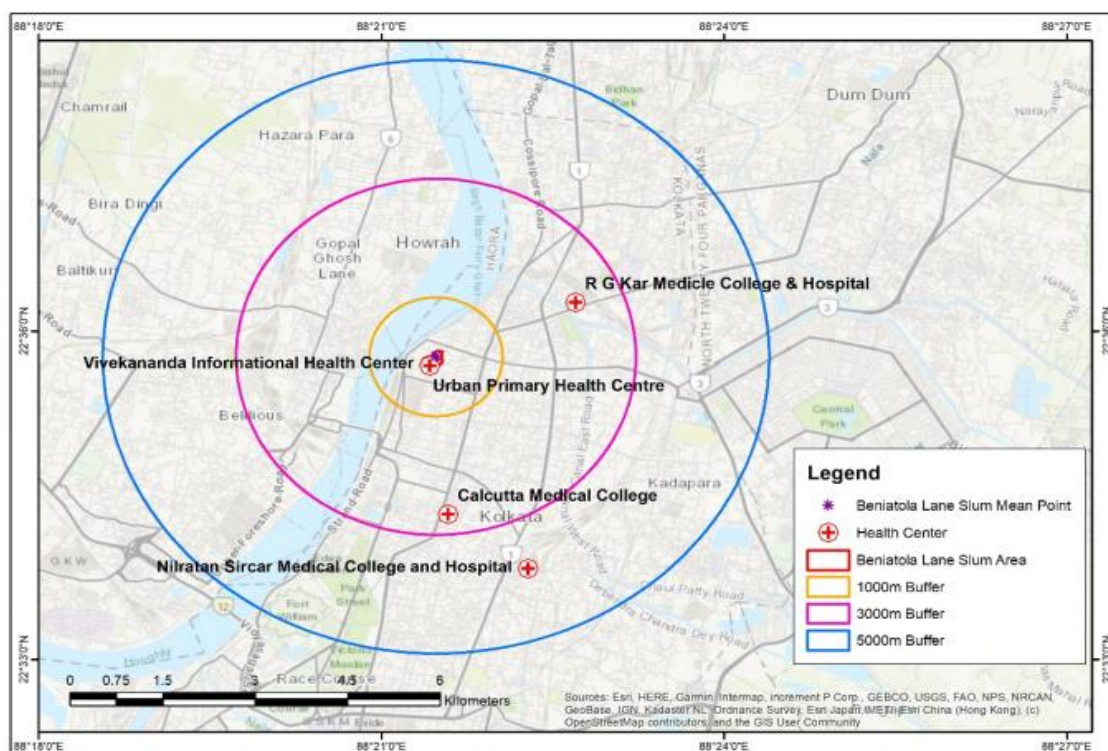


Figure 4.18: Health Institutes surrounded by the Baniatola Street Slum

Sources- Primary Survey, August, 2021

The prevalence rate of chronic diseases in this sample is 20.19 percent (Table 4.4). In the context of maternal health, the residents also receive assistance from these hospitals. The maternal age at first delivery for females is limited to a maximum of 23 years (Table 4.4). Consequently, there is a relatively high percentage of underweight children at birth, namely 37.56%. Despite receiving support from healthcare facilities, such as medications, vitamins, and iron tablets, during pregnancy, the prevalence of underweight births remains significant (Table 4.4).

The health status of the New Tangra Lane Slum (Industrial Period Zone) is influenced by several variables, which are described as follows. The frequency of waste removal in the slum area is significantly infrequent, occurring only once per week. This leads to a relatively unsanitary environment, hence increasing the potential for disease transmission (Table 4.4). However, often encountered ailments such as fever, runny nose, bronchitis, seasonal infections, viral fever, malaria, and dengue often persist on a weekly basis, leading to an average monthly spend of 765 rupees (Table 4.4). In the vicinity of 2000 meters of the slum, there exists a multitude of healthcare providers that offer affordable medical services to individuals suffering from chronic ailments (Figure 4.19). However, despite the availability of such facilities, the prevalence rate of chronic diseases in this particular slum remains at 2.36 percent (Table 4.4). This can be attributed to the unsanitary conditions of the surrounding environment and an unhealthy dietary regimen. In the realm of maternal health, the local inhabitants also receive support from these medical facilities. The maximum age for first delivery among females is restricted to 19 years, as indicated in Table 4.4. This age is considered quite young for childbirth. As a result, there exists a substantially elevated proportion of infants with low birth weight, specifically amounting to 51.46%. Despite the provision of healthcare interventions, such as pharmaceuticals, dietary supplements, and iron supplementation, to pregnant individuals, the occurrence of infants with low birth weight continues to be substantial (Table 4.4).

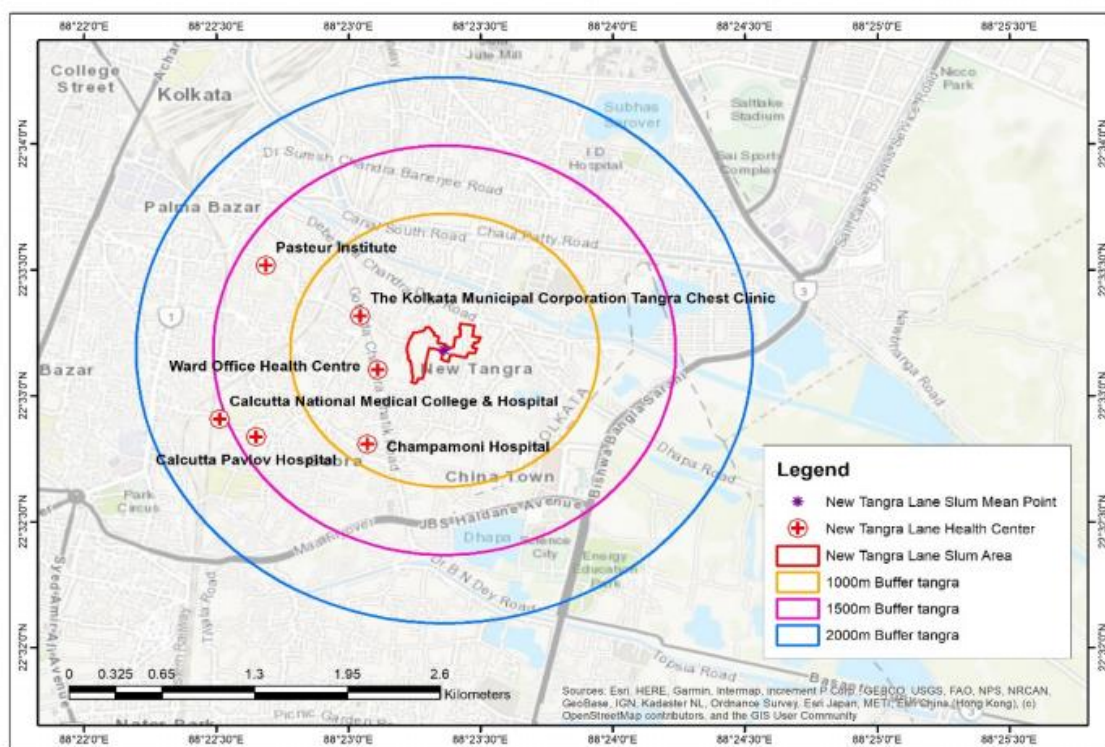


Figure 4.19: Health Institutes surrounded by the New Tangra Lane Slum

Sources- Primary Survey, August, 2021

The determination of the health status of the Baghajatin Colony Slum (Post-Independence or Post-Partition Period Zone) is influenced by various aspects, which are elaborated upon below. The frequency of waste removal in the slum area is significantly high, occurring daily.

This regularity contributes to maintaining a relatively clean environment, hence reducing the potential for disease transmission (Table 4.4). Nevertheless, often-encountered maladies such as pyrexia, rhinorrhea, bronchitis, seasonal infections, and viral pyrexia persist every month, resulting in an average monthly expenditure of 750 rupees (Table 4.4). Within a 1500-meter radius of the slum, numerous cost-effective healthcare providers offer individuals the opportunity to receive treatment for chronic ailments (Figure 4.18). The observed prevalence rate of chronic diseases within the selected sample is 23.56 percent (Table 4.4). The hospitals also provide aid to the locals in the field of maternal health. The highest allowable maternal age at first delivery for females is 22 years (Table 4.4). As a result, there exists a comparatively elevated proportion of infants with low birth weight, specifically 18.69 percent. Despite the provision of healthcare resources, including drugs, vitamins, and iron tablets, to pregnant women, the occurrence of underweight babies continues to be substantial (Table 4.4).

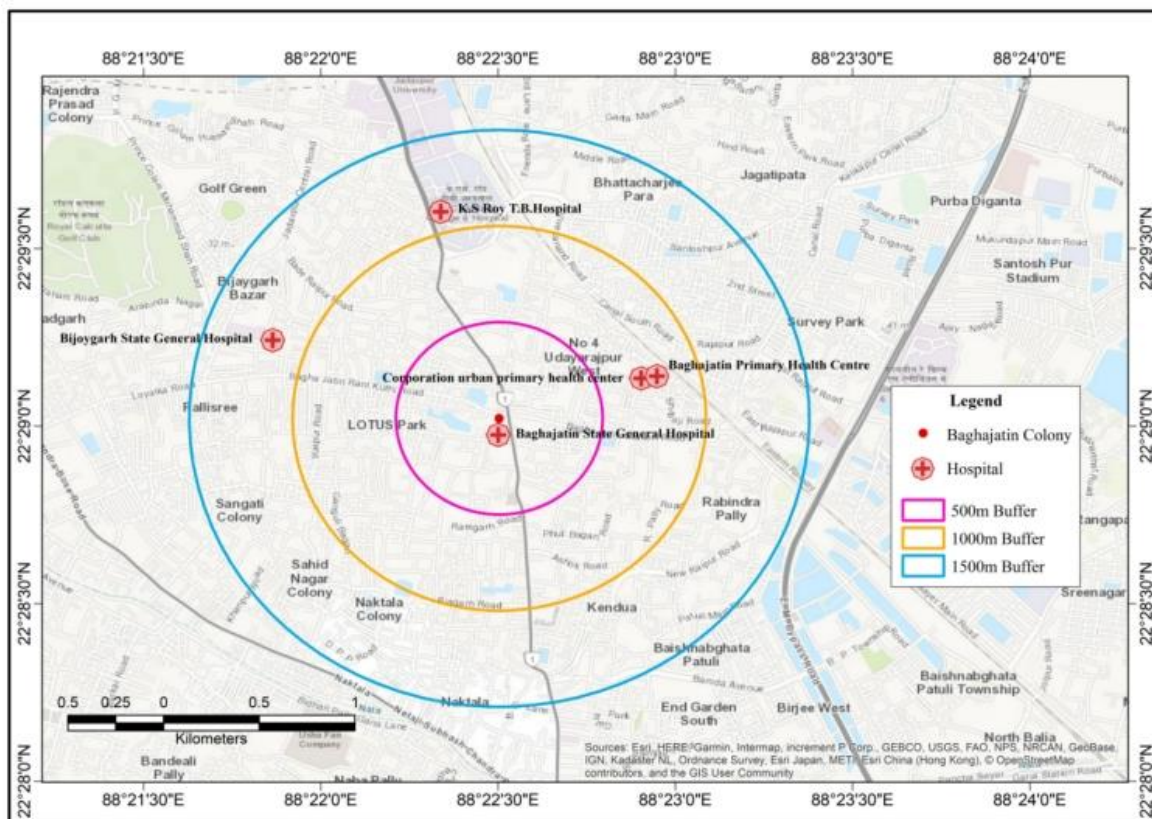


Figure 4.20: Health Institutes surrounded by the Baghajatin Colony Slum

Sources- Primary Survey, August, 2021

The health condition of the Sahid Smriti Slum (Post Land Reform Period Zone), is impacted by various factors, which are delineated as follows. The frequency of rubbish clearance in the slum neighborhood is very low, transpiring only once every two weeks. This phenomenon results in an environment that exhibits a relatively low level of sanitation, thereby augmenting the likelihood of disease transmission (Table 4.4). However, ailments such as fever, runny nose, bronchitis, seasonal infections, viral fever, malaria, and dengue often persist every week, leading to an average monthly spend of 755 rupees (Table 4.4). In the 2500-meter vicinity of the slum, only two healthcare providers offer affordable medical services to individuals suffering from chronic ailments (Figure 4.21). Therefore, the unavailability of such facilities, the prevalence rate of chronic diseases in this particular slum remains at 17.39 percent (Table 4.4). This can be attributed to the unsanitary conditions of the surrounding environment and an unhealthy dietary regimen. In the realm of maternal health, the local inhabitants also receive support from these medical facilities. The maximum age for first delivery among females is restricted to 19.5 years (Table 4.4). This age is considered quite young for childbirth. As a result, there exists a substantially elevated proportion of infants with low birth weight,

specifically amounting to 36.66 percent. Despite the provision of healthcare interventions, such as pharmaceuticals, dietary supplements, and iron supplementation, to pregnant individuals, the occurrence of infants with low birth weight continues to be substantial (Table 4.4).

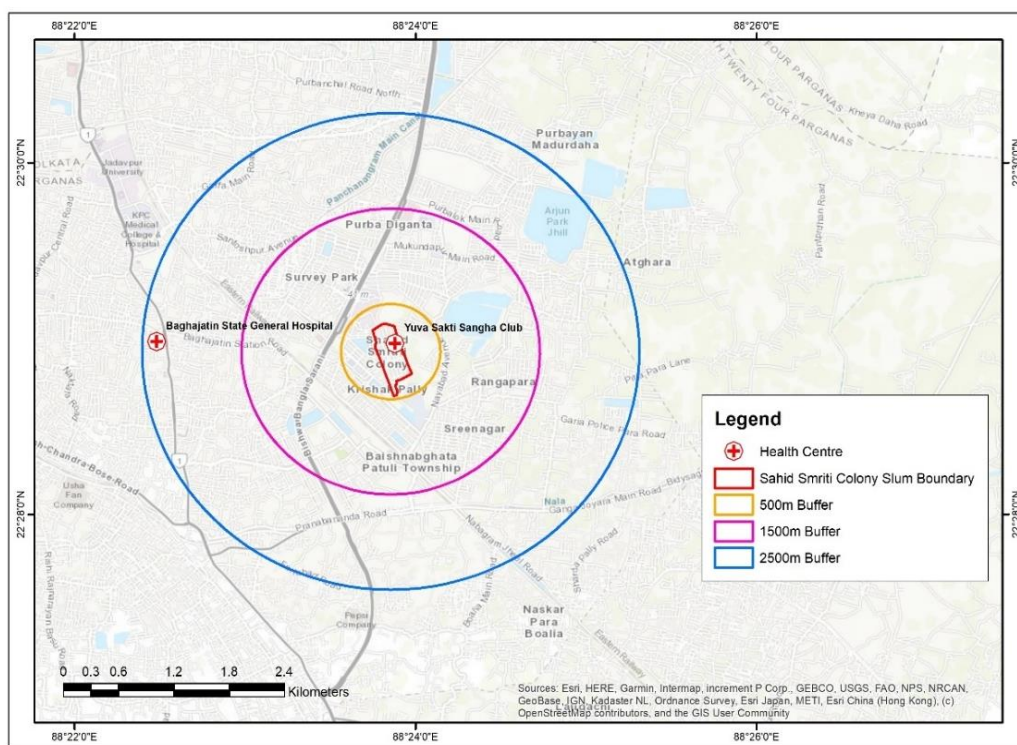


Figure 4.21: Health Institutes surrounded by the Sahid Smriti Colony Slum

Sources- Primary Survey, August 2021

The health condition of the Adhikary Para Colony Slum (New Age Kolkata Period Zone), is impacted by various factors, which are delineated as follows. The frequency of rubbish clearance in the slum neighborhood is very low, transpiring only once every two weeks. This phenomenon results in an environment that exhibits a relatively low level of sanitation, thereby augmenting the likelihood of disease transmission (Table 4.4). However, ailments such as fever, runny nose, bronchitis, seasonal infections, viral fever, malaria, and dengue often persist every month, leading to an average monthly spend of 560 rupees (Table 4.4). In the 5000-meter vicinity of the slum, only two healthcare providers offer affordable medical services to individuals suffering from chronic ailments (Figure 4.22). Therefore, the unavailability of such facilities, the prevalence rate of chronic diseases in this particular slum remains at 18.55 percent (Table 4.4). This can be attributed to the unsanitary conditions of the surrounding environment and an unhealthy dietary regimen. In the realm of maternal health, the local inhabitants also receive support from

these medical facilities. The maximum age for first delivery among females is restricted to 20.5 years (Table 4.4). This age is considered quite young for childbirth. As a result, there exists a substantially elevated proportion of infants with low birth weight, specifically amounting to 19.56 percent. Despite the provision of healthcare interventions, such as pharmaceuticals, dietary supplements, and iron supplementation, to pregnant individuals, the occurrence of infants with low birth weight continues to be substantial (Table 4.4).

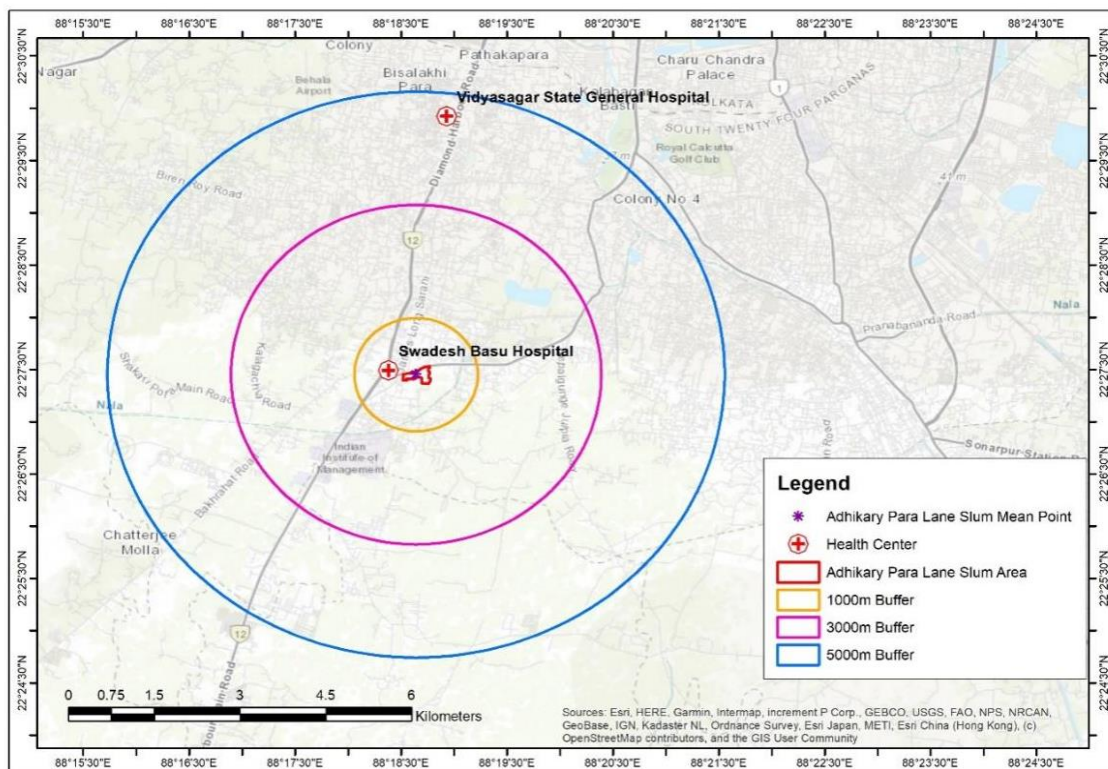


Figure 4.22: Health Institutes surrounded by the Adhikary Para Colony Slum

Sources- Primary Survey, August 2021

A composite indicator has been developed (Table 4.4) to evaluate the degree of inclusiveness regarding the Health Care and sanitation Conditions of the five chosen slums. This index incorporates various factors related to Health Care and sanitation Conditions, including the Prevalence Rate of Chronic Diseases, Frequency of General Diseases, Percentage of underweight children at birth, Maternal Age at first delivery, Medical Expenses/Households, and Garbage Clearance Frequency. Through the analysis of these indicators, it is possible to ascertain the slums that are experiencing more favorable living conditions. Based on the composite index provided in Table 4.3, Baghajatin Colony Slum (Post-Independence or Post-Partition Period Zone) holds the top rank, indicating that

it exhibits the highest level of inclusivity among all the slums. In terms of ranking, Baniatola Street Slum (Colonial Period Zone), holds the second position, while Adhikary Para Colony Slum (New-Age Kolkata Period Zone), occupies the third place. The Sahid Smriti Slum (Post Land Reform Period Zone), holds the fourth position in terms of ranking, whilst the New Tangra Lane Slum (Industrial Period Zone), is placed fifth or last, suggesting comparatively lower levels of inclusion.

Table No 4.4: Comparison of the Health Care and sanitation Conditions Among all the Slums

Serial No.	Name of the Slum	Prevalence Rate of Chronic Diseases	Rank	Frequency of General Diseases	Rank	Percentage of underweight children at birth	Rank	Maternal Age at first delivery	Rank	Medical Expenses/Households	Rank	Garbage Clearance Frequency	Rank	Composite Index of Health & Sanitation	Average Composite Index of Health and Sanitation
1	Baniatola Street Slum	20.19	2	Every week	2	37.56	4	23	1	700	2	Daily	1	12	2
2	New Tangra Lane Slum	2.36	5	Every week	2	51.46	5	19	5	765	5	Weekly	2	24	4
3	Baghajatin Colony Slum	23.56	1	Every month	1	18.69	1	22	2	750	3	Daily	1	9	1.5
4	Sahid Smriti Slum	17.39	4	Every week	2	36.66	3	19.5	4	755	4	Fortnight	3	20	3.33
5	Adhikary Para Colony Slum	18.55	3	Every Month	1	19.56	2	20.5	3	560	1	Fortnight	3	13	2.17

Sources-Computed by Researcher, Primary Survey, August,2021

4.2.d Economic Condition and Facilities

The notion of inclusive growth refers to a form of economic progress that fosters employment opportunities and contributes to the alleviation of poverty. The concept pertains to providing vital healthcare and educational services to those facing economic adversity. The aforementioned refers to guaranteeing fair and equal access to various possibilities and promoting the development of individuals via education and the acquisition of skills. The concept covers a series of developmental stages that prioritize ecological sustainability, strive for effective governance, and contribute to the establishment of a community that is attentive to gender issues. The present study examines the economic conditions prevalent in various slum areas of Kolkata, including the Colonial Period Zone, Industrial Period Zone, Post-Independence or Post-Partition Period Zone, Post Land Reform Period Zone, and New-Age Kolkata Period Zone. Each of these zones will be explored individually in terms of their economic status.

The economic status of Baniatola Street Slum (Colonial Period Zone) is determined by several characteristics as outlined below. The indigenous population in this region has been involved in commercial activities since antiquity, with a significant number of individuals participating in import and export trade, while others have concentrated on domestic commerce, particularly in the textile industry. The businesses in question failed due to inadequate innovation and adaptation, ultimately succumbing to the widespread adoption of synthetic fibers within the clothing industry. The absence was filled by small-scale hosiery and handmade clothing businesses, which were more adept at meeting the demands of the local populace. The individuals in question established various enterprises in tandem, including but not limited to coupling, city sweeping, sanitation, daily wage labor in markets, weaving in small-scale firms, and owning tea shops (Primary Survey, August 2021). The mean income of individuals residing in slums is reported to be 5700 units. On average, each household in these slum areas consists of 1.9 earning members and 1.65 dependents (Table 4.5).

The economic status of the New Tangra Lane Slum (Industrial Period Zone) is influenced by several variables, which are described as follows. The tanneries of Kolkata, which amounted to a total of 500, were primarily located in the Tangra area. Over time, due to the tremendous urban expansion of Kolkata, these previously peripheral regions have

become densely populated locations. Consequently, the tanneries situated in these regions were unable to undergo expansion, modernization, or establish an efficient system for managing solid and water waste. The aforementioned circumstances resulted in significant challenges for both the tanneries and the residents residing in these localities. Still maximum of the Tangra slum dwellers work as tannery workers there (Primary Survey, August 2021). The mean income of individuals residing in slums is reported to be 4230 units. On average, each household in these slum areas consists of 1.56 earning members and 2.65 dependents (Table 4.5).

The determination of the economic status of the Baghajatin Colony Slum (Post-Independence or Post-Partition Period Zone) is influenced by various aspects. A significant proportion of the colony residents engage in various commercial activities, such as operating grocery stores, mechanical workshops, small-scale construction firms, and metalworking shops. Additionally, a subset of individuals also provides services on a modest scale (Primary Survey, August 2021).

The mean income of individuals residing in slums is reported to be 12000 units. On average, each household in these slum areas consists of 2.45 earning members and 1.25 dependents (Table 4.5).

The economic condition of the Sahid Smriti Slum (Post Land Reform Period Zone), is impacted by various factors, which are delineated as follows. A considerable number of the male inhabitants of the colony were employed as construction laborers, in addition to working in occupations such as mechanical labor, rickshaw pulling, and operating tea stalls. Conversely, the female residents of the colony predominantly find employment as domestic workers, fulfilling roles as household servants. The mean income of individuals residing in slums is reported to be 3254 units. On average, each household in these slum areas consists of 2.1 earning members and 2.21 dependents (Table 4.5).

The economic condition of the Adhikary Para Colony Slum (New Age Kolkata Period Zone), is impacted by various factors, which are delineated as follows. Formerly mostly engaged in agriculture, the residents of this slum have modified their work culture to include construction, real estate betting, grocery store workers, automobile drivers, rikshaw pullers, house servants, vegetable dealers, and other assorted occupations. From 2010, however, economic workers have shifted their attention to medical aid, as

Thakurpukur has developed into south Kolkata's primary medical hub. Thakurpukur Cancer Hospital-Saroj Gupta Cancer Center & Research Institute, BMRI Hospital (P) Ltd, DM Hospitals Pvt. Ltd, Swadesh Basu Hospital, Kasturi Medical Centre Pvt. Ltd., Apollo Clinic Thakurpukur, Humanity Hospital, Narayan Memorial Hospital, Indira IVF Fertility Centre, Command Hospital, St. Jude India Child Care Centers, and a slew of other private hospitals developed in this area. The hospitals accounted for the lion's share of new employment opportunities. Because of this, most male workers who couldn't read or write left their jobs and went into the medical field as helpers. Compared to other urban ghettos, this area has a significantly higher employment rate, as evidenced by a primary study. The prevailing work culture in this context primarily involves individuals employed in various departments of hospitals, such as sweepers responsible for collecting blood and other specimens from households for pathological laboratories affiliated with multiple hospitals. Additionally, the workforce includes canteen workers, ward boys, tea vendors operating outside hospitals, personnel serving in diverse dispensaries within hospital premises, ambulance drivers, and hospital contractors. The mean income of individuals residing in slums is reported to be 6150 units. On average, each household in these slum areas consists of 1.2 earning members and 2.11 dependents (Table 4.5).

A composite indicator has been developed (Table 4.5) to evaluate the degree of inclusiveness regarding the Economic Conditions of the five chosen slums. This index incorporates various factors related to Economic Conditions, including Income Level, number of Earning Members per Household, Number of Dependents per Household, and Below Poverty Level in Percentage (Official). Through the analysis of these indicators, it is possible to ascertain the slums that are experiencing more favorable economic conditions. Based on the composite index provided in

Table 4.5, Baghajatin Colony Slum (Post-Independence or Post-Partition Period Zone) holds the top rank, indicating that it exhibits the highest level of inclusivity among all the slums. In terms of ranking, Adhikary Para Colony Slum (New-Age Kolkata Period Zone), holds the second position, while, Baniatola Street Slum (Colonial Period Zone) occupies the third place. The Sahid Smriti Slum (Post Land Reform Period Zone), holds the fourth position in terms of ranking, whilst the New Tangra Lane Slum (Industrial Period Zone), is placed fifth or last, suggesting comparatively lower levels of inclusion.

Table No 4.5: Comparison of the Economic Conditions Among all the Slums

Serial No.	Name of the Slum	Income Level	Rank	No. of Earning Members/Household	Rank	No. of Dependents/ Household	Rank	Below Poverty Level in Percentage (Official)	Rank	Composite Index of Economic Conditions	Average Composite Index of Economic Conditions
1	Baniatola Street Slum	5700	3	1.9	3	1.65	2	80.21	5	13	3.25
2	New Tangra Lane Slum	4230	4	1.56	4	2.65	5	78.46	3	16	4
3	Baghajatin Colony Slum	12000	1	2.45	1	1.25	1	21.36	1	4	1
4	Sahid Smriti Slum	3254	5	2.1	2	2.21	4	84.32	4	15	3.75
5	Adhikary Para Colony Slum	6150	2	1.2	5	2.11	3	79.65	2	12	3

Sources-Computed by Researcher, Primary Survey, August, 2021

4.2.e Transport and Communication Facilities

Transportation and communication play a crucial role in enabling individuals to overcome the challenges posed by geographical distances. It serves as an effective method for establishing communication with others, regardless of the geographical distance that may separate them. Transportation commonly involves the movement of people or goods from one place to another using various modes of transportation. In contrast, communication can be defined as the process by which information or data is transmitted from a sender to a recipient. The present study examines the Transport and Communication conditions prevalent in various slum areas of Kolkata, including the Colonial Period Zone, Industrial Period Zone, Post-Independence or Post-Partition Period Zone, Post Land Reform Period Zone, and New-Age Kolkata Period Zone. Each of these zones will be explored individually in terms of their Transport and Communication. The first Baniatola Street Slum (Colonial Period Zone) has Pucca roadways within the slum area whereas for New Tangra Lane Slum (Industrial Period Zone) is Semi Pucca, for Baghajatin Colony Slum (Post-Independence or Post-Partition Period Zone) it is Pucca, for Sahid Smriti Slum (Post Land Reform Period Zone) it is Kaccha and lastly for Adhikary Para Colony Slum (New Age Kolkata Period Zone), it is Semi Pucca. On the other hand, in the case of Access to

media (Newspapers and Television) in Baniatola Street Slum (Colonial Period Zone), the access is 43.67 percent, for New Tangra Lane Slum (Industrial Period Zone) it is 42.44 percent, for Baghajatin Colony Slum (Post-Independence or Post-Partition Period Zone) it is 49.36 percent, for Sahid Smriti Slum (Post Land Reform Period Zone) it is 16.66 percent, lastly for Adhikary Para Colony Slum (New Age Kolkata Period Zone), it is 12.35 percent.

A composite indicator (Table 4.6) has been developed to evaluate the degree of inclusiveness regarding the Transport and Communication Conditions of the five chosen slums. This index incorporates various factors related to Transport and Communication Conditions, including Road Type inside the slum area and access to media (Newspapers and Television). Analyzing these indicators makes it possible to ascertain which slums are experiencing more favorable transport and communication conditions. Based on the composite index provided in Table 4.6, Baghajatin Colony Slum (Post-Independence or Post-Partition Period Zone) holds the top rank, indicating that it exhibits the highest level of inclusivity among all the slums. Regarding ranking, Baniatola Street Slum (Colonial Period Zone), holds the second position, while, New Tangra Lane Slum (Industrial Period Zone) occupies the third place. The Sahid Smriti Slum (Post Land Reform Period Zone), and Adhikary Para Colony Slum (New-Age Kolkata Period Zone) hold the fourth position in terms of ranking, suggesting comparatively lower levels of inclusion.

Table No 4.6: Comparison of Transport and Communication Facilities Conditions Among all the Slums

Serial No	Name of the Slum	Road Type	Rank	Access to media (Newspapers and Television)	Rank	Composite Index of Transport & Communication	Average Composite Index of Transport and Communication
1	Baniatola Street Slum	Pucca	1	43.67	2	3	1.5
2	New Tangra Lane Slum	Semi Pucca	2	42.44	3	5	2.5
3	Baghajatin Colony Slum	Pucca	1	49.36	1	2	1
4	Sahid Smriti Slum	Kaccha	3	16.66	4	7	3.5
5	Adhikary Para Colony Slum	Semi Pucca	2	12.35	5	7	3.5

Sources-Computed by Researcher, Primary Survey, August, 2021

4.2.f Disaster Facilities

Lastly, in relation to the issue of natural catastrophes, a composite Index has been established, which primarily concentrates on the waterlogging and fire risk in slums, as well as the level of awareness among residents. The present study examines the Disaster Facilities conditions prevalent in various slum areas of Kolkata, including the Colonial Period Zone, Industrial Period Zone, Post-Independence or Post-Partition Period Zone, Post Land Reform Period Zone, and New-Age Kolkata Period Zone. Each of these zones will be explored individually in terms of their Disaster Facilities.

The first Baniatola Street Slum (Colonial Period Zone) has a Percentage of Households aware of Disasters 84.36 percent because Three years ago they faced mild Occurrences of Fire hazards and this slum faces Waterlogging Only During Monsoons. The New Tangra Lane Slum (Industrial Period Zone) has a Percentage of Households aware of Disasters 76.12 percent because More than Five years ago faced huge Occurrences of Fire hazards and this slum faces Waterlogging During Light Showers. Baghajatin Colony Slum (Post-Independence or Post-Partition Period Zone) has a Percentage of Households aware of Disasters 92.31 percent because Eight years ago faced mild Occurrences of Fire hazards and this slum faced Waterlogging problems Only During Monsoon. Sahid Smriti Slum (Post Land Reform Period Zone) has a Percentage of Households aware of Disasters 71.66 percent because Five Years ago faced huge Occurrences of Fire hazards and this slum faced Waterlogging problems During Light Shower. Adhikary Para Colony Slum (New Age Kolkata Period Zone) has a Percentage of Households aware of Disasters percent 72.25 because ten Years ago faced huge Occurrences of Fire hazards and this slum faced Waterlogging problems During Light Showers.

A composite indicator has been developed (Table 4.7) to evaluate the degree of inclusiveness regarding the Disaster Facilities Conditions of the five chosen slums. This index incorporates various factors related to Disaster Facilities, including the Percentage of Households aware of Disasters, Frequency of Waterlogging, and Occurrence of the last Fire hazard (if any). Through the analysis of these indicators, it is possible to ascertain the slums that are experiencing more favorable Disaster Facilities conditions. Based on the composite index provided in Table 4.7, Baghajatin Colony Slum (Post-Independence or Post-Partition Period Zone) holds the top rank, indicating that it exhibits the highest level of inclusivity among all the slums. In terms of ranking, Adhikary Para Colony Slum (New-

Age Kolkata Period Zone), holds the second position, while, Baniatola Street Slum (Colonial Period Zone) and New Tangra Lane Slum (Industrial Period Zone) occupy the third place. The Sahid Smriti Slum (Post Land Reform Period Zone), holds the fourth position in terms of ranking, suggesting comparatively lower levels of inclusion.

Table No 4.7: Comparison of Disaster Facilities Among all the Slums

Serial No.	Name of the Slum	Percentage of Households aware of Disasters	Rank	Frequency of Waterlogging	Rank	Occurrence of last Fire hazard (if any)	Rank	Composite Index of Disaster Issues	Average Composite Index of Disaster Issues
1	Baniatola Street Slum	84.36	2	Only During Monsoons	1	Three years ago (Mild)	5	8	2.67
2	New Tangra Lane Slum	76.12	3	Always During Light Showers	2	More than Five years ago (Huge)	3	8	2.67
3	Baghajatin Colony Slum	92.31	1	Only During Monsoon	1	Eight years ago (Mild)	2	4	1.67
4	Sahid Smriti Slum	71.66	5	During a Light Shower	2	Five Years ago (Huge)	4	11	3.67
5	Adhikary Para Colony Slum	72.25	4	Always During Light Showers	2	Ten years ago (Medium)	1	7	2.33

Sources-Computed by Researcher, Primary Survey, August, 2021

The Composite Index was formulated (Table 4.8) by evaluating the aforementioned criteria, and afterward, the Average Composite Index was derived from the outcomes of this evaluation. By analyzing the six composite indices representing each parameter rank, it has been able to evaluate the relative inclusiveness of the five slums under consideration.


In what position may it potentially be ranked? The Baghajatin Colony Slum (Post-Independence or Post-Partition Period Zone) is the most inclusive and ranked as one, followed by the Baniatola Street Slum (Colonial Period Zone) ranked as two, Adhikary Para Colony Slum (New-Age Kolkata Period Zone) ranked as three, New Tangra Lane Slum (Industrial Period Zone) ranked as four and Sahid Smriti Slum (Post Land Reform Period Zone) ranked as five which is the least inclusive among all the selected slum. Table 4.9 presents a ranking of slums based on their level of development, ranging from the most developed to the least developed or developing.

Table No 4.8: Composite Index of all the selected Slums

Serial Number	Name of the Slum	Average Composite Index of Literacy Status	Average Composite Index of Living Conditions	Average Composite Index of Health Care Facilities	Average Composite Index of Economic Condition	Average Composite Index of Transportation and Communication	Average Composite Index of Disaster Facilities	Composite Index Score	Average Composite Index Score	Rank
1	Baniatola Street Slum	2.33	1.6	2	3.25	1.5	2.67	13.35	2.11	2
2	New Tangra Lane Slum	3.33	3.8	4	4	2.5	2.67	20.30	3.33	4
3	Baghajatin Colony Slum	1	1.4	1.5	1	1	1.67	7.57	1.21	1
4	Sahid Smriti Colony Slum	3.67	3.2	3.33	3.75	3.5	3.67	20.12	3.52	5
5	Adhikary Para Colony Slum	4.67	2.8	2.17	3	3.5	2.33	19.47	3.10	3

Sources-Computed by Researcher, Primary Survey, August, 2021

Table No 4.9: Ranking Index of all the selected Slums

Rank	Name of the Slum	Description (Era)	Status
1	Baghajatin Colony Slum	Post-Independence or Post-Partition Period Zone	Developed  Developing
2	Baniatola Street Slum	Colonial Period Zone	
3	Adhikary Para Colony Slum	New-Age Kolkata Period Zone	
4.	New Tangra Lane Slum	Industrial Period Zone	
5	Sahid Smriti Colony Slum	Post Land Reform Period Zone	

Sources-Computed by Researcher, Primary Survey, August, 2021

4.3 Section II: Inclusiveness Hindered - Discovering Challenges Within Slums

Numerous challenges have been identified inside each slum that impede their capacity to attain inclusiveness. The issues have been further examined and summarized in Table 4.10.

Table 4.10: Inclusiveness Hindered - Discovering Challenges Within Slums

	<i>Baniatola Street Slum (Rank 2)</i>	<i>New Tangra Lane Slum (Rank 4)</i>	<i>Baghajatin Colony Slum (Rank 1)</i>	<i>Sahid Smriti Colony Slum (Rank 5)</i>	<i>Adhikary Para Colony Slum (Rank 3)</i>
<i>Education</i>	Lack of affordable Schools or Educational Facilities	X	X	Lack of affordable Schools or Educational Facilities	
	Financial Constraints			Distance of the Institution from Slum	
	Poor Infrastructure of the Governmental Schools			Financial Constraints	
	Child Labor and Social Pressures			Poor Infrastructure of the Governmental Schools	
	Limited Awareness of the Importance of Education			Child Labor and Social Pressures	
	Lack of affordable Schools or Educational Facilities			Limited Awareness of the Importance of Education	
	<i>Living Condition</i>			X	Overcrowding and Limited Space
Lack of Basic Amenities					
Unsafe and Unstable Structures					
Vulnerability to Natural Disasters					
Inadequate Land Tenure and Rights					

	<i>Baniatola Street Slum (Rank 2)</i>	<i>New Tangra Lane Slum (Rank 4)</i>	<i>Baghajatin Colony Slum (Rank 1)</i>	<i>Sahid Smriti Colony Slum (Rank 5)</i>	<i>Adhikary Para Colony Slum (Rank 3)</i>
<i>Health and Sanitation</i>	X	Overcrowding Situation	Limited infrastructural availability within affordable Healthcare Facilities.	Malnutrition and Food Insecurity	X
		Malnutrition and Food Insecurity		Limited Medical Supplies and Equipment	
		Limited Medical Supplies and Equipment		Shortage of Healthcare Personnel	
		Shortage of Healthcare Personnel		Inadequate Emergency Services	
		Inadequate Emergency Services		Poor Infrastructure in Healthcare Facilities	
		Poor Infrastructure in Healthcare Facilities		Distance from the Medical Services	
		Unsafe housing conditions		Social determinants of health	
		Social determinants of health		Malnutrition and Food Insecurity	
<i>Economy</i>	Inheritance Business Practice	Lack of Formal Industries and Businesses	X	Lack of Formal Industries and Businesses	X
	Low-Skilled Labor Market	Low-skilled Labor Market		Informal Economy Dominance	
	Informal Economy Dominance	Informal Economy Dominance		Limited Education and Training	
	Limited Access to Markets and Resources	Limited Education and Training		Lack of Support Services	
	Inheritance Business Practice	Market Access Challenges		Lack of Formal Industries and Businesses	
<i>Transportation and Communication</i>	X	X	X	Limited Transportation Infrastructure	
				Lack of Communication Infrastructure	
<i>Disaster preparedness</i>	X	X	X	X	Waterlogging Problem

Sources-Primary Survey, 2022, Computed by Researcher

The discussion of issues related to the slum and the accompanying actions implemented to mitigate them has been conducted in an organized and sequential manner, prioritizing the most urgent concern and subsequently addressing the subsequent four critical issues.

The main issue regarding the **Baghajatin Colony Slum (Rank 1)** pertains to *health-related challenges*. The problem of limited access to healthcare in the Baghajatin colony slum is caused by plenty of factors that collectively contribute to inadequate healthcare services for its residents. Several barriers can be recognized, specifically,

- I. *Limited infrastructural availability within affordable Healthcare Facilities:*
The Baghajatin colony slum is near several healthcare facilities. Specifically, there is one governmental hospital within a 500-meter radius, two primary health centers within a 1000-meter radius, and two additional governmental hospitals within a 1500-meter radius. However, it is important to note that these healthcare facilities lack adequate infrastructure in terms of health equipment. The slum lacks sufficient healthcare infrastructure, including access to clean water and sanitation and a shortage of full-time medical professionals and attendants, all of which are crucial for promoting and sustaining good health.

To mitigate the issue of limited access to healthcare services within the 'Baghajatin slum, a range of initiatives may be considered for implementation. These are the following,

- i) *Establishing Mobile Health Clinics-* The idea of establishing mobile health clinics in or near slum neighborhoods is to provide necessary healthcare services during certain periods when medical assistants will be available.
- ii) *Improving infrastructure-* Enhancing infrastructure includes the provision of essential services such as access to clean water, enough sanitation facilities, and efficient waste management systems. Additionally, it involves ensuring the availability of full-time medical professionals, including doctors and nurses, as well as equipping healthcare facilities with appropriate medical testing and surgical equipment.
- iii) *Governmental and NGO Help-* Collaborating with community leaders and local organizations to mobilize support for enhanced healthcare services and infrastructure within the slum area.

The mitigation of health inaccessibility in the Baghajatin slum necessitates a comprehensive strategy that encompasses active involvement of the community,

intervention by governmental entities, and cooperation between healthcare providers and local authorities, with the ultimate goal of ensuring fair and impartial access to healthcare services for every inhabitant.

Furthermore, the biggest issues confronted by the ***Baniatola Street Slum (Rank 2)*** are related to *education and economic opportunities*.

Education: The problem of limited access to education in the Baniatola Street Slum is likely driven by a range of factors that hinder the achievement of education that is both of high quality and inexpensive.

- I. *Lack of affordable Schools or Educational Facilities:* The Baniatola Street Slum is characterized by a limited number of accessible government-run elementary and secondary educational institutions that cater to the educational needs of both genders. The insufficient presence of schools or educational institutions in the region restricts the opportunity for children to receive formal education, thereby impeding their future economic prospects.
- II. *Financial Constraints:* The economic situation of this particular slum is characterized by significant challenges, leading to difficulties in meeting the financial requirements associated with education, including expenses such as school fees, uniforms, books, and transportation to the nearby private school.
- III. *Poor Infrastructure of the Governmental Schools:* Government-run educational institutions currently face significant deficiencies in infrastructure, encompassing inadequate classrooms, sanitation facilities, and teaching resources. These deficiencies pose considerable obstacles for students in terms of attendance and effective learning. Consequently, parents are compelled to enroll their children in private schools. However, due to limited financial resources, many parents are unable to sustain these arrangements, resulting in their children being compelled to discontinue their education.
- IV. *Child Labor and Social Pressures:* The financial challenges experienced by families compel children to engage in labor or contribute to household earnings, impeding their regular attendance in educational institutions and ultimately exacerbating student dropout rates.

- V. *Limited Awareness of the Importance of Education:* The lack of parental or guardian understanding of the benefits of education among slum dwellers results in a reduced emphasis on the educational endeavors of their children.

In order to mitigate the issue of educational inaccessibility in Baniatola Street Slum, a range of activities can be contemplated,

- i) *Establishment of Community Learning Centers:* In addition to the educational institutions established by the government, there are also schools initiated and managed by local groups, such as clubs. The establishment of informal educational spaces within the community can offer children who are unable to attend regular schools accessible and cost-effective educational opportunities.
- ii) *Scholarships and Financial Support:* The provision of scholarships and financial aid programs by governmental and municipal authorities can effectively alleviate the financial strain on families, hence promoting school attendance among children.
- iii) *Improvement of Existing Schools:* One potential strategy for improving the quality of education in current educational institutions is the implementation of infrastructural upgrades, the provision of educational resources, and the training of teachers.
- iv) *Advocacy and Awareness Programs:* The implementation of awareness programs aimed at highlighting the significance of education in shaping the future of children, along with the active involvement of parents in the educational journey.
- v) *Collaboration with NGOs and Government:* Collaborating with non-governmental organizations (NGOs) or governmental entities to execute initiatives focused on enhancing educational accessibility and quality within the slum area.

The resolution of educational inaccessibility in Baniatola Street Slum necessitates a collaborative endeavor encompassing the community, local governing bodies, educational establishments, and diverse stakeholders to guarantee equal access to high-quality education for all children, regardless of their socioeconomic status or living circumstances.

Economic opportunities: The Baniatola Street Bustee faces various constraints that limit the availability of business opportunities.

- I. *Inheritance Business Practice:* Baniatola served as the district primarily inhabited by merchants. In the region of Bengal, those affiliated with the 'Benia' caste were actively engaged in various economic activities such as trading, merchant activities, moneylending, and banking, among others. During the colonial era, merchants

began to establish settlements in this region and engage in commercial activities. Over time, they have become involved in the hosiery and small garment industry, which is currently seeing limited success. Consequently, they are currently facing significant economic challenges.

- II. *Low-Skilled Labor Market:* The residents have constraints in terms of accessing skill development or vocational training programs, which consequently hinders their capacity to secure higher-paying employment opportunities or broaden their skill sets. The slum inhabitants possess skills primarily in their inherent small-scale textile startup, limiting their access to diverse job markets beyond their current occupation.
- III. *Informal Economy Dominance:* In addition to their involvement in the textile industry, a significant portion of the local population depends on informal occupations, such as street vending or daily wage labor. These types of employment sometimes yield unpredictable earnings and lack the provision of social security benefits.
- IV. *Limited Access to Markets and Resources:* The garments produced by the company are non-branded and do not align with current fashion trends, resulting in a lack of market access, resources, and networks essential for entrepreneurial endeavors. Consequently, inhabitants face obstacles in developing and expanding their own businesses. This ultimately hinders their economic advancement.

In order to mitigate the issue of limited access to economic prospects in Baniatola Street Slum, several potential initiatives can be explored,

- i) *Skills Development Programs:* The lack of vocational training possibilities and knowledge within the government for the specific slum area has resulted in a deficiency of skills necessary for pursuing various emerging job prospects, aside from those related to entrepreneurship. Hence, the implementation of vocational training and skill development programs by state government and local administration, customized to meet the specific needs of the community, can effectively equip citizens with marketable abilities. This, in turn, has the potential to enhance their earning potential.
- ii) *Microfinance and Entrepreneurship Support:* The limited financial resources available to those residing in slums pose a significant obstacle to attaining elevated levels of productivity in their entrepreneurial pursuits. As a result, with the

provision of government aid through the provision of increased access to microfinance initiatives, the provision of business training, and the implementation of mentorship programs, individuals may improve their ability to generate more profits from their small firms and extend their market penetration.

- iii) *Promoting Local Markets and Industries*: The implementation of a government awareness program in this slum, in collaboration with local markets, and the promotion of small-scale enterprises for the resale of neighborhood products, has the potential to foster the development of the local business market and contribute to the stimulation of economic growth.
- iv) *Government and NGO Support*: Engaging in partnerships with governmental entities and non-governmental organizations to facilitate the provision of resources, marketing of their products, and implementation of initiatives targeting the enhancement of economic empowerment and the generation of employment opportunities.
- v) *Education and Awareness*: The dissemination of knowledge regarding financial literacy, employment prospects, and entrepreneurial endeavors has the potential to equip individuals with the necessary tools to make well-informed choices about economic undertakings.

To enhance economic prospects in Baniatola Street Bustee, a holistic strategy is necessary, encompassing skill enhancement, assistance for entrepreneurs, resource accessibility, and collaboration among local authorities, community organizations, and stakeholders. This multifaceted approach aims to establish enduring means of livelihood for the residents.

The *Adhikary Para Colony Slum (Rank 3)* deals with several challenges, namely *education, transport and communication, and Disaster Issues*.

Education: The issue of educational inaccessibility in the Adhikary Para Colony Slum is likely influenced by a multitude of issues that impede the attainment of both high-quality and affordable education.

- I. *Lack of affordable Schools or Educational Facilities*: The Adhikary Para Colony Slum demonstrates a lack of government-operated elementary and secondary educational institutions that are easily accessible to fulfill the educational needs of both male and female residents. The restricted presence of schools or

educational institutions in the region is a barrier to children's capacity to obtain formal education, thereby impeding their future economic prospects.

- II. *Distance of the Institution from Slum:* The distance between the basic governmental schools and the slum premises is considerable, with children having to walk approximately 2 kilometers for their education. Furthermore, for secondary school education, the distance increases to 5 kilometers. This poses challenges in terms of both the physical and financial burden of daily travel for both male and female students.
- III. *Financial Constraints:* The economic circumstances prevalent in this specific slum are marked by notable obstacles, resulting in hardships in fulfilling the financial obligations linked to education, encompassing expenditures such as school fees, uniforms, books, and transportation to the adjacent private educational institution.
- IV. *Poor Infrastructure of the Governmental Schools:* Government-operated educational institutions presently encounter notable shortcomings in infrastructure, including insufficient classrooms, sanitation amenities, and instructional materials. The presence of these impairments presents significant challenges for students about their attendance and ability to engage in effective learning. As a result, parents feel obligated to enroll their children in private schools. Nevertheless, as a consequence of constrained financial means, several parents find themselves unable to maintain such arrangements, leading to a situation where their children are driven to quit their pursuit of education.
- V. *Child Labor and Social Pressures:* The economic difficulties faced by households necessitate the involvement of children in labor or their contribution to household income, which hinders their consistent attendance in educational institutions and eventually worsens the rates of student attrition.
- VI. *Limited Awareness of the Importance of Education:* Lack of parental or guardian understanding of the benefits of education could result in a reduced prioritization of children's educational endeavors.

To mitigate the issue of educational inaccessibility in *Adhikary Para Colony Slum*, a range of activities can be contemplated,

- i) *Establishment of Community Learning Centers:* In addition to the educational institutions established by governmental authorities, there are schools that are

initiated and controlled by local organizations, such as clubs. The implementation of informal educational venues within the local community can provide youngsters who are unable to enroll in conventional educational institutions with accessible and economically viable educational prospects.

- ii) *Scholarships and Financial Support*: The implementation of scholarship and financial aid initiatives by governmental and municipal entities has the potential to significantly mitigate the economic burden faced by families, hence fostering increased rates of school enrollment among children.
- iii) *Improvement of Existing Schools*: One potential approach for enhancing the caliber of education in contemporary educational establishments involves the adoption of infrastructure enhancements, the provision of educational materials, and the professional development of teachers.
- iv) *Advocacy and Awareness Programs*: The execution of awareness initiatives designed to emphasize the importance of education in influencing the future of children, coupled with the active engagement of parents in the educational process.
- v) *Collaboration with NGOs and Government*: Engaging in partnerships with non-governmental organizations (NGOs) or governmental agencies to implement projects aimed at improving educational accessibility and quality in slum areas.

The resolution of the issue of educational inaccessibility in Adhikary Para Colony Slum requires a collaborative effort involving the community, local government entities, educational institutions, and various stakeholders. This collective endeavor aims to ensure equitable access to high-quality education for all children, irrespective of their socioeconomic status or living conditions.

Transport and Communication within Slum Area: The presence of transportation and communication challenges within a slum area, represented by Adhikary Para Colony Slum, can have a substantial influence on the everyday lives of its inhabitants and their ability to avail themselves of many services. Frequently encountered problems encompass:

- I. *Limited Transportation Infrastructure*: The absence of adequate road infrastructure in this slum poses significant difficulties for residents in traversing the narrow and dirt thoroughfares. The road infrastructure within slum areas is characterized by semi-pucca construction, which leads to further deterioration during periods of rainfall. Additionally, the road corridors exhibit a significant

narrowness, resulting in minimal spacing between adjacent slum structures. Consequently, traversing through these areas becomes challenging, further exacerbating the potential for fire hazards due to the limited space available.

II. Lack of Communication Infrastructure: Insufficient availability of telecommunication services, including mobile networks and internet connectivity, as well as limited access to newspapers, might impede the capacity of individuals to engage in external contact, obtain information, or seek necessary support.

To mitigate the challenges of transit and communication within the Adhikary Para Colony Slum, a range of options can be contemplated:

- a) *Improvement of Transportation Infrastructure:* The proposed intervention involves enhancing the infrastructure inside the slum area, specifically through the upgrading of roads, establishment of improved access points, and enhancement of public transport networks. These measures aim to promote smoother mobility for the residents residing in the slum region.
- b) *Enhanced Communication Facilities:* The intent is to enhance communication and information accessibility for citizens by ensuring the provision of inexpensive and dependable telecommunication services, encompassing mobile networks and internet connectivity.
- c) *Engagement with Local Authorities and NGOs:* Engaging in partnerships with governmental entities and non-profit entities to effectively tackle transportation and communication infrastructure deficiencies, lobbying for enhancements, and implementing enduring and environmentally-friendly resolutions.

Resolving transport and communication challenges in Adhikary Para Colony Slum necessitates a collaborative approach involving local authorities, community leaders, non-governmental organizations (NGOs), and residents. This collective effort aims to boost infrastructure, expand service accessibility, and improve the general standard of living in the slum region.

Disaster Issues (Waterlogging Problem): Waterlogging is a prevalent concern that impacts numerous urban regions, encompassing impoverished settlements such as Adhikary Para Colony. Waterlogging is a phenomenon that arises as a result of insufficient drainage systems, excessive precipitation, inadequate infrastructure, and bad land management

practices. In impoverished urban regions, the presence of slums can give rise to a multitude of issues.

- I. *Poor drainage systems*: Insufficient or inadequately maintained drainage infrastructure inside these urban areas has resulted in the occurrence of waterlogging. Within these slums, the predominant type of drainage system is an open drainage system. The lack of adequate infrastructure, including drains, culverts, and canals, can lead to the accumulation of stagnant water in periods of intense precipitation.
- II. *Lack of maintenance*: The exacerbation of the problem is attributed to the neglect or inadequate upkeep of the current drainage system. The drainage system undergoes maintenance by the government on a biweekly basis. However, the occurrence of blockages, and damages to drains, culverts, and sewers hinders the smooth flow of water, resulting in waterlogging.
- III. *Absence of proper sanitation facilities*: The inadequate provision of toilet facilities and sewage infrastructure in this slum area has led to the mixing of sewage water with rainwater, hence exacerbating waterlogging and posing health hazards.
- IV. *Land encroachment and informal settlements*: The encroachment upon marshlands, and floodplains for residential and other land uses has the potential to alter the natural hydrological processes, hence exacerbating waterlogging problems. Due to the antiquity of the land area in question, it has been observed that a significant portion of the land has repeatedly been encroached upon by human settlements, so obstructing the natural water sources and leading to the aforementioned outcome.

The mitigation of waterlogging in slums necessitates a holistic approach encompassing urban planning, infrastructure development, community engagement, and sustainable resource management.

- a) *Improvement of Drainage Systems*: The implementation or enhancement of pre-existing drainage systems is crucial for facilitating appropriate water flow and mitigating waterlogging occurrences during periods of intense precipitation.
- b) *Elevating Infrastructure*: One potential strategy to mitigate the ingress of water into residential structures and facilitate effective water drainage involves the

elevation of roadways and dwellings, along with the establishment of appropriate gradients to facilitate runoff.

- c) *Regular Maintenance*: Regular maintenance of drainage systems, including the removal of waste or blockages, and verification of their functionality prior to the onset of the monsoon season, is vital.
- d) *Community Awareness*: The intention is to provide residents with information regarding waste disposal practices, promote the avoidance of drain clogging, and raise awareness about the significance of maintaining a clean environment to mitigate waterlogging.
- e) *Community Participation*: Engaging citizens in community clean-up initiatives, drainage upkeep, and the implementation of tailored solutions that cater to the unique requirements of the locality.
- f) *Government Intervention*: Engaging in partnerships with local governmental bodies to allocate resources towards the enhancement of infrastructure, including the implementation of more efficient drainage systems and overall improvement of the infrastructure inside the marginalized urban settlement.

The mitigation of waterlogging in Adhikary Para Colony Slum necessitates a comprehensive strategy encompassing several aspects such as infrastructure enhancement, community involvement, governmental interventions, and sustainable urban design. This approach aims to minimize hazards and enhance the quality of life for the inhabitants.

The New **Tangra Lane Slum (Rank 4)** is confronted with several challenges, namely *health, economy, and housing*.

Health: The health challenges prevalent in slum neighborhoods such as New Tangra Lane are multifaceted, as they arise from a combination of various causes that contribute to substandard health conditions. Several prevalent health issues in these regions include:

- I. *Overcrowding Situation*: The high population density inside this slum area contributes to the heightened transmission of infectious diseases such as tuberculosis, influenza, and COVID-19 because of the close proximity of individuals and inadequate ventilation.
- II. *Malnutrition and Food Insecurity*: The limited access to nutritious food due to economic constraints leads to the prevalence of malnutrition, stunted growth in children, and a range of other health issues.

- III. *Limited Medical Supplies and Equipment:* In situations when healthcare facilities are available, it is likely that they experience a shortage of essential medical supplies, equipment, or medications that are necessary for providing adequate healthcare to patients.
- IV. *Shortage of Healthcare Personnel:* An insufficient healthcare workforce, including physicians, nurses, and other medical personnel, is resulting in challenges such as overcrowding, prolonged waiting times, and suboptimal provision of healthcare services.
- V. *Inadequate Emergency Services:* The low availability of emergency medical services or constrained accessibility to ambulances poses a substantial risk in the event of medical emergencies or accidents transpiring within the slum locality.
- VI. *Poor Infrastructure in Healthcare Facilities:* The harmful impact on the provision of high-quality patient care is attributed to the existence of damaged structures, inadequate sanitary measures, and insufficient infrastructure within healthcare organizations.
- VII. *Unsafe housing conditions:* The substandard and densely populated habitations characterized by insufficient ventilation, restricted availability of potable water, and exposure to contaminants within this urban slum amplifies the susceptibility to respiratory ailments, asthma, and various other health complications.
- VIII. *Social determinants of health:* Various factors, including inadequate education, unemployment, absence of social support networks, and marginalization, exert a significant influence on health outcomes inside slum regions.

The effective management of health concerns in slum areas necessitates the implementation of comprehensive interventions that prioritize the enhancement of healthcare accessibility, provision of sanitary facilities, availability of clean water, promotion of adequate nutrition, facilitation of education, and promotion of sustainable urban development. The implementation of successful interventions and the enhancement of the general health and well-being of slum residents necessitate collaboration among governments, non-governmental organizations, community groups, and healthcare practitioners. In order to effectively tackle the challenges pertaining to health infrastructure

and health issues in the New Tangra Lane Slum, a number of strategies can be implemented,

- i) *Establishment of Healthcare Centers:* The proposition entails the construction or enhancement of healthcare infrastructure in close proximity to or within slum areas, with the aim of guaranteeing that inhabitants have adequate access to vital medical services.
- ii) *Provision of Medical Supplies and Equipment:* It is imperative to ensure that healthcare facilities possess adequate medical supplies, diagnostic instruments, and drugs in order to effectively address the healthcare requirements of the population.
- iii) *Staff Training and Recruitment:* Our goal is to provide training and recruitment opportunities for healthcare professionals in order to address the healthcare needs of the people residing in the slum region.
- iv) *Emergency Medical Services:* Establishing emergency response systems or engaging in partnerships with local hospitals to ensure prompt provision of emergency medical services and ambulance infrastructure.
- v) *Infrastructure Upgrades:* The purpose of this program is to enhance the quality of healthcare delivery by refurbishing and enhancing existing healthcare facilities, with a focus on maintaining cleanliness, improving infrastructure, and cultivating a more favorable environment.
- vi) *Community Health Programs:* The implementation of health education programs, preventative care initiatives, and routine health check-ups within the community serves to foster wellness and mitigate the occurrence of diseases.
- vii) *Government Support:* Engaging in partnerships with governmental entities to facilitate the distribution of resources, financial investments, and policy endorsements aimed at enhancing the health infrastructure and services inside the marginalized urban settlement.
- viii) *Improving Sanitation and Hygiene:* The implementation of effective waste management systems, provision of adequate sanitation facilities, and ensuring access to clean water can have a substantial impact on mitigating the prevalence and transmission of infectious diseases.

- ix) *Healthcare Services Access*: Improving overall health outcomes can be achieved by guaranteeing inexpensive access to healthcare services, encompassing routine check-ups, immunizations, and treatment for prevalent ailments.
- x) *Health Education*: The implementation of health awareness programs aimed at educating inhabitants about preventive measures, cleanliness practices, and the significance of obtaining medical care when necessary.
- xi) *Nutrition Support*: Addressing malnutrition can be achieved through several strategies, such as facilitating the availability of nutritious food, providing supplements specifically designed for vulnerable populations such as children and pregnant women, and imparting knowledge about the importance of balanced meals.
- xii) *Community Participation*: Promoting community engagement in health-related endeavors, such as organizing clean-up activities, conducting awareness campaigns, and fostering a conducive environment for healthy living.

Enhancing the health conditions in the New Tangra Lane Slum necessitates the implementation of a holistic strategy including several facets, such as the advancement of infrastructure, facilitation of healthcare accessibility, promotion of education, active engagement of the community, and collaboration with diverse stakeholders and governmental entities. The resolution of health infrastructure challenges in the New Tangra Lane Slum necessitates collaborative endeavors by local governing bodies, healthcare institutions, non-governmental organizations (NGOs), and the community at large, in order to guarantee equitable healthcare accessibility and provision of high-quality services to all inhabitants.

Economy: In the slum sections of New Tangra Lane Slum, the availability of economic prospects is constrained by a multitude of reasons, resulting in difficulties in obtaining permanent and remunerative employment.

- I. *Lack of Formal Industries and Businesses*: The gradual closure of traditional industries or well-established firms, such as tanneries, shoe manufacture, and leather bag production, within or near the deprived slum area, poses limitations on the local population's capacity to attain stable employment opportunities. Over time, the generation of money gradually decreased, leading to constraints in their monetary situation.

- II. *Low-skilled Labor Market:* The residents possess expertise solely in the field of leather works; however, these opportunities are diminishing over time. Furthermore, they face restricted opportunities for skill enhancement or vocational training in alternative industries, thereby limiting their prospects for obtaining higher-paying employment or diversifying their livelihoods.
- III. *Informal Economy Dominance:* In addition to engaging in ternary activities, a significant number of inhabitants may depend on informal economic pursuits, such as street hawking and daily wage labor. These endeavors typically yield meager and unpredictable income, lacking job stability and associated benefits.
- IV. *Limited Education and Training:* The limited availability of skilled education and vocational training hampers the residents' capacity to obtain the necessary skills for higher-paying or specialized employment opportunities.
- V. *Market Access Challenges:* The residents of the slum face significant challenges in expanding their economic activities beyond the local area due to restricted market access, insufficient infrastructure, and inadequate networks.
- VI. *Lack of Support Services:* The limited availability of business support services, including training, mentorship, and access to markets, as well as inadequate financial support from both governmental and non-governmental sources, hinders the entrepreneurial potential of individuals residing in the area.

To mitigate the economic challenges faced in the New Tangra Lane Slum, potential interventions may encompass the following strategies:

- a) *Skills Development Programs:* The implementation of vocational training and skill development programs that are customized to cater to the specific requirements of the community aims to provide residents with the necessary competencies and qualifications to secure employment opportunities across diverse sectors.
- b) *Job Creation Initiatives:* The promotion of small-scale business, facilitation of community-driven ventures, and fostering of local job opportunities within the slum are essential components of a comprehensive approach to socio-economic development in marginalized urban areas.
- c) *Access to Microfinance and Entrepreneurship Support:* The intent is to facilitate people's empowerment in initiating and maintaining enterprises through the provision of microfinance initiatives, small business loans, and entrepreneurship training.

- d) *Education and Training*: Enhancing residents' qualifications and employment chances by facilitating access to high-quality education, adult education initiatives, and specialized training programs.
- e) *Government and NGO Support*: Engaging in partnerships with governmental entities and non-profit entities to effectively execute initiatives aimed at generating employment opportunities, providing assistance in securing work, and actively advocating for legislation that fosters inclusive employment practices.
- f) *Public-Private Partnerships*: The involvement of local businesses, industries, and private sectors in fostering employment possibilities, delivering skill-based training, and facilitating community development projects.

To effectively tackle the employment challenges faced by the people of New Tangra Lane Slum, it is imperative to adopt a comprehensive strategy that encompasses a range of interventions. These interventions should include skill enhancement initiatives, provision of support for entrepreneurial endeavors, facilitation of resource accessibility, promotion of education, and fostering collaboration among diverse stakeholders. By implementing such a multifaceted approach, sustainable livelihood prospects can be established for slum dwellers.

Housing- In impoverished localities such as New Tangra Lane, the prevalence of substandard living conditions gives rise to numerous issues faced by its residents.

- I. *Overcrowding and Limited Space*: Housing units situated in slum regions frequently exhibit overcrowding, characterized by constrained spatial capacity and insufficient infrastructure, hence resulting in deteriorated living conditions.
- II. *Lack of Basic Amenities*: Numerous residential constructions exhibit a deficiency in the provision of fundamental utilities, including but not limited to potable water, adequate sanitary facilities, reliable electricity, and sufficient ventilation, all of which are important for the establishment of a conducive and salubrious habitat.
- III. *Unsafe and Unstable Structures*: The housing units exhibit potential deficiencies in construction quality, use of substandard materials, and susceptibility to structural failure, hence presenting hazards to the safety and welfare of inhabitants.
- IV. *Vulnerability to Natural Disasters*: In slum regions, structures that are constructed with substandard quality are frequently more vulnerable to damage or complete destruction in the event of natural catastrophes such as floods or storms.

- V. *Inadequate Land Tenure and Rights*: The absence of formal land tenure or legal rights to dwelling among residents can result in a state of instability and susceptibility to eviction or displacement.

In order to mitigate the issue of inadequate housing in the New Tangra Lane Slum, a range of strategies might be implemented.

- i) *Upgrading Housing Infrastructure*: The implementation of home improvement projects aims to enhance the quality of existing structures, facilitate the provision of essential utilities, and uphold safety requirements.
- ii) *Community-Led Development*: To ensure the consideration of residents' needs and preferences, it is imperative to involve them in the planning and execution of housing renovation activities.
- iii) *Government Support*: Engaging in partnerships with local authorities and government agencies to effectively execute housing regulations, provide financial resources, and facilitate the advancement of infrastructure in marginalized urban settlements.
- iv) *Access to Basic Services*: The main purpose is to ensure the provision of clean water, sanitary facilities, energy, and waste management systems within the slum area.
- v) *Awareness and Empowerment*: The objectives encompassed in this initiative involve the dissemination of knowledge to local inhabitants on their legal entitlements, the promotion of stable and legally recognized land ownership, as well as the facilitation of community engagement in endeavors aimed at enhancing housing conditions.
- vi) *Partnerships and Collaborations*: Collaborating with non-governmental organizations (NGOs), community-based organizations, and relevant stakeholders to collectively mobilize resources, share expertise, and provide support for initiatives aimed at enhancing housing conditions.

In order to effectively tackle the issue of inadequate housing in the New Tangra Lane Slum, it is imperative to adopt a holistic strategy including several elements such as infrastructure enhancement, active community participation, governmental assistance, and the implementation of sustainable housing alternatives. This multifaceted approach aims

to ameliorate the living circumstances within the slum and safeguard the welfare of its inhabitants.

The **Sahid Smriti colony slum (Rank 5)** is confronted with several challenges, including, *education, economy, transport, and health.*

Education: The issue of educational inaccessibility in the Sahid Smriti colony slum is likely influenced by a multitude of issues that impede the attainment of both high-quality and affordable education.

- I. *Lack of affordable Schools or Educational Facilities:* The Sahid Smriti colony slum exhibits a scarcity of government-operated primary and secondary educational establishments that are readily available to meet the educational requirements of both male and female individuals. The limited availability of schools or educational establishments in the area hinders children's access to formal education, thereby obstructing their future economic potential.
- II. *Distance of the Institution from Slum:* The distance between the basic governmental schools and the slum premises is considerable, with children having to walk approximately 2 kilometers for their education. Furthermore, for secondary school education, the distance increases to 5 kilometers. This poses challenges in terms of both the physical and financial burden of daily travel for both male and female students.
- III. *Financial Constraints:* The economic circumstances prevalent in this specific slum are marked by notable obstacles, resulting in hardships in fulfilling the financial obligations linked to education, encompassing expenditures such as school fees, uniforms, books, and transportation to the adjacent private educational institution.
- IV. *Poor Infrastructure of the Governmental Schools:* Government-operated educational institutions presently encounter notable shortcomings in infrastructure, including insufficient classrooms, sanitation amenities, and instructional materials. The presence of these impairments presents significant challenges for students in relation to their attendance and ability to engage in effective learning. As a result, parents feel obligated to enroll their children in private schools. Nevertheless, as a consequence of constrained financial means, several parents find themselves unable to maintain such arrangements, leading to a situation where their children are driven to quit their pursuit of education.

- V. *Child Labor and Social Pressures*: The economic difficulties faced by households necessitate the involvement of children in labor or their contribution to household income, which hinders their consistent attendance in educational institutions and eventually worsens the rates of student attrition.
- VI. *Limited Awareness of the Importance of Education*: Lack of parental or guardian understanding of the benefits of education could result in a reduced prioritization of children's educational endeavors.

In order to mitigate the issue of educational inaccessibility in Sahid Smriti colony slum, a range of activities can be contemplated,

- i) *Establishment of Community Learning Centers*: In addition to the educational institutions established by governmental authorities, there are schools that are initiated and controlled by local organizations, such as clubs. The implementation of informal educational venues within the local community can provide youngsters who are unable to enroll in conventional educational institutions with accessible and economically viable educational prospects.
- ii) *Scholarships and Financial Support*: The implementation of scholarship and financial aid initiatives by governmental and municipal entities has the potential to significantly mitigate the economic burden faced by families, hence fostering increased rates of school enrollment among children.
- iii) *Improvement of Existing Schools*: One potential approach for enhancing the caliber of education in contemporary educational establishments involves the adoption of infrastructure enhancements, the provision of educational materials, and the professional development of teachers.
- iv) *Advocacy and Awareness Programs*: The execution of awareness initiatives designed to emphasize the importance of education in influencing the future of children, coupled with the active engagement of parents in the educational process.
- v) *Collaboration with NGOs and Government*: Engaging in partnerships with non-governmental organizations (NGOs) or governmental agencies to implement projects aimed at improving educational accessibility and quality in slum areas.

The resolution of the issue of educational inaccessibility in the Sahid Smriti colony slum requires a collaborative effort involving the community, local government entities,

educational institutions, and various stakeholders. This collective endeavor aims to ensure equitable access to high-quality education for all children, irrespective of their socioeconomic status or living conditions.

Economy: In the slum sections of the Sahid Smriti colony slum, the availability of economic prospects is constrained by a multitude of reasons, resulting in difficulties in obtaining permanent and remunerative employment.

- I. *Lack of Formal Industries and Businesses:* The present slum area lacks the necessary foundations for business development, including infrastructure, skills, financial investment, and other resources required to enhance its economic status. Furthermore, the Slum region has a deficiency in fundamental infrastructure elements, including adequate road networks, access to electricity, suitable sanitation facilities, and a reliable water supply. These crucial components are important for the establishment and long-term viability of formal companies or businesses. The lack of these amenities presents a significant obstacle for firms to effectively carry out their operations.
- II. *Informal Economy Dominance:* A considerable proportion of the population relies on informal economic activities, such as street vending and daily wage labor. These pursuits often result in modest and uncertain earnings, characterized by a lack of employment security and accompanying perks.
- III. *Limited Education and Training:* The limited availability of skilled education and vocational training hampers the residents' capacity to obtain the necessary skills for higher-paying or specialized employment opportunities.
- IV. *Lack of Support Services:* The limited availability of business support services, including training, mentorship, and access to markets, as well as inadequate financial support from both governmental and non-governmental sources, hinders the entrepreneurial potential of individuals residing in the area.

In order to mitigate the economic challenges faced in the Sahid Smriti colony slum, potential interventions may encompass the following strategies:

- i) *Skills Development Programs:* The implementation of vocational training and skill development programs that are customized to cater to the specific requirements of

the community aims to provide residents with the necessary competencies and qualifications to secure employment opportunities across diverse sectors.

- ii) *Job Creation Initiatives*: The promotion of small-scale business, facilitation of community-driven ventures, and fostering of local job opportunities within the slum are essential components of a comprehensive approach to socio-economic development in marginalized urban areas.
- iii) *Access to Microfinance and Entrepreneurship Support*: The intent is to facilitate people's empowerment in initiating and maintaining enterprises through the provision of microfinance initiatives, small business loans, and entrepreneurship training.
- iv) *Education and Training*: Enhancing residents' qualifications and employment chances by facilitating access to high-quality education, adult education initiatives, and specialized training programs.
- v) *Government and NGO Support*: Engaging in partnerships with governmental entities and non-profit entities to effectively execute initiatives aimed at generating employment opportunities, providing assistance in securing work, and actively advocating for legislation that fosters inclusive employment practices.
- vi) *Public-Private Partnerships*: The involvement of local businesses, industries, and private sectors in fostering employment possibilities, delivering skill-based training, and facilitating community development projects.

In order to effectively tackle the employment challenges faced by the people of the Sahid Smriti colony slum, it is imperative to adopt a comprehensive strategy that encompasses a range of interventions. These interventions should include skill enhancement initiatives, provision of support for entrepreneurial endeavors, facilitation of resource accessibility, promotion of education, and fostering collaboration among diverse stakeholders. By implementing such a multifaceted approach, sustainable livelihood prospects can be established for slum dwellers.

Transport and Communication within Slum Area: The presence of transportation and communication challenges within a slum area, represented by Sahid Smriti colony slum, can have a substantial influence on the everyday lives of its inhabitants and their ability to avail themselves of many services. Frequently encountered problems encompass:

I. Limited Transportation Infrastructure: The absence of adequate road infrastructure in this slum poses significant difficulties for residents in traversing the narrow and dirt thoroughfares. The road infrastructure within slum areas is characterized by semi-pucca construction, which leads to further deterioration during periods of rainfall. Additionally, the road corridors exhibit a significant narrowness, resulting in minimal spacing between adjacent slum structures. Consequently, traversing through these areas becomes challenging, further exacerbating the potential for fire hazards due to the limited space available.

II. Lack of Communication Infrastructure: Insufficient availability of telecommunication services, including mobile networks and internet connectivity, as well as limited access to newspapers, might impede the capacity of individuals to engage in external contact, obtain information, or seek necessary support.

In order to mitigate the challenges pertaining to transit and communication within the Sahid Smriti colony slum, a range of options can be contemplated:

- i) *Improvement of Transportation Infrastructure:* The proposed intervention involves enhancing the infrastructure inside the slum area, specifically through the upgrading of roads, establishment of improved access points, and enhancement of public transport networks. These measures aim to promote smoother mobility for the residents residing in the slum region.
- ii) *Enhanced Communication Facilities:* The intent is to enhance communication and information accessibility for citizens by ensuring the provision of inexpensive and dependable telecommunication services, encompassing mobile networks and internet connectivity.
- iii) *Engagement with Local Authorities and NGOs:* Engaging in partnerships with governmental entities and non-profit entities to effectively tackle deficiencies in transportation and communication infrastructure, lobbying for enhancements, and implementing enduring and environmentally-friendly resolutions.

The resolution of transport and communication challenges in the Sahid Smriti colony slum necessitates a collaborative approach involving local authorities, community leaders, non-

governmental organizations (NGOs), and residents. This collective effort aims to boost infrastructure, expand service accessibility, and improve the general standard of living in the slum region.

Health: The health challenges prevalent in slum neighborhoods such as the Sahid Smriti colony slum are multifaceted, as they arise from a combination of various causes that contribute to substandard health conditions. Several prevalent health issues in these regions include:

- I. *Malnutrition and Food Insecurity:* The presence of economic restraints results in restricted availability of nourishing food, hence contributing to the occurrence of malnutrition, impaired growth in children, and various other health concerns.
- II. *Limited Medical Supplies and Equipment:* In situations where healthcare facilities are available, it appears that there are deficiencies in essential medical supplies, equipment, or medications that are necessary for providing adequate healthcare to patients.
- III. *Shortage of Healthcare Personnel:* The presence of an inadequate number of healthcare professionals, encompassing doctors, nurses, and other medical personnel, is leading to issues such as overcrowding, extended waiting periods, and poor delivery of healthcare services.
- IV. *Inadequate Emergency Services:* The lack of availability of emergency medical services or limited access to ambulances provides a significant hazard in the event of medical crises or accidents occurring within the slum area.
- V. *Poor Infrastructure in Healthcare Facilities:* The presence of deteriorated structures, insufficient sanitary measures, and inadequate infrastructure within healthcare establishments is having a detrimental effect on the provision of excellent care to patients.
- VI. *Distance from the Medical Services:* The distance between the slums and health service institutions poses significant challenges. While there are health centers within a 500-meter radius, these facilities do not adequately address all medical crises. As a result, residents are compelled to travel a distance of 2500 meters, which presents a grave concern for patients in need of immediate medical attention.

- VII. *Social determinants of health:* Various factors, including inadequate education, unemployment, absence of social support networks, and marginalization, exert a significant influence on health outcomes inside slum regions.

To effectively tackle the challenges of health infrastructure and health issues in the Sahid Smriti colony slum, several strategies can be implemented:

- i) *Establishment of Healthcare Centers:* The proposition entails the construction or enhancement of healthcare infrastructure near or within slum areas, to guarantee that inhabitants have adequate access to vital medical services.
- ii) *Provision of Medical Supplies and Equipment:* It is imperative to ensure that healthcare facilities possess adequate medical supplies, diagnostic instruments, and drugs to effectively address the healthcare requirements of the population.
- iii) *Staff Training and Recruitment:* Our goal is to provide training and recruitment opportunities for healthcare professionals to address the healthcare needs of the people residing in the slum region.
- iv) *Emergency Medical Services:* Establishing emergency response systems or engaging in partnerships with local hospitals to ensure prompt provision of emergency medical services and ambulance infrastructure.
- v) *Infrastructure Upgrades:* The purpose of this program is to enhance the quality of healthcare delivery by refurbishing and enhancing existing healthcare facilities, with a focus on maintaining cleanliness, improving infrastructure, and cultivating a more favorable environment.
- vi) *Community Health Programs:* The implementation of health education programs, preventative care initiatives, and routine health check-ups within the community serves to foster wellness and mitigate the occurrence of diseases.
- vii) *Government Support:* Engaging in partnerships with governmental entities to facilitate the distribution of resources, financial investments, and policy endorsements aimed at enhancing the health infrastructure and services inside the marginalized urban settlement.
- viii) *Improving Sanitation and Hygiene:* The implementation of effective waste management systems, provision of adequate sanitation facilities, and ensuring access to clean water can have a substantial impact on mitigating the prevalence and transmission of infectious diseases.

- ix) *Healthcare Services Access:* Improving overall health outcomes can be achieved by guaranteeing inexpensive access to healthcare services, encompassing routine check-ups, immunizations, and treatment for prevalent ailments.
- x) *Health Education:* The implementation of health awareness programs aimed at educating inhabitants about preventive measures, cleanliness practices, and the significance of obtaining medical care when necessary.
- xi) *Nutrition Support:* Addressing malnutrition can be achieved through several strategies, such as facilitating the availability of nutritious food, providing supplements specifically designed for vulnerable populations such as children and pregnant women, and imparting knowledge about the importance of balanced meals.
- xii) *Community Participation:* Promoting community engagement in health-related endeavors, such as organizing clean-up activities, conducting awareness campaigns, and fostering a conducive environment for healthy living.

Enhancing the health conditions in the Sahid Smriti colony slum necessitates the implementation of a holistic strategy including several facets, such as the advancement of infrastructure, facilitation of healthcare accessibility, promotion of education, active engagement of the community, and collaboration with diverse stakeholders and governmental entities. The resolution of health infrastructure challenges in the New Tangra Lane Slum necessitates collaborative endeavors by local governing bodies, healthcare institutions, non-governmental organizations (NGOs), and the community at large, to guarantee equitable healthcare accessibility and provision of high-quality services to all inhabitants.

4.4 Section III: Planning Design for Slum Inclusive Ward

The consideration of slums is undertaken to promote inclusivity across various domains, including education, living conditions, health and sanitation, economy, transport and communication, as well as disaster preparedness. To address the aforementioned issues, it is possible to enhance the problem-solving approach by developing an all-encompassing slum planning model at the ward level. The development of an inclusive slum planning model necessitates the implementation of policies that effectively cater to the unique requirements and obstacles faced by slum residents, all while striving for sustainable

development. The following are components of a comprehensive slum planning framework that promotes inclusivity

- a) *Community Participation and Empowerment*: Involve individuals residing in impoverished urban areas in the process of urban planning. The inclusion of individuals' thoughts, needs, and ideas is of utmost importance in the process of building solutions that are tailored to their unique situations. To foster community engagement, it is recommended to implement community forums, engage local leaders, and facilitate participatory workshops to collect valuable input.
- b) *Basic Infrastructure Development*: Enhance infrastructure by facilitating the provision of essential amenities such as access to potable water, sanitary facilities, reliable energy, efficient drainage systems, and well-maintained paved roads. Improving these essential aspects is crucial for boosting the quality of life and health outcomes in urban slums.
- c) *Affordable Housing and Land Tenure Security*: Efforts should be directed towards establishing a robust system of secure land tenure for residents living in slums, as this can contribute to the promotion of stability and incentivize investments in their housing. The objective is to create cost-effective housing alternatives that take into account the financial circumstances of individuals and provide secure and satisfactory living conditions.
- d) *Access to Education and Healthcare*: Equitable access to high-quality education and healthcare services must be guaranteed. One potential strategy to enhance accessibility for inhabitants of slum regions is the establishment of educational institutions, medical clinics, and healthcare centers either within or near these communities.
- e) *Livelihood Opportunities*: Facilitate the establishment of economic avenues near or inside impoverished urban settlements through the promotion of small-scale enterprises, vocational training initiatives, and employment prospects. Promote the cultivation of entrepreneurial spirit and extend assistance to facilitate the flourishing of micro-enterprises.
- f) *Environmental Sustainability*: In order to promote environmental sustainability, it is imperative to implement a range of measures, including the establishment of waste management programs, the creation of green areas, and the initiation of

various projects aimed at mitigating pollution. Advocate for the adoption of environmentally sustainable practices and the utilization of renewable energy sources in appropriate contexts.

- g) *Safety and Security*: To bolster safety protocols and fortify security in slum areas, it is imperative to enhance the quality of lighting, implement community policing activities, and establish secure public spaces. The act of addressing safety concerns contributes to the cultivation of a feeling of overall wellness among the community's inhabitants.
- h) *Policy and Governance Reforms*: Promote policy changes and reforms at various governmental levels, including local, regional, and national, with the aim of prioritizing the development of slum areas. Advocate for policies aimed at safeguarding the fundamental rights of individuals residing in slums and allocating resources to facilitate their socio-economic advancement.
- i) *Partnerships and Collaborations*: Engage in partnerships with governmental bodies, non-governmental organizations (NGOs), commercial sector entities, and community-based organizations in order to maximize resources, specialized knowledge, and financial support for initiatives aimed at improving slum development.
- j) *Monitoring and Evaluation*: Develop systems to routinely assess the progress and evaluate the impact of measures aimed at addressing slum development. Utilize input from local inhabitants and relevant parties to enhance tactics and ascertain the efficacy of actions.

An effective approach to creating a slum planning model that includes everyone demands a thorough and integrated strategy that recognizes the multifaceted range of problems faced by slum communities. Creating sustainable and inclusive urban environments for slum people can be accomplished by adopting a comprehensive approach that emphasizes participation, fundamental infrastructure, social services, economic opportunities, environmental factors, and legislative reforms. A prototype (Figure 4.23) has been developed to incorporate all these facilities to establish an administrative boundary (Ward Boundary) that is both inclusive and sustainable for economically disadvantaged communities, specifically slums.

The ward boundary model presented in Figure 4.23 seeks to establish a holistic and environmentally sustainable setting designed primarily for economically disadvantaged groups, including those living in slums. This type includes a range of facilities, from basic to moderately equipped. Within this ward, three distinct groups of residents are commonly observed in real-life scenarios. The first category, Type-I, consists of affluent individuals residing in exclusive gated communities. The second category, known as Type II, comprises middle-income individuals who fall within the middle-income range. Lastly, Type III comprises economically disadvantaged individuals who have been either rehabilitated or relocated from other parts of the city, and they now reside in upgraded infrastructure within slum communities.

The ward's infrastructure includes two hospitals, one that offers inexpensive services for the middle- and low-income population, and another that provides upscale facilities for the high-income group. Additionally, the plans entail the establishment of two schools, with the possibility of one being sponsored by the government and the other by an international organization. The layout also includes vital economic infrastructure such as a bank, post office, non-governmental organization (NGO), and administrative headquarters (ward office). In addition, there are plans to establish a local market and shopping Centre that will cater to consumers from different income groups, including both high-income individuals and those in the middle to low-income categories. This will provide a range of shopping options that are tailored to different financial capacities. Strategic vegetation planting is advised to sustain the ecological equilibrium. In addition, the idea recommends creating a park with an open area that includes a small body of water and a public playground that can be used by all district residents. This will greatly contribute to the conservation of environmental variety. A proposition has been made to establish a pumping station that will function as a water supply adjacent to the canal. The ward's design prioritizes the establishment of efficient transport networks both within and around the region.

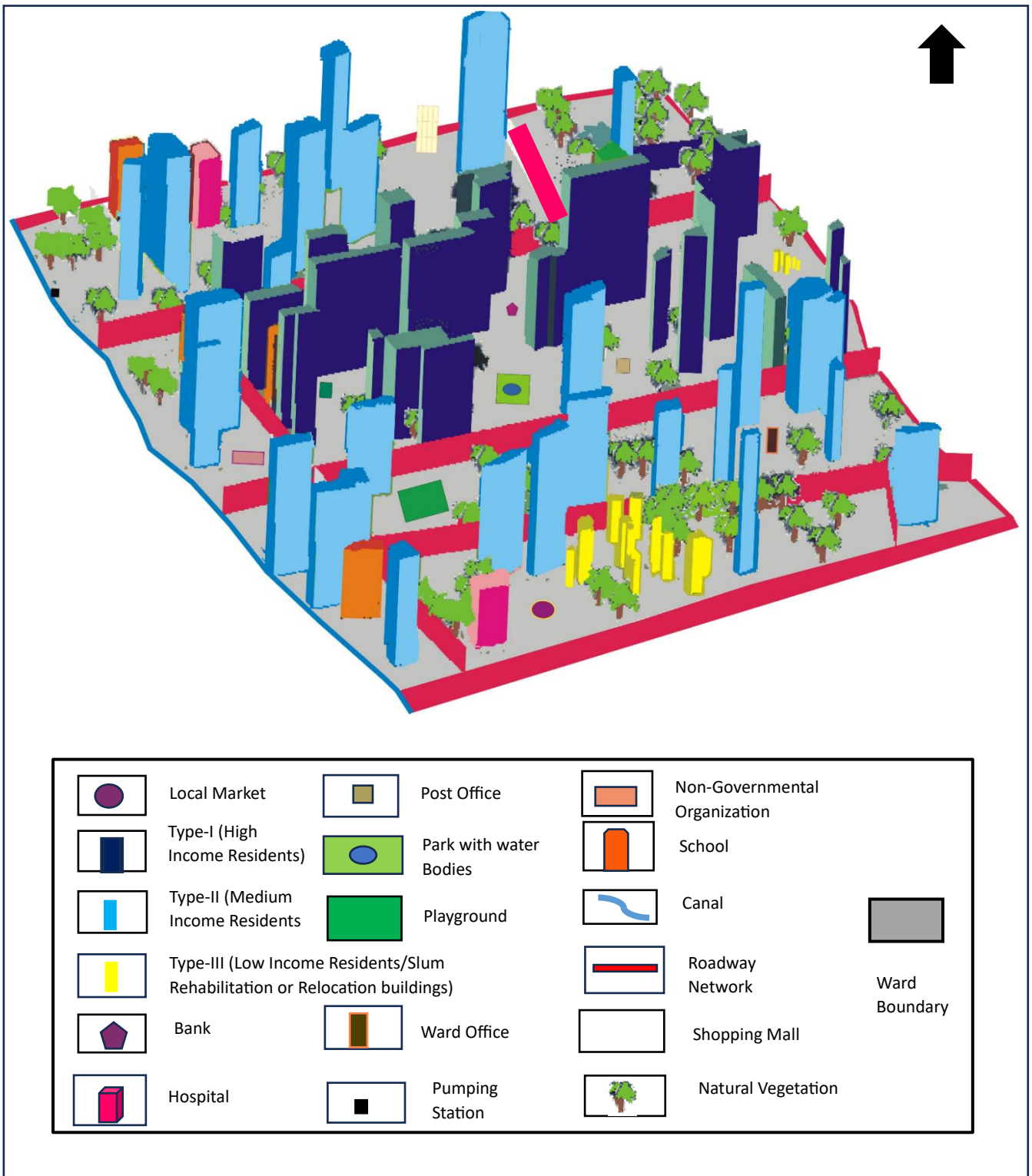


Figure 4.23: A prototype for Slum Inclusive Ward

Source-Prepared by Researcher

4.5 Conclusion

The study involves comparing multiple slums across various indicators, including literacy rate, living conditions, healthcare services, economic status, transportation and communication, and disaster readiness. The evaluation of each slum's performance has been conducted using these indicators, resulting in the computation of composite index scores. After analyzing the numbers, it is evident that there are significant discrepancies in the scores among different slums. Slums like New Tangra Lane and Sahid Smriti Colony demonstrate higher average composite index scores, indicating comparatively unfavorable conditions. Conversely, Baniatola Street Slum, Baghajatin Colony Slum, and Adhikary Para Colony Slum have lower average composite index scores, suggesting relatively better overall conditions based on the given variables. This analysis underscores the disparities within different slums, underscoring the need for targeted initiatives to improve conditions, particularly in areas such as literacy, living conditions, and healthcare access. By addressing these inequalities, it is possible to improve the standard of living in these places and generate fairer living circumstances across the region. Moreover, the organization of these destitute regions based on their composite index scores highlights the relative positions of each slum in terms of their overall situation. This data is crucial for governments and organizations to effectively identify and implement focused initiatives aimed at enhancing the well-being of these disadvantaged individuals. Ultimately, targeted measures and precise interventions can result in substantial improvements in the quality of life in these economically disadvantaged metropolitan areas.

To effectively address the challenges faced by slum populations, it is crucial to implement a comprehensive and inclusive approach that recognizes the diverse needs and complexities within these communities. An all-encompassing slum planning framework comprises crucial aspects such as community engagement, infrastructure development, housing stability, access to education and healthcare, economic empowerment, environmental sustainability, safety measures, governance reforms, partnerships, and monitoring and evaluation. The establishment of sustainable and inclusive urban settings for slum dwellers requires a targeted approach to tackle the inequalities in education, healthcare, infrastructure, and economic opportunities. Highlighting community involvement and empowerment is crucial for creating tailored solutions that correspond to the unique circumstances of these regions. Furthermore, it is crucial to foster partnerships

and collaborative initiatives among different sectors and implement policy reforms at several levels of government to attain sustainable development in slum areas. By adopting a holistic strategy that incorporates engagement, infrastructure enhancement, social welfare, economic empowerment, environmental factors, and legal changes, it is possible to establish a strong foundation for extensive and enduring advancement in slum communities. Continuous monitoring, evaluation, and adaptation of approaches based on local feedback are essential to assure the efficacy and triumph of initiatives targeting the intricate challenges encountered by slum residents. To enhance the living conditions of slum dwellers, it is imperative to implement a comprehensive strategy that addresses all facets of urban development.

References

- Bhattacharya, R. (2003). The nature in "The Second City of the Empire." *The Indian Economic & Social History Review*, 40(2), 191-235. <https://doi.org/10.1177/001946460304000203>
- Bose, N.K Calcutta: 1964- a social survey review by: Nitish r. De, printed in india by s. R. Krishnan at inland printers, victoria mills building, gamdevi road, bombay - 7, and published by s. P. Lalvani, lalvani publishing house, 210 dr. D. N. Road, bombay 1, published in 1965 <https://www.jstor.org/stable/27760884>
- Chaudhuri S. 1990 Calcutta The living City Vol I The past and Vol II The present and future, ISBN- 13: 978-0-19-563696-3 and ISBN-13:978-0-19-563697-0
- Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021
- Ghosh S. (1990), Review essay: Celebrating Calcutta, Published online by Cambridge University Press: 09 February 2009, , Issue 1 , April 1992 , pp. 84 – 98 DOI: <https://doi.org/10.1017/S0963926800009640>
- Ghosh, S and Mondal, M. (2019): Risk Analysis for Recommendation of an Effective Fire Hazard Management System: A Study in Kolkata Municipal Corporation (KMC) Area, West Bengal, India, *International Journal for Research in Engineering Application & Management*, Vol-05, Issue-02, May 2019
- Haraprasad Chattopadhyay, a K.P. Bagchi & Company, 1990 - Calcutta (India) – 127, Marsh to Township East of Calcutta, 1990). <https://doi.org/10.1016/j.jum.2018.03.002>. <https://www.sciencedirect.com/science/article/pii/S2226585617301279>
- Klove, R. C. (1968). Basic Development Plan for the Calcutta Metropolitan District, 1966-1986. by Calcutta Metropolitan Planning Organization, *Economic Geography*, Vol. 44, No. 3 (Jul. 1968), pp. 270-272 (3 pages), <https://doi.org/10.2307/142763>
- Lubell H., 1974. "Urbanisation and employment; insights from a series of case studies of third world metropolitan cities," ILO Working Papers 991598933402676, International Labour Organization. RePEc:ilo:ilowps:991598933402676, http://www.ilo.org/public/libdoc/ilo/1974/74B09_837.pdf
- Mishra S.V (2018), Urban deprivation in a global south city-a neighborhood scale study of Kolkata, India, Habitat International, Volume 80, 2018, Pages 1-10, ISSN 0197-3975, <https://doi.org/10.1016/j.habitatint.2018.08.006>, (<https://www.sciencedirect.com/science/article/pii/S0197397518303825>)

- Mitra, A. (2012). Insights into inclusive growth, employment, and wellbeing in India. *Springer Science & Business Media*. ISBN 978-81-322-0656-9, Doi-10.1007/978-81-322-0656-9, pp 134-138.
- Racine J. (1990) Calcutta 1981: The City, Its Crisis, and the Debate on Urban Planning and Development Hardcover – 1 December 1988 Concept Publishing Company Pvt. Ltd., Publication date- 1 January 1990 ISBN-10 8170221935, ISBN-13 978-8170221937
- Roy N R, 1986, Calcutta the profile of a city, 1986, West Bengal Public Library, Publisher K. P. BAGCHI AND COMPANY, CALCUTTA, digitallibraryindia; JaiGyan,
- Sam S., Hobson J., Joshi P., (2003) The Pune Slum Census: creating a socio-economic and spatial information base on a GIS for integrated and inclusive city development, Elsevier: Habitat International, Volume 27, Issue 4, 2003, Pages 595-611, ISSN 0197-3975, [https://doi.org/10.1016/S0197-3975\(03\)00007-9](https://doi.org/10.1016/S0197-3975(03)00007-9).

Chapter 5: Physical Location (Site) as Basis for Inclusion of Slums

A slum is an urban residential area with a high population density, characterized by poorly constructed housing units and commonly linked to poverty. Slums typically have dilapidated or unfinished infrastructure and are predominantly populated by disadvantaged individuals. This chapter examines both registered and unregistered slums, taking into account their geographical locations. Their current circumstances and strategies for planning were examined using in-situ rehabilitation planning and ex-situ relocation planning. Finally, the potential and state of these two strategies in real-life situations have been examined.

5.1 Introduction

"Slum" is frequently used to describe informal urban settlements with substandard housing and deplorable living conditions. Generally, these neighborhoods were visible along the canal or railway line that extended toward the city's core. This physical location (site) exerts some influence over the amenity structure of slum inhabitants; consequently, the 'Site' and Situation of slums will play a significant role in determining the future inclusiveness level. The term site refers to the physical location of a community or the distinctive regional landscape. Site factors include landforms, climate, vegetation, water availability, soil quality, minerals, and fauna. Furthermore, the term is related to the verb "to situate" (meaning "to locate") and the noun "a position" (meaning "a holding"). A construction site or slum refers to the land on which a structure stands or will shortly stand. In contrast, "situation" refers to a place's location about its surroundings and other locations. Situational factors include the accessibility of a location, the extent of a place's connections to another, and the proximity of a location to basic materials like rivers, canals, hill stations, etc. if they are not specifically located on the site.

This chapter demonstrates how a slum's physical location influences its decision to reside and how, by relocating the slum, it can be integrated into society. This chapter is divided into three sections. The first section describes the present state of low-income settlements in Kolkata (selected slums) in terms of physical access to safe, healthy, affordable housing for all and access to fundamental urban essential services such as water, waste disposal, electricity, safety, and sources of income. The second section examines two planning approaches: in-situ slum reservation and ex-situ slum reservation, which are contingent upon the classification of slums as registered or unregistered. It focuses on the flaws in the planning of these slums. It proposes a model to make the slum residents more inclusive and compact to access the most facilities. The third section provides a concluding case study based on real-life examples of the challenges encountered by slum dwellers as a result of the two methods discussed in chapter two and which could be applied to the dwellers.

5.2 Background of the Study

Kolkata, the capital of West Bengal, is ranked among the ten largest urban agglomerations globally based on population. As per Sengupta U.'s (2006) findings, around 33 percent of Kolkata's present populace inhabits slum localities. Askari and Gupta (2016) reported that

the Kolkata Environmental Improvement Project (KEIP) has initiated the restoration of a canal bank slum in Kolkata. The project was financially supported by the Asian Development Bank (ADB), the Government of West Bengal (GWB), the Kolkata Municipality Corporation (KMC), and the Kolkata Metropolitan Development Association (KMDA). By the West Bengal Slum Areas (Improvement and Clearance) Act of 1972, erecting any novel hut or structure, and making substantial modifications or alterations to pre-existing structures within a slum area, is proscribed unless authorized in writing by the designated authority. The prescribed protocol for approaching the authority must be followed, and strict adherence to any conditions imposed by the authority is required. According to Bardhan et al. (2009), Kolkata is home to a combined total of 2500 officially registered slums and an additional 3500 unregistered slums, which are dispersed throughout the city's 16 Boroughs and 144 wards, as per the report by the World Bank Development Report (2011). India has implemented various noteworthy programs aimed at the strategic planning of slum redevelopment and resettlement. The present investigation scrutinized three federal initiatives and two programs at the state level. The Valmiki Ambedkar Awaaz Yojana (VAMBAY) and the National Slum Dwellers Programme (NSDP) are nationwide initiatives that work in conjunction with state governments and have a primary emphasis on urban regions.

The Indira Awaas Yojana is a rural housing program that seeks to provide dwellings in rural regions. The Valmiki Ambedkar Awaas Yojana (VAMBAY) was implemented in 2001 with the primary objective of offering housing facilities to the urban underprivileged population. Furthermore, a significant proportion of the overall program budget, precisely 20 percent, is allocated towards the provision of community sanitation facilities as part of the Nirmal Bharat Abhiyan (NBA) program. The National Slum Development Programme (NSDP) was initiated in 1996 to allocate funds for the enhancement of physical and community infrastructure, as well as the improvement of shelter conditions for individuals inhabiting slum areas. The employment of community structures was first implemented under the Urban Basic Services Programme (UBSP) and subsequently under the Swarna Jayanti Shahari Rozgar Yojana (SJSRY). The Indira Awaas Yojana (IAY) was initially established in 1985 as a sub-scheme of JRY. However, in 1996, it transformed and became an independent scheme. The program provides extensive financial aid to underprivileged individuals living in rural regions to build their residential abodes. The Valmiki Ambedkar Awaas Yojana (VAMBAY) and the National Slum Development Programme (NSDP) were

the primary initiatives relied upon by the slums in Kolkata and its surrounding areas. Since 2017, there has been a transition towards the Basic Services for Urban Poor (BSUP) and Banglar Bari initiatives.

The extant literature review on slum planning reveals that relocation and rehabilitation schemes have been suggested not only in Kolkata but also in other highly populated urban areas such as Mumbai (Sheth et al., 2009) and Delhi (Chalana & Rishi, 2015) that harbor substantial slum communities. Presently, these endeavors have exhibited significant accomplishments. The strategies commonly utilized prioritize basic needs (Vaid & Evans, 2017), tackle healthcare issues (Askari & Gupta, 2016), and encourage the participation of women in daily pursuits.

Numerous studies suggest that the relocation and rehabilitation process could potentially enhance the quality of life and transform a significant number of slums in India. In his article titled "Slum Rehabilitation in the Context of Urban Sustainability: A Case Study of Mumbai, India," Sheth (2009) posited that this technique is the most effective means of rehabilitating slums and promoting the "self-development" approach to stabilize their economic activities. As per the report on Scalable Processor Architecture (SPARC) in 2014, a group of around 800 families affiliated with the Mumbai Railway Federation, residing along a section of the central tracks, initiated a relocation process in 1998. Subsequently, the government, in collaboration with Mumbai Port Trust, Tata Power, and Alliance (Jagdale, R. H. 2014), planned to relocate an additional 12,000 households. This initiative was not limited to Mumbai alone, as the Delhi Urban Shelter Improvement Board (DUSIB) also played a role in facilitating the relocation of households in Delhi, as reported in the Delhi Urban Shelter Improvement Board report of 2016. This study has examined the approach of slum redevelopment via rehabilitation and resettlement.

5.3 Study Area

The majority of Kolkata's (KMC) slums are situated in marginalized and unhygienic areas, such as by a canal or railway line. To analyze further their inclusive management of education, secure and healthy housing, health and sanitation, water, etc., stratified random sampling was used to select two strata: one along the railway line and the other along the canal line. Now, this stratum is divided into two sampling groups: registered slums (recognized by Kolkata Municipal Corporation) and unregistered slums (not acknowledged by Kolkata Municipal Corporation). Registered slums can be divided into

four general categories. During the British era, middlemen seized land from landowners, typically on a long-term lease, and constructed hut-style settlements which they rented out to migrants. Migrants have been required a place to live and had no choice but to accept substandard housing. There is a second form of a slum known as "Thika tenant slums" in which the slum dwellers have constructed their homes after taking possession at a fixed rent. The third form of slums is those built by zamindars (landowners) and rented out to slum dwellers. Locally, these communities are known as bustees. Refugee Resettlement Colonies (locally known as udbastu colonies) are the fourth category of slums, where the government has leased land to refugees from present-day Bangladesh for 99 years at nominal rents. On the other side among the types of unauthorized slums are those that are merely encroachments on the roadside (locally known as jhupri), canals (known as khaldhar), or any vacant land (known as udbastu), railway lines by the impoverished who have been displaced from the city or laid off from their jobs. A second form of reported displacement is caused by an excessive increase in family size. The selection of these particular slums was based on two key factors: their physical location (Site) and their Authorization status. The primary aim of this study, as outlined in Chapter One, is to identify any discrepancies in the availability of safe, affordable housing and basic urban services such as water, waste disposal, power, and safety. Additionally, the study aims to examine the income levels of slum residents and explore ways to integrate them into the city's larger economic and social fabric. Table No.5.1 discusses the selected slum name and strata designs, while Table 5. 2 provides a detailed description.

Table 5.1: Selection of Slums (Base and Sampling Techniques)

Sampling Techniques	Basis of Slum Selection	Sub-Sampling Techniques	Sub-Basis of Slum Selection	Selection of Slums
Stratified Sampling	Along the Canal line	Purposive sampling	Registered Slum	<i>Narkel Danga Canal East Road Bustee, Borough Number 3, Ward Number 29</i>
			Unregistered Slum	<i>Narkel Danga Canal West Road Bustee, Borough Number 3, Ward Number 29</i>
	Registered Slum		<i>Panchanantala Road, 2 Raja Basanta Roy Road, Borough Number 8, Ward Number 90</i>	
	Unregistered Slum		<i>Madhobtala Bustee, Borough Number 10, Ward Number 92</i>	
	Along the Railway line			

Source- Prepared by Researcher

Table 5.2: Basic Details of Selected Registered and Unregistered Slum

Parameters/ Selection of Slum	Along the Railway line (Registered Slum)	Along the Canal line (Registered Slum)	Along the Railway line (Unregistered Slum)	Along the Canal line (Unregistered Slum)
Premises No	22 -24,32 Panchanantala Rd	29-42	9-12	Unknown
Name of Street / Road/Lane adjacent to Bustee	160\C Kakulia Road	9,10,8,5, Narkel Danga North Road	9-12 Dhakuria (Main) Station Road	Canal West Road, unknown metaled road
Name of Bustee local Name Registered or no	32 22 24 Panchanantala Rd	Canal East Road	Madhobatala lane	Canal west Road
Postal Zone No.	700029	700011	700032	700011
Approx. area of Bustee in SQ MT	26,700.00	17,159.00	12,365.00	8123.02
Total No. of Families	1,686	156	83	49
Total nos. of Dwellers	6521	205	176	123
Total No. of Structures	208	55	61	32

(Source for Registered Slum- Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021) and (Source for Unregistered Slum -Primary Survey by the Researcher,2021)

The Registered Canal side Narkel Danga Canal East Road Slum is located at 22°34'54.42"N, 88°22'48.73"E, along the canal on the western side of the slum, bordered by Narkel Danga Canal East Road on the west, Narkel Danga North Road on the east, Maniktola main road on the north, and Potopara Lane on the south (Fig. 5.1). The slum's east-west width is 88.35 meters, while its north-south length is 337.27 meters. This slum was originally part of patta land, where a Thika tenant, defined in the 1949 act as "any individual who possesses, whether under a signed lease or otherwise, land under another person" (Dasgupta B., 1973)78 Thikas, was still subject to the zamindar's and his thikadars' economic interests. The Thika Tenancy Act was enacted. On the other hand, the unregistered Canal side Narkel Danga Canal West Road Bustee is located at 22°34'29.42"N, 88°22'38.18"E along the canal on the eastern side of the slum, Canal West Road on the west, Narkel Danga main road on the north, and the Canal east and west foot-connector on the south (Fig. 5.1). The slum's East-West width is 13.38 meters, while its north-south length is 285.62 meters. This slum was evolved by the homeless refugees of the city back in the twentieth century (Kundu N.,2003). Unregistered land encroaching settlements on roadsides (jhupri), along canals, or on another vacant land (udbastu) do not have access to tenure security.

The sample size ranges from 5% to 10% of the population using random sampling.

The Panchanantala Slum has a total population of 6,521, with a sample size of 327, which constitutes 5% of the population. The Canal East Road Slum, with a 10% sampling rate,

has a total population of 205, and the sampled population is 21. Similarly, the Madhobtala Lane Slum, also with a 10% sampling rate, has a total population of 176, and the sample size is 18. Lastly, the Canal West Road Slum, with the same 10% sampling percentage, has a total population of 123, and the sampled population is 13.

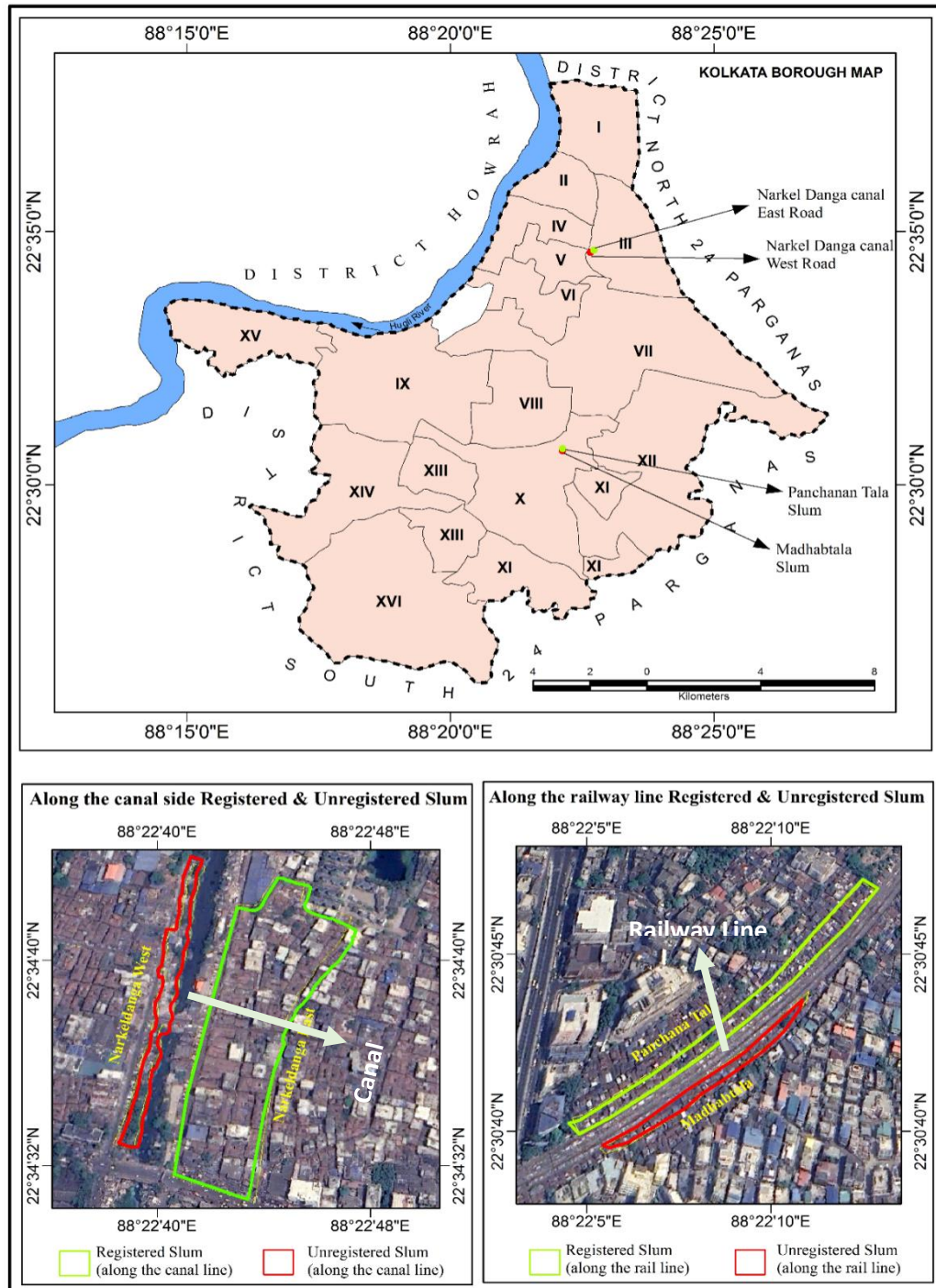


Figure 5.1: Location of the Registered and Unregistered slums both along the Canal Line and Railway Line

Source- Prepared by the Researcher

Similarly, the registered railway line Panchanan Tala slum is located at 22°30'42.88"N, 88°22'7.96"E along both sides of the Lake Gardens railway line just beneath Thakura Sri Chaitanya Mahaprabhu flyover surrounded by Panchanantala nonmetallic road all over within the slum and Kakulia road on the northern side of the slum and lake road in the southern portion of the slum and just at the back side of AMRI, Dhakuria hospital (Fig. 5.1). The slum's east-west length is 90.87 meters, while its north-south length is 305.98 meters. This slum arose primarily as a result of surplus partition population pressure, but it soon became a major hub for the economically disadvantaged people of south Kolkata. On the other side of the unregistered Madhobtala Bustee, Dhakuria slum is located at 22°30'40.45"N, 88°22'7.92"E along both sides of the lake Gardens railway line just beneath Thakura Sri Chaitanya Mahaprabhu flyover surrounded Dhakuria main road all over within the slum and Kakulia road on the northern side of the slum and lake road in the southern portion of the slum and just at the back side of Dhakuria railway station area (Fig. 5.1). The length of the favela from east to west is 28.23 meters, while its length from north to south is 273.42 meters. This slum also arose as a consequence of the second and third waves of surplus partition population pressure.

Various techniques have been considered to analyze the goals indicated in the objectives utilizing the chosen slum. Families from slum areas were selected at random to participate in a questionnaire survey to determine the study's findings. After dividing the questionnaire survey data into six parameters of accessible amenities, namely education, living conditions, health and sanitation facilities, economic conditions, communication & accessibility, and disaster issues, a mean composite index is calculated. The average composite score Index is calculated using Kendell's method to evaluate and compare the quality of life in various communities. A variety of cartographic approaches have been used to depict their standard of living. Secondly, site appropriateness and slum relocation plans have been developed based on the LULC status of the surrounding area for selected unregistered slums. Thirdly, an in-situ planning model of slums has been developed for registered slums, and a SWOT analysis has been conducted to evaluate the benefits. Which of these two methods, In-situ rehabilitation and ex-situ relocation planning, is more inclusive? Two additional slum case studies have been used to determine which method is more inclusive.

For the primary survey, GPS and a questionnaire were used, and for secondary data, KMC Slum department data from 2021, satellite imagery, and Google Earth were used as well. Auto-Cad software has also been utilized for the analysis of in-situ model planning.

5.4 Section- I: Ranking of the Slums based on Amenities Available

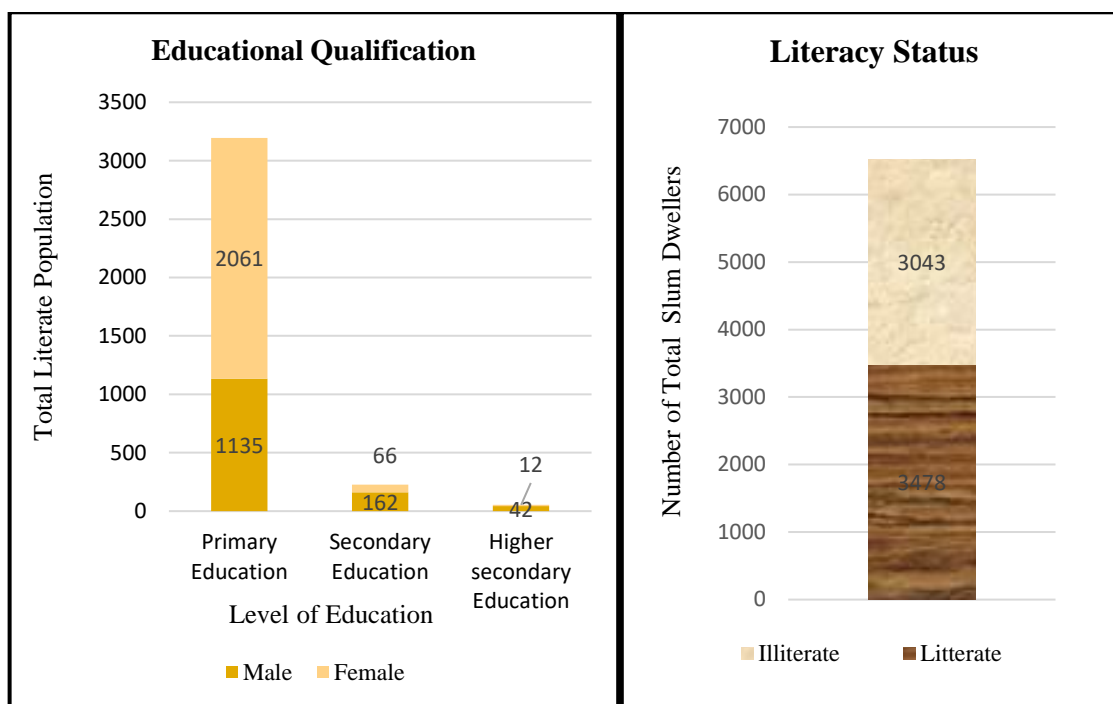
The amenities provided in both slums were evaluated based on their educational facilities, housing, health and sanitation, economic situation, transportation & communication facilities, and disaster preparedness, and a composite index was developed to determine the status of the slums.

5.4.a Educational facilities

Inclusive education is the most effective way to offer everybody an equal opportunity to attend school, learn, and acquire the necessary skills for success. In the context of inclusive education, it is a fundamental principle that all students are enrolled in educational institutions.

Panchanantala Railway Bustee Slum has higher educational facilities than Narkel Danga Canal East Road Slum. The educational institutes are significantly closer to the Panchanantala neighborhood, and the range of institutes is greater here. There are six schools (Primary Survey, August 2021) around the slum, three of which are girls' schools, two of which are boys' schools, and one of which is co-educational, and all of these schools are within 600 meters of the slum. Because of the ease of access, the scope for female education appears to be greater here, as evidenced by higher literacy rates of 61.50 percent among females (Primary survey, August 2021). The graphical representation provided here depicts the educational qualifications of slum residents according to gender (Fig. 5.2.a) and literacy ratio (Fig. 5.2.b). The data highlights the dominance of females in terms of educational attainment. Based on the aforementioned parameters, the calculated average combined Index for education indicates a comparatively high value of 4.67 for this slum (Table 5.3). Whereas, in Narkel Danga Canal East Road slum, the number of accessible schools for females is comparatively low, with only an Urdu medium girls' school located near the slum and boys' schools and other vernacular language schools located 1 km away (Primary Survey, August 2021). As a consequence, girls can access schools owing to their proximity, but boys' schools are far away, and many students do not attend (FGD, August 2021). As a result, male-female literacy appears to be about equal in this slum. The accompanying visual depiction illustrates the educational attainment of individuals residing in slums, categorized by gender (Fig. 5.3.a), as well as the literacy rate (Fig. 5.3.b). Therefore, the calculated average combined Index for education based on the aforementioned parameter is relatively low for this slum is 6.33 (Table no-5.3).

Registered Slum

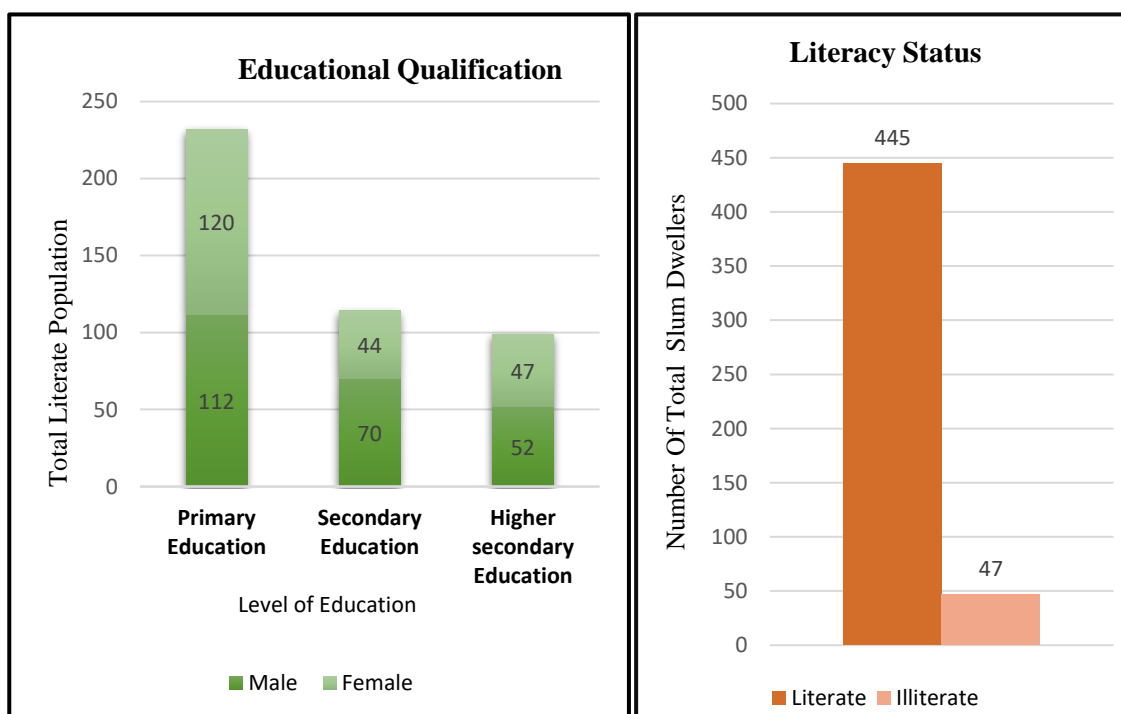


5.2.a: Education Qualification

5.2.b: Literacy Status

Figure 5.2: Panchanantala Road Bustee (Along the Railway Line)

(Source - Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021)



5.3.a: Education Qualification

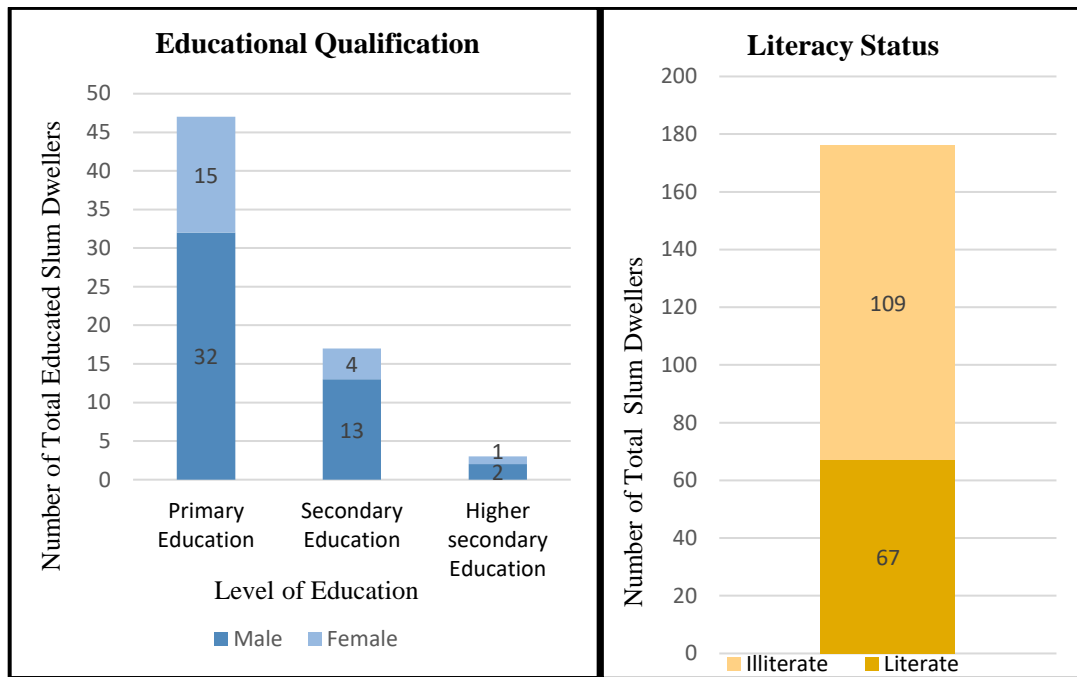
5.3.b: Literacy Status

Figure 5.3: Narkel Danga Canal East Road Bustee (Along the Canal Line, Registered Slum)

(Source - Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021-22)

On the other hand, for Unregistered Slums, it can be observed that the average level of education is quite low, primarily due to their economic difficulties. Madhobtala Bustee, Dhakuria along the railway line is much better in an unregistered slum than Narkel Danga Canal West Road Unregistered Bustee. Table 5.3 displays that the average literacy rate in Unregistered Madhobtala Bustee, Dhakuria is 39.21 percent. This low literacy rate is due to a lack of awareness and the absence of affordable educational institutions, not a lack of institutions. Compared to the enrollment rate, the attrition rate (Table no-5.3) is 19.32 percent, which is quite high due to family economic issues. Consequently, the ratio of literate to illiterate residents in the slum is 67:109 (Fig. 5.4.b), and the male literacy rate is considerably higher than the female literacy rate among the literate population due to family priorities (Fig. 5.4. a). This society provides neither the male nor female population with adequate vocational training opportunities (Table no.-5.3). Therefore, the calculated average combined Index for education based on the aforementioned parameter is relatively low for this slum is 7 (Table no-5.3). Similarly, the average literacy rate among Narkel Danga Canal West Road Unregistered Bustee is 21.68 percent (Table no 5.3). This low literacy rate is not due to a lack of institutions, but rather to a lack of awareness and the absence of affordable educational institutions. In comparison to the enrollment rate, the attrition rate is 26.32 percent (Table no-5.3), which is quite high due to family economic issues. Consequently, the ratio of literate to illiterate inhabitants in the slum is 27:96 (Fig. 5.5.b), and among the literate population, the male literacy rate is significantly higher than the female literacy rate due to religious constraints (Fig. 5.5.a). Neither the male nor female population of this society receives adequate vocational training opportunities (Table no-5.3). Consequently, the calculated average combined Index for education based on the aforementioned parameter for this slum is relatively low,8. (Table no-5.3).

Unregistered Slum

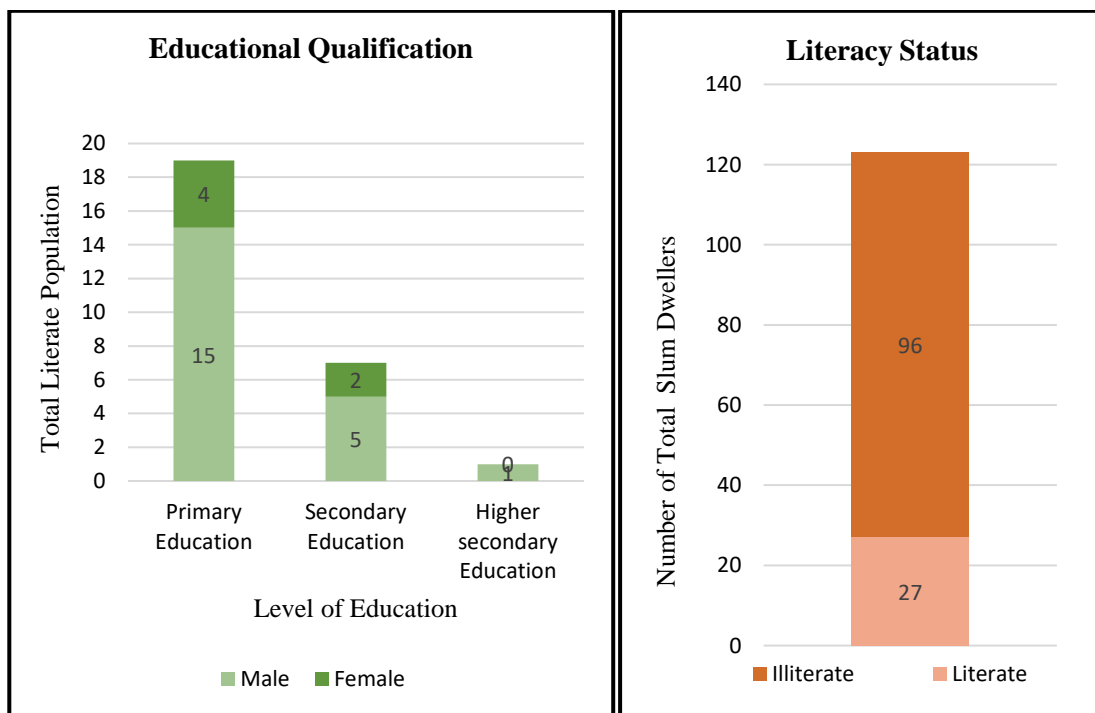


5.4.a: Education Qualification

5.4.b: Literacy Status

Figure 5.4: Madhobtala Lane Bustee (Along the Railway Line, Unregistered Slum)

(Source -Primary Survey, August 2021)



5.5.a: Education Qualification

5.5.b: Literacy Status

Figure 5.5: Narkel Danga Canal West Road Bustee (Along the Canal Line, Unregistered Slum)

(Source -Primary Survey, August 2021)

The Composite Index has been developed to enable a comparative evaluation of the aforementioned slums, considering the specified parameters through comprehensive analysis. A composite index with rankings has been compiled and is displayed in Table 5.3. The Panchanantala Road slum has been identified as the top-ranked settlement, between the authorization of slums i.e., registered and unregistered slums, and location of the slums i.e., along the railway and its educational inclusivity. The Narkel Danga Canal East Road registered slum, along canal lines, is ranked second, while the Madhobtala Bustee in Dhakuria unregistered slum along the railway line is ranked third and the Narkel Danga Canal West Road unregistered Bustee, along canal line, is ranked fourth.

On the contrary, the registered slum areas of Panchanantala Road exhibit a higher degree of inclusivity than the registered slum of Narkel Danga Canal East Road. On the other hand, the degree of inclusiveness is relatively greater in the unregistered settlement of Madhobtala Bustee, Dhakuria, in contrast to Narkel Danga Canal West Road Bustee.

Lastly, the findings indicate that the Registered Panchanantala slum located along the railway line is comparatively more inclusive than the Unregistered Madhobtala Bustee, Dhakuria slum, and the Registered Narkel Danga Canal East Road slum, situated along the canal line, exhibits a higher degree of inclusivity as compared to the Unregistered Narkel Danga Canal West Road Bustee (Table-5.3).

Table No 5.3: Comparison of the Literacy Index Among all the Selected slums

Sl No	Status of Slum	Name of the Slum	Literacy Rate	Rank	Vocational Training (percent)	Rank	Dropouts (percent)	Rank	Composite Index of Literacy	Avg C. I of Literacy
1	Registered Slum	Panchanantala Road slum	67.46	4	5.46	8	9.52	2	14	4.67
		Narkel Danga Canal East Road slum	45.66	6	2.75	9	16.34	4	19	6.33
3	Unregistered Slum	Madhobtala Bustee, Dhakuria	39.21	7	1.32	10	19.32	4	21	7
4		Narkel Danga Canal West Road Bustee	21.68	8	0.9	10	26.32	6	24	8

Sources-Computed based on the Primary Data, 2021

5.4.b Living Condition Facilities

The Inclusive Living methodology involves a thorough assessment of housing design that encompasses not only structural modifications but also the function of housing in facilitating social engagement, cultivating connections, and mitigating systemic barriers to aging in place.

The majority of the dwellings in the Canal East Road slum are constructed using Kucha or semi-pucca materials, such as mud or bamboo shoots, and are covered with Mud Talis. A small proportion of the dwellings are constructed using Pucca materials, such as bricks, and have roofs coated with asbestos. In contrast, the Panchanantala slum consists solely of Pucca buildings, which are considered permanent dwellings (Table 5.4). The living conditions in the Canal East Road slum are characterized by a high degree of unsanitary conditions, with a typical occupancy rate of 12 individuals per dwelling unit, which is often confined to a 5' by 7' room. The crowding index of the area in question is 4.4, while the Panchanantala slum exhibits a crowding index of 2.76. The maximum occupancy of a dwelling in the Panchanantala slum is five individuals, with no more than five individuals observed in a room measuring 5X7 feet, as indicated in Table 5.4. In addition, the ventilation within these habitations is significantly insufficient and constricting in the slums, albeit slightly superior in Panchanantala. According to the survey results, a significant proportion of households in the Canal East Road slum lacked windows in a 5'/7' room with only one small entrance. The spatial allocation per family and individual in the Canal East Road slum, Narkel Danga, and Panchanantala slum, Dhakuria, have been depicted in Figs. 5.6 and 5.7, respectively. Specifically, the data indicated that approximately 90 percent of these households had no windows. In contrast, the majority of households in Panchanantala were found to have two windows and one single door in 90 percent of the surveyed instances. The state of the flooring is comparable between the two scenarios, however, there exists a slight variation in the roofing. Specifically, in the Narkel Danga Canal East Road slum, the surveyed households indicate that 72.35 percent of the structures are constructed with Tali (Mud Tiles) and 27.65 percent with tin. In contrast, the Panchanantala slum reveals that 51.74 percent of the structures are made of tin and 48.26 percent are made of Tali. The graphical representations of the hutment structures and compositions of the two registered slums are depicted in Figs. 5.8 and 5.9, respectively. The water quality in both slums is deplorable, ranging from semi-fresh to fresh. In the case of Narkel Danga Canal East Road slum, there is an abundance of fresh water which is served by KMC, which is supplied three times a day for two hours each, i.e. six hours a day, and water is quite accessible with the presence of a large number of

taps within a few meters gap. Still, in the case of Panchanantala slum, the water crisis is very high, with only two water sources (Tap) area. Consequently, individuals are required to cover a considerable distance to procure their daily water needs, posing a significant challenge for vulnerable groups such as women, the elderly, and pregnant women. In terms of other home facilities, 83.54 percent of Canal East Road slum inhabitants have an in-house kitchen, compared to 70.12 percent in Panchanantala, however, the existence and use of LPG is considerably higher in Panchanantala slum than in Canal East Road slum (Table Number-5.4).

Conversely, the non-registered slums situated in Madhobtala Bustee, Dhakuria, and Canal West Road, Narkel Danga exhibit a significantly inferior quality of life in comparison to the registered slum. Household crowding is defined as a condition in which the number of occupants residing in a particular dwelling exceeds the available capacity of the living space, as determined by factors such as the number of rooms, bedrooms, or floor area. Research has demonstrated that this particular ailment has adverse impacts on both physiological and psychological well-being. Crowding is a phenomenon that arises due to a disparity between the dimensions of a living space and the number of occupants who inhabit it. The extent of overcrowding is linked to the spatial characteristics and arrangement of the dwelling, including the size of the rooms, as well as the composition, size, and needs of the household, which may include any additional long-term residents. The level of occupancy within a household is influenced by multiple variables, such as the number of individuals residing together, their ages, relationships, and genders, among other factors. Under specific conditions, a dwelling may be classified as overcrowded if two unrelated individuals cohabit in a single bedroom, while it may not meet the criteria for overcrowding if the aforementioned individuals are in a romantic relationship. The concept of crowding encompasses both the tangible characteristics and spatial arrangements of a residential unit. Individuals may choose to gather in certain rooms of their homes to avoid colder or uninhabitable areas or to save money on heating expenses. According to Table 5.4, the Crowding Index of Madhobtala Bustee in Dhakuria is 5.76, while that of Canal West Road in Narkel Danga is 6.91. These values indicate a significant indication of the low standard of living in these areas. The Madhobtala Bustee in Dhakuria exhibits a high crowding index due to a dearth of resources and a lack of awareness among its inhabitants. Conversely, Canal West Road in Narkel Danga displays a high crowding index due to the prevalence of religious dominance, extreme poverty, and high fertility behavior. Secondly, the basis of both slums consists of Kuccha, which is constructed using wood, and Talis. As these slums are unregistered, no substantial foundation is observable

in this area. The predominant construction of dwellings in the two specified slums is Kuccha, as evidenced by the utilization of wood and mud for walls and floors, and a similarly composed roof. (Table 5.4). The dimensions of the rooms in Madhobtala Slum and Canal West Road, Narkel Danga are approximately 5 feet by 3 feet and 4 feet by 3 feet, respectively. The current number of rooms available is inadequate to accommodate the proposed population for habitation. On average, there are 13 individuals residing in a small room in the Canal East Road slum. The ventilation within the space is limited to a single open door, as opposed to being present throughout the entirety of the area. Regarding Madhobtala Bustee, the ventilation classification is marginally superior due to the presence of at least two windows and one door in each dwelling. Additionally, the average population density within a single room is comparatively lower, with seven individuals on average. In many slum areas, the living quarters consist of a single room, which does not include a designated kitchen space. As a result, residents often prepare their meals in the open areas of the slum, such as on the streets or in unenclosed areas within the community. In the Madhobtala slum, a mere 29.36 Percent (Table 5.4) of the total slum inhabitants engage in indoor cooking, while the remaining majority resort to outdoor cooking. Similarly, in the Canal West Road slum located in Narkel Danga, only 19.24 percent (Table 5.4) of the slum dwellers can conduct their cooking activities indoors, while the rest utilize outdoor spaces as their kitchens. Contrarily, it is evident that wood and coal are still predominantly utilized for cooking purposes. This is exemplified by the fact that in the Madhobtala slum, 21.36 percent of residents possess an LPG connection, whereas in the Canal West Road slum, Narkel Danga, this figure is only 7.23 Percentage (Table 5.4). The individuals in question find themselves in this particular stage as a result of challenging economic circumstances and governmental neglect.

The water quality in both slums is extremely poor, with levels ranging from semi-brackish to brackish. Within the confines of the Narkel Danga Canal West Road slum, there is an abundant provision of potable water, which is dispensed by the Kolkata Municipal Corporation (KMC) thrice daily for two hours each, resulting in a cumulative duration of six hours per diem. Moreover, the water supply is readily available owing to the existence of multiple taps situated nearby. However, the aforementioned taps are located in a roadside area that is not easily accessible to individuals. Consequently, they resort to utilizing small hand pumps and self-constructed water ponds for both drinking and sanitation purposes. It is important to note that the water in these ponds is naturally brackish. In contrast, the Madhobtala slum encounters a significant dearth of water, as it has access to only two tap water sources. Consequently, individuals are required to travel

a considerable distance to procure their daily water needs, posing a significant challenge for vulnerable groups such as women, the elderly, and pregnant individuals. Additionally, the water quality is brackish. The following plates display various parameters about living conditions in the four slums, such as housing types, water sources, and cooking conditions. (Plate- 5. a to 5. 1).



Plate 5. a: Narkel Danga Canal East Road Bustee (Along the Canal Line, Registered Slum)



Plate-5. b: Narkel Danga Canal West Road Bustee (Along the Canal Line, Unregistered Slum)



Plate 5. c: Panchanantala Road Bustee (Along the Railway Line, Registered Slum)



Plate 5.d: Madhobtala Lane Bustee (Along the Railway Line, Unregistered Slum)



Plate 5. e: Utilization of Drinking water in washing, bathing, etc. Narkel Danga Canal East Road Bustee (Along the Canal Line, Registered Slum)



Plate 5. f: Community Water Storage in Panchanantala Road Bustee (Along the Railway Line, Registered Slum)



Plate 5. g: Personal water storage at Madhobatala Lane Bustee (Along the Railway Line, Unregistered Slum)



Plate 5.h: Personal Water Storage in Panchanantala Road Bustee (Along the Railway Line, Registered Slum)

Source- Captured, August 2021



Plate 5.i: Household Structure of Narkel Danga Canal East Road Bustee (Along the Canal Line, Registered Slum)



Plate 5.j: Household Structure of Narkel Danga Canal West Road Bustee



Plate 5. k: Household Structure of Panchanantala Road Bustee (Along the Railway Line, Registered Slum)

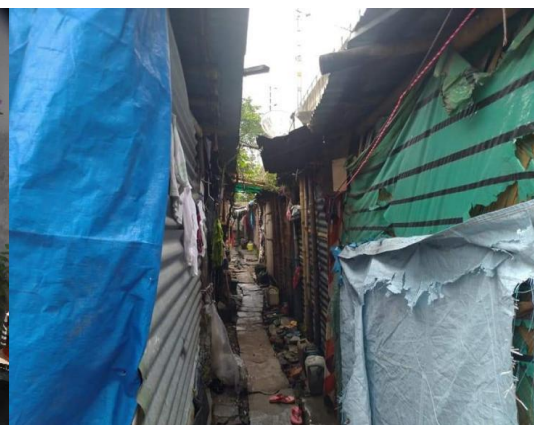


Plate 5.l: Household Structure of Madhobatala Lane Bustee (Along the Railway Line, Unregistered Slum)

Source- Captured, August 2021

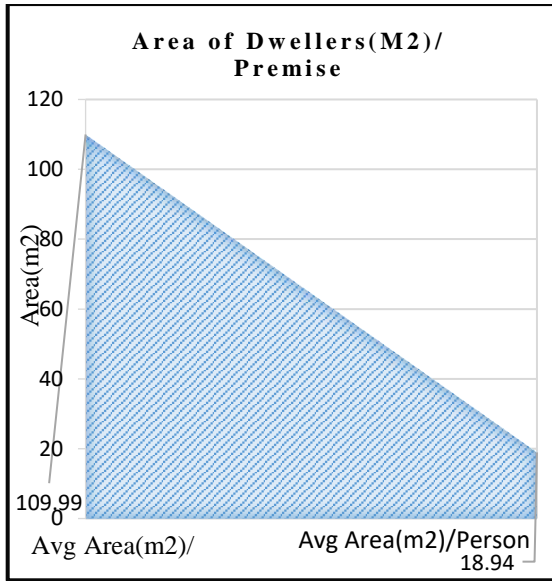


Figure 5.6: Area Occupied per family and person in meters, Narkel Danga Canal East Road Bustee (Registered Slum)

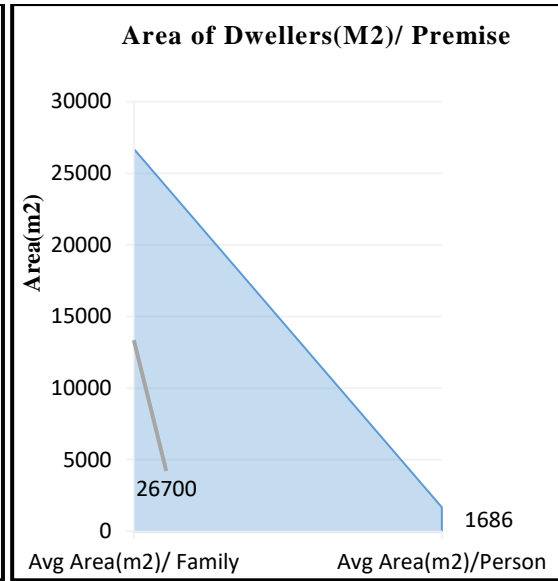


Figure- 5.7: Area Occupied per family and person in meters, Panchanantala Road Bustee (Registered Slum)

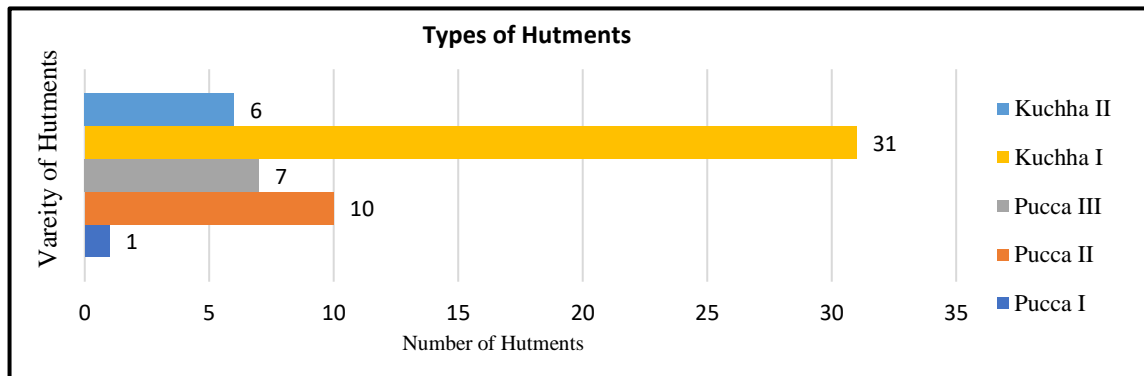


Figure-5.8: Hutment structure with the story of Narkel Danga Canal East Road Bustee (Registered Slum)

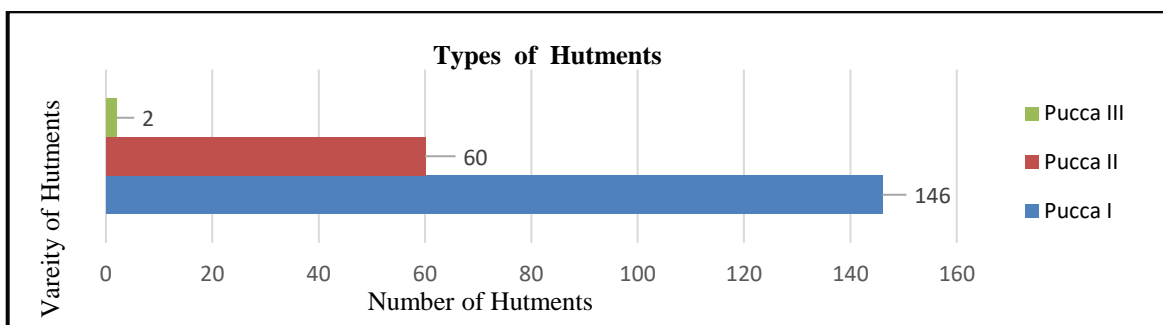


Figure-5.9: Hutment structure with the story of Panchanantala Road Bustee, Dhakuria (Registered Slum)

Source for Registered Slum: Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021)

Table 5.4 was produced using data from the primary survey to provide insight into the residential conditions of individuals living in slums based on the specified parameters. This study calculated a composite index to evaluate various slums based on their location

and authorization status. The average composite index of living conditions was then utilized to rank each slum individually. Among the all slums Panchanantala Road registered slum, it is evident that the slum ranked 1 exhibits the highest level of facilitation and inclusivity, with an average composite index of living conditions of 2.6. Following this, the Narkel Danga Canal East Road registered Bustee ranks second with an average composite index of living conditions of 2.8. The Madhobatala Bustee, Dhakuria unregistered slum ranks third with an average composite index of living conditions of 5.6. Lastly, the Narkel Danga Canal West Road unregistered Bustee is in the fourth position with an average composite index of living conditions of 5.8, indicating it is the least facilitated and inclusive. (Table-5.4)

Table 5.4: Comparison of the Living Conditions Among all the Selected Slums

Sl No	Status of Slum	Name of the Slum	Crowding Index	Rank	House Type	Rank	Water Quality	Rank	HHs with In-house Kitchen (Percentage)	Rank	HHs with LPG (Percentage)	Rank	Composite Index of Living Conditions	Avg C.I of Living cond.
1.	Registered Slum	Panchanantala Road, 2 Raja Basanta Roy Road slum	2.761	3	Pucca	1	Semi Fresh	2	70.12	3	63.5	4	13	2.6
2.		Narkel Danga Canal East Road Bustee	4.45	5	Semi Pucca	2	Fresh	1	83.54	2	61.12	4	14	2.8
3	Unregistered Slum	Madhobatala Bustee, Dhakuria	5.76	6	Kuccha	3	Semi Brackish	3	29.32	8	21.36	8	28	5.6
4		Narkel Danga Canal West Road Bustee	6.91	7	Kuccha	3	Brackish	4	19.24	9	7.23	10	29	5.8

Sources-Computed based on Primary Survey, August 2021

Moreover, in the aforementioned comparison between the Registered slum Panchanantala Road, Dhakuria, and Narkel Danga Canal East Road Bustee, it can be inferred that the former exhibits greater inclusivity. In a comparable vein, it can be observed that the

unregistered slum located between Madhobtala Bustee and Dhakuria exhibits a higher degree of inclusivity and facilitation in comparison to Narkel Danga Canal West Road Bustee. (Table-5.4)

In terms of site and context, it can be observed that the Panchanantala Road slum situated along the railway line in Dhakuria exhibits a higher degree of facilitation and inclusivity as compared to the Madhobtala Bustee in the same locality. Similarly, the Narkel Danga Canal East Road Bustee located along the canal line demonstrates a greater level of inclusivity in comparison to the Narkel Danga Canal West Road Bustee. (Table-5.4)

5.4.c Health Care Facilities

The concept of inclusive health is founded on two fundamental principles: the attainment of equitable access and the achievement of full participation. Equitable access refers to providing services and resources essential for individuals to attain optimal health outcomes.

The healthcare infrastructure in both registered slum areas is inadequate and substandard. The provision of health facilities along the Canal East Road slum is limited to only three establishments. One of the figures presented in the study (Plate-5.m) indicates the presence of a prominent healthcare facility situated within a distance of 250 meters from the periphery of the slum (Primary Survey, August 2021). This source provides essential healthcare services, including maternal care for women, administration of iron, vitamins, and other basic medications during pregnancy, as well as basic immunizations for children after birth, such as polio vaccinations. In addition, two hospitals are sponsored by the government and are located within a radius of 750 meters (Primary Survey, August 2021), where individuals seek medical attention for substantial health-related issues. Notwithstanding, the incidence proportion of Chronic Diseases within this impoverished urban area is typically 9.56 percent (Table 5.6), indicating a relatively modest occurrence. However, the primary etiology of such ailments is frequently attributed to inadequate access to fundamental amenities and unhygienic circumstances in medical facilities. The Panchanantala slum presents a comparable scenario, with the absence of a nearby health facility. The provision of primary health care services to the slum dwellers, including maternal drugs for females and immunizations for children, is solely available through the related ward office (Plate-5. n). Individuals were required to travel a distance exceeding 600 meters to access medical facilities under the government's purview in the case of a

substantial health concern (Primary Survey, August 2021). Consequently, they were compelled to depend on private physicians. The prevalence of chronic diseases among the residents of this particular slum is 13.49 percent (Table 5.6), indicating a higher incidence rate compared to that of Narkel Danga Slum.

On the other hand, for unregistered slums, the health condition is extremely poor. Slum environments are residential areas that exhibit housing structures that are either unsafe or structurally deficient. The majority of slums exhibit high population density, inadequate provision of basic amenities such as potable water and sanitation, and experience tenure insecurity. It is more probable for slums to be located in regions that are exposed to additional environmental hazards, such as flood-prone areas, mountainsides that are susceptible to mudslides, or near waste disposal sites or industries with high pollution levels. The aforementioned factors contribute to the escalation of health hazards associated with housing, such as infectious and noncommunicable diseases, violence and injury, and mental health concerns. The prevalence of diarrhea disease among children residing in slums is higher, primarily attributable to their heightened vulnerability to contaminated water and inadequate sanitation facilities. The phenomenon of crowding has been observed to intensify the likelihood of airborne disease transmission, particularly in the case of tuberculosis. The thermal conditions of housing are indicative of the social aspect of housing and its impact on health. Households with lower incomes face challenges in meeting the expenses of heating and retrofitting their residences to ensure proper insulation and maintenance. In addition, the elderly population is highly susceptible to mortality linked with severe temperatures, whether it be extreme heat or cold. The presence of inadequate housing conditions has been linked to negative psychological outcomes, including stress and mental health issues. The environmental factors commonly found in slums, such as crowding, pollution, noise, inadequate lighting, and limited access to green spaces, have been linked to the exacerbation of mental health disorders, including depression, anxiety, violence, and other forms of social dysfunction.

The Madhobtala Bustee in Dhakuria experiences a high incidence of general diseases, occurring every month with an average frequency. The prevalence rate of chronic diseases in this area is 3.23 percent (Table 5.6). Thus, it can be inferred that the mortality rate is comparatively elevated in the aforementioned slum area as indicated by Table 5.6. However, in the case of Narkel Danga Canal West Road Bustee, the mortality rate is relatively lower. Every week, it is common for individuals to experience general illnesses,

particularly in areas where the prevalence rate of chronic diseases is 1.76 percent, as indicated in Table 5.6.

The prevalence of early marriage in slums is a significant and pervasive issue that can be attributed to various factors, including negative attitudes towards girls, the perception of girl children as a burden, limited awareness, poverty, customary practices within households, and religious influences. The Narkel Danga Canal West Road Bustee faces significant challenges due to religious dominance, low literacy rates, and a lack of awareness. According to Table 5.6, the mean maternal age for first childbirth among girls residing in this slum is 16.45. Additionally, it is noteworthy that the age at which these girls are getting married is even lower than this, which is below the legal age for marriage in India. On average, it can be stated that there are four children per family if individual families are concerned about their educational pursuits. During pregnancy, some individuals may not have access to essential supplements such as iron, folic acid, and other vitamins. Additionally, these supplements may not be provided by the government. As a result of inadequate access to medication and nourishment, 79.32 Percent of newborns are born with low birth weight. Consequently, in subsequent instances, children are diagnosed with multiple ailments and experience cases of infant mortality. A significant proportion of mothers, specifically 90.12 percent, experience various life-threatening issues during childbirth. Additionally, 12.35 percent of females have reportedly passed away after giving birth to their second child. In a majority of cases, it is observed that mothers give birth to their children at home without seeking the services of a maternity clinic or hospital. Approximately 15.63 percent of mothers receive hospitalization during pregnancy, while the remaining individuals give birth in their respective residences. The closest government hospitals that offer affordable healthcare services are Nil Ratan Sircar Medical College and Hospital, situated at a distance of 2.2 kilometers, and R G Kar Medical College and Hospital, located 3.3 kilometers away from the aforementioned slum (Primary Survey, August 2021). Overall, it is evident that the family's monthly expenditure on medical treatment and medication amounts to approximately 120 rupees. This relatively low cost is not indicative of their infrequent illnesses, but rather a result of their financial constraints, which prevent them from allocating a greater sum towards healthcare expenses.

Likewise, in Madhobtala Bustee located in Dhakuria, the predominant factor contributing to early marriage is primarily attributed to poverty and inadequate awareness. According

to the data, a significant proportion of young women, specifically 85 percent, enter into marriage at the age of 18.12 years and subsequently experience their initial pregnancy at 19.23 years of age (Table 5.6). In addition, the availability of hospitals that offer affordable healthcare services is limited in the area. Consequently, individuals with various health conditions, ranging from mild to severe, often depend on health centers for medical attention. During pregnancy, essential medications are dispensed by health centers that are managed by Ward Office-90. Over 80Percentage of female residents in the slum area opt to deliver their babies at the nearest government maternity hospitals, namely Bangur Institute of Neurosciences located 5.4 km away, and Baghajatin State General Hospital located 3.7 km away (Primary Survey, August 2021). Approximately 62.32 percent of neonates are born with a low birth weight (Table 5.6). On average, each family in this area has two children. Thanks to government support in the form of medicine and supplements, malnutrition is prevented and both mother and child maintain good health after birth. The rate of infant mortality is 2.12 percent, and the incidence of maternal mortality following childbirth is less than 1 percent (Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021). Approximately 16.23 percent of females experience complications after their initial childbirth (Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021). Moreover, it is noteworthy that families typically allocate approximately 210 rupees per month towards the purchase of common medications.

Table 5.5: Sewerage Condition of Selected Registered and Unregistered Slum

Parameters	Sewer Pipe Diameter	Sewer Pipe Length
Panchanantala Road, Dhakuria	300	2586
Narkel Danga Canal East Road Bustee	10	455
Madhobtala Bustee, Dhakuria	0	0
Narkel Danga Canal West Road Bustee	0	0

(Source for Registered Slum: Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021) and (Source for Unregistered Slum -Primary Survey by the Researcher,2021)

The analysis of Table no-5.5 indicates that the sewer pipes' diameter and length in Panchanantala Road and 2 Raja Basanta Roy Road exhibit a higher potential for mitigating water entrapment within the slum compared to Narkel Danga Canal East Road Bustee, where the diameter is considerably smaller. In regards to the provision of latrine facilities, it is noteworthy that Narkel Danga Canal East Road Bustee possesses a total of 59 sanitary

latrines and 2 service latrines (Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021). This translates to a ratio of 3.47 latrines per capita for the aforementioned population (Plate-5. p). Conversely, it can be observed that the Panchanantala Basanta Roy Road slum possesses a total of 149 sanitary latrines (Civic Status of Kolkata Municipal Corporation, Slum Development Department 2021). This figure corresponds to a ratio of 43.76 among the slum's population (Plate-5. o). The prevalence of shared latrines in the Panchanantala Basanta Roy Road slum poses a significant risk to public health due to its high susceptibility to communicable diseases when compared to the Narkel Danga Canal East Road Bustee. Also, for the sanitation facilities Madhobtala slum uses community toilets where 83 slum families share 3 toilets for their daily use ((Plate-5. q) and Canal West Road 49 slum family shares 1 community toilet (Plate-5. r) which is a big source of spreading germs (Primary Survey, August 2021). But for unregistered slums, there are no sewerage pipelines present within the premises. Also, for the garbage clearance huge dissimilarity could be seen over these slums, where Panchanantala Road slum, Dhakuria gets to clear their garbage every week, Narkel Danga Canal East Road slum once in a fortnight, Madhobtala Bustee, Dhakuria Once in a month, and Narkel Danga Canal West Road Bustee maximum time remains dirty because it's got clear once after every six months (Primary Survey, August 2021 and Plate 5.s-5. z). The comparison of all selected Registered and Unregistered slums with the help of Kendall's method ranking has been shown below in Table 5.6.



Plate 5.m: Nearest Health center for Narkel Danga Canal East and West Road (Along the Canal Line, Registered and Unregistered Slum)



Plate 5.n: Nearest Health center (ward office) for Panchanantala Road slum, Dhakuria (Along the Railway Line, Registered Slum)



Plate 5. o: Toilet facility of Panchanantala Road slum, Dhakuria (Along the Railway Line, Registered Slum)



Plate 5. p: Toilet facility of Narkel Danga Canal East Road (Along the Canal Line, Registered Slum)



Plate 5.q: Toilet facility of Madhobtala slum, Dhakuria (Along the Railway Line, Unregistered Slum)



Plate 5. r : Toilet facility of Narkel Danga Canal West Road (Along the Canal Line, Unregistered Slum)



Plate 5.s: Garbage condition of Panchanantala Road slum, Dhakuria (Along the Railway Line, Registered Slum)



Plate 5.t: Garbage condition of Narkel Danga Canal East Road (Along the Canal Line, Registered Slum)

Source- Captured, August 2021



Plate 5.u: Garbage condition of Narkel Danga Canal west Road (Along the Canal Line, Unregistered Slum)



Plate 5.v: Garbage condition of Madhobatala slum, Dhakuria (Along the Railway Line, Unregistered Slum)



Plate 5.w: Sewerage Condition of Panchanantala Road slum, Dhakuria (Along the Railway Line, Registered Slum)



Plate 5.x: Sewerage Condition of Narkel Danga Canal East Road (Along the Canal Line, Registered Slum)



Plate 5.y: Sewerage Condition of Madhobatala slum, Dhakuria (Along the Railway Line, Unregistered Slum)



Plate 5.z: Sewerage Condition of Narkel Danga Canal West Road (Along the Canal Line, Unregistered Slum)

Source- Captured, August 2021

Table 5.6: Comparison of the Health Care and sanitation Conditions Among all the Selected Slums

Serial Number	Status of Slum	Name of the Slum	Prevalence Rate of Chronic Diseases	Rank	Frequency of General Diseases	Rank	percent of an underweight child at birth	Rank	Maternal Age at the first delivery	Rank	Medical Expenses/HH	Rank	Garbage Clearance Frequency	Rank	Composite Index of Health & Sanitation	Avg. C.I of Health & Sanitation
1	Registered Slum	Panchanantala Road slum, Dhakuria	13.49	4	Every month	2	40.01	5	19.75	4	740	4	Weekly	2	21	3.5
2		Narkel Danga Canal East Road slum	9.56	5	Every month	2	36.83	4	23.33	2	560	3	Once a fortnight	3	19	3.17
3	Unregistered Slum	Madhobatala Bustee, Dhakuria	3.23	6	Every month	2	62.32	7	19.23	4	210	2	Once in month	4	25	4.17
4		Narkel Danga Canal West Road Bustee	1.76	6	Every week	3	79.32	8	16.45	6	120	1	Once in a six-month	5	29	4.83

Sources-Computed based on, Primary Survey, August 2021

Table 5.6 presents a comparative analysis between the Registered Panchanantala Road slum Dhakuria, Narkel Danga Canal East Road slum and the Unregistered Slum Madhobatala Bustee Dhakuria, Narkel Danga Canal West Road Bustee. The average comparative Index score among all registered and unregistered slums is also included in Table 5.6. The Narkel Danga Canal East Road slum holds the top position with an index value of 3.17, followed by the Panchanantala Road slum in Dhakuria with an index value of 3.5. The third position is occupied by the Madhobatala Bustee with an index value of

4.17. Lastly, the Narkel Danga Canal West Road Bustee secures the fourth or final position with an index value of 4.83.

Similarly, it could be said that the registered slum Narkel Danga Canal East Road slum is more inclusive and better in terms of Health Care and sanitation Conditions than the Panchanantala Road slum, Dhakuria. Again, between the Unregistered slum Madhobtala Bustee, Dhakuria is more inclusive and better in terms of Health Care and sanitation Conditions than Narkel Danga Canal West Road Bustee.

Also, it could be seen along the side of railway slums Panchanantala Road registered slum Dhakuria is more inclusive and better in terms of Health Care and sanitation Conditions than Unregistered slum Madhobtala Bustee, Dhakuria and seen along the side of canal slums Narkel Danga Canal East Road registered slum is more inclusive and better in terms of Health Care and sanitation Conditions than Unregistered Narkel Danga Canal West Road Bustee.

5.4.d Economic Condition

The concept of inclusive growth pertains to a type of economic expansion that engenders employment opportunities and aids in the mitigation of poverty. The notion involves the delivery of essential healthcare and educational amenities to individuals who experience economic hardship. The aforementioned pertains to ensuring equitable access to opportunities and fostering individual empowerment through education and skill-building. The notion encompasses a sequence of growth that emphasizes ecological sustainability, endeavors to achieve efficient governance, and aids in the formation of a community that is sensitive to gender concerns.

The slum located along the Narkel Danga Canal East Road exhibits a relatively higher economic condition in comparison to the slums situated along the Panchanantala Road and the 2 Raja Basanta Roy Road. The heightened economic susceptibility of the Narkel Danga Canal East Road informal settlement can be attributed to its central location within the urban vicinity. It is noteworthy that Table No. 5.7 reveals a comparatively higher dependency ratio and per capita economic consumption in the Narkel Danga Canal East Road slum as compared to the Panchanantala Road slum and 2 Raja Basanta Roy Road slum. The aforementioned phenomenon is attributed to the comparatively greater household size that is commonly observed in the Panchanantala Road and 2 Raja Basanta Roy Road slums in contrast to other slums. The compound bar chart illustrates the

combined data regarding the total number of male and female adults who earn a living and live in slum areas. The level of accountability demonstrated by individuals possessing BPL cards, consequent to their registration with the government, is comparatively greater in the Panchanantala Road and 2 Raja Basanta Roy Road slums as opposed to the Narkel Danga Canal East Road slum. The aforementioned result can be attributed to the proactive measures implemented by the government in the Panchanantala locality. The underlying cause for the presence of developmental initiatives in the vicinity of Panchanantala Road is attributed to the involvement of the government in the area.

Based on the selected parameters, the mean composite index for the registered slum reveals that Narkel Danga Canal East Road has a value of 3, while the Panchanantala Road slum has a value of 4 (Table 5.7).

On the other hand, the Madhobtala Bustee, which is not officially registered, operates within the informal sector of Dhakuria's and Narkel Danga Canal West Road Bustee. However, it does engage in contractual arrangements with the formal sector, albeit to a restricted degree. Residents of slums engage in diverse economic pursuits, including but not limited to manufacturing, hospitality, street vending, and transportation, with a particular emphasis on rickshaw pulling, auto driving, and small-scale entrepreneurship. The predominant source of income for residents of slum households is derived from unskilled wage labor or self-employment within the informal sector, often lacking a fixed physical location. Consequently, the mean monthly earnings of Madhobtala Bustee's households are considerably inferior to those residing in non-slum regions. As per the data presented in Table 5.7, the average monthly earnings of the slum households under the survey are a meager amount of 1500. The observed slum demonstrates a Dependency ratio of approximately 3.2 and an earning member ratio of 1.2, which are important findings. Additionally, according to official documentation, the proportion of individuals classified as Below the Poverty Line (BPL) is significantly high, reaching 91.23 percent. The study reveals that the monthly income of households residing in the Narkel Danga Canal West Road Bustee slum is relatively higher, with an average of 2500. The slum in question has a dependency ratio of 3.2 and an earning member ratio of 0.7. Additionally, it is worth noting that 93.56 percent of registered individuals in this area fall under the Below Poverty Line (BPL) category (Table 5.7).

Based on the selected parameters, it can be concluded that the mean composite index for unregistered slums indicates a value of 5.25 for Madhobatala Bustee and 5.5 for Narkel Danga Canal West Road Bustee (Table 5.7).

Table No 5.7: Comparison of the Economic Conditions Among all the Selected Slums

Serial Number	Name of the Slum	Name of the Slum	Income Level	Rank	No. of Earning Members/Household	Rank	No. of Dependents/Household	Rank	BPL (percent)	Rank	Composite Index of Economic Conditions	Avg C.I of Economic cond.
1	Registered Slum	Panchananta la Road slum, Dhakuria	5000	5	2.03	4	1.266	2	63.33	5	16	4
2		Narkel Danga Canal East Road slum	6500	3	2.2	4	1.83	2	45.29	3	12	3
3	Unregistered Slum	Madhobatala Bustee, Dhakuria	1500	6	1.2	5	3.2	4	91.23	6	21	5.25
4		Narkel Danga Canal West Road Bustee	2500	5	0.7	6	4.62	5	93.56	6	22	5.5

Sources-Computed based on Primary Survey, August 2021

5.4.e Transport and Communication Conditions

Transportation and communication serve as means for human beings to surmount the obstacle of geographical separation. It is an efficacious means of establishing communication with individuals, irrespective of the geographical expanse that may exist between them. Transportation typically entails the conveyance of individuals or commodities from one location to another using a mode of transportation. Conversely, communication refers to the transmission of information or data from a sender to a receiver.

Concerning the internal conditions of the slum, the state of the road infrastructure near the slum is being considered. The Narkel Danga Canal East Road slum, which is officially

recognized, features broad and surfaced thoroughfares. In contrast, the Panchanantala Road slum, particularly the 2 Raja Basanta Roy Road slum, is characterized by partially surfaced roads, with certain sections remaining unsurfaced. The fifth table in the document provides data on the WS system, IPSCC, and Black Top area coverage, along with the dimensions of the roadways in the Panchanantala Road slum. The aforementioned data holds relevance to both of the informal settlements. In contrast, concerning the execution of contemporary accessibility, both slums exhibit almost equivalent ratios of facilities. The composite index of inclusivity is comparatively higher for Narkel Danga Canal East Road slum, with an average score of 4.5, as opposed to the Panchanantala Road slum, which has an average score of 5, based on factors such as road type and access to media outlets such as newspapers and television (Table- 5.8).

In contrast, the unregistered slum of Madhobtala Bustee lacks proper road infrastructure and instead utilizes the adjacent railway track as a pathway. This alternative route is often in a state of disrepair and poses a safety hazard, as residents may encounter railway accidents. Located amid the horizontally planned slum, there exists a narrow one-meter road at the rear end that serves as a connection between Dhakuria station road. However, due to its central location, residents are required to access the road from both sides. Other than these two, there are no other existing roadways. Likewise, in terms of communication, every household possesses a mobile phone, however, only a minority of 10.21 percent have access to television (Table 5.8). Furthermore, the utilization of newspapers is non-existent due to a lack of awareness. The Narkel Danga Canal East Road slum is located adjacent to the Narkel Danga main road, providing convenient access to 22 ft roadways and various transportation options such as auto, bus, and riksa. According to the data, 62 percent of family members possess the ability to utilize (Table- 5.8). mobile phones, while neither television nor mobile phones exhibit any degree of accessibility. Thus, based on the evaluation of amenities using the Average Composite Index, the value obtained was 5.5 (Table- 5.8).

Table No 5.8: Comparison of Transport and Communication Facilities Conditions Among all the Selected Slums

Sl No	Status of Slum	Name of the Slum	Road Type	Rank	Access to media (Newspapers, Mobile & Television)	Rank	Composite Index of Transport & Communication	Avg C. I of Transport & Communication
1	Registered Slum	Panchanan tala Road slum, slum	semi pucca	2	23.33	8	10	5
2		Narkel Danga Canal East Road slum	pucca	1	24.5	8	9	4.5
3	Unregistered Slum	Madhobtal a Bustee, Dhakuria	Kuccha	3	10.21	9	12	6
4		Narkel Danga Canal West Road Bustee	pucca	1	1.23	10	11	5.5

Sources-Computed based on, Primary Survey, August 2021

5.4.f Disaster Preparedness

Last but not least, about the problem of natural disasters, an average composite Index has been developed below, the primary focus of which is on the waterlogging and fire hazard of slums, as well as inhabitants' awareness. In contrast to the two officially recognized slums, the aforementioned locations have a lower incidence of water logging in comparison to other regions within the jurisdiction of the Kolkata Municipal Corporation. An exception to this phenomenon occurs during the period of intense monsoon precipitation, wherein the water may experience temporary stagnation for several hours. However, in the context of unregistered slums, both of them have recurrent issues with water logging due to the absence of adequate sewerage infrastructure. The Narkel Danga Canal west road slum, located adjacent to canals, experiences recurring waterlogging

issues every week due to the accumulation of canal water and daily wastewater from the city. In contrast, the Madhobtala Bustee located in Dhakuria encounters a notable predicament characterized by the absence of a well-functioning drainage infrastructure for the disposal of their daily wastewater, leading to recurrent inundation of the slum every week (Table No-5.9). Furthermore, even mild rainfall exacerbates the issue, causing excessive flooding in the area. Furthermore, the occurrence of a fire, albeit of a very minor nature, was seen in both of the documented informal settlements roughly six months ago. However, when considering the level of knowledge, it becomes evident that the Narkel Danga Canal East Road slum exhibits a comparatively lower level of awareness in contrast to the Panchanantala Road slum and the 2 Raja Basanta Roy Road slum. Nevertheless, both the unregistered slums are confronted with the recurring threat of fire hazards. Madhobtala Bustee, located in Dhakuria, experiences recurring fire hazards of varying severity every week. These hazards can be attributed to the structural composition of the buildings and a lack of knowledge among the residents. Similarly, Narkel Danga Canal West Road Bustee also encounters similar fire risks (Table No-5.9).

Based on the aforementioned parameters in the average composite Index of Disaster Issues (Table No-5.9), it can be concluded that the Panchanantala Road slum and the 2 Raja Basanta Roy Road slum exhibit a higher level of resilience compared to the Narkel Danga Canal East Road slum among the registered slums. Similarly, among the unregistered slums, Madhobtala Bustee and Dhakuria demonstrate greater resilience than the Narkel Danga Canal West Road Bustee. When considering all the slums collectively, it can be observed that Panchanantala Road slum has the top rank, followed by Narkel Danga Canal East Road slum at rank 2, Madhobtala Bustee in Dhakuria at rank 3, and Narkel Danga Canal West Road Bustee at rank 4.

Table No 5.9: Comparison of Disaster Facilities Among all the Selected Slums

Serial Number	Status of Slum	Name of the Slum	percent of HHs aware of disasters	Rank	Frequency of water logging	Rank	Occurrence of last fire hazard (if any)	Rank	Composite Index of Disaster Issues	Avg C. I of Disaster Issues
1	Registered Slum	Panchanantala Road slum,	80	2	Only during monsoons	1	6 months ago,	3	6	2
2		Narkel Danga Canal East Road slum	58.39	5	Only during monsoons	1	6 months ago,	3	9	3
3	Unregistered Slum	Madhobatala Bustee, Dhakuria	32.65	7	During light shower	2	One week ago,	5	14	4.67
4		Narkel Danga Canal West Road Bustee	7.23	10	weekly	3	Every month	4	17	5.67

Sources-Computed based on, Primary Survey, August 2021

5.4.g. Comparison through Composite Index Analysis

The Composite Index was formulated by evaluating the aforementioned criteria, and afterward, the Average Composite Index was derived from the outcomes of this evaluation. By analyzing the six composite indices representing each parameter rank, we have been able to evaluate the relative inclusiveness of the four slums under consideration. In what position may it potentially be ranked? The registered Panchanantala Road slum occupies the highest position in the ranking, with the Narkel Danga Canal East Road registered slum securing the second spot. Following closely behind is the unregistered Madhobatala Bustee located in Dhakuria, which holds the third position. Lastly, the unregistered Narkel Danga Canal West Road Bustee is ranked fourth (Table No-5.10).

Table No 5.10: Composite Index of all the selected Parameters of Registered and Unregistered Slums.

Statu s of Slum	Name of the Slum	Average Composite Index of Literacy	Average Composite Index of Living Conditions	Average Composite Index of Health Care Facilities	Average Composite Index of Economic Condition	Average Composite Index of Transportation and Communication	Average Composite Index of Disaster Facilities	Average Composite Index	Composite Index	Rank
Registered Slum	Panchanantala Road slum	4.67	2.6	3.5	4	5	2	21.77	3.63	1
	Narkel Danga Canal East Road slum	6.33	2.8	3.17	3	4.5	3	22.8	3.8	2
Unregistered Slum	Madhobatala Lane Bustee, Dhakuria	7	5.6	4.17	5.25	6	4.67	32.69	5.45	3
	Narkel Danga Canal West Road Bustee	8	5.8	4.83	5.5	5.5	5.67	35.3	5.88	4

Sources-Computed based on, Primary Survey, August 2021

Through the analysis of this composite index using various parameters given, some significant concerns have been uncovered about its lack of inclusivity. These flaws will be further examined in the following sections. The subsequent analysis will now focus on the discrepancies in inclusion and the underlying concerns present in both slums, as indicated by the findings of the previous quantitative evaluation.

5.5 Problems of Panchanantala Road Slum, Dhakuria (Registered Slum, Along the Railway Line)

- 1) The slum's geographical location is near railway lines, which consequently leads to restricted availability of sufficient sanitary facilities. As a result, the absence of adequate sanitation facilities exacerbates the unhygienic and chaotic circumstances prevalent in the slum, thus resulting in an elevated prevalence of morbidity.

- 2) The family's overall income is significantly diminished due to a scarcity of available workspace. Additionally, the proportion of family members engaged in employment is notably low, while the number of dependents is substantial.
- 3) The prevalence of underweight childbirth is estimated to be approximately 40 percent, primarily attributed to a dearth of government health services and infrastructure. This insufficiency in resources contributes to elevated rates of infant death and the development of long-term serious diseases, primarily stemming from compromised immunity. (Primary Survey conducted in August 2021).
- 4) Despite the overall satisfactory state of dwellings, the potential for vulnerability in times of crisis remains considerable due to issues such as overcrowding and the absence of sufficient internal spaces between houses. The residents of slums exhibit a commendable level of awareness in addressing fire threats; nonetheless, the high population density exacerbates their vulnerability to such incidents.
- 5) The water quality in this slum is characterized by brackishness, and its sufficiency is deemed poor. Additionally, the proximity of the water source to the area poses significant challenges in meeting the daily drinking water needs of the residents.

5.6 Problems of Narkel Danga Canal East Road Slum (Registered Slum, Along the Canal Line)

- 1) The crowding index within this slum is quantified as 4.45, despite the intermittent presence of 10 individuals per room. This high population density negatively impacts the residents' quality of life and contributes to the frequent transfer of pathogens.
- 2) In the context of this specific slum, despite the proximity of the school to the area, there exists a limited level of awareness regarding education, resulting in poor literacy rates and a high incidence of school dropouts.
- 3) The sanitation conditions in the area are substandard, as waste collection occurs either biweekly or monthly. This inadequate waste management contributes to filthy conditions within the slum and exacerbates issues related to waterlogging.
- 4) The sanitation infrastructure and drainage conditions exhibit significant deficiencies, as seen by the inadequate provision of toilet facilities, with a ratio of one toilet every 20-25 individuals. This suboptimal arrangement poses a great risk for the spread of pathogens and diseases, particularly in the context of the ongoing pandemic.

5.7 Problems of Madhobatala Bustee, Dhakuria (Unregistered Slum, Along the Railway Line)

- 1) The composition of this slum primarily consists of individuals who have sought sanctuary, resulting in a significant economic constraint within the community. This gives rise to a significant predicament in their fundamental daily existence, encompassing the preservation of their standard of living, access to adequate education, healthcare services, and several other necessities.
- 2) In the context of education, the matter of awareness, in addition to poverty, emerges as a significant factor contributing to children's propensity to discontinue their schooling. Additionally, the lack of accessible and affordable vocational training programs in this community contributes significantly to high levels of unemployment. Consequently, this situation indirectly exacerbates poverty and contributes to economic decline.
- 3) Based on the Primary Survey (August 2021) it could be seen a significant proportion, specifically 78.64 percent, of individuals residing in slums are unable to access governmental initiatives like the 'Ujjwala' Programme, which aims to provide affordable LPG for home use. Consequently, these individuals resort to using coal, wood, and crude oil as cooking fuels, resulting in environmental pollution and posing significant health risks to slum inhabitants. Comparably, it is seen that 70.68 percent (Primary Survey, August 2021) of residents engage in outdoor food preparation, while the remaining portion conducts such activities within their dwellings. This prevalent practice within slum areas often contributes to the occurrence of fire incidents.
- 4) The water quality in this area is very low, exhibiting brackish characteristics. Additionally, the accessibility of water in this slum is severely limited, with residents having to travel an average distance of more than 1.5 km to obtain water (Primary Survey, August 2021). This poses a significant challenge, particularly for elderly individuals and women residing in this community.
- 5) The hutments are constructed using combustible materials such as wood, tin, plastics, and shredded garments, which pose significant risks during fire and atmosphere hazards.

- 6) The slum exhibits a significantly elevated crowding index of 5.76 (Primary Survey, August 2021), indicating that, on average, around six individuals reside within a confined space of five by six feet. The ease of germ transmission and subsequent health deterioration are factors to consider.
- 7) The lack of a sewerage pipeline in this specific slum area requires the utilization of open and surface sewerage systems. Additionally, the municipal corporation only conducts garbage clearance once a month. Consequently, these circumstances often result in water logging problems within the slum, which greatly facilitates the transmission of diseases among its inhabitants and creates an unsanitary and unhygienic living environment.
- 8) The provision of adequate sanitation facilities poses a significant challenge in slum areas. Specifically, the issue of toilets stands out as a pressing concern. In these areas, a staggering 83 slum families or 176 residents are compelled to rely on a mere three toilets (Primary Survey, August 2021). Consequently, the average ratio of families to toilets stands at 27.67 or 58.67 individuals (Primary Survey, August 2021), indicating a severe scarcity of sanitation facilities. Moreover, it is worth noting that the absence of separate toilets for females exacerbates the situation. Furthermore, the lack of regular cleaning and maintenance of these facilities contributes to the rapid spread of diseases within the community.
- 9) Lastly, it is interesting to note that more than 90 percent of individuals (Primary Survey, August 2021) residing in slums are classified as living below the poverty line. However, they have difficulties accessing government-provided ration facilities and other resources designated for individuals in this socioeconomic category.

5.8 Problems of Narkel Danga Canal West Road Bustee (Unregistered Slum, Along the Canal Line)

- 1) The Narkel Danga Canal West Road Bustee is situated adjacent to an unsanitary canal, where rubbish and untreated sewage accumulate, creating an overall unclean slum environment. Consequently, the residents of this area are prone to experiencing significant health problems.
- 2) The demographic makeup of this slum predominantly comprises persons who have sought refuge, leading to a notable economic burden among the local population.

This situation presents a notable dilemma in their basic everyday lives, encompassing the maintenance of their quality of life, access to sufficient education, healthcare services, and various other essential needs.

- 3) Within the context of education, the issue of awareness, of poverty, arises as a noticeable determinant influencing children's inclination to cease their educational pursuits. Furthermore, the dearth of easily attainable and reasonably priced vocational training initiatives within this particular community plays a substantial role in the elevated rates of joblessness. As a result, this circumstance indirectly worsens the condition of poverty and adds to the downfall of the economy.
- 4) Due to the lack of official registration with the government, the slum in question does not receive any government-provided facilities, including those related to LPG access. According to the Primary Survey conducted in August 2021, around 92.77 percent of individuals living in slums are unable to avail themselves of LPG and instead rely on alternative cooking techniques. As a result, these persons opt for the utilization of coal, wood, and crude oil as sources of fuel for cooking purposes, hence leading to environmental contamination and presenting substantial health hazards to residents in slum areas. Similarly, it can be observed that a significant proportion of residents, specifically 80.76 percent according to the Primary Survey conducted in August 2021, partake in the practice of outdoor food preparation. Conversely, the remaining segment of the population chooses to engage in these culinary activities within the confines of their houses. The widespread adoption of this particular practice inside impoverished urban areas frequently leads to the incidence of fire-related events.
- 5) The water quality in this area is characterized as brackish. Although there are no issues with water accessibility, the untreated sewage water and canal water contaminate the local drinking water supply, resulting in the use of unpurified water. Consequently, the residents are susceptible to waterborne infections.
- 6) The hutments are built using flammable materials such as wood, tin, plastics, and shredded garments. Additionally, the spaces between the hutments are quite limited, resulting in a high level of congestion. This situation presents considerable dangers in terms of fire hazards and atmospheric risks and also contributes to the rapid spread of vulnerability to such hazards.

- 7) According to the Primary Survey conducted in August 2021, the slum demonstrates a notably higher crowding index of 6.91. This index suggests that, on average, almost seven individuals live in a limited area measuring two by four feet. The ease with which germs can be transmitted and the subsequent decline of health are important elements to take into account.
- 8) The degree of educational awareness among slum residents is significantly low, resulting in a lack of sufficient knowledge and techniques to effectively address the risk of fire hazards.
- 9) The absence of a sewerage pipeline in the particular slum area necessitates the implementation of open and surface sewerage systems. Furthermore, the municipal corporation solely carries out waste disposal activities on a biweekly basis. As a result, these conditions frequently give rise to waterlogging issues within the slum, significantly facilitating the transmission of diseases among its residents and establishing an unpleasant and unhealthy living environment.
- 10) The provision of sufficient sanitation facilities presents a notable obstacle in urban slum communities. The matter of toilets emerges as a significant and urgent topic. According to the Primary Survey conducted in August 2021, it was found that in the aforementioned regions, a significant number of slum households, specifically 49 families or a total of 123 individuals, are constrained to depend on a single toilet facility. As a result, the current data from the Primary Survey conducted in August 2021 reveals that the average ratio of families to toilets is 49 or 123 individuals. This data underscores the significant shortage of sanitation facilities. Furthermore, it is important to acknowledge that the lack of segregated lavatory facilities for women further intensifies the issue. In addition, the absence of consistent cleaning and upkeep of these facilities has a role in the accelerated transmission of diseases throughout the population. Furthermore, it might be argued that these toilets are, in fact, public facilities accessible to both slum inhabitants and the general public, rather than being exclusively designated for the slum residents. It is worth noting that the maintenance and cleaning of these toilets are undertaken by the government, albeit at intervals of two to three months. The absence of a functional water supply exacerbated the unhygienic conditions of the location.

- 11) The lack of economic opportunities among slum residents results in a significantly low monthly family income. Additionally, due to the presence of large family sizes, the dependency ratio is considerably high, specifically recorded as 4.62 (Primary Survey conducted in August 2021).

Ultimately, in the last part, it can be asserted that there exist numerous challenges within both the registered and unregistered slums as previously delineated. In addressing these issues, a planning methodology has been examined in part II of this chapter, with distinct approaches for registered and unregistered slums. Because the slum in question is located within premises officially recognized by the government, there exists an opportunity to enhance the structural and amenity aspects of the slum through rehabilitation planning. This, in turn, has the potential to improve the quality of life for the residents of the slum. In contrast, the unregistered slums are located within government premises that lack official registration. Consequently, it is possible to devise relocation strategies aimed at providing registered government land, enough facilities, amenities, and an improved quality of life for slum residents. Section II of the document comprises six graphical representations (5.10 and 5.11 for registered slum; 5.12, 5.13, 5.14 & 5.15 for unregistered slum) that depict inclusive planning metrics for both registered and unregistered slum inhabitants, tailored to meet their specific needs.

5.9 Section II: Model Planning (Relocation/Rehabilitation) for Making the slums more Inclusive

To find a solution to this issue Planning has been done with an eye on slum relocation and rehabilitation, which has been taken into consideration. The process of resettling or relocation is identifying and moving a population, no matter how large or little, from their local habitat or native area to a host place, which may or may not have chosen to welcome them. (Dasgupta, B.1973) This may be a contentious process. Migration is possible for it to occur willingly when people or groups move from one location to another of their own free decision. It is also possible for it to occur involuntarily, such as when a governmental agency compels people to do something against their will for the greater welfare of the public. (Bardhan, R., et Al. 2015) The advantages, whether monetary or nonmonetary or in any form, that the person being relocated is supplied in substitute for the lost location, possessions, job locations, connections, and so on are referred to as compensation. Resettlement often takes place in conjunction with some type of compensation. In the case of those who live in slums, compensation is given to qualifying slum families in the form of land or housing that is purchased at prices that are heavily discounted. It is common

practice to use the term relocation interchangeably with the phrase resettlement. The term "relocation" refers to the process through which individuals move from the place where they now reside to a different, more permanent setting.

On the other hand, rehabilitation refers to the process of reorganizing or rearranging the current physical layout to create an environment that is more beneficial and conducive to achieving a higher quality of life. When moving a significant number of families from one location to another, local authorities are required to create a "Resettlement Plan" that outlines the approach that will be taken by the relevant agency throughout the process of relocating the families. (Askari & Gupta,2016). This plan must be approved by the city council. In addition to that, it includes a physical design for the location, detailing the services that will be provided there, with or without housing. What is not typically included, however, is a strategy for the rehabilitation of the livelihoods of the affected families. This may involve the creation of new chances for income generation or the restoration of the economic activities that were lost.

Both the selected registered and unregistered slums necessitate specific and suitable planning strategies to promote inclusion and enable their growth. As a result, slums that have obtained formal registration have undergone planning procedures based on the rehabilitation model, whereas unregistered slums have been planned using the relocation model. The government has officially designated land for recognized slums, albeit without registering the land in the names of the residents. The slums have been equipped with essential amenities, including access to clean water, sanitation facilities, healthcare centers, and provisions for basic sustenance. However, a more comprehensive strategy is necessary to enhance the inclusivity and organization of these regions. On the contrary, unregistered slums are unlawfully inhabited by individuals and, as a result, are not eligible for the aforementioned amenities. Therefore, it is crucial to facilitate the relocation of unregistered slums to a specifically designated area leased by the government. This would enable them to access similar amenities as those provided in registered slums but in a more structured and organized manner. Among the selected urban regions, there are prevalent situations of overcrowding, poverty, and insufficient living standards. The rehabilitation strategy has been devised for the officially recognized slum situated adjacent to the railway line and canal line, known as Panchanantala Road Slum in Dhakuria, and the Narkel Danga Canal East Road Slum, as depicted in Fig.-5.10 & 5.11. In contrast, the relocation strategy has been devised for the informal settlement situated adjacent to the railway line and canal

line known as Madhobtala Bustee in Dhakuria, as well as the Narkel Danga Canal West Road Bustee, as depicted in Fig. 5.12 & 5.13; 5.14 & 5.15

5.9.1 Rehabilitation Planning for Panchanan Tala Road Slum, Dhakuria (*Registered Slum, Along the Railway Line*): *In-situ Slum Conservation Planning*

The Panchanantala slum is situated adjacent to the railway line (Fig. 5.10) and has been designated for rehabilitation planning, as indicated on the map (Fig. 5.11). In this instance of urban planning, all horizontal slum settlements have been designed as multi-story buildings featuring individual units with a floor area ranging from 190 to 230 square feet. Additionally, each unit is equipped with separate, internal toilet facilities. The conversion of horizontal space coverage by slums into vertical settlement coverage allows for additional space to be allocated towards the development of various amenities such as schools, health centers, libraries, markets, shops, and water sources. Furthermore, this approach also enables the integration of plantations to maintain ecological balance and promote greenery within the vicinity. The proposed plan model map (Fig. 5.11) entails the development of a complex that is designed to provide housing for all slum dwellers in a centralized location along a well-defined roadway axis. The crimson thoroughfares serve as primary paved routes that longitudinally link the slums from end to end. Additionally, two paved roads could be constructed transversely across the slum to enhance its accessibility. In addition to the primary thoroughfares, it may be advisable to strategize the placement of a water connectivity infrastructure, as indicated by the blue line depicted on the map (Fig. 5.11), to facilitate a reliable water supply. The water taps are strategically located beneath the vertical structures, health facilities, libraries, and entry points of the informal settlement. In addition, it may be beneficial to establish a modest healthcare facility with appropriate resources that cater to the healthcare needs of slum residents, particularly those afflicted with specific ailments prevalent in the area. It may not be feasible to establish independent educational institutions exclusively for slum residents such as schools and colleges. However, it is possible to establish a small non-governmental organization or library to promote awareness among slum dwellers on topics such as daily education, health, and maternal care. Additionally, this organization could provide education to impoverished children and infants. Additionally, the excess area could be utilized for planting and preserving vegetation. Furthermore, a designated area could be allocated for a children's park or playground. Finally, the vacated areas have the potential to be repurposed for economic activities such as the establishment of market stalls, small grocery stores, fruit stands, and similar enterprises.

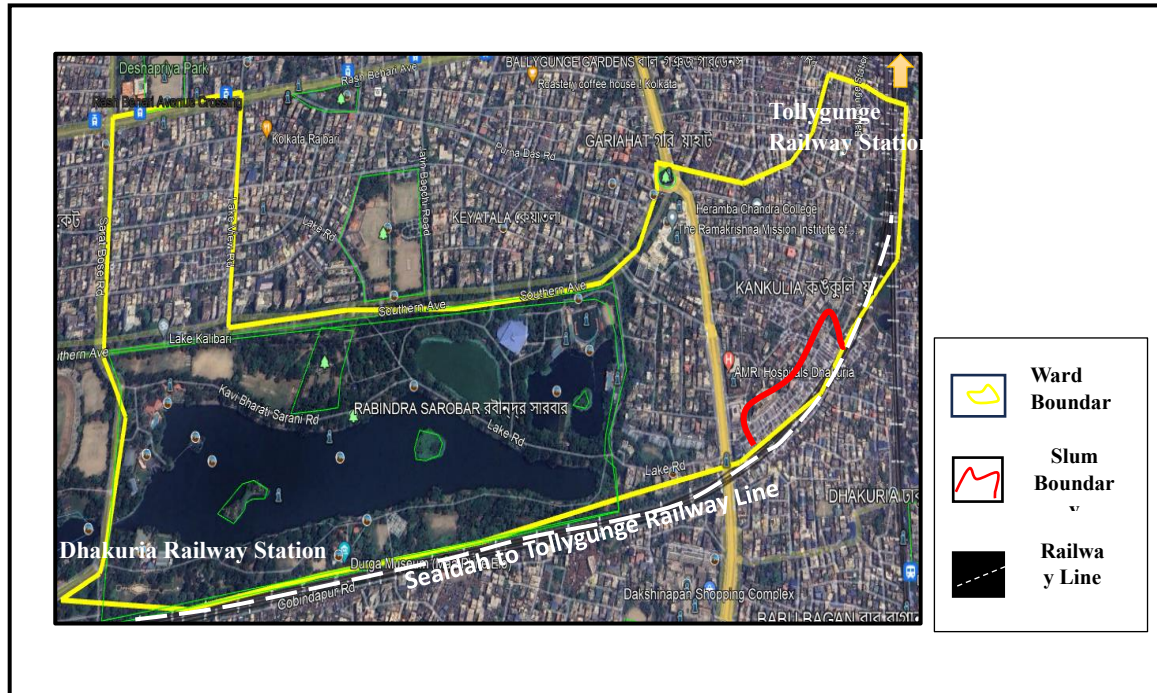


Figure 5.10: Location of Panchanantala slum within Ward No-90, Along the Railway Line

Source- Prepared through Google Earth Pro

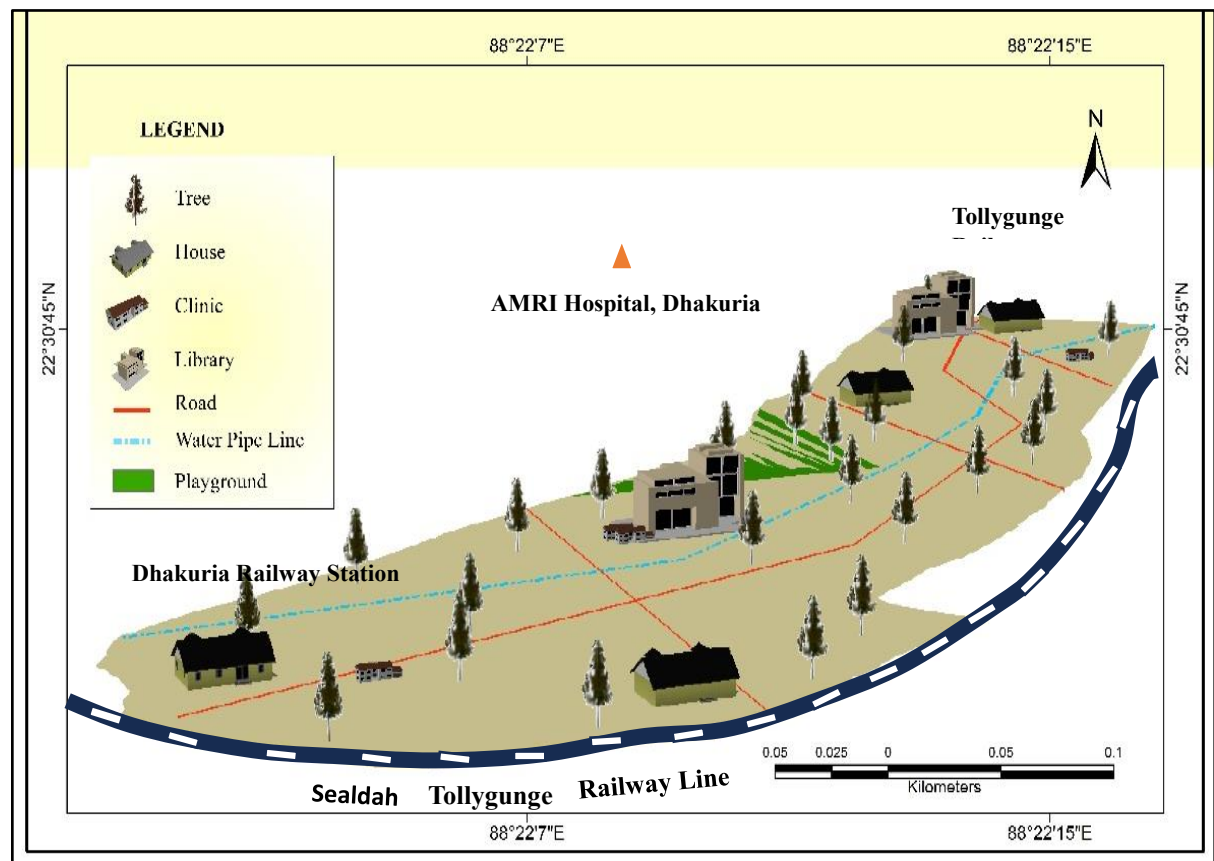


Figure 5.11: Rehabilitation Planning for Panchanantala Road Slum Dhakuria (Registered Slum, Along the Railway Line)

Source- Prepared by Researcher through AutoCAD Modelling

5.9.2 Rehabilitation Planning for Narkel Danga Canal East Road Slum (Registered Slum, Along the Canal Line): In-situ Slum Conservation Planning

The Narkel Danga Canal East Road Slum is located adjacent to the Narkel Danga Canal, as depicted in the model map. This slum bears a resemblance to the Panchanantala slum discussed earlier. (Fig. 5.12).

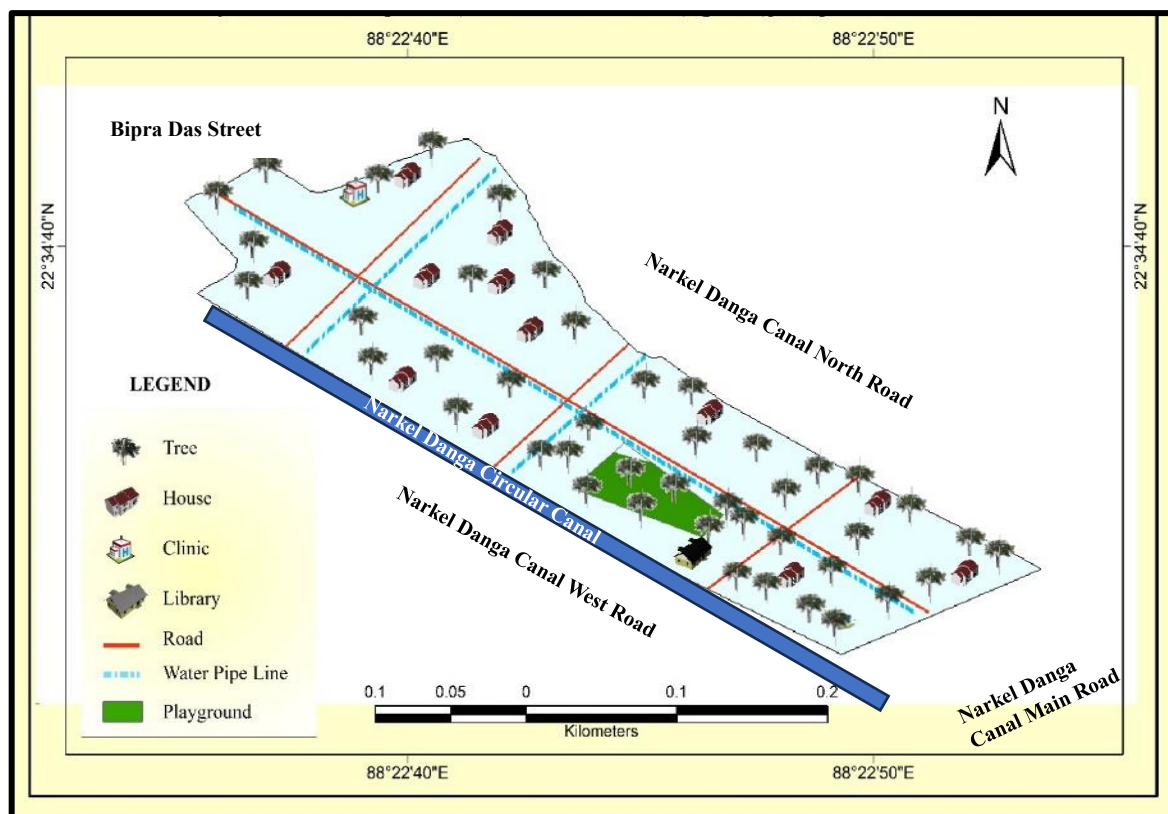


Figure 5.12: Rehabilitation Planning for Narkel Danga Canal East Road Slum (Registered Slum, Along the Canal Line)

Source- Prepared by Researcher through AutoCAD Modelling

5.10 SWOC/SWOT Analysis

To evaluate the level of inclusivity of slum facilities, a comprehensive analysis using the SWOT/SWOC framework was carried out within the respective slums. The objective of this analysis was to ascertain the potential impact of ethnic status on the prevailing conditions. The rehabilitation of the slums stated above is a result of government planning, however implemented through different means. Certain individuals demonstrate a higher level of competence in the area of planning, whereas others may exhibit more noticeable constraints in this aspect. Therefore, in the present context, a comprehensive SWOT/SWOC analysis has been undertaken to assess the internal strengths, weaknesses,

external opportunities, and threats to suggest an enhanced strategic approach for planning (Table 5.11).

Table 5.11: SWOT/SWOC analysis for rehabilitation planning of Panchanantala Road Slum, Dhakuria (Registered Slum, Along the Railway Line) and Narkel Danga Canal East Road Bustee (Registered Slum, Along the Canal Line)

Parameters	Panchanantala Road Slum, Dhakuria (<i>Registered Slum, Along the Railway Line</i>) and Narkel Danga Canal East Road Bustee (<i>Registered Slum, Along the Canal Line</i>)
<i>Strength</i>	<ul style="list-style-type: none"> • Through the implementation of vertical slum design, a significant portion of the slum area is left unoccupied, including essential amenities such as educational institutions, healthcare facilities, water supplies, recreational areas, economic establishments, and green spaces. The accessibilities provided to both the slums contribute to their inherently inclusive nature. • Due to the ongoing process of upgrading slums with permanent structures, it is expected that these areas will exhibit increased resilience in the face of fire and atmospheric threats. • The upgrading of building infrastructure will result in the concurrent upgrading of sewerage systems. Consequently, the reduction of water logging and rubbish congestion would contribute to an improvement in the health conditions of urban slum dwellers, as their exposure to a polluted environment will be mitigated.
<i>weakness</i>	<ul style="list-style-type: none"> • The crowding index of the household will remain unchanged as the occupants will receive their housing as a whole family unit, hence continuing to reside in a congested way. Consequently, the issue of limited living space, as measured by the Area of Dwellers (M2) to Premise premises ratio, will remain unresolved.
<i>Opportunities</i>	<ul style="list-style-type: none"> • In the case of migration or economic rebuilding, individuals would not only be provided with a modest dwelling equipped with necessary amenities but also be allocated a share of economic activities that can be pursued simultaneously.
<i>Threats/Challenges</i>	<ul style="list-style-type: none"> • Maintaining the structural integrity of vertical buildings by their original design poses a significant challenge for governmental authorities. • The concentration of individuals within a single dwelling can provide numerous difficulties in the context of outbreaks, whether they be epidemic, endemic, or pandemic in nature.

Source- Prepared by the Researcher

5.11 Relocation Planning for Madhobtala Bustee Dhakuria (*Unregistered Slum, Along the Railway Line*) : Ex-situ Slum Conservation Planning

Madhobtala Bustee Dhakuria is an informal settlement located adjacent to the Panchanantala slum in Dhakuria, occupying an unregistered area within the government-owned grounds. Consequently, a relocation plan has been developed (as seen in Fig. 5.13) to ensure the provision of registered land with suitable and sufficient amenities for the affected individuals. The planning process has been conducted using many substantial methodologies. The relocation of slums could be facilitated by providing fundamental amenities such as schools, hospitals, and water sources. The government has identified a relocation site with proximity as a key factor, where registered land can be allocated to individuals. Based on the identification of two appropriate relocation sites, denoted as 1 and 2 in Fig. 5.13, it has been determined that suitable lands for relocation have been located. Both of these relocated areas are located within a 400-meter radius of the northeastern and southwestern sections, respectively, of the original slum site. The land that has been shifted possesses sufficient access to educational institutions, healthcare facilities, and supplies of water. To assess the status of the land, namely, whether it is unoccupied or occupied, a land-use and land cover map (Fig. 5.14) was conducted. The map indicates that both portions of the land are unoccupied, with no evidence of built-up areas or vegetation in that location. Hence, the selection of these lands would result in the preservation of vegetation coverage, thereby ensuring the absence of ecological loss. Once the land has been selected, the implementation of vertical construction planning can be carried out, following the approach employed in the Panchanan Tala Road Slum Dhakuria, a registered slum located along the railway line (Fig. 5.11).

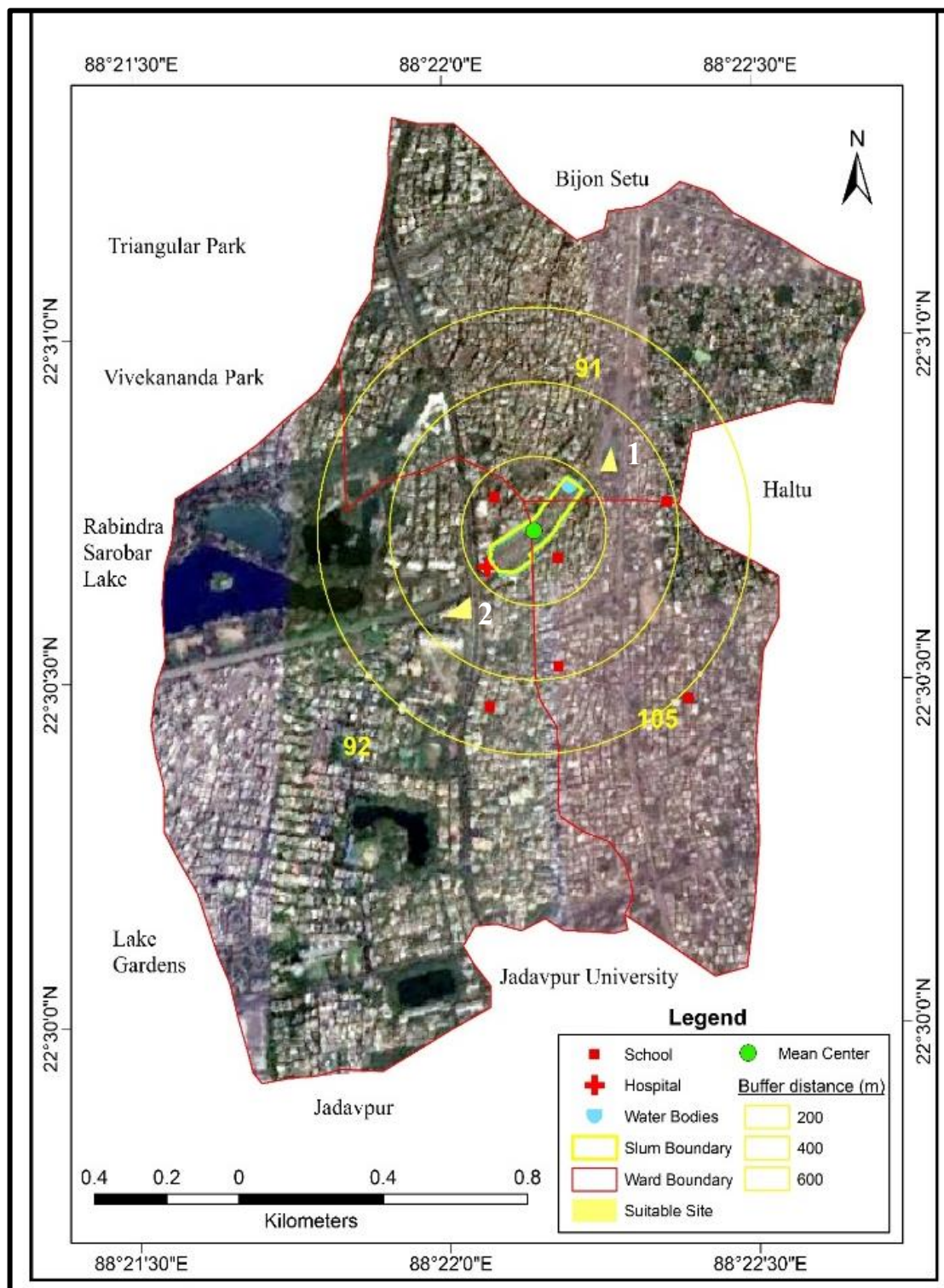


Figure 5.13: Relocation Planning for Madhobtala Bustee Dhakuria (Unregistered Slum, Along the Railway Line) *Source- Prepared by Researcher*

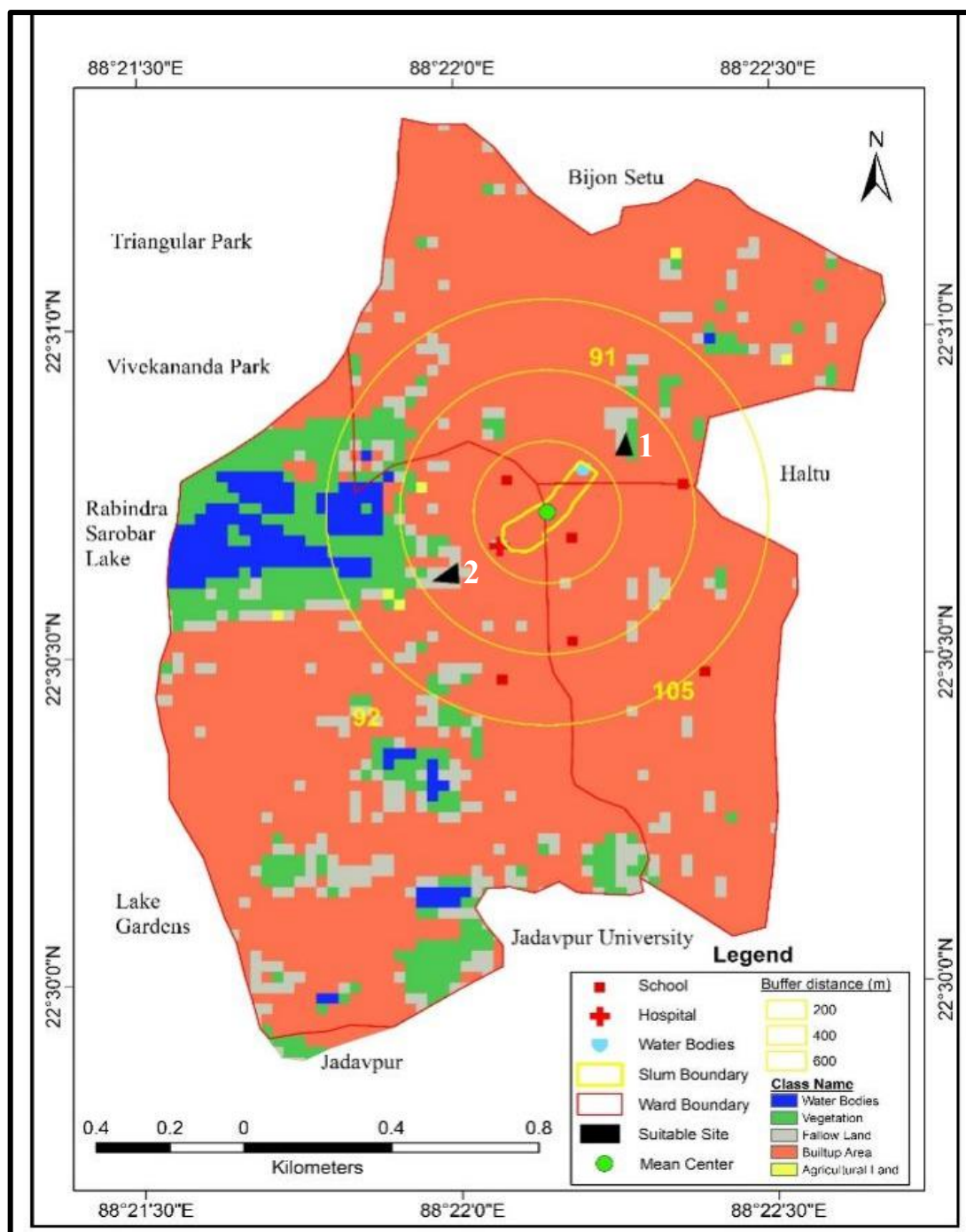


Figure 5.14: Land-use and Land Cover Map for Madhobtala Bustee Dhakuria (Unregistered Slum, Along the Railway Line)

Source- Prepared by Researcher

In addition to site suitability, a map depicting land usage and land cover has been developed for the Narkel Danga Canal West Road Bustee Unregistered Slum, specifically along the Canal Line (Fig. 5.15 and 5.16). As a result, six areas have been identified as potential relocation sites.

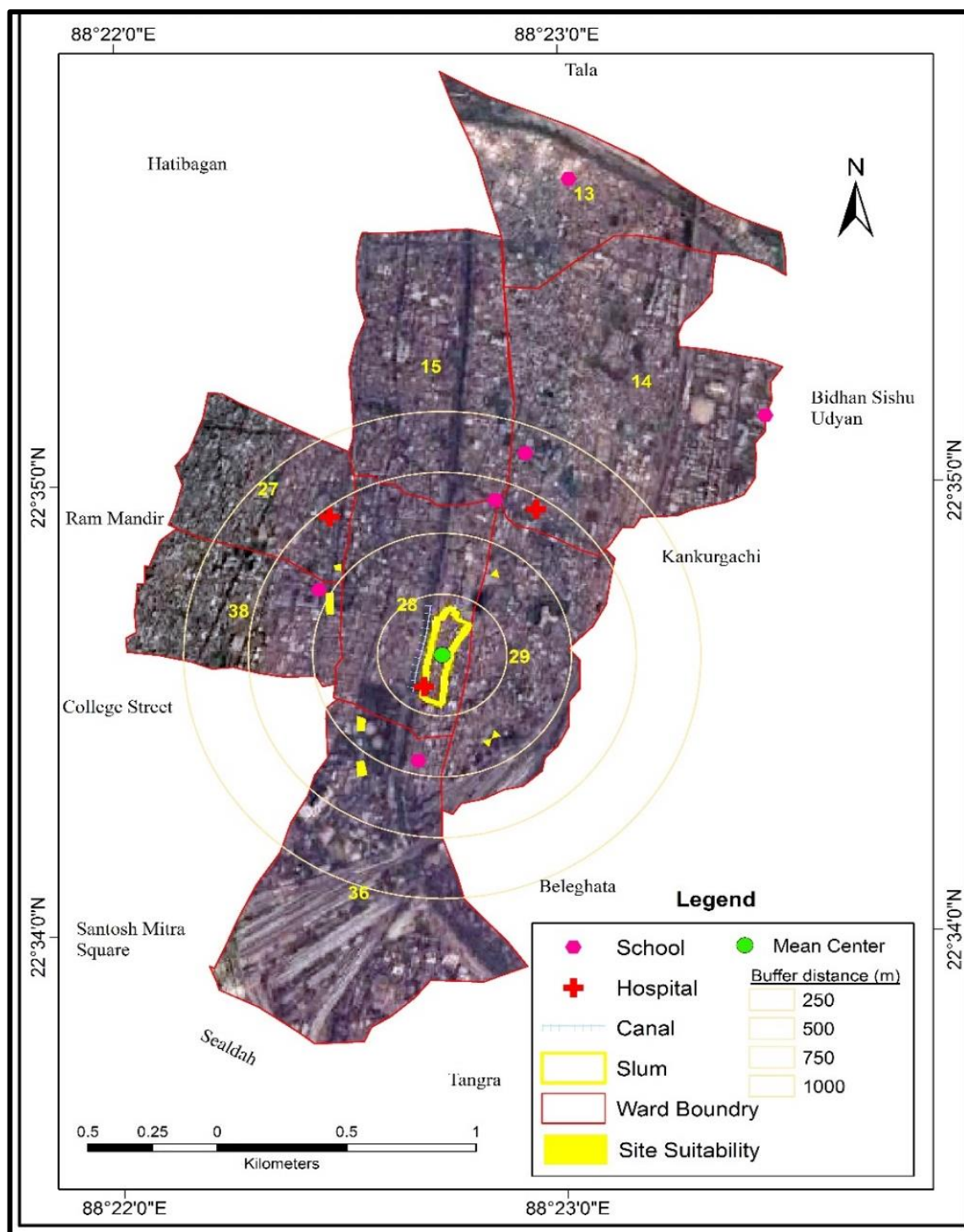


Figure 5.15: Relocation Planning for Narkel Danga Canal West Road Bustee (Unregistered Slum, Along the Canal Line) *Source- Prepared by Researcher*

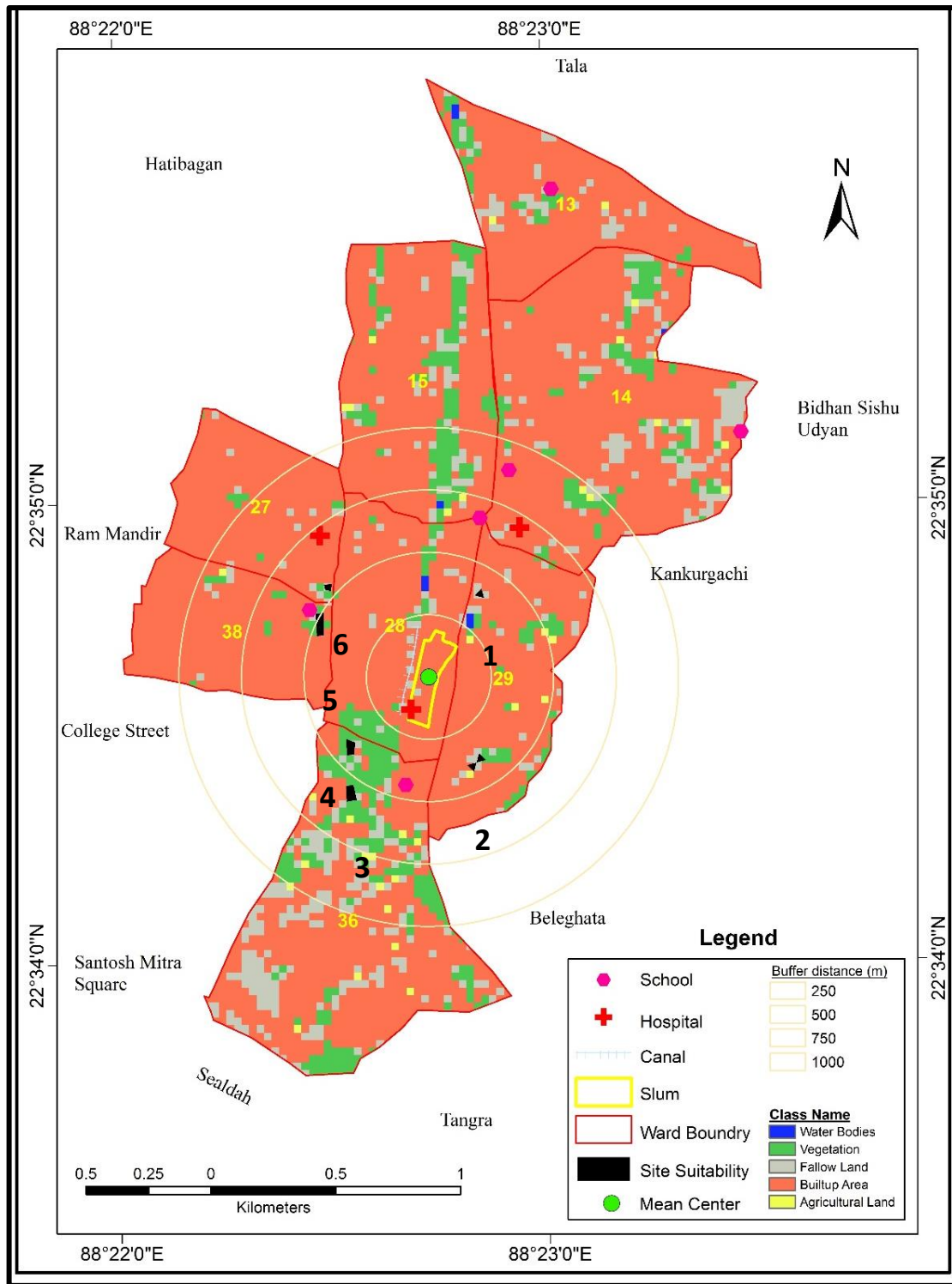


Figure 5.16: Land-use and Land Cover Map for Narkel Danga Canal West Road Bustee (Unregistered Slum, Along the Canal Line)

Source- Prepared by Researcher

This study delves into the investigation of issues associated with the displacement or relocation of slums, with a particular focus on analyzing their varying levels of significance.

5.12 Resettlement Losses

Displaced individuals may potentially experience a range of diverse types of losses. The outcome will lead to the dismantling of various systems and structures. Various forms of losses, such as land, assets, and services, economic losses that entail the loss of livelihood and income constraints, social losses that involve the destruction of community structures and habitat, and cultural losses that encompass the elimination of religious sites, public spaces, and rituals and routines, collectively contribute to psychological distress and traumatic stress.

5.13 An Opportunity for Development

An alternative perspective on resettlement regards it as a strategy for fostering the growth and development of peripheral regions and central urban districts. The aforementioned perspective is commonly referred to as urban renewal within academic discourse. Research indicates that the relocation of urban slums is commonly strategized in the peri-urban area. This requires the construction of modern infrastructure systems in the outer areas and the integration into the services that are already in place. Thus, new areas are developed in a manner that is seamlessly integrated with the expansion of the pre-existing urban landscape. Below is a SWOT/ SWOC study to evaluate their potential (Table 5.12).

Table 5.12: SWOT/SWOC analysis for Madhobtala Bustee Dhakuria (Unregistered Slum, Along the Railway Line) and Narkel Danga Canal West Road Bustee (Unregistered Slum, Along the Canal Line)

Parameters	Madhobtala Bustee Dhakuria (Unregistered Slum, Along the Railway Line) and Narkel Danga Canal West Road Bustee (Unregistered Slum, Along the Canal Line)
Strength	<ol style="list-style-type: none"> 1) This location is the shortest distance from inexpensive educational institutes for girls, boys, primary, secondary, and high secondary schools. 2) This location is a short distance from the health point, such as health centers and hospitals. 3) It is accessible by pucca road on both sides, namely Raja Dharendra Street and Narkel Danga Main Road. 4) This location is on government property, and the land type is fallow land. As a result, the legal process for relocating will be rather simple.
weakness	<ol style="list-style-type: none"> 1) The crowding index of the home will remain the same since the dwellers will receive their dwelling as a full family, which means they will continue to live an average of 5 persons per room, resulting in the Area of Dwellers (M2)/Premise premises (space crunch) problem being unresolved. 2) Even if infrastructure improves the quality of the toilet, the sharing problem of latrines will persist.
Opportunities	<ol style="list-style-type: none"> 1) The slum resident would be given a suitable pucca dwelling with a good roof and walls. This might be an effective way to combat fire dangers. 2) Because this will be a freshly developed region, the sewage system will be upgraded, and vertical buildings will eliminate the water logging problem up to a certain point. 3) In the event of migration or economic reconstruction, they would receive not only a small household with enough facilities but also a portion of their economic activity that may be carried out concurrently.
Threats/C challenges	<ol style="list-style-type: none"> 1) Congestion under one roof may cause problems during emergencies. 2) A high-density population under one roof might pose several challenges during outbreak/epidemic/endemic/pandemic-type situations.

Source- Prepared by Researcher

5.14 Recommendations for Enhancing the Inclusivity in Planning for the Relocation of Slums.

Both of these slums have been designed by the government to improve their quality of life and livelihood, but the slum inhabitants must make some efforts to ensure their success, which are as follows.

- a) If a small tax payment option for the upkeep of the premise, including housing and other facilities, the value of the planning would be much appreciated, and the government could also expand the premise further with that money.
- b) Education awareness should be maintained only by slum residents, as the government only provides physical infrastructure and not intellectual infrastructure.
- c) Because the government is investing money in physical infrastructure changes such as health, water, and drainage, slum residents should maintain cleanliness and provide a healthy and clean environment for future generations.

This section aimed to ascertain the available amenities in both urban slums and non-slum areas using a composite amenity index. Additionally, it proposed planning strategies to enhance the standard of living in these slum regions. A site-suitability map was generated utilizing the land use and land cover (LULC) data of the adjacent region to propose improved residential conditions for individuals residing in slums. The National Slum Development Programme (NSDP) and Indira Awaas Yojana (IAY) are two prominent slum development initiatives aimed at improving the living conditions of slum dwellers. However, their effectiveness has been hindered by various factors such as inadequate awareness among residents, political interference, entrenched cultural attitudes among the elderly, and insufficient monitoring of government policies. Hence, it can be inferred that a meticulous analysis of the issues at hand can establish model planning as the optimal approach for the enhancement of slums and the living conditions of their inhabitants.

The third half of the chapter is a real-life case study conducted in Kolkata (KMC Region), focusing on the relocation and rehabilitation planning for both unregistered and registered slums. This case study aims to examine the prospects and challenges associated with such initiatives.

5.15 Section III: Case Study of Monoharpukur Slum and Nonadanga Slum, Kolkata to Check the Strengths and Challenges of Relocation and Rehabilitation Model Planning

Assessment of viable options for slum improvement includes consideration of both the In-situ (rehabilitation) and Ex-situ (relocation) strategies. A study was conducted in the Monoharpukur and Nonadanga slums of Kolkata utilizing focused group discussions and questionnaire surveys to evaluate the potential benefits and challenges associated with the employment of rehabilitation and relocation methods. The process of selecting the slums has been based entirely on the Kolkata Municipal Corporation's methodology for planning

the relocation and rehabilitation of slums. Based on a comparative analysis of these two types of slum improvement, it can be inferred that the in-situ approach to slum development is superior and more comprehensive in its inclusivity when compared with the ex-situ method.

Ex-situ conservation involves the intentional relocation of economically disadvantaged individuals living in threatened slum areas to designated protected areas, to ensure their welfare, maintain their living conditions, and improve their overall quality of life. In contrast, the concept of in-situ redevelopment pertains to the process of revitalizing existing slum neighborhoods by providing essential municipal and infrastructural facilities immediately on the land occupied by the slum, thus benefiting its people. The government of India has made significant efforts in the post-independence era to enhance the living conditions in metropolitan areas, particularly in slums. In the context of colonial governance, the slums were conceptualized as architecturally impermanent settlements that emerged as a result of informal occupation, typically near areas of economic activity (Sanyal T., 2018). The initial technique to address the presence of slums in metropolitan areas, by colonial policy, was the official strategy employed. However, this approach has undergone notable transformations over the previous few decades. The initiation of this endeavor commenced in its early stages with the implementation of the Slum Clearance Act of 1956. Numerous initiatives and policies have been implemented by consecutive administrations, reflecting evolving priorities and policy changes about informal settlements. One of the foremost concerns about enhancements in slum conditions pertains to the shift in policy approach from slum clearance to slum rehabilitation, with a specific emphasis on safeguarding the rights of individuals residing in slums. The prevailing policies in the field have been primarily characterized by two dominant strategies: ex-situ relocation and in-situ rehabilitation within slum areas. This current study endeavors to evaluate the effectiveness of both strategies in two specific slums within the Kolkata metropolitan region, which serve as representative examples of the two aforementioned approaches to slum improvement in India. This study aims to compare two distinct situations in terms of the outcomes observed among slum inhabitants who have been either relocated or rehabilitated. The objective is to assess which of the two options yields greater inclusivity and an improved quality of life for those individuals who have been displaced. Several research studies have been undertaken in India to evaluate the soundness of the study objectives and present a substantiated rationale for concluding the article. A

significant corpus of scholarly study exists about the wide array of policies and activities implemented to enhance the conditions of slums in India. Multiple studies have demonstrated that the process of relocating and rehabilitating slums in India holds promise for enhancing the overall quality of life experienced by their inhabitants. Sheth A.Z., 2009 stated that rehabilitation might be seen as a viable approach to improving slum regions. Sheth A.Z., 2009 proposed the adoption of a "self-development" strategy to facilitate the enhancement of economic stability within these communities. Several programs have demonstrated notable accomplishments, mostly focusing on essential needs (Vaid & Evans, 2017), healthcare concerns (Askari & Gupta, 2016), and the inclusion of women in regular work assignments. In 1998, approximately 800 families residing along a section of the central tracks of the railway federation of Mumbai were among the first to participate in what was a community-driven relocation (SPARC, 2014). The rehabilitation process later extended to include slums in Delhi. Kolkata, the administrative center of West Bengal, ranks among the top 10 largest urban agglomerations globally, with approximately one-third of its inhabitants residing in slum areas (Sengupta U.,2006). The rehabilitation of a canal bank slum was carried out by the Kolkata Environmental Improvement Project, funded by the Asian Development Bank (ADB) and aided by the Government of West Bengal, Kolkata Municipal Corporation (KMC), and Kolkata Metropolitan Development Association (KMDA) (Askari & Gupta, 2016).

In Kolkata, many measures have been implemented to improve the living conditions of slum residents, either through relocation or rehabilitation initiatives. According to the West Bengal Slum Areas Improvement and Clearance Act of 1972, it is prohibited to erect any new hut or building or undertake substantial alterations to an existing one within any slum area without obtaining prior written authorization from the relevant authority. According to Bardhan et al. (2009), it is imperative to acquire the necessary authorization in the defined manner, and any construction or alteration must comply with the specific or general conditions set forth by the relevant authority.

Kolkata is home to a total of 2011 registered and 3,500 unregistered slums, which are dispersed throughout the city's 16 Boroughs and 144 wards (World Bank, 2011). The facilitation of slum rehabilitation and resettlement in India is achieved by the implementation of multiple schemes, encompassing three federal projects and two state-level programs.

The Valmiki Ambedkar Awas Yojana and the National Slum Development Programme are two nationwide projects that primarily target metropolitan areas (Narayan L., 2014). The implementation of the Valmiki Ambedkar Awaas Yojana in 2001 aimed to cater to the housing requirements of the urban underprivileged population, with a specific allocation of 20 percent dedicated to the provision of communal sanitary facilities. The slums in Kolkata and its environs mostly relied on the VAMBAY and NSDP initiatives, which were subsequently succeeded by the Basic Services for Urban Poor (BSUP) and Banglar Bari programs in 2017. In addition, the National Slum Development Programme (NSDP), which was launched in 1996, provides financial assistance for the improvement of both the physical and social infrastructure, as well as the refurbishment of slum dwellings (Buckley R.M. et.al. 2007).

The primary aim of this investigation is to compare instances of in-situ rehabilitation with ex-situ relocation of individuals residing in slums to conclude the greater efficacy of the one vis a vis the other by analyzing the impact of these interventions on the daily social life of the affected population and by identifying favorable and unfavorable outcomes.

The selection of slums for this study was based on purposive sampling, with a focus on ex-situ (relocation) and in-situ (rehabilitation) scenarios. The study only considers populations directly affected by these scenarios, making the selection process justifiable. With the help of a mixed-methods approach that utilizes both primary and secondary data sources. The collection of primary data involved the utilization of various methods, including a questionnaire survey, focused group discussion, GPS survey, and perception analysis. These methods were employed to gain insights into the quality of life and challenges experienced by individuals following the implementation of the aforementioned planning measures. On the other hand, secondary data was sourced from the KMC slum section, KMDA (slum development, housing, estate, amenities department), and Maps ESRI Digital Database. This secondary data was utilized to illustrate the current distribution of slums and potential relocation options.

A comprehensive survey has been conducted on a sample of 110 apartments out of a total of 4,672 in Nonadanga, an ex-situ slum. Additionally, separate focused group discussions were held of varying age groups irrespective of gender. For the Manohar Pukur in-situ slum, a comprehensive survey was conducted in all the 45 apartments of the slum. Focused group discussion was also carried out similarly. The study measured the livelihood index, composite index (a statistical tool that groups many different equities, securities, or

indexes to create a representation of overall market or sector performance), Qualitative methods such as group discussions and open questionnaire surveys were also used to analyze the data.

The Livelihood index is based on six variables such as literacy, living conditions, economic status, transportation and communication status, health and sanitation facilities, and disaster-related concerns. The literacy index included metrics such as the percentage of individuals with literacy skills, the percentage of individuals who have undergone vocational training, and the percentage of individuals who have dropped out of educational programs. The living condition index has been developed based on variables such as crowding, types of available housing, quality of water supply, and percentage of households equipped with in-house kitchens and LPG. The health and sanitation facilities index has been calculated based on variables such as the frequency of garbage clearance, prevalence rate of chronic diseases, frequency of general diseases, percentage of underweight children at birth, maternal age at first delivery, and medical expenses per household. An index for economic status has been developed by considering income level, the number of earning members per household, the number of dependents per household, and the percentage of households below the poverty line. Similarly, the index for transport and communication status has been measured with the help of variables such as newspapers and television. Index for disaster issues has been calculated by considering the percentage of fire hazard-prone households with an Ultimately, utilizing these parameters and sub-parameters, an average composite index was computed and utilized to rank slums based on their respective facilities.

The city of Kolkata has been selected as a study site due to its significant slum population, with nearly one-third of the city's total population residing in impoverished and dispersed slum areas. The unique characteristic of this urban settlement is its interconnectivity with high-end localities, occasionally extending to middle-class areas. For comparative analysis, two slums have been selected: Nonadanga slum as a relocation site (located at 22°31'15" N, 88°24'53" E) and Monoharpukur road slum as the rehabilitation site (located at 22.31'12" N, 88.21'22" E) as illustrated in Fig. 5.17.

The Nonadanga Slum has a total population of 5,280, with a sampled population of 264, representing 5% of the total, selected through random sampling. In comparison, the Monoharpukur Slum has a total population of 135, with a sampled population of 27, representing 20% of the total, also selected via random sampling.

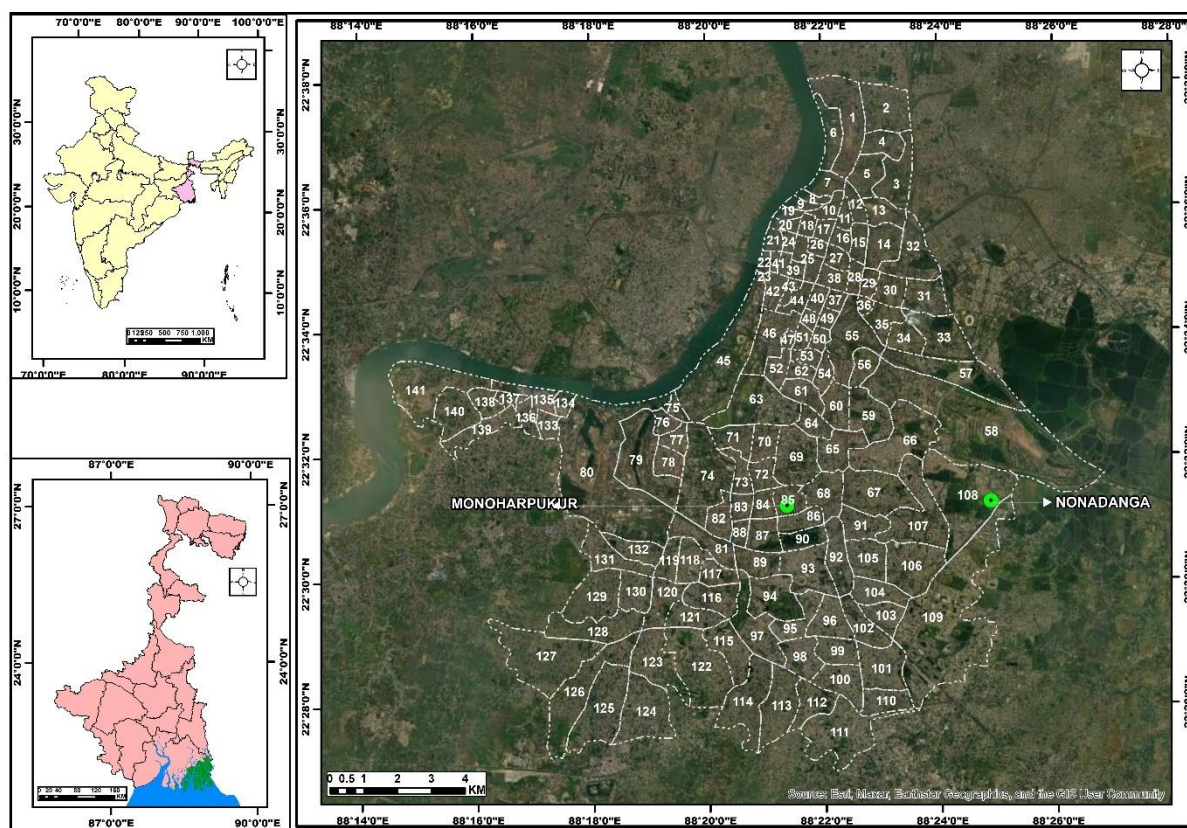


Figure 5.17: Location of the selected slums: Monoharpukur in-situ slum and Nonadanga Ex-situ Slum

Source-Prepared by Researcher

5.16 Ex-situ (Relocation) slum planning

Nonadanga slum is characterized by saline bodies of water. However, after the implementation of the land reform and acquisition legislation, the governing authorities undertook measures to manually transform the saline coverage area into a viable landmass. The KMC and KMDA initiated a plan to utilize the land for residential purposes, specifically to relocate slum dwellers. Between 2000 and 2005, the KMC and KMDA collaborated to construct 146 buildings under the Valmiki Ambedkar Awaas Yojana and the National Slum Development Program (NSDP). Each building consisted of 32 apartments, totaling 4,672 apartments being gradually established as relocated spaces. These apartments were designed to have an area of approximately 180 square feet, consisting of a single room and a bathroom. The first building to be named in the area is Ambedkar Abashan, which is considered the oldest and most impressive structure when compared to other buildings in the neighborhood. The Abashan region encompasses a total of 16 buildings, comprising 512 apartments, all of which are classified as AA or the Best Category apartments according to the Primary Survey of 2022. In addition to the B

block comprising 16 buildings and 512 apartments, subsequent constructions included the Vivekananda Abashan or C block with 10 buildings and 320 apartments, the Swarg Malancha Abashan or CA block with 14 buildings and 448 apartments, the E block with 26 buildings and 832 apartments, and the Rail colony blocks with 64 buildings and 2048 apartments.

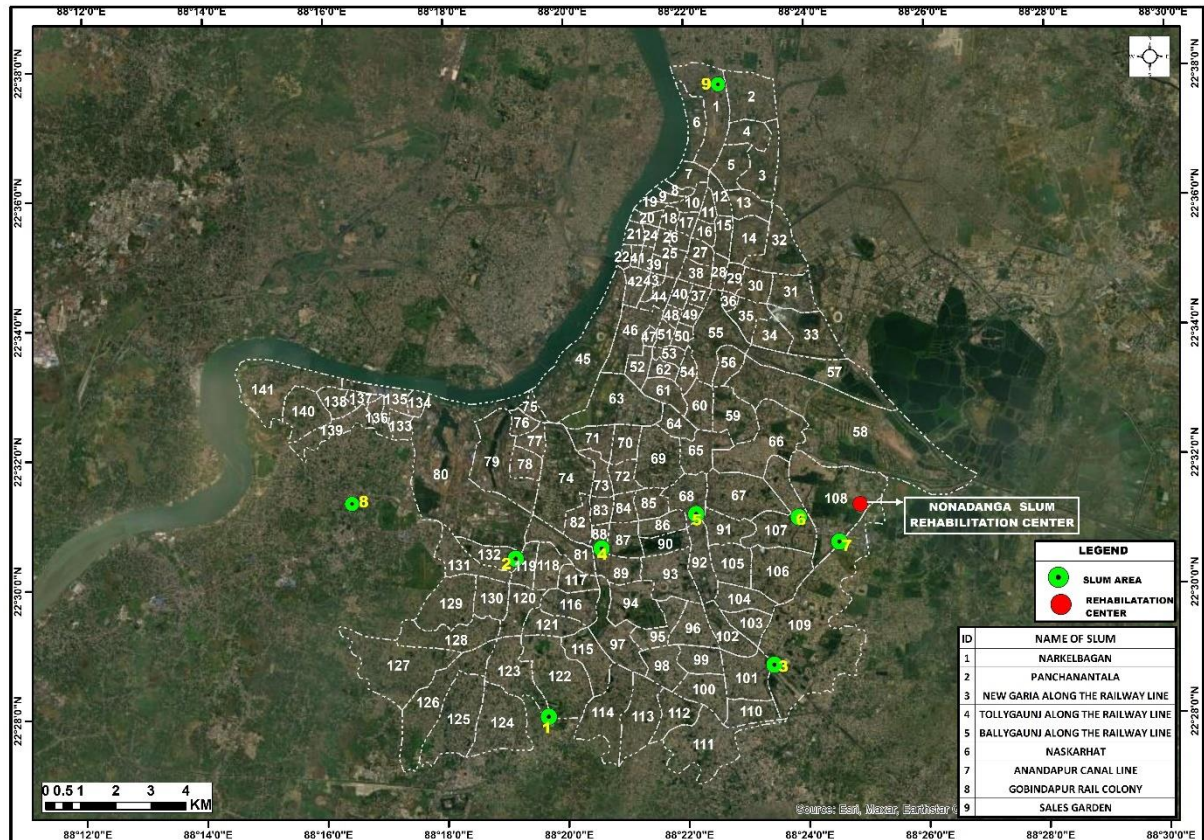


Figure 5.18: The origins of the slum dwellers in the Nonadanga slum can be traced back to various sources. of KMC and KMDA Area

Sources-Prepared by Researcher through GPS, Primary survey June 2022

The KMC area witnessed the displacement of 8368 slum dwellers, primarily due to the implementation of metro railway planning, broad zoning of roadways, and Housing projects (Banerjee-Guha 2012). The slums have been transferred from several places under the jurisdiction of KMC (Kolkata Municipal Corporation) and KMDA (Kolkata Metropolitan Development Authority) to the Nonadanga region as part of an ex-situ slum conservation effort. Table 5.13 provides information about the name and distance of the original slum source, whereas Fig number 5.18 visually represents the same information.

Table 5.13: Distance of the Nonadanga Relocated Slum from the Various Displacement Slums

Serial Number	Name of the Original Location	Distance from Nonadanga Relocation Center to source Slum location (Meters)
1.	Narkelbagan, Thakurpukur canal side (Unregistered Slum)	10548
2.	Panchanantala Bara Bagan Slum (Registered Slum)	9992
3.	New Garia along the railway line slum (Unregistered Slum)	5534
4.	Tollygunge along the railway line slum (Unregistered Slum)	8237
5.	Ballygunge along the railway line slum (Unregistered Slum)	3626
6.	Naskarhat Slum (Registered Slum)	641
7.	Anandapur Canal line slum (Unregistered Slum)	677
8.	Gobindapur Rail Colony (Registered Slum)	14696
9.	Sales Garden (Registered Slum)	12658

Source- Prepared by Using FGD, GPS, and Google Earth Pro

Consequently, the government authorities initiated the relocation of these families to the designated planned area. Between 2007 and 2010, occupants inhabited these apartments; however, legal settlement rights or land tenure have yet to be granted, with only provisional paperwork currently in place. The majority of the dwellers were drawn from slums dispersed over the city (Fig. 5.18). Following the relocation of the residents, the government designated this area as a site for the resettlement of homeless including unregistered slum dwellers from various locations in Kolkata. The area remains in a perpetual state of development to facilitate future relocation and rehabilitation planning.

The present study employs both quantitative (livelihood index method) and qualitative (perception and focused group discussion) methods to evaluate the efficacy of the relocation effort. The exclusive use of quantitative data analysis, as presented in Table 5.14, may not sufficiently validate the prosperity of slum residents in terms of their living conditions or their perception of their livelihood. Consequently, it is imperative to incorporate qualitative analysis for each selected parameter to enhance the accuracy and clarity of the justification.

The literacy situation in this relocated slum is poor. Based on the survey, it was found that around 55 percent of the slum population in the Nonadanga relocation site is literate of which 40 percent can just read and write and 15 percent of the sample population have completed their secondary education.

Table 5.14: Combined Livelihood Index for Nonadanga Slum

Slum	Avg C. I of Literacy	Avg C.I of Living condition	Avg C.I of Economic condition	Avg. C. I of Health & Sanitation	Avg C. I of Transport & Communication	Avg C. I of Disaster Issues	Combined Index
Nonadanga Slum (relocation)	3.66	1.8	3	3.67	3	2.67	2.96

Source-prepared by Researcher, primary survey, June 2022

The prevalence of high illiteracy may be attributed to a range of factors, notably economic hardship, insufficient awareness, and limited access to educational institutions. Educational institutions are located at a distance greater than 5 kilometers. Only two schools- a primary and a higher secondary school are available within a 5-kilometer distance but closed since 2017. Coupled with inadequate transportation, particularly during peak hours in the morning and evening it is the female children who are more deprived of accessing education. Consequently, residents of the slum are left with no alternative but to either commute a distance of 8-10 kilometers or seek admission to private educational institutions to access education. Both of these options impose a significant burden on the literacy status of the slum dwellers. The dropout rate is 5 percent which is considerable considering overall low enrollment. Only a meager 1.36 percent of the working population received vocational training, mostly by men in occupations like motor and electrical repairs, etc.

Planned relocation has made it possible for all the relocated households to enjoy pucca houses in a vertical settlement. With a mean crowding index per household of 6.59 the household density however is high. The size of the rooms in the buildings is 175 square feet, with independent toilets. The rooms with only a single small window per apartment are poorly ventilated. In each building tower, there exists a singular water storage facility that facilitates the distribution of water through a network of pipelines, enabling the supply of water to individual apartments. This system effectively serves an average population of 832 inhabitants. The quality of drinking water, sourced from the Science City water purification pumping station, however, is of good standard. The majority (86.23 percent) of the households use CNG gas for cooking received under the Ujjwala scheme of the government providing subsidized cooking gas for this purpose. With poor maintenance overflow of the drainage channels is frequent adding to already hazardous air quality and unsanitary conditions prevalent in the slum. Disposal of other solid waste too is infrequent. The water supply of daily life is insufficient due to the low groundwater level in the area.

The morbidity rate is high as 68.31 percent reported suffering from frequent general illnesses while 41.23 percent were affected by chronic diseases. The low prevalence of both diseases can be attributed to inadequate medical facilities, such as the absence of affordable hospitals within an 8-kilometer radius of the location. Additionally, the sole health center within approximately 1 kilometer of the site does not offer. The community is characterized by a conspicuous lack of private medical practitioners within a one-kilometer radius. Consequently, citizens are obligated to seek medical assistance from private facilities located beyond 3 kilometers, particularly in extreme emergencies. This alternative is sometimes accompanied by excessive expenses, therefore further aggravating the economic hardship experienced by the individuals involved. In conclusion, it has been previously observed that the insufficient accessibility of the transport system frequently leads to patients experiencing difficulties in reaching medical facilities within a reasonable timeframe. The causes stated above exert a direct influence on the occurrence of health problems, hence offering a justification for the ongoing decline in prevalence. The economic condition of this slum settlement is suboptimal, with an average monthly income of approximately 4500 rupees per family member. The average earning and dependency ratio per family is 1:6, and a significant proportion of the residents, specifically 86.30Percentage, possess Below Poverty Line (BPL) cards. The economic prospects in the vicinity of this settlement are considerably bleak. To procure sustenance, they must traverse a distance of no less than 10 kilometers, a mode of transportation that proves to be economically viable despite the associated expenses of public transit. However, they are compelled to endure all circumstances that may arise during their journey. The economic burden has a direct impact on the status of women and girls. The declining economic status of families has resulted in reduced educational opportunities for girls and an increase in the incidence of early marriages. Approximately 65.12 percent of the female demographic is entering into matrimony within the age range of 16 to 17, with an average maternal age of 18.36 years for the initial childbirth. The prevalence of early marriage within the slum community has resulted in significant challenges for the succeeding generation. Specifically, approximately 46.23 percent of births are characterized by low birth weight, and the infant mortality rate is notably high. The environs of the impoverished settlement exhibit a partial linkage to the metaled thoroughfare, whereas the internal pathways of the slum evince a lack of metallic surfacing and a suboptimal state. The slum area experiences prolonged periods of stagnant water due to inadequate drainage and low elevation, lasting approximately 2-3 days per week. In the event of natural disasters or heavy precipitation, this area may become submerged for a

duration of 30 to 45 days. The prevalence of congestion and cooking activities within residential dwellings has resulted in an increased likelihood of fire hazards. Over the past two years, there has been an average of one small-scale fire hazard per month. It is noteworthy that a significant proportion, approximately 97 percent, of the overall populace has been made cognizant of this peril and has taken measures to exercise prudence and undertake appropriate measures to mitigate this issue.

5.17 In-situ (rehabilitation) slum planning

Monoharpukur is an example of an in-situ rehabilitation location. In the year 2013, the local councilor and a Member of the Legislative Assembly (MLA) collaborated on a plan to enhance the visual appeal of the ward by rehabilitating the slum dwellers (Fig. 5.19) to improve their overall quality of life. This initiative was carried out in partnership with the Kolkata Municipal Corporation (KMC). Consequently, following a two-year planning phase and an additional three-year construction period, the aforementioned slums were successfully eradicated. Subsequently, in the fiscal year 2017-18, the inhabitants were relocated to rehabilitated residences consisting of pucca houses measuring approximately 165 square feet. Each dwelling unit was equipped with one room and one bathroom to accommodate the needs of each respective family. Approximately 45 households were displaced, signifying a deliberate effort to enhance the living conditions of the slum residents by relocating them to a different area. The practice being referred to is commonly known as in-situ slum conservation.

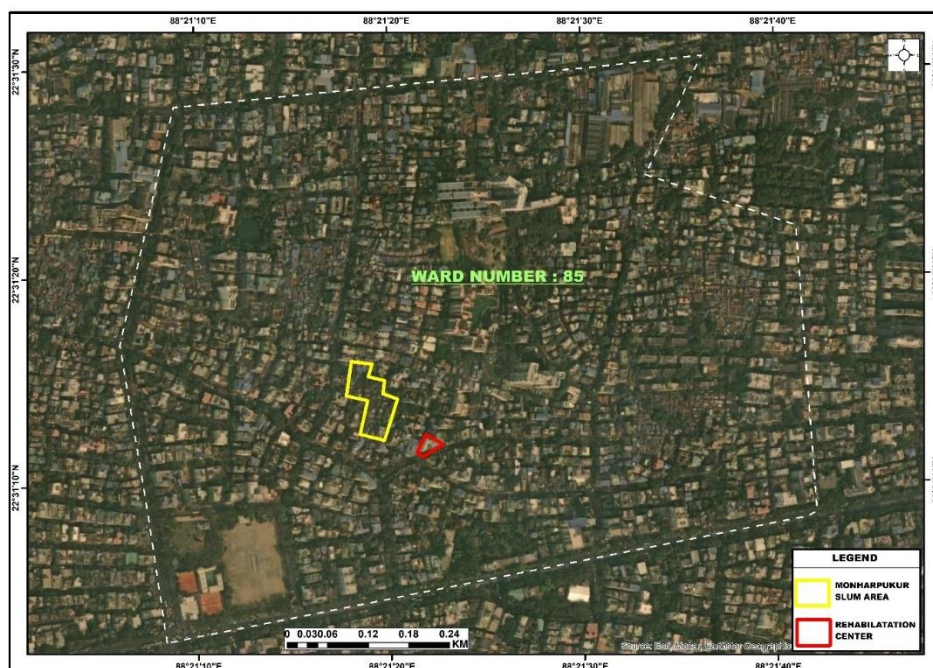


Figure-5.19: Sources of Monoharpukur in-situ slum dwellers from the KMC area

sources-Prepared by Researcher through GPS, Primary survey June 2022

In addition, to assess the efficacy of this rehabilitation Program, two methods have been employed: a quantitative approach utilizing the livelihood index method, and a qualitative approach involving perception surveys and focused group discussions, similar to the previous evaluation.

Table 5.15: Combined Livelihood Index for Monoharpukur Road Slum

Slum	Avg C. I of Literacy	Avg C.I of Living condition.	Avg C.I of Economic condition.	Avg. C. I of Health & Nutrition	Avg C. I of Transport & Communication	Avg C. I of Disaster Issues	Combined Index
Monoharpukur Road Bustee (Rehabilitation)	2	1.4	2.75	1.83	1	1	1.663

Source-prepared by Researcher, primary survey, June 2022

Monoharpukur slum is a slum that has undergone a process of rehabilitation, wherein the residents of the slum are relocated within the same vicinity. This relocation involves the removal of the impoverished slum settlement and the provision of improved housing facilities, to enhance the overall quality of life for the slum dwellers. The foundational principles of the rehabilitation program remained unchanged, albeit presented in a condensed manner. Consequently, the individuals' means of subsistence were not disrupted, as they were able to remain within the same vicinity. The in-situ conversion of slums has yielded superior outcomes in terms of both quality and quantity, as evidenced by the data presented in Table 5.15 when compared to ex-situ relocation.

The slum exhibits a literacy rate of 86.23 Percentage. Among its inhabitants, approximately 56 percent have completed secondary education, while 23 Percent have received primary education. A mere 7.23 percent of the population possesses the ability to sign their names, while 13.77 Percent remain entirely illiterate. The condition of literacy in this area has improved due to increased accessibility and proximity of educational institutions to the slum. Within a radius of 1 kilometer from the slum, there are three primary schools and four higher secondary schools accessible to its residents. The dropout rate of 9.31 percent is relatively elevated, considering the high enrolment ratio. The provision of governmental assistance for education and vocational training is commendable, as it allows 6.21 percent of the illiterate population to receive vocational training through governmental support. The crowding index of 4.12 per room provides insight into the population density and reproductive patterns within the given region. The majority of male individuals within the family are employed in manual labor positions

such as construction workers, drivers, bus conductors, and cleaners. Conversely, female members tend to work as domestic helpers in nearby neighborhoods. The average monthly income for the family amounts to 8500 rupees. In a majority of instances, there is observable parity in the involvement of both males and females in economic endeavors. However, individuals belonging to the younger and older age groups within the family tend to rely on others for financial support. The economic dependency ratio within this particular slum is estimated to be 2:3, indicating that for every two individuals who are economically active, three individuals are dependent on them. Furthermore, it is noteworthy that approximately 96. The rehabilitated apartments have an approximate area of 156 square feet and comprise a single room with an attached bathroom. To access potable water, individuals utilize tap water sourced from the immediate vicinity of the building, with a total of five drinking water sources available within a 50-meter radius. Additionally, for everyday needs, individuals can readily obtain government-supplied pumped water. Approximately 98.14 percent of the overall population utilizes the kitchen facilities within their residences for cooking, while 91.21 percent of the populace relies on liquefied petroleum gas (LPG) as their chosen method of cooking. The healthcare provisions for the residents are commendable, as they have convenient access to government hospitals and health centers located within a one-kilometer radius. Furthermore, these healthcare facilities are adequately equipped to meet the needs of the population. The incidence of common illnesses among the population is observed every month for the majority of residents. However, a significant proportion, specifically 69.23 percent, effectively manage these ailments due to the favorable accessibility of healthcare facilities and the convenient availability of transportation options. The improvement in female literacy rates has increased in the age at which women get married. Additionally, the average age at which women have their first child has also risen to 22.14 years. As a consequence, the percentage of underweight children at birth is relatively low, standing at 16.23 percent. The average monthly medical expenses for the common ailment amount to approximately 200-250 rupees. The municipal facilities exhibit a high level of effectiveness, as they consistently engage in the daily removal of waste and maintenance of drainage systems. The transportation infrastructure in the vicinity exhibits a high degree of connectivity, facilitated by both private and governmental modes of transportation. The road network surrounding the slum is characterized by well-constructed and fully paved surfaces. Approximately 75 percent of the overall population residing in slums possess the ability to avail themselves of television and newspapers as viable sources of information, thereby establishing a significant level of connectivity with the external world.

Waterlogging activities are infrequent in these areas due to favorable drainage conditions, governmental support, and a high level of awareness regarding fire hazards and other related issues.

5.18 Comparative Analysis of the Composite Index for both the Rehabilitated and Relocated slum

In this study, a Combined Index (Table 5.16) has been constructed to assess the ranking of slums and compare their facilities. Through qualitative and quantitative socio-economic analysis, it is evident that Monoharpukur Road Bustee, as a slum relocation and rehabilitation site, exhibits greater inclusivity and a higher provision of facilities compared to Nonadanga slum relocation colony, which demonstrates fewer facilities and less inclusivity as an ex-situ slum conservation area. The causes and prospects underlying these disparities are further discussed below to provide a comprehensive justification for the aforementioned Index.

Table 5.16: Cumulative Analysis of the selected amenities of the slums, Ranking of the slum

Name of the Slum	Borough Number	Ward Number	Description	Combined Index	Ranking	Status
Nonadanga slum relocation colony	12	108	Relocation and combination of various Slum	2.96	2	Less Facilitated
Monoharpukur road Bustee	8	85	Rehabilitation of slum on the same premises.	1.663	1	Well Facilitated

Source-prepared by Researcher, primary survey, June 2022

5.19 SWOC Analysis for both the Rehabilitated and Relocated Slum

To assess the inclusivity of slum facilities, a SWOT/SWOC analysis was conducted in both slums to determine the potential influence of ethnic status on the situation. The aforementioned relocation and rehabilitation of both slums are outcomes of governmental planning, albeit employing distinct approaches. Certain individuals exhibit greater proficiency in planning, while others may display more pronounced limitations in this regard. Hence, in this particular scenario, a SWOT/SWOC analysis has been conducted to examine the strengths, weaknesses, opportunities, and threats to propose an improved course of action, be it relocation or rehabilitation (Table 5.17 & 5.18)

Table 5.17: SWOT /SWOC analysis: Nonadanga slum relocation colony

S (Strength)	W (weakness)
<p>I. pucca household which is safer during climatic hazards.</p> <p>II. shifting the population to vertical households has saved unwanted forceful illegal occupation of horizontal land</p> <p>III. Common toilets replaced by individual toilets reduce the spreading of diseases.</p> <p>IV. After relocation as they are compact planning for water sources, sanitation, and other amenities is quite easy for the planner.</p>	<p>I. Travel modes are insufficient particularly during morning and evening so the use of private means is an extreme burden for them.</p> <p>II. Water scarcity due to the non-availability of filtered water and the presence of canals causes contamination of underground water which they use</p> <p>III. No underground drainage is available and shallow open drainage leads to flooding of the area</p> <p>IV. Livelihood opportunities are scarce in this new settlement which is far from the usual economic areas. No self-help group, female co-operatives, or male working possibilities have been made government yet.</p>
O (Opportunity)	T/C (Threat/Challenges)
<p>I. This settlement is a planned model with proper infrastructure and livelihood opportunities that can be a model slum.</p> <p>II. Land available for schools and Hospitals to be built here</p>	<p>I. Forceful acquisition of apartments by political sources is restricting many of the urban poor from relocating further and controlling the social atmosphere of the dwellers.</p> <p>II. No maintenance of apartments and poor building materials are leading this settlement into a disaster for further time.</p> <p>III. Environmental modification through wetland conversion (after the Ramseyer Act of 1960) may lead to instability in this area and its surroundings in the future.</p>

Source-Prepared by Researcher

Table 5.18: SWOT /SWOC analysis: Monoharpukur Road bustee

S (Strength)	W (weakness)
<p>I. As horizontal settlement has converted to vertical settlement; therefore, the left-over vast area could be used for further amenities for the urban poor</p> <p>II. Replacement of common toilets with individual toilets has reduced the spread of diseases</p> <p>III. The location of this slum is the main strength for more inclusion as it is situated in a well-developed societal area and the middle of the city.</p>	<p>I. As these people are culturally backward than the rest of the region a constant social distance and discrimination are always faced by them.</p>
O (Opportunity)	T/C (Threat/Challenges)
<p>I. This settlement is a planned model with the planned basic amenities. The vertical development has made available space that can be used as recreation for the slum dwellers or economic activities</p>	<p>I. The Main challenge is the upkeep and maintenance of the apartments which will be a challenge for the Municipal Corporation</p>

Source-Prepared by Researcher

5.20 Findings

This research posits that the preservation of slums holds significant importance in fostering regional and balanced development, as they serve as crucial reservoirs of affordable labor and manpower within urban areas. The approach to slum conservation and upgradation can vary depending on the location. The findings of the study indicate that ex-situ slum locations exhibit a relatively high comparative combined index, whereas in-situ slum locations demonstrate a comparatively low index. Hence, it can be inferred that, in most instances, in-situ conservation proves to be more comprehensive and advantageous for the inhabitants of slums when compared to ex-situ conservation. Based on the comprehensive study, it can be concluded that in-situ slum conservation is more inclusive compared to ex-situ conservation. This is due to the greater availability of development facilities and planning, as well as the fact that in-situ conservation allows slums to remain close to their original location. As a result, job opportunities and surrounding amenities remain highly accessible, which is not the case for ex-situ slum conservation.

References

- Askari, M. H., & Gupta, K. (2016). Changes in socioeconomic and health condition of rehabilitated slum dwellers in Kolkata, West Bengal. *International Journal of Human Capital in Urban Management*, 1(2), 117–122.
- Banerjee-Guha, S. (2012). Nonadanga eviction: Questioning the right to the city. *Economic and Political Weekly*, 47(17), 13–15. <http://www.jstor.org/stable/23214816>
- Research and Social Science*, 49, 53–67. <https://doi.org/10.1016/j.erss.2018.10.020>
- Resilient and Sustainable Cities*, 245–264.
- Bardhan, R., Sarkar, S., Jana, A., & Velaga, N. R. (2015). Mumbai slums since independence: Evaluating the policy outcomes. *Habitat International*, 50, 1-11. Received 8 May 2015, Revised 24 June 2015, Accepted 16 July 2015, Available online 24 July 2015, Version of Record 24 July 2015. <https://doi.org/10.1016/j.habitatint.2015.07.009>
- Buckley, R. M., Singh, M., & Kalarickal, J. (2005). Strategizing slum improvement in India: A method to monitor and refocus slum development programs. *Land and Urban Policies for Poverty Reduction*, pp 351. Volume 1 EDITED BY Mila Freire, Ricardo Lima, Dean Cira, Bruce Ferguson, The World Bank, Brasflia, 2007, Christine Kessides, Jose Aroudo Mota, Diana Motta
- https://scholar.google.com/scholar?hl=en&as_sdt=2007&q=Buckley%2C+R.+M.%2C+Singh%2C+M.%2C+%26+Kalarickal%2C+J.+%282005%29.+Strategizing+slum+improvement+in+India%3A+A+method+to+monitor+and+refocus+slum+development+programs.+Land+and+Urban+Policies+for+Poverty+Reduction%2C+351.&btnG=
- Chalana, M., & Rishi, S. (2015). Twilight in Delhi: The failure of slum rehabilitation programs in creating a healthier city. *Transforming Distressed Global Communities: Making Inclusive, Safe, Resilient and Sustainable Cities*, ISBN- 9781472410641 Vol-I, pp 245–264. <https://www.google.co.in/search?tbm=bks&hl=en&q=ChalanaPercentage2C+M.Percentage2C+Percentage26+RishiPercentage2C+S.+Percentage282015Percentage29.+Twilight+in+DelhiPercentage3A+The+failure+of+slum+rehabilitation+programs+in+creating+a+healthier+city.+Transforming+Distressed+Global+CommunitiesPercentage3A+Making+InclusivePercentage2C+SafePercentage2C+Resilient+and+Sustainable+CitiesPercentage2C+245PercentageE2Percentage80Percentage93264.>
- Dasgupta, B. (1973). Naxalite armed struggles and the annihilation campaign in rural areas. *Economic and Political Weekly* Vol. 8, No. 4/6, Annual Number (Feb. 1973), PP- 173–188, ISSN- 4362290. <https://www.jstor.org/stable/4362290>

- Jagdale, R. H. (2014). An overview of slum rehabilitation schemes in Mumbai, India. The Report Committee for Rohit H. Jagdale, The University of Texas at Austin, 2014, pp 32-36.
<http://hdl.handle.net/2152/26620>
- Kolkata Municipal Corporation. (2021-22). Ward Office Data Collection Centre KMC, Slum Department.
- Kundu N. (2003). Exclusionary urbanization in Asia: A macro-overview. *Economic and Political Weekly*, 48-58. Vol. 44, No. 48 (NOVEMBER 28-DECEMBER 4, 2009), pp. 48-58 (11 pages) <https://www.jstor.org/stable/25663837>
- Narayan, L. (2014). Slum free cities: Strategies and solutions. *International Journal of Research*, 1(7), 577-588. Report of Delhi Urban Shelter Improvement Board, Government of NCT Delhi, Raja Garden New Delhi, No- D- 232/DD (Reh.) HQ/2016, Dated- 14.06.2016
- Sanyal T (2018) The Chawls and Slums of Mumbai: Story of Urban Sprawl.
https://deepblue.lib.umich.edu/bitstream/handle/2027.42/143823/A_12Percentage20ThePercentage20ChawlsPercentage20andPercentage20SlumsPercentage20ofPercentage20Mumbai.pdf, retrieved on 2.08.2023
- Sengupta, U. (2006). Inclusive Development? A State-Led Land Development Model in New Town, Kolkata. *SAGE: Environment and Planning C: Government and Policy*, January 1, 2013 Volume Number-31, Issue Number-2, Page-357–376.
<https://doi.org/10.1068/c1103>
- Sheth, A.Z., Velaga, N.R. and Price, A.D.F., 2009. Slum rehabilitation in the context of urban sustainability: a case study of Mumbai, India. In: *Proceedings of SUE-MoT: 2nd International Conference on Whole Life Urban Sustainability and its Assessment*, 22-24th April, Loughborough, UK. <https://dspace.lboro.ac.uk/2134/5818>
- SPARC Report, Copyright 2014 The Society for the Promotion of Area Resource Centers, 2nd Floor, Lodge, Dr BR Ambedkar Road, Dadar East, Mumbai 400014
- Sunikka-Blank, M., Bardhan, R., & Haque, A. N. (2009). Gender, domestic energy, and design of inclusive low-income habitats: A case of slum rehabilitation housing in Mumbai, India. *Energy India. Environment and Behavior*, 49(7), 771–790.
<https://doi.org/10.1177/0013916516667975>
- Kolkata Municipal Corporation. (2021-22). Household amenities Parameters and Civic Statues, Slum Department, KMC.

- Tracada, E. (2015). *Smart Economy in Smart Cities*, Springer: Advances in 21st Century Human Settlements, Singapore, Edition, 1 (pp. 323–328). <https://doi.org/10.1007/978-981-10-1610-3>, ISBN: 978-981-10-1610-3.
[https://www.researchgate.net/post/what is the Idea of inclusive cities and how it is related to the smart cities Any references or examples/5551bfff5dbbbd2c288b466d/citation/download.-*](https://www.researchgate.net/post/what_is_the_Idea_of_inclusive_cities_and_how_it_is_related_to_the_smart_cities_Any_references_or_examples/5551bfff5dbbbd2c288b466d/citation/download.-*)
- Tsenkova, S., & French, M. (2011). Affordable land and housing in Europe and North America. *United Nations Human Settlements Programme. Volume 9 (3)*. ISSN- 17535069, 17535077 (e) . PP- 322-326, <https://doi.org/10.1080/17535069.2016.1240514>
- Vaid, U., & Evans, G. W. (2017). Housing quality and health: An evaluation of slum rehabilitation in World Bank (2011): India's vulnerability of the Kolkata metropolitan area to increased precipitation in a changing climate. Report No. 53282-IN, p. 10.
- World Development Report 2011: Conflict, Security, and Development.
<https://doi.org/10.1596/978-0-8213-8828-0>,
<https://openknowledge.worldbank.org/entities/publication/25f2300c-f9d4-54de-8a56-30566e72003a>

Chapter 6: Religion as a Basis for Inclusiveness in the Slums

For this chapter, two slums have been selected based on their religious composition. In Kolkata, there are two prominent religious sects based on their population composition. Two slums are selected, one predominantly Hindu and the other predominantly Muslim. A study was conducted to determine the level of inclusivity between two slums about different religious communities. The findings were based on measurements and observations.

6.1 Introduction

The promotion of inclusion is of great significance in society, requiring collaborative endeavors to create fair and diverse settings in all aspects of life. The statement does not suggest a requirement for possessing all knowledge but rather emphasizes the importance of gaining an understanding of the notion of inclusion as an essential starting point. Inclusion pertains to the cultural context in which individuals from various backgrounds can effectively participate in their professional endeavors, feeling comfortable and confident in expressing their true identities and operating in a manner that is consistent with their personal preferences, all the while successfully fulfilling the requirements of the organization or service. The adoption of inclusive practices ensures that every individual is afforded a sense of dignity and, importantly, contributes to the overall value. Exclusion can be defined as a deliberate action aimed at impeding or limiting the involvement of an individual or group in various activities, denying them enough attention, or excluding them from a specific framework of inclusiveness. Exclusion is a frequently seen concept that refers to the intentional denial of advantages, resources, and opportunities that are generally accessible to individuals belonging to diverse social groupings. The origins of the term can be traced back to its Latin origin, more especially to the verb "excludere," which denotes the act of closing or shutting (Danner H.G., 2014). Exclusionary practices are evident in various sectors, encompassing housing and social interactions, among others. The phenomenon of persons facing exclusion from communities and institutions can be attributed to the presence of varying religious beliefs. The presence of biases or preconceived beliefs can be attributed to the manifestation of this phenomenon, resulting in discriminatory practices and widespread violations of human rights.

The issue of religious exclusivism is a growing and intricate challenge for individuals who align themselves with religious beliefs and seek to foster harmonious and fair cohabitation with followers of various religious customs (Pratt D., 2007). The phenomenon of urbanization is undergoing significant expansion daily, serving as the primary catalyst propelling the city toward global expansion. India is a prominent component of a broader entity and is largely acknowledged for its notable social and religious heterogeneity. This component does not preclude the existence of Kolkata, a significant and functioning region in West Bengal, India. The rise in population density inside metropolitan regions necessitates a concomitant demand for the regeneration of slum neighborhoods. The first observation of social cohesion within the slum was followed by a subsequent decrease over a certain duration. The objective of this chapter is to examine the influence of religion as a component of social segregation and its capacity to either facilitate or impede social

inclusiveness. Kolkata Municipal Corporation (KMC) is distinguished by its heterogeneous population, comprising both indigenous inhabitants and individuals who have migrated to the locality. These individuals relocate to the region for several motives, such as pursuing job prospects or using existing services. It is crucial to acknowledge that migratory reasons are not contingent upon religious beliefs. The examination of data derived from the Kolkata City Population Report 2022, encompassing the timeframe spanning from 2011 to 2022, indicates that the religious makeup of the KMC region is predominantly Hindu, constituting around 76.51 percent of the total populace. In the specified geographical region, there is an observed state of peaceful cohabitation among various religious practices, including Islam, Christianity, Jainism, Sikhism, and Buddhism, with respective proportions of 20.60 percent, 0.88 percent, 0.47 percent, 0.31 percent, and 0.31 percent (Chatterjee et al.,2022). Each religion has its own unique culture, structure, and orientation, resulting in the formation of discrete enclaves for each religious community. The incorporation of a religious group's framework within the Ghetto of another presents significant problems, hence making it a multifaceted undertaking. Nevertheless, the urban settlement pattern witnessed in Kolkata has permitted the cohabitation of several religious sects, albeit with necessary adaptations. A study was done to investigate the problems, benefits, infrastructure, and provisions encountered by the Hindu and Muslim communities (Two major religious communities of West Bengal) in the KMC region. This chapter utilized two representative samples from these populations. The objective of this analysis is to examine the spatial coexistence dynamics among the entities being studied and assess the possibility of mutual inclusion and integration. The main aim of this study is to perform an analysis of two distinct settlements, namely Smith Hoe Lane Bustee and Ata Bag Bustee. The Smith Hoe Lane Bustee is characterized by its mostly Muslim demographic composition, whereas the surrounding geographical area is primarily occupied by a Hindu slum community, as reported in the KMC Slum Development Report of 2022. In contrast, the case of Ata Bag exemplifies a Hindu settlement that is spatially included by neighboring Muslim settlements (KMC Slum Development Report, 2022).

This chapter has been bifurcated into two distinct objectives. The term "specific objective" pertains to a precisely delineated and concentrated aim that is intended to be accomplished within a specified period. a) Elaborate objectives are precise and quantifiable results that contribute to the attainment of the overarching goal. These objectives offer a more detailed and inclusive comprehension of the necessary steps and actions needed to achieve the particular objective. b) The main objective of this research is to assess the degree of inclusiveness in two urban areas with distinct religious majorities, situated in slum settings,

in contrast to a nearby area predominantly influenced by a different religious tradition, across multiple social dimensions.

To support this objective, other sub-objectives are considered. This chapter examines the discrepancies in food accessibility across various religious communities and assesses the presence of religious hegemony within this specific context. The objective of this chapter is to assess the level of religious tolerance exhibited by a specific religious community that coexists with predominant religions in its local vicinity. It also aims to examine the level of security and control experienced by women within a specific religious context that is situated near a more dominant religious group, as well as to assess the availability of educational opportunities in diverse surroundings.

The study was carried out employing a particular research methodology. The selection of slums was initially conducted through the implementation of a stratified sampling technique. The process entailed the stratification of slum areas in Kolkata, taking into account the predominant religious affiliations of the residents, specifically those following the Muslim and Hindu faiths. By a methodical methodology, purposive sampling was employed to deliberately select the aforementioned two slums for investigation. The slum area known as Smith Hoe Lane, which has a majority Muslim population, has been demarcated from the neighboring slum area predominantly inhabited by Hindus, primarily due to its significantly higher population density. In contrast, the slum area known as Ata Bag, which is predominantly inhabited by Hindus, has been delineated from the adjacent slum area with a Muslim majority, primarily based on the density of its population. The justification for selecting these two slums has been illustrated by employing cartographic techniques, such as utilizing a buffer zoning map to ascertain their geographical placement, as well as statistical methods, including nearest Neighborhood analysis and Z score. Furthermore, to undertake a thorough examination of inclusivity, it is imperative to delve further into the topic. The utilization of various research methods, including the Likert scale, questionnaire survey, interview method, and focused group discussion, has resulted in the development of separate indices that correspond to a wide range of domains. These domains include but are not limited to food and accessibility, economies, cultural and religious tolerance, literacy, and concerns connected to female security.

A composite index has been developed by combining the aforementioned parameters to comprehensively rank the chosen slums. Various proposed measures have been suggested to augment the inclusivity of the marginalized slum. This study elucidates the substantial social challenges inherent in both slums, necessitating individuals to adapt as the sole

feasible approach to navigate their daily existence. Notwithstanding the aforementioned challenges, the adoption of a proficient planning methodology holds promise in mitigating certain apprehensions. The culmination of the planning process to attain inclusivity and sustainability in slum areas holds promise for yielding substantial benefits for the future well-being of individuals residing in these communities.

6.2 Study Area

The subsequent section provides an overview of the geographical and sociodemographic attributes of the aforementioned slums (Fig. 6.1). The Ata Bag slum is located at geographical coordinates 22°54'65" N and 88°29'15" E within Borough 15 and Ward 134. The specified region is delineated by Taratala Road in the northern direction, Battikal Second Lane in the western direction, A Fizer Lane in the southern direction, and Meher Manzil Road in the eastern direction. The Bustee community, which is predominantly Hindu, is geographically encompassed by Muslim socio-cultural activities and residential areas. In this specific geographic area, it has been observed that the mean area per individual within the premises is 41.5 sq. meters, whereas the mean area per household within the premises is 52.34 sq. meters. Furthermore, it has been determined that the average number of individuals per household is 4.76 sq. meters. The overall spatial extent of this urban settlement characterized by substandard living conditions is estimated to be approximately 26,016.50 square meters. The demographic composition of the inhabited territory comprises 769 males, 785 females, and 812 individuals classified as children, resulting in a total population of 2366 persons. This particular slum is a geographically delineated settlement situated in ward number 134, exhibiting a demographic composition that is predominantly Muslim or a combination of Hindu and Muslim residents. In contrast, the Ata bag slum is notable for its unique concentration of Hindu residents, distinct cultural practices, and predominant use of the Bengali language (KMC Slum Development Report, 2022). The geographical coordinates of the Smith Hoe Lane slum are situated at 22°33'40.7" N and 88°21'12.09" E within Borough No 6, Ward no 53. The geographical boundaries of this slum settlement consist of Haji Mohammad Mohsin Square Road to the south, Rafi Ahmed Kidwai Road to the west, S N Banerjee Road to the north, and Taltala Lane to the east. The Bustee community, predominantly Muslim, is geographically encompassed by Hindu socio-cultural activities and residential areas. In this specific geographic area, it has been observed that the average number of individuals per family is 5.92 sq. meter, the average area occupied by residents per dwelling is 18.09 sq. meter, and the average area occupied by residents per family is 122.39 sq. meter. The approximate total area of the Bustee is 2,584.00 square meters. The demographic composition of the

inhabited territory comprises 370 males, 173 females, and 90 individuals who are classified as children, resulting in a total population of 633. This particular slum is a geographically delineated settlement situated in ward number 53, exhibiting a demographic composition that is predominantly Hindu or a blend of Hindu and Muslim residents. In contrast, the Smith Hoe Lane slum is distinctive due to its notable concentration of Muslim residents, the prevalence of Islamic cultural practices, and the predominant usage of the Hindi language (KMC Slum Development Report,2022).

The sample size for the study is determined by selecting 10% of the total population through random sampling. Specifically, for Ata Bag Slum, with a total population of 2,366, the sampled population is 236, and for Smith Lane Slum, with a total population of 633, the sampled population is 64.

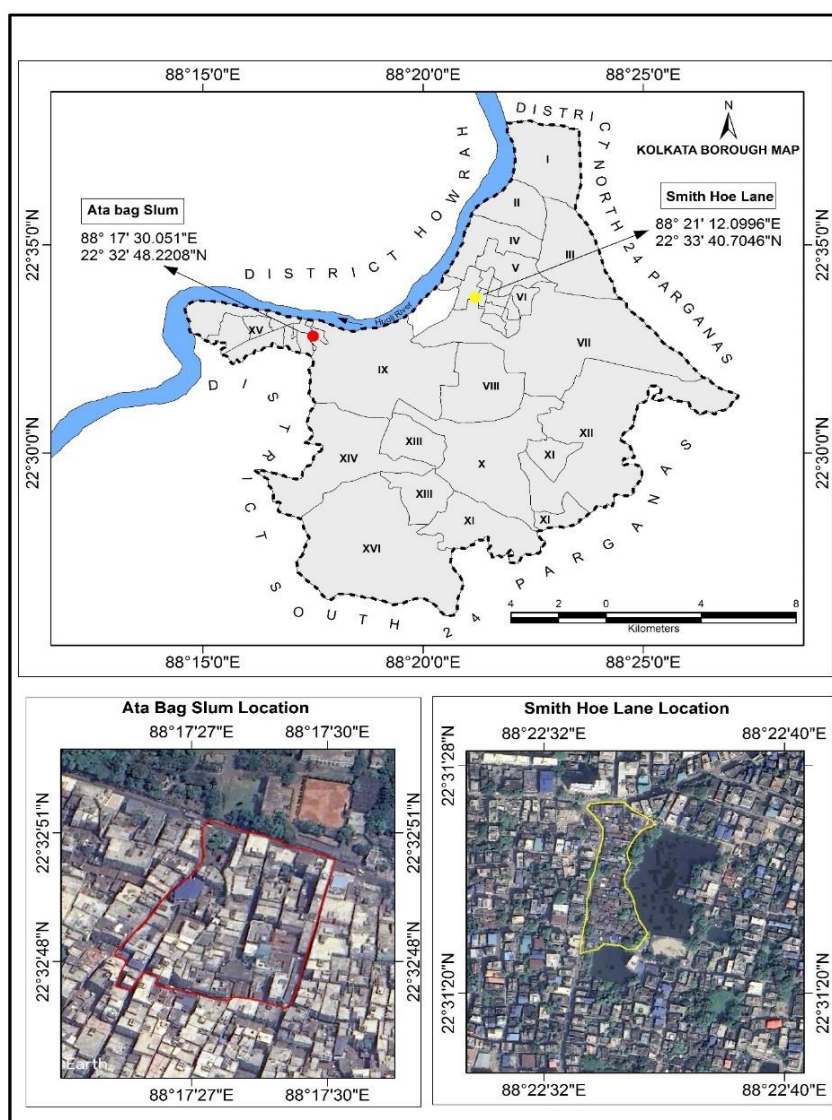


Figure 6.1: Location of the Selected Slums

Sources- Prepared by Researcher

6.3 Reasons and Method of the choice of the Slums

Ata Bag is a Hindu residential area exhibiting the characteristics of a slum, primarily inhabited by a Muslim community. Its geographical boundaries are predominantly adjacent to other slums and areas predominantly occupied by affluent individuals belonging to the Muslim faith. However, the administration is primarily influenced by individuals who adhere to the Hindu faith. The research findings suggest that there are various types of slums in the specific borough and ward, including those predominantly inhabited by Hindus, Muslims, and individuals practicing both religions, as well as slums where one religious group dominates over the other. The slums have been depicted in the accompanying table (Tables 6.1 and 6.2) and Fig 6.2 utilizing distinct numbers to represent their respective religious compositions.

Table 6.1: Ward Wise Religion Based Slum Details of Brough Number 15

Borough Number	Ward Number	Number of Bustee	Hindu Dominated Population*	Muslims Dominated Population **	Others Dominated Population ***	Total Population
15	133	6	14259	9979	0	24238
	134	19	9795	25438	0	35233
	135	11	2300	30094	0	32394
	136	5	0	18447	0	18447
	137	6	0	23619	0	23619
	138	16	475	16164	0	16639
	139	17	843	19258	0	20101
	140	5	2126	4676	0	6802
	141	6	3255	11641	0	14896

Source- Kolkata Municipal Corporation, Slum Development Report, May 2022

Table 6.2: Religion-based slum population of Ward 134, Borough 15.

Borough Number	Ward Number	Name of Bustee	Hindu Dominated Population*	Muslims Dominated Population **	Other Dominated Population ***	Total Population
15	134	Banerjee bagan	0	2652	0	2652
		Fatehpur	54	965	0	1019
		Paharpur	56	1849	0	1905
		Hari babu	0	4034	0	4034
		Azar mollah	1344	29	0	1373
		Fatehpur village	3786	1109	0	4895
		Mathar para	0	1451	0	1451
		Masjid Talab	77	1335	0	1412
		Mangra talab	0	728	0	728
		kumar para	100	691	0	791
		Alif nagar	83	1763	0	1846
		Meher manzil	79	1803	0	1882
		Sahi astable	1023	3573	0	4596
		Ata bag	2366	0	0	2366
		Batti kal	253	0	0	253
		Dhan Kheti	51	1216	0	1267
		Bangla Bustee	348	0	0	348
		Kharai patty	0	2240	0	2240
Matches Khal	175	0	0	175		

Source- Kolkata Municipal Corporation, Slum Development Report May 2022

Reference for Tables Number 6.1 and 6.2

*Hindu Slum means where 98 percent population of that slum is Hindu religion.

** Muslim Slum means where 98 percent population of that slum is Muslim religion-based

*** Others or Bi- Religion Slum means where the Ratio of Hindu Muslims is 48-52percent.

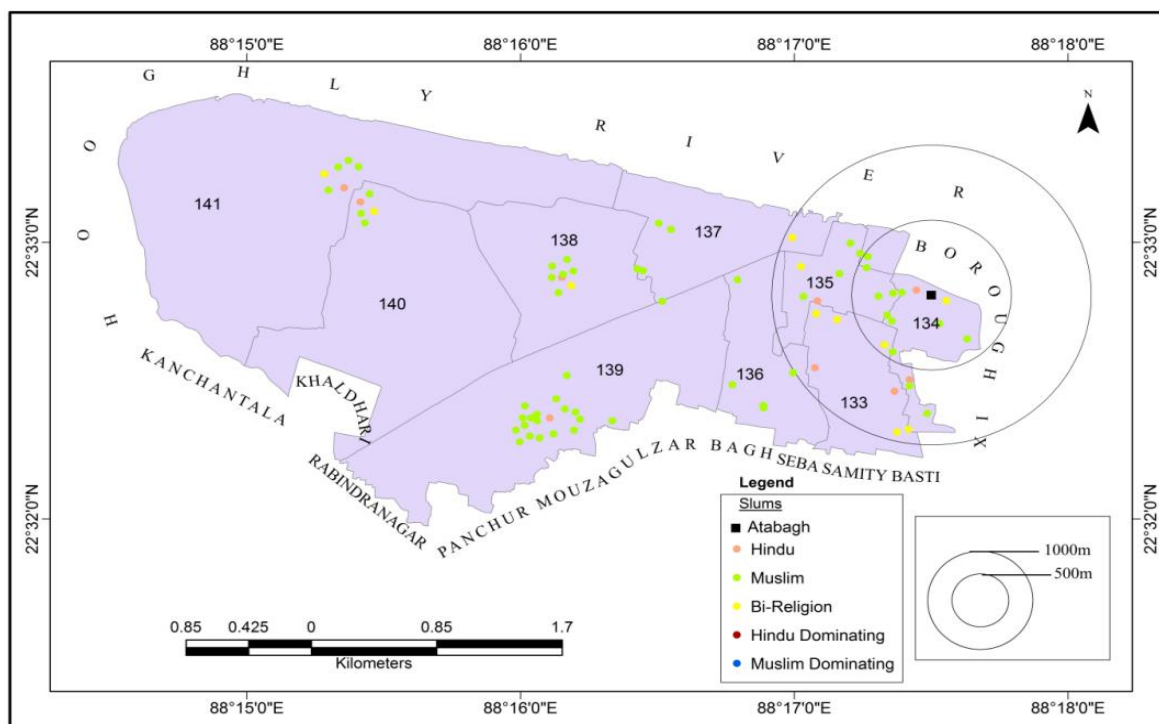


Figure 6.2: Buffer Zoning Map for Ata Bag Slum (Hindu Populated Bustee) Borough 15, Ward 134 Surrounded by the Muslim Population

Source- Prepared by Researcher

Reference for Figure Number 6.2

- Hindu Slums—98 percent of Hindus live in slums.*
- Muslim Slums—Over 98 percent of Muslims live in slums.*
- Bi-Religion-Slums are 48-52 percent Hindu-Muslim.*
- Hindu-dominated slums have over 75 percent Hindus.*
- Muslim-Dominated Slums Have over 75 percent Muslims*

Fig. 6.2 illustrates the structural makeup of these urban settlements located within the specified Borough 15 is nine distinct wards, each distinguished by a numerical designation ranging from 133 to 141. In addition, the Borough contains a total of Ninety-one slum areas within its jurisdiction. Ward 133 encompasses six discrete residential regions distinguished by socio-religious demographics (Table 6.1). Among the aforementioned regions, it is worth noting that one is primarily inhabited by individuals who identify themselves as Muslim, while two are predominantly populated by individuals who identify themselves as Hindu. Additionally, three of these regions display a diverse demographic composition, with residents adhering to both Hinduism and Islam. Ward 134 (Table 6.2) encompasses a collective of nineteen slums, of which five are primarily inhabited by individuals practicing Hinduism, one is predominantly Hindu-dominated, one is predominantly Muslim-dominated, and the remaining twelve are predominantly populated

by individuals practicing Islam. In summary, the KMC list of 2022 has recorded the inclusion of nine additional bustees, commonly known as slums, after the year 2000. The recent identification of these bustees was carried out using population composition as a determining factor. Out of the nine bustees being examined, five are characterized by a diverse religious composition, while the remaining four are predominantly identified as Muslim. Moreover, upon conducting a population assessment from Tables 6.1 & 6.2 it is evident that the borough under consideration comprises a Hindu slum population of 66,106 individuals, while the Muslim slum population totals 312,965 individuals. In terms of the overall distribution of slum residents, it is observed that the Hindu population accounts for 21.12 percent of the total, while the Muslim population comprises 78.88 percent (Kolkata Municipal Corporation, 2022). The justification for selecting Ata Bag Bustee is based on its substantial population proportion relative to other Hindu bustees in the borough. This is supported by the KMC slum list of 2022, which reports a figure of 2366 individuals residing in Ata Bag Bustee. Moreover, it is crucial to acknowledge the lack of a Muslim community in this specific region. The investigation of the sample's randomness and inclusiveness involved the utilization of several methods. These methods encompassed examining the presence of bi-religion bustees, Muslim bustees, and other Hindu bustees, alongside implementing a neighborhood proximity index.

Fig. 6.3 illustrates the interconnection between the Ata Bag slum and other Hindu slums. This borough comprises nine Hindu slums, excluding the Ata Bag bustee. The slums in question are Ram Jhupri, which had a Hindu population of 1913 and 151 individuals practicing other religions, and Hari Bose Jhupri, with a Hindu population of 4254 persons. These slums are located in Ward 133. In ward 134, there is Azar Molla bustee with a Hindu population of 1344 and a Muslim population of 29, as well as Batti Kal bustee with a Hindu population of 253 persons. Lastly, in ward 135, there is Das Para Bustee with a Hindu population of 620 persons. The examination of the nearest neighbors of the population reveals that there exists a random and non-clustered association between the Hindu population and the Ata Bag slum (Fig. 6.4A). The calculated z-score is 1.1359950, and the corresponding p-value is 0.255977 (Fig. 6.4B). The previously mentioned percentage share of the Hindu population exhibits a relatively lower proportion when compared to the percentages attributed to individuals adhering to alternative religious practices. Hence, it can be asserted that the occurrences of Hindu slum population-related activities within this specific borough are relatively infrequent.

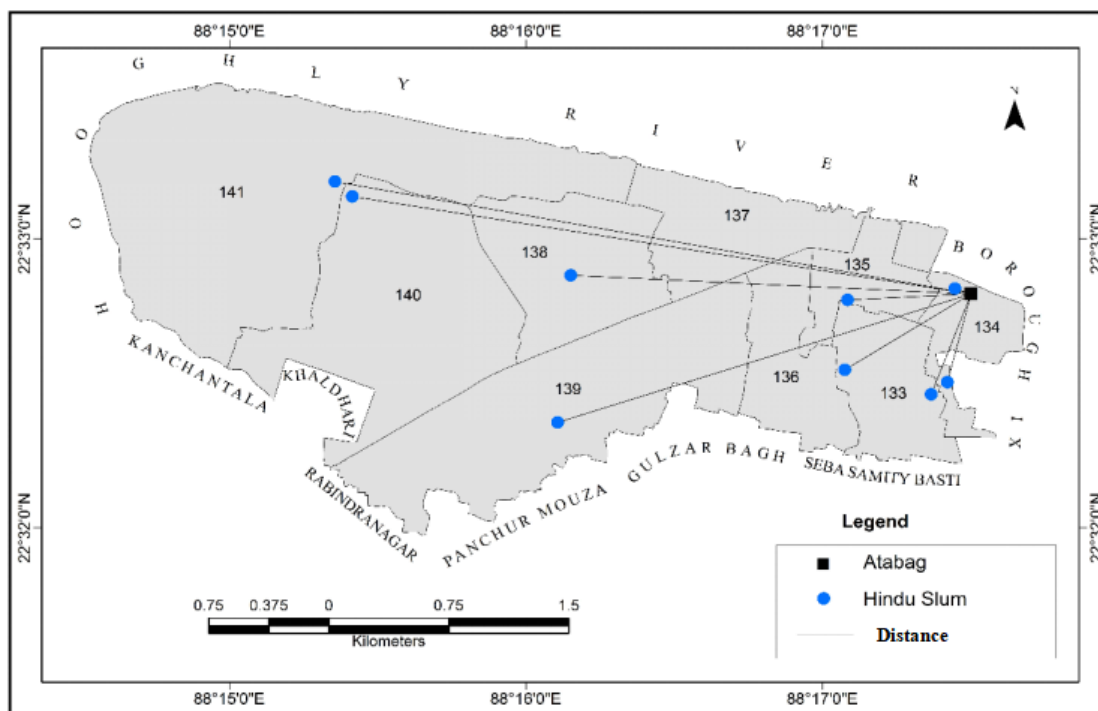
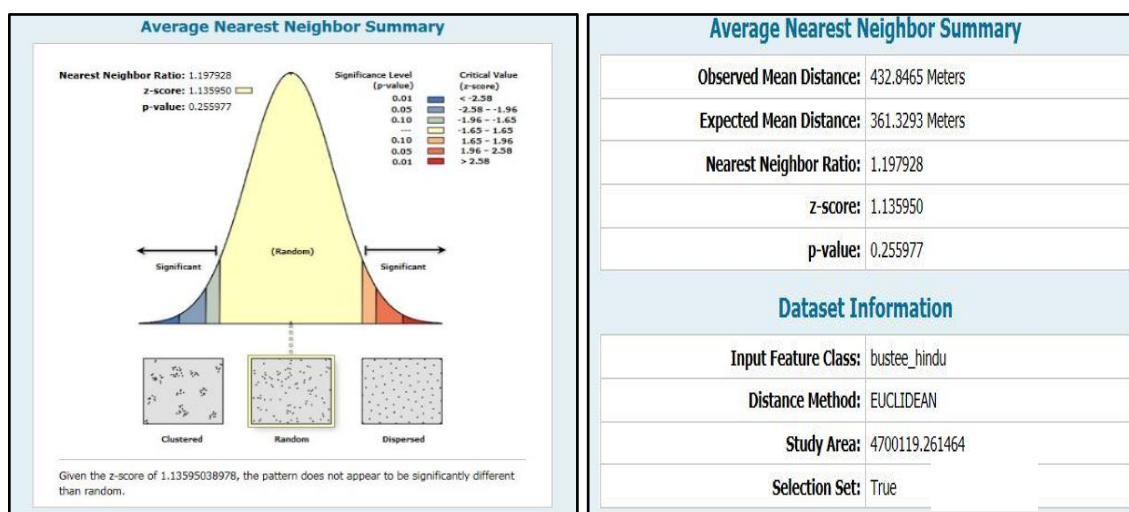


Figure 6.3: Ata Bag Hindu Slum (Surrounded by Muslim Slum Population), Hindu Slum concentration

Source-Prepared by Researcher



6.4A

6.4B

Figure 6.4: Nearest Neighborhood Analysis and Z-Square Analysis of Ata Bag Slum with Other Surrounding Hindu Slums

Source-Prepared by Researcher

If an attempt were made to establish a similar connection between Ata Bag Bustee and other Muslim-populated bustees, it is conceivable that a higher degree of clustering would be observed (Fig. 6.6A) The Z score is calculated to be -5.559873 (Fig. 6.6B). Currently, Ward 134 accommodates 73 Muslim-populated Bustees, who are dispersed across multiple wards ranging from 133 to 141. In ward no. 133, there exist four slums that are

predominantly inhabited by the Muslim population. However, there are no slums exclusively populated by Muslims in this ward. In Ward 134, there are twelve slums with a significant Muslim population. Similarly, Ward 135 has eight slums with a Muslim majority. Ward 136 has five such slums, while Ward 137 has six. Moving on to ward no. 138, there are fourteen slums with a notable Muslim population. In Ward 139, there are sixteen slums predominantly inhabited by Muslims. Ward No. 140 has three slums with a Muslim majority, and Ward 141 has five slums with a similar demographic. About the recently established slums, the data on the slum population reveals that the Kolkata Municipal Corporation (KMC) is projected to have implemented four additional slums predominantly inhabited by Muslim residents in wards 136, 137, 138, and 139 after the year 2022. Each of these slums will be assigned a distinct numerical identifier. Hence, it can be asserted that the Muslim slum populations exhibit a notable degree of numerical and proportional significance, as indicated by the aforementioned considerations. However, during further analysis, the connection between the Ata Bag slum and the Bi-religion slum is being considered. There are a total of eleven bi-religion slums situated within this borough. Among these, five are situated in Ward 133, while one is located in Ward 134, 135, 137, 138, 140, and 141, respectively. The cartographic representation depicts (Fig. 6.5) the spatial separation between the slum of Ata Bag and adjacent slums through the utilization of a designated symbol. The Ata Bag slum, along with other slums, is subjected to a comprehensive assessment using the closest neighborhood analysis.

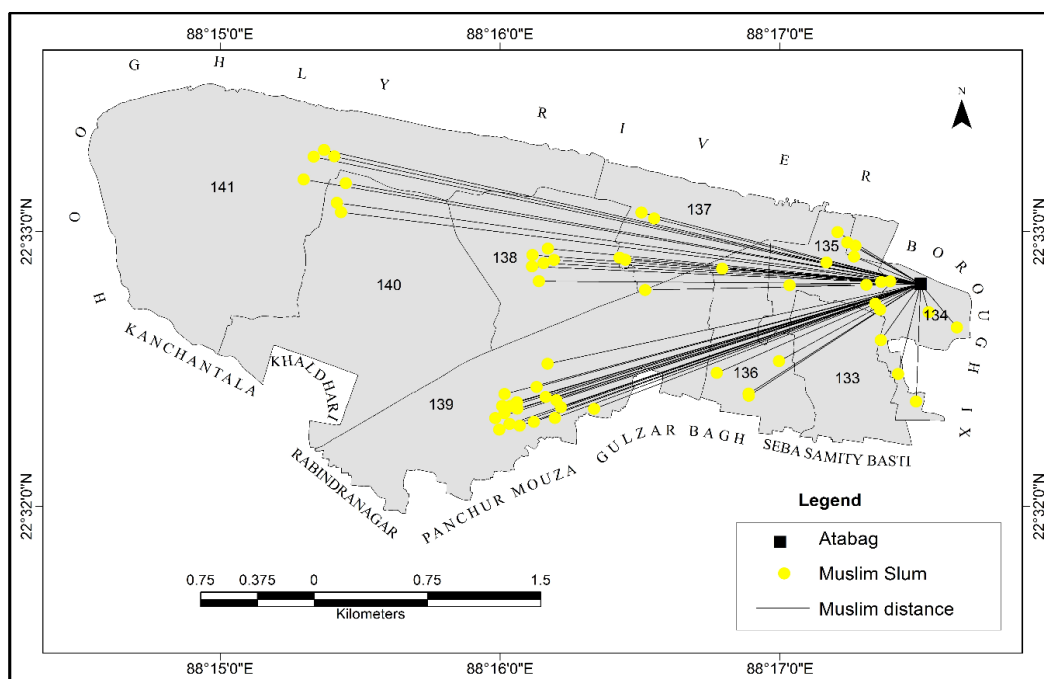


Figure 6.5: Ata Bag Hindu Slum (Surrounded by Muslim Slum Population), Muslim Slum concentration
 Source-Prepared by Researcher

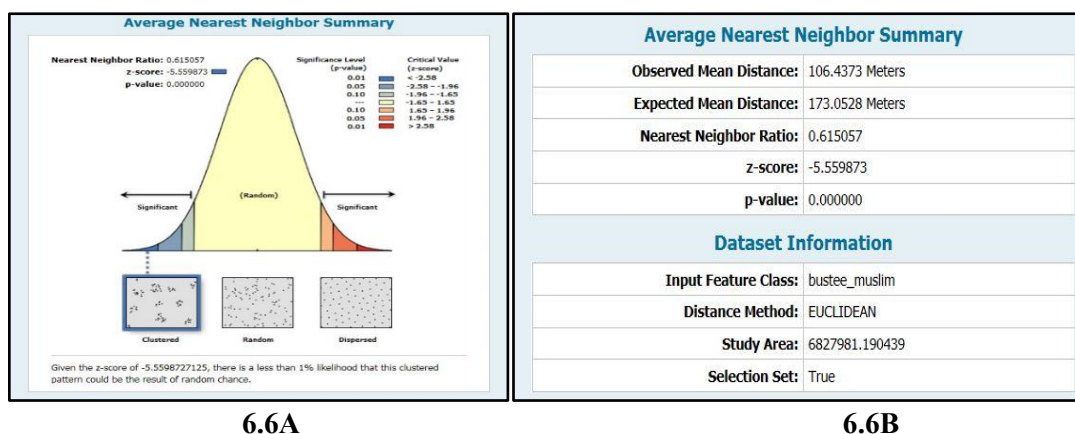


Figure 6.6: Nearest Neighborhood Analysis and Z-Square Analysis of Ata Bag Slum with Other Surrounding Muslim Slums
Source-Prepared by Researcher

The findings of this evaluation indicate that the Ata Bag slum exhibits a random pattern of connectivity with other slums (Fig. 6.8A). The ratio between the closest neighborhood and the sample size is 1.179675 (Fig. 6.8B). The Z-score value is 1.140026, and the P-value is 0.254276 (Fig. 6.8B). According to the conducted study, it is plausible to assert that bi-religious slums exhibit a higher degree of unpredictability in comparison to other pre-existing slums within the same borough (Fig. 6.7)

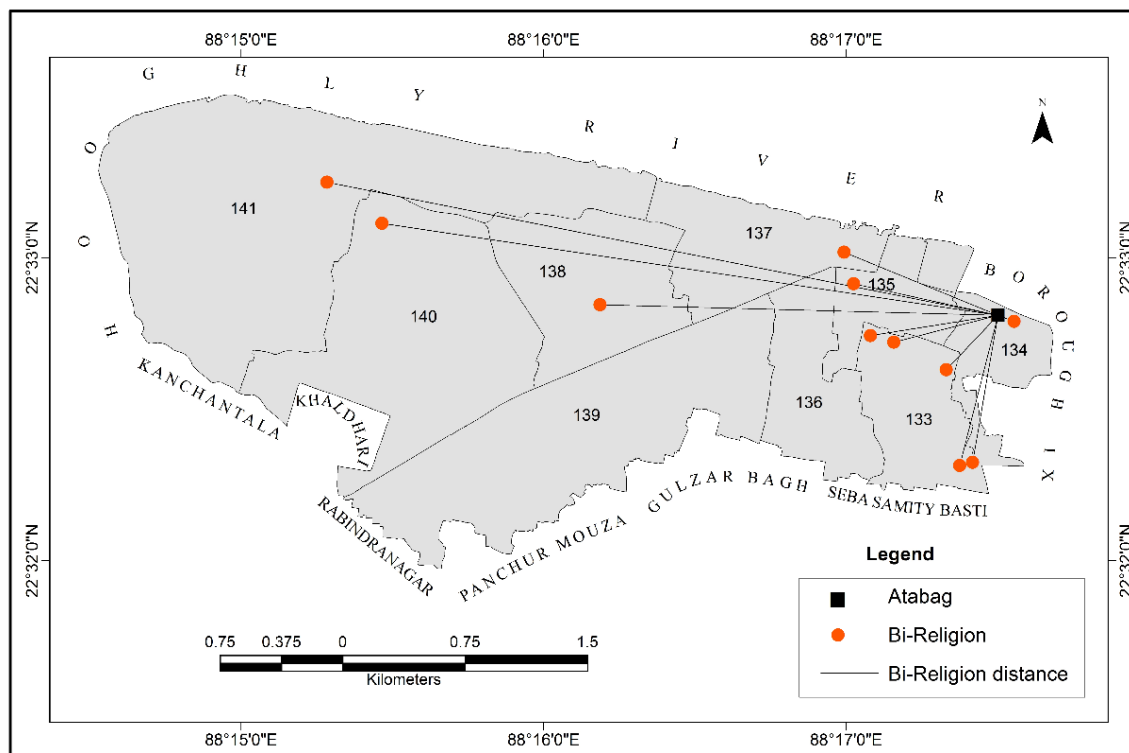
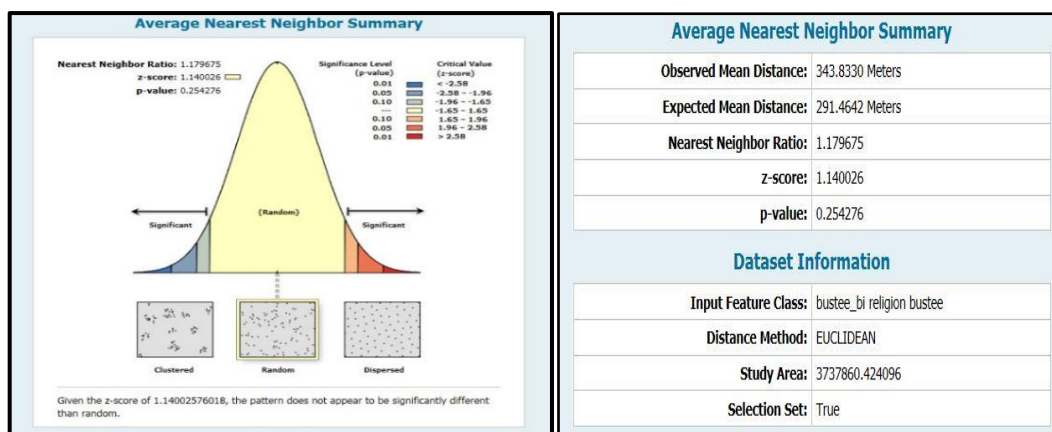


Figure 6.7: Ata Bag Hindu Slum (Surrounded by Muslim Slum Population), Bi-Religion Slum concentration
Source-Prepared by Researcher



6.8A

6.8B

Figure 6.8: Nearest Neighborhood analysis and Z Square Analysis of Ata Bag Slum with other Surrounding Bi-religion Slums

Smith Hoe Lane is a Muslim residential area exhibiting the characteristics of a slum, primarily inhabited by a Hindu community. Its geographical boundaries are predominantly adjacent to other slums and areas predominantly occupied by affluent individuals belonging to the Hindu faith. The research findings suggest that there are various types of slums in the specific borough and ward, including those predominantly inhabited by Hindus, Muslims, and individuals practicing both religions, as well as slums where one religious group dominates over the other (Fig. 6.9). The slums have been depicted in the accompanying tables (Tables 6.3 and 6.4), and Map (Fig. 6.9) utilizing distinct numbers to represent their respective religious compositions.

Table 6.3: Ward Wise Religion Based Slum Details of Brough Number 6

Borough Number	Ward Number	Number of Bustee	Hindu Dominated Population*	Muslims Dominated Population**	Others Dominated Population***	Total Population
6	46	5	1420	1664	136	3220
	47	10	1896	550	0	2446
	51	18	2318	0	0	2318
	52	4	4450	86	13	4549
	53	19	3292	1805	25	5122
	54	9	1179	28657	210	30046
	55	9	10357	7878	504	18739
	60	5	572	12800	0	13372
	61	10	2161	6718	490	9369
62	11	931	17695	397	19557	

Source- Kolkata Municipal Corporation, Slum Development Report, May 2022.

Table 6.4: Religion-based slum population of Ward 53, Borough 6.

Borough Number	Ward Number	Name of Bustee	Hindu Dominated Population *	Muslims Dominated Population **	Others Dominated Population ***	Total Population
6	53	Durga Charan Doctor Lane	494	0	0	494
		Taltala Bazar Street	78	471	0	549
		Doctor Lane	268	0	13	281
		Durga Charan Lane, Doctor Lane, Doctor Road	494	0	0	494
		Library Road	94	0	0	94
		Taltala Bazar Street	35	0	0	35
		Niogi Pukur Lane, S.N Banerjee Lane	100	0	0	100
		Durga Charan Doctor Lane	108	0	0	108
		Taltala Lane	9	288	0	297
		S.N Banerjee Road, Dr. D. Ch. Lane	381	0	0	381
		Dedar Box Lane	115	26	0	141
		Ram Shankar Roy Lane	80	102	12	194
		Dr. Bye Lane	183	0	0	183
		Library Road	198	0	0	198
		Durga Charan Doctor Lane	401	0	0	401
		Sarang Lane	71	0	0	71
		Smith Lane, Block Main St., Rafi A.K Road	0	633	0	633
		Library Rd	49	0	0	49
		Taltala Bazar St	134	285	0	419

Source- Kolkata Municipal Corporation, Slum Development Report, May 2022

Reference for Table Number 6.3 and 6.4

*Hindu Slum means where 98 percent population of that slum is Hindu religion.

** Muslim Slum means where 98 percent population of that slum is Muslim religion-based

*** Others or Bi- Religion Slum means where the Ratio of Hindu Muslims is 48-52percent.

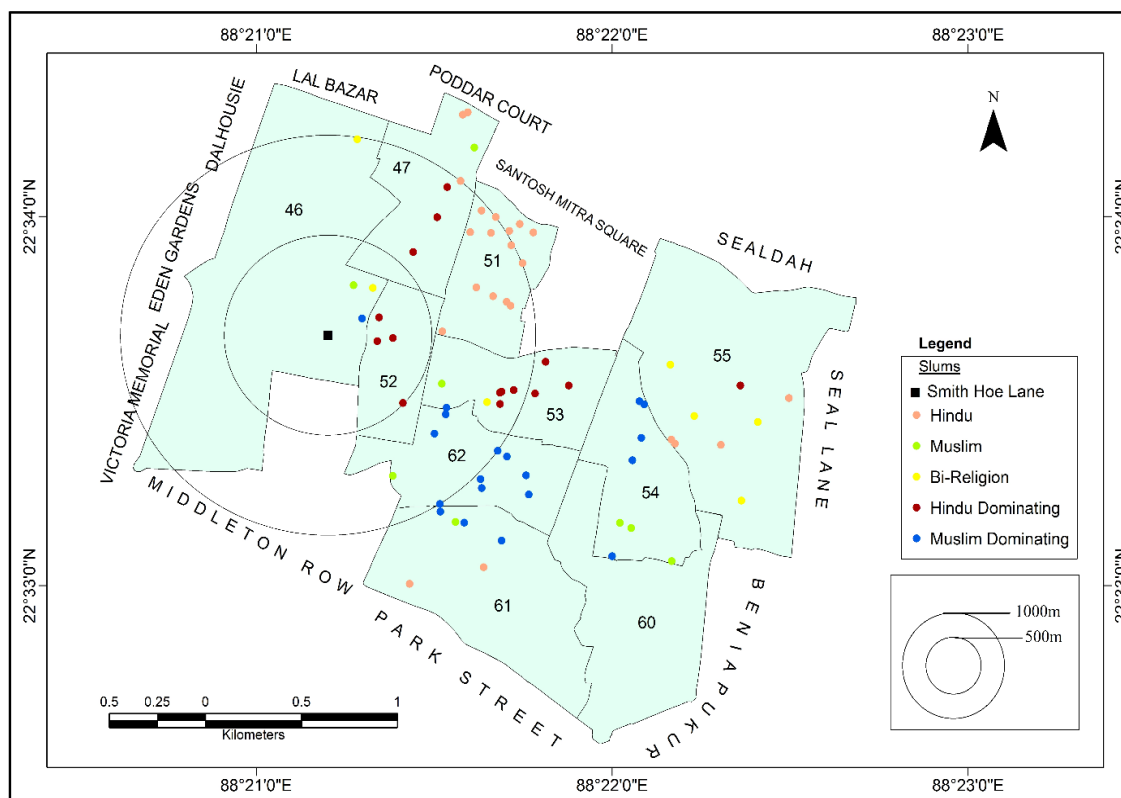


Figure 6.9: Buffer Zoning Map for Smith Hoe Lane (Muslim Slum Population) Borough 6, Ward 53 Surrounded by the Hindu Population
 Source- Prepared by Researcher

Reference for Figure Number 6. 9

- Hindu Slums—98 percent of Hindus live in slums.*
- Muslim Slums—Over 98 percent of Muslims live in slums.*
- Bi-Religion-Slums are 48-52 percent Hindu-Muslim.*
- Hindu-dominated slums have over 75 percent Hindus.*
- Muslim-Dominated Slums Have over 75 percent Muslims*

Fig.6.10 illustrates the graphical depiction of the spatial distribution of the Hindu slum population throughout various wards within Borough 6, with a focus on the Muslim slum located at Smith Hoe Lane. After doing a study of the Z score and nearest neighborhood analysis, it is evident that the Smith Hoe Lane Slum displays discernible associations with other slums populated by Hindu, Muslim, and bi-religious people. The analysis reveals that there is a Nearest Neighbour Ratio of 0.679797 in the context of the association between Hindu slums and the presence of a Muslim Smith Hoe Lane slum (Fig. 6.11B). The z-score for this ratio is -3.874241, indicating a significant deviation from the expected distribution (Fig.6.11B). Additionally, the p-value of 0.000107 further supports the observation of a clustered distribution of Hindu-occupied slums in proximity to the mentioned Muslim Smith Hoe Lane slum (Fig. 6.11A).

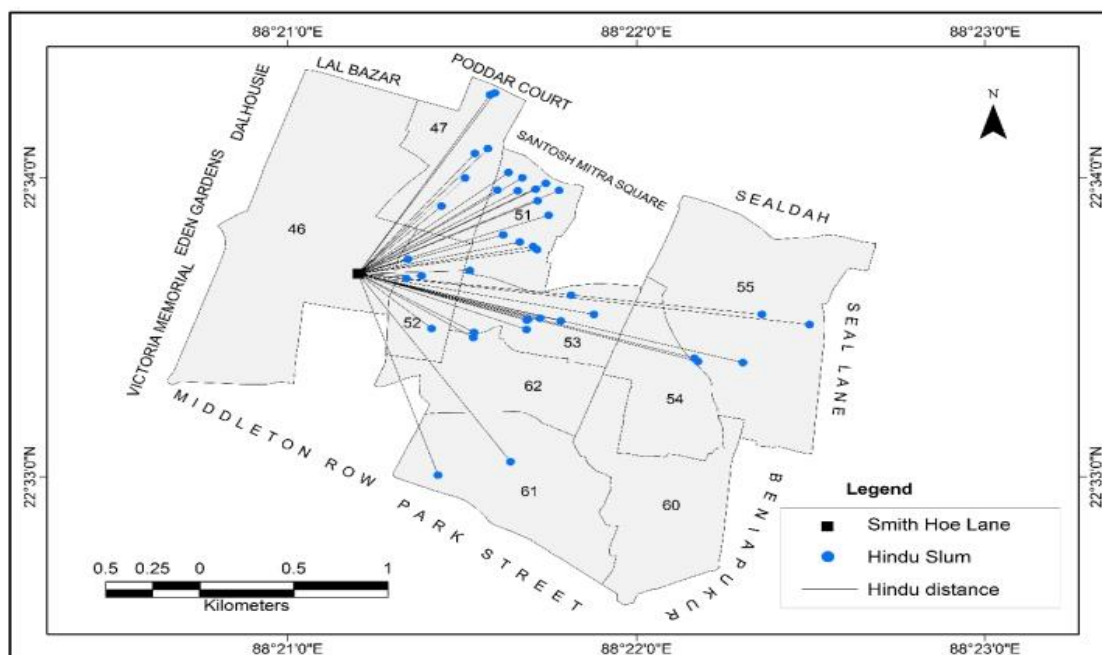
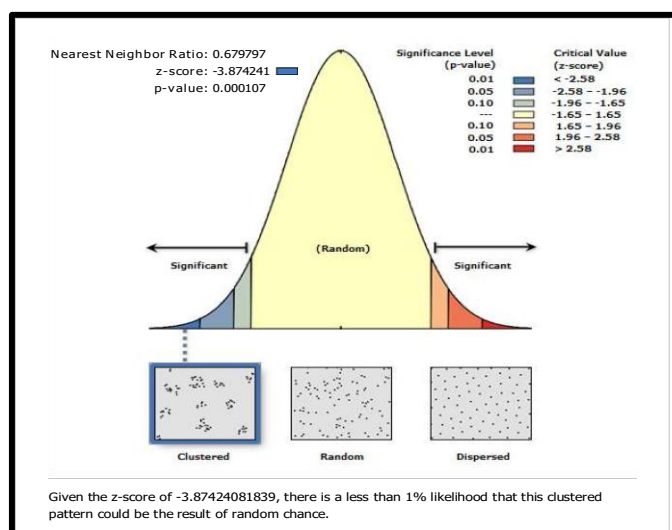


Figure 6.10: Smith Hoe Lane Muslim Slum (Surrounded by Hindu Slum Population), Hindu Slum concentration
 Source- Prepared by the Researcher



6.11A

Observed Mean Distance:	108.3834 Meters
Expected Mean Distance:	159.4350 Meters
Nearest Neighbor Ratio:	0.679797
z-score:	-3.874241
p-value:	0.000107

Input Feature Class:	Hindu
Distance Method:	EUCLIDEAN
Study Area:	4067123.376066
Selection Set:	True

6.11B

Figure 6. 11: Nearest Neighborhood Analysis and Z-Score Analysis of Smith Hoe Lane Slum with other Surrounding Hindu Slums
 Source-Prepared by Researcher

Upon analyzing the association with adjacent Muslim slums, it is evident that the nearest-neighbor ratio stands at 0.807174 (6.13B). The z-score for the given ratio is -1.951982, and the associated p-value is 0.050940 (6.13B). The results of this study suggest that there is a limited degree of clustering observed within the Muslim slum community (6.13A).

Fig. 6.12 displays the graphical representation of the concentration of Muslim slums inside the designated ward and borough.

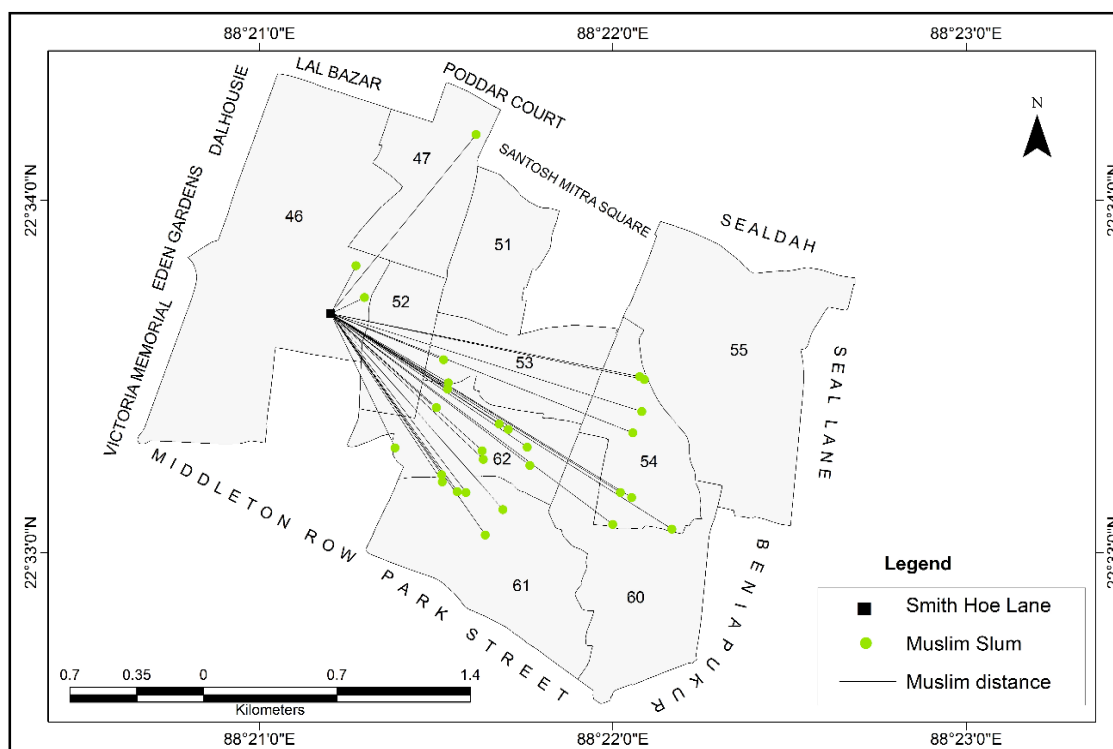
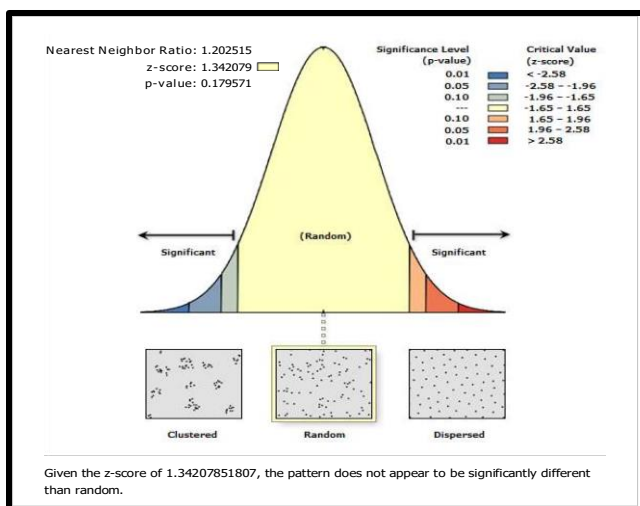


Figure 6.12: Smith Hoe Lane Muslim Slum (Surrounded by Hindu Slum Population), Muslim Slum concentration



6.13A

Observed Mean Distance:	332.6456 Meters
Expected Mean Distance:	276.6250 Meters
Nearest Neighbor Ratio:	0.807174
z-score:	-1.951982
p-value:	0.050940

Input Feature Class:	Muslim
Distance Method:	EUCLIDEAN
Study Area:	3673026.137251
Selection Set:	True

6.13B

Figure 6.13: Nearest Neighborhood Analysis and Z-Score Analysis of Smith Hoe Lane Slum with other Surrounding Muslim Slums

Source-Prepared by Researcher

In the final analysis, upon examining the correlation with neighboring Bi-religion slums, it becomes apparent that the nearest-neighbor ratio is 1.2022515, accompanied by a z-score of 1.342079 and a p-value of 0.179571 (Fig. 6.15B).

Fig. 6.15A, suggests a limited degree of random distribution within the bi-religion slum cluster. Furthermore, Fig. 6.14 illustrates the graphical depiction of the concentration of Bi-religion slums inside the chosen ward and borough.

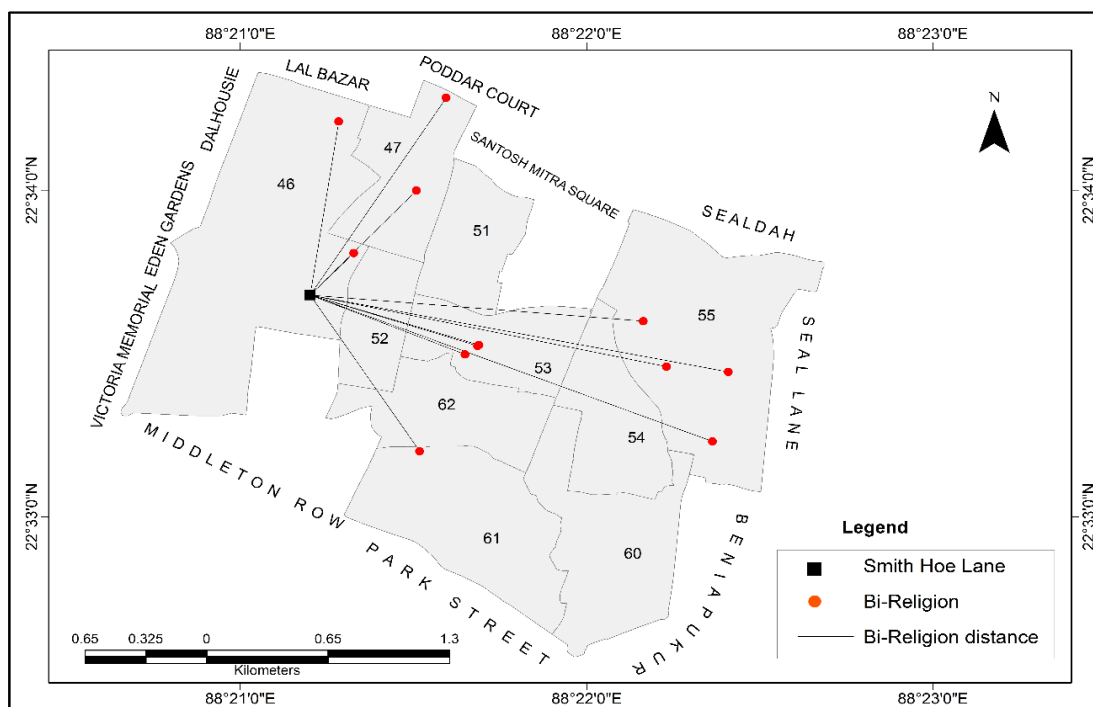
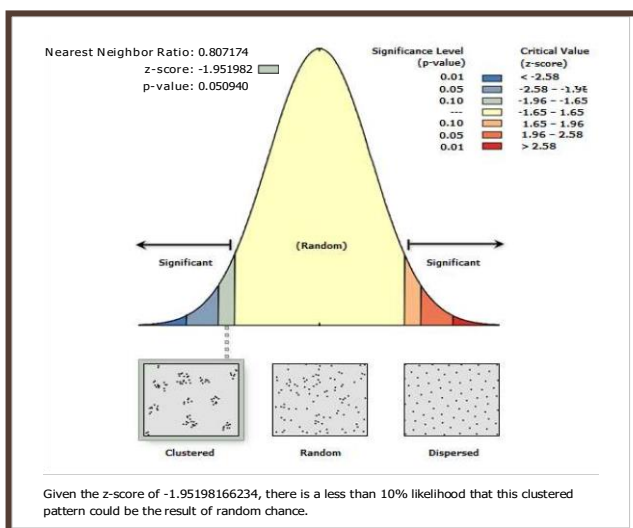


Figure 6.14: Smith Hoe Lane Muslim Slum (Surrounded by Hindu Slum Population), Bi-Religion Slum concentration

Source- Prepared by the Researcher



6.15A

Observed Mean Distance:	332.6456 Meters
Expected Mean Distance:	276.6250 Meters
Nearest Neighbor Ratio:	1.202515
z-score:	1.342079
p-value:	0.179571

Input Feature Class:	bi-religion
Distance Method:	EUCLIDEAN
Study Area:	3673026.137251
Selection Set:	True

6.15B

Figure 6.15: Nearest Neighborhood Analysis and Z-Score Analysis of Smith Hoe Lane Slum with Other Surrounding Muslim Slums

Source-Prepared by Researcher

Hence, the aforementioned observation may be substantiated through the utilization of diverse statistical, analytical, and graphical methodologies, which collectively indicate that these slums are distinct entities situated within a separate religious slum enclave. To ascertain the inclusivity of both slums near each other, it is necessary to conduct a comprehensive assessment. If the assessment reveals a lack of inclusivity, appropriate measures can be devised and implemented to foster inclusivity within the respective communities.

To assess its inclusivity, certain characteristics are considered within the domain of infrastructure, which will be further elaborated upon.

6.4 Accessibility Measurement Status of Slum Dwellers

To assess the inclusion status of these slums, four characteristics have been considered: Access to Education, Food accessibility, Cultural tolerance, and Security, with a particular focus on the safety of females.

The major indicator of inclusion was chosen to be the level of illiteracy among inhabitants residing in slum areas. Generally, the term "literacy" encompasses certain frameworks and practices related to the understanding and practice of reading and writing. This practice enhances individuals' proficiency in comprehending and articulating written content of societal matters that necessitate attention. Table 6.5 presents data on literacy rates, rates of residents with occupational training, and rates of school dropouts for both of these slums.

Table 6.5: Literacy Status of both the selected slums

SI No	Name of the Slum	Literacy Rate	Rank	Vocational Training (percent)	Rank	Dropouts (percent)	Rank	Enrolment Ratio	Rank	Composite Index of Literacy	Avg C.I of Literacy
1	Smith Hoe Lane	85.62	1	5.22	1	13.78	1	51.47	1	4	1.0
2	Ata Bag Bustee	84.48	2	3.44	2	14.37	2	46.28	2	8	2.0

Source-Prepared by Researcher (Primary Survey, June 2022)

In both urban slum areas, the literacy rates exhibit a relatively high and comparable level. However, a significant disparity arises in terms of the availability of inexpensive and accessible educational opportunities. In the context of the Ata Bag slum, there exists a notable concentration of Urdu medium schools and Madrasas within a radius of 3 km from its location. Consequently, students need to go an additional distance of 10 km to access their fundamental and affordable educational opportunities. Although there are two private

schools located within a 7-kilometer radius, it is monetarily unfeasible for the residents of the slum to access them. Furthermore, there is a lack of support for female education and a dearth of additional resources in the region. In addition to these factors, it is noteworthy that both slum areas experience significant rates of student dropout throughout the early stages of their academic journey. Furthermore, the enrollment ratio within these slum communities is also considerably low. According to Table 6.5, the enrolment ratio in the Ata Bag slum is 46.28, while in Smith Hoe Lane it is 51.47 (Table 6.5). The corresponding dropout percentages for these areas are 14.37 percent and 13.78 percent (Table 6.5), respectively. The lower rates of dropout and enrolment ratios in slum areas can be attributed to several gender-specific factors. In the Ata Bag Slum, a significant number of male students discontinue their education due to the financial constraints faced by their families, limited awareness about the importance of education, and inadequate access to inclusive educational opportunities. Conversely, female students encounter challenges related to personal safety while commuting to educational institutions, as well as societal barriers that restrict or undervalue their educational pursuits. Similar observations can be made in the Smith Hoe Lane slum, except for concerns related to women's safety.

However, a comparable form of vocational training can be observed in both slums and as a result of certain community initiatives aimed at reducing poverty. In the Smith Hoe Lane slum, residents have access to several non-governmental vocational training programs. These programs focus on mechanical workshops in motor vehicle garages and electric wiring workshops in houses. The rate of participation in these vocational training programs is likewise recorded at 5.22 percent (Table 6.5). The primary occupation in the Ata Bag Slum Community is kite making, which serves as a means of livelihood for the residents. Consequently, a significant number of individuals seek training in kite-making workshops and factories. Additionally, shoe making is another prevalent vocational training pursued by many residents, who also find employment in this field. Furthermore, the vocational training rate within this slum community stands at 3.44 percent (Table 6.5).

Considering all these educational parameters a composite ranking method index has been formulated where it could be seen that the literacy rate of Smith Hoe Lane slum is better than Ata Bag Lane Slum (Table 6.5)

A table, denoted as Table 6.6, has been created to assess the satisfaction level of individuals based on a rating scale ranging from 5 (indicating high satisfaction) to 1 (indicating low satisfaction). The purpose of this table is to gain an understanding of the satisfaction levels of the participants.

Table 6.6: Satisfaction Index of Literacy Status

Slum Name	Ata Bag slum					Smith Hoe Lane Slum				
	Very Satisfied	Satisfied	Moderately satisfied	Less Satisfied	Very less satisfied	Very Satisfied	Satisfied	Moderately satisfied	Less Satisfied	Very less satisfied
The distance they had to travel to get basic Education	X	X	X	X	√	X	X	√	X	X
School fee structure	X	X	X	X	√	X	X	√	X	X
Quality of Education	X	X	X	√	X	X	√	X	X	X
Vocational Training	X	X	√	X	X	X	√	X	X	X
Female Children encouragement to studies	X	X	X	X	√	X	√	X	X	X
Governmental Initiatives	X	X	X	X	√	X		√	X	X

Source-Prepared by Researcher (Primary Survey, June 2022)

Note- Index Value for Table-6.6: Very Satisfied-5, Satisfied-4, Moderately satisfied-3, Less Satisfied-2, Very less satisfied-1

The second one is Food accessibility which refers to the condition in which individuals possess the physical, social, and economic means to obtain an adequate supply of food that is both safe and nutritious, thereby satisfying their dietary requirements and preferences, and promoting a state of well-being conducive to an active and healthy lifestyle. The term "food security" encompasses the concepts of food availability, affordability, and accessibility for all individuals within a certain geographic area. Table 6.7 presents a comprehensive analysis of the availability, cost, and accessibility of food within the two aforementioned slums.

Table 6.7: Food Accessibility

Perception of the Dwellers	Ata Bag slum	Smith Hoe Lane Slum
How far they had to travel to get their traditional food	1.5 Kilometer	300 meters
Affordability and pricing	10-15percent more expensive	Normal Price
Food Quality and Safety	Not very good quality	Moderately normal quality
Governmental Initiatives	Not much	Mostly yes

Source-Prepared by Researcher (Primary Survey, June 2022)

During the focused group discussion, an examination was conducted on the metrics of food accessibility in slums, utilizing numerous sub-factors. The data presented in Table 6.7 illustrates a clear disparity in the accessibility of food amenities between the two slum

areas. The Ata Bag slum community is confronted with significant challenges regarding food accessibility. According to the residents of the slum, they need to travel a minimum distance of 1.5 km to obtain their daily food following the religious procedure, such as non-halal chicken and mutton. It is worth noting that the surrounding area predominantly favors halal meat, particularly beef. The remaining grocery items are obtained from the surrounding area, while the limited availability of culturally significant cuisine is due to cultural domination. In addition to this, due to the unique nature of these shops within their respective localities, customers are often required to pay an additional 10-15 percent premium. Unfortunately, the quality of the products offered by these establishments can occasionally be subpar. Consequently, a majority of individuals opt to engage in shopping activities outside of their local vicinity, utilizing numerous sources such as Behala, Sealdah, Howrah, and Jadavpur, upon completion of their work commitments. Lastly, it is often seen that individuals frequently direct their complaints toward the local government; nevertheless, they often encounter a sense of apathy within the administration. However, the residents of Smith Hoe Lane Slum face minimal challenges in accessing their preferred food within a 300-meter radius at regular prices. In terms of hygiene and government initiatives, they express satisfaction.

Table 6.8, has been created to assess the satisfaction level of individuals based on a rating scale ranging from 5 (indicating high satisfaction) to 1 (indicating low satisfaction). The purpose of this table is to gain an understanding of the satisfaction levels of the participants.

Table 6.8: Satisfaction Index of Food Accessibility

Slum Name	Ata Bag slum					Smith Hoe Lane Slum				
	Very Satisfied	Satisfied	Moderately satisfied	Less Satisfied	Very less satisfied	Very Satisfied	Satisfied	Moderately satisfied	Less Satisfied	Very less satisfied
How far they had to travel to get their traditional food	X	X	X	X	√	X	√	X	X	X
Affordability and pricing	X	X	X	√	X	√	X	X	X	X
Food Quality and Safety	X	X	√	X	X	X	√	X	X	X
Governmental Initiatives	X	X	X	X	√	√	X	X	X	X

Source-Prepared by Researcher (Primary Survey, June 2022)

Note- Index Value for Table 6.8: Very Satisfied-5, Satisfied-4, Moderately satisfied-3, Less Satisfied-2, Very less satisfied-1

The third one is Cultural tolerance which can be defined as a proclivity towards actively pursuing comprehension of diverse cultures, accepting both their differences and intersections, to establish common norms that facilitate successful intercultural exchanges.

Table 6.9: Cultural Tolerance

Perception of the Dwellers	Ata Bag slum	Smith Hoe Lane Slum
How often gets a chance to arrange cultural activity	Once a year	Almost every occasion
Nearest Worship places	800-meter (Durga mandir)	50 meters (Mosque)
Problem they face	Hooliganism, destruction of ideals, trace passing with wrong intentions, Unwanted miking, huge fights, non-cooperation	non-cooperation sometimes
Participation in other religious activities	Yes appreciated	Mostly not accepted
Forced to change religion	Yes, most of the time	No
Governmental Initiatives	No initiatives	Helpful

Source-Prepared by Researcher (Primary Survey, June 2022)

Based on the findings of the focused group discussion in Table 6.9 it is evident that the Ata Bag slum experiences significant cultural intolerance due to its proximity to a predominantly Muslim area. The residents of Ata Bag cannot freely engage in their cultural practices within the community, except for the annual Durga Puja celebration. However, even during this event, they encounter various challenges such as hooliganism, destruction of symbols, inappropriate behavior, unwanted noise pollution, frequent conflicts, and a lack of cooperation over several years. On multiple occasions, the individuals sought assistance from the local administration, but without success, resulting in their need to travel a distance of about 800 meters to access their place of worship. On numerous occasions, individuals are compelled to alter their religious beliefs due to external influences from their immediate environment, hence being encouraged to engage in Muslim religious practices. In contrast, the residents of Smith Hoe Lane Slum can partake in their religious practices within their immediate community with few instances of non-cooperation. Furthermore, individuals can engage in their daily religious observance within a radius of 50 meters from the slum. However, Hindu ceremonies do not typically provide a warm reception to them.

Table 6.10 has been created to assess individuals' satisfaction levels based on a rating scale ranging from 5 (indicating high satisfaction) to 1 (indicating low satisfaction). The purpose of this table is to gain an understanding of the participants' satisfaction levels.

Table 6.10: Satisfaction Index of Cultural Tolerance

Slum Name	Ata Bag slum					Smith Hoe Lane Slum				
	Very Satisfied	Satisfied	Moderately satisfied	Less Satisfied	Very less satisfied	Very Satisfied	Satisfied	Moderately satisfied	Less Satisfied	Very less satisfied
How often gets a chance to arrange cultural activity	X	X	X	X	√	√	X	X	X	X
Worship places	X	X	X	√	X	√	X	X	X	X
Problem they face	X	X	X	X	√	X	√	X	X	X
Participation in other religious activities	X	X	X	X	√	X	√	X	X	X
Forced to change religion	X	X	X	X	√	X	√	X	X	X
Governmental Initiatives	X	X	X	X	√	√	X	X	X	X

Source-Prepared by Researcher (Primary Survey, June 2022)

Note- Index Value for Table 6.10: Very Satisfied-5, Satisfied-4, Moderately satisfied-3, Less Satisfied-2, Very less satisfied-1

The fourth one is Female security which encompasses a range of initiatives, practices, and policies that are designed to mitigate gender-based violence, namely violence targeting women. These measures also address women's apprehension of crime. The concept of women's safety encompasses the establishment and maintenance of secure environments, commonly referred to as safe spaces. The space environment is not devoid of influence or bias.

Table 6.11: Security especially Females

Perception of the Dwellers	Ata Bag slum	Smith Hoe Lane Slum
Crime rates for opposite religion	Very high (29percent)	Less (7 percent)
Types of crimes to opposite religion	Fight, Arguments, Rape, eve-teasing, Murder	Fight, Arguments
Acceptance of female work participation from opposite religion	11percent	82percent
Safety of females after evening outside their houses	Not Safe at all (majority-81percent)	Safe (89percent)
Acceptance of female decisions in social activities	Not appreciated	appreciated
Respect for opposite religious women	No	yes

Source-Prepared by Researcher (Primary Survey, June 2022)

Table 6.11 illustrates the security concerns experienced by female residents in slum areas, as identified through a focused group discussion with members of the slum community. The Ata Bag slum dwellers encounter significant challenges and confront life-threatening situations due to the presence of neighboring slum dwellers. Due to its proximity to Muslim communities, the Ata Bag neighborhood exerts significant influence over its female residents. The residents are prohibited from remaining outdoors beyond 6 p.m., even though their families do not strongly object to this regulation. However, it is worth noting that instances of harassment and molestation are frequently encountered by young girls. In addition to this, it is noteworthy that between the years 2011 and 2022, a total of five females, one of whom was a 7-year-old child, experienced incidents of sexual assault (Lal Bazar crime report, June 2022). Consequently, families exhibit significant apprehension regarding the employment of their daughters outside the confines of their homes, primarily due to concerns surrounding the potential exposure to late-night hours. In addition, it is noteworthy that within societal contexts, females encounter exclusion from participating in decision-making processes. Overall, it can be said that the social standing of women in the Ata Bag slum is not favorable. The individuals had lodged multiple complaints on this matter with the local authorities, yet were unable to obtain a resolution. Both female and male residents occasionally encounter instances of conflict, argumentation, and life-threatening activities, as indicated by the elevated crime rates. In contrast, the Smith Hoe Lane Slum exhibits a higher level of security about women's protection, as there have been no reported incidents of sexual assault perpetrated by members of the opposing religious group. However, occasional altercations or disagreements among males about various issues do occur within the vicinity, but these incidents are generally not of a severe kind. The female security personnel of Smith Hoe Lane Slum are widely recognized and valued.

Table 6.12 has been created to assess the satisfaction level of individuals based on a rating scale ranging from 5 (indicating high satisfaction) to 1 (indicating low satisfaction). The purpose of this table is to gain an understanding of the satisfaction levels of the participants.

Table 6.12: Satisfaction Index of Security especially females

Slum Name	Ata Bag slum					Smith Hoe Lane Slum				
	Very Satisfied	Satisfied	Moderately satisfied	Less Satisfied	Very less satisfied	Very Satisfied	Satisfied	Moderately satisfied	Less Satisfied	Very less satisfied
Crime rates for opposite religion	X	X	X	X	√	X	√	X	X	X
Types of crimes to opposite religion	X	X	X	X	√	X	√	X	X	X
Acceptance of female work participation from opposite religion	X	X	X	X	√	X	X	√	X	X
Safety of females after evening outside their houses	X	X	X	X	√	X	X	√	X	X
Acceptance of female decisions in social activities	X	X	X	X	√	X	X	√	X	X
Respect for opposite religious women	X	X	X	X	√	X	√	X	X	X

Source-Prepared by Researcher (Primary Survey, June 2022)

Note- Index Value for Table 6.12: Very Satisfied-5, Satisfied-4, Moderately satisfied-3, Less Satisfied-2, Very less satisfied-1

A composite index has been constructed using these three characteristics to assess the level of inclusivity. This information is presented in Table 6.13. The level of inclusivity in Smith Hoe Lane Slum surpasses that of the Ata Bag Slum.

Table 6.13: Composite Satisfactory Index

Slum Name	Literacy Status	Food Accessibility	Cultural Tolerance	Security especially females	Total composite Index	Average Composite Index	Rank	Status
Ata Bag slum	9	7	9	6	31	7.75	5	Less Inclusive
Smith Hoe Lane Slum	21	18	27	21	66	21.75	4	More Inclusive

Source-Prepared by Researcher based on Ranking Index

6.5 Problems of Ata Bag Slum for Being Less Inclusive

This could be summed up as follows:

- (1) The primary challenges faced in the realm of education within this particular slum pertain to language and religion, as well as the accessibility of educational opportunities. Factors like distance to educational institutions, lack of encouragement, limited awareness, and financial constraints further compound the difficulties experienced in this context.
- (2) Regarding the issue of food accessibility, it can be observed that the Muslim community residing near the Hindu slums exhibits a comparatively lower degree of inclusivity. Conversely, the situation in Smith Hoe Lane presents a contrasting scenario. The inhabitants of the slum area known as Smith Hoe Lane noted that their dietary needs were being met within the confines of their community, whereas the residents of the Ata Bag Bustee slum area encountered a contrasting situation.
- (3) Both slums exhibit a limited degree of religious tolerance, with residents exhibiting a strong sense of pride in their respective cultural identities.
- (4) The Ata Bag slum exhibits a predominantly female population. However, a recent study conducted through focus groups revealed that the female residents of this area do not express significant concerns regarding security or crime. In comparison, Smith Hoe Lane experiences a lesser degree of perceived dominance, insecurity, or criminal activity. Apart from this, some parameters are taken to make this slum more inclusive in the cognitive dimension.

6.6 How can the inclusivity of Ata Bag Slum be enhanced?

As a means of making this more accessible, the strategy has been broken down into three sections.

- Social Cohesion
- Social Inclusion
- Social Participation

The initial component is essential in enhancing religious inclusivity within a slum setting. The concept of "social cohesiveness" refers to the various elements that contribute to the maintenance of communal unity. In a community characterized by strong integration, individuals experience a sense of belonging and perceive themselves as being valued by the collective entity. The condition of population homogeneity is not deemed a requisite

for the establishment of social cohesion. Conversely, societies leverage the inherent advantages of their multicultural composition by implementing a strategy centered on mutual respect, encompassing diverse perspectives, opinions, and skills. When competing interests collide, the likelihood of resorting to negative patterns of tension and conflict decreases.

Furthermore, the concept of "social cohesiveness" refers to the various elements that contribute to the maintenance of communal unity. In a community characterized by strong integration, individuals experience a sense of belonging and perceive themselves as being esteemed by the collective entity. The condition of population homogeneity is not deemed a requisite for the establishment of social cohesion. Conversely, societies leverage the inherent advantages of their multicultural composition by implementing a policy of mutual respect, encompassing various aspects such as ideas, opinions, and skills. When competing interests collide, there is a reduced likelihood of reverting to negative patterns characterized by tension and conflict.

In contemporary discourse, engagement in communal endeavors is commonly characterized as a manifestation of social participation. The ability to contribute to and engage in decision-making processes. The establishment of trust among individuals is facilitated by their social interactions, thereby establishing a foundation for the development of a shared sense of collective responsibility.

It is crucial to bear in mind that effectively addressing inclusion issues necessitates a comprehensive examination of these matters from multiple perspectives, rather than solely relying on a singular viewpoint. Discrimination can be addressed through various approaches, encompassing social, legal, cultural, and political dimensions. The mainstreaming of social inclusion goals holds significant importance within poverty eradication strategies, necessitating comprehensive changes across various domains such as the macroeconomy, labor market, housing market, education system, healthcare system, media, transportation, legal system, and leisure and cultural sector. Hence, it is imperative to incorporate the objective of social inclusion into all pertinent policies. To assess the level of participation of marginalized populations in civic, cultural, and economic endeavors, it is imperative to take into account the accessibility of public transportation within respective regions. To conduct an inquiry into the realm of education, it is imperative to ascertain whether all children are afforded equitable opportunities for learning within educational institutions and to determine whether any children are

marginalized based on their race, gender, or religious affiliation. About the healthcare industry, it is imperative to conduct an inquiry into the extent to which the distinctive needs of marginalized communities are being addressed, as well as to ascertain whether any disparities in mortality rates or life expectancy exist between marginalized populations and the majority.

To attain the desired level of social inclusion, it is imperative to closely examine the domains characterized by prevalent exclusion, ineffective engagement, and limited participation. What are the reasons and mechanisms behind the exclusion of individuals from society's decision-making processes? Which specific individuals or groups are affected, and what are the observable effects on the economy, society, and government? To mitigate the exclusion of specific individuals from societal inclusion, it is imperative to modify the existing structures, methods, and power dynamics. To commence our analysis, we will examine the demographic groups that are frequently marginalized and the key industries that necessitate the integration of perspectives on social inclusion. Here The following discussion pertains to the incorporation of multi-dimensional elements to foster inclusivity within a neighborhood.

6.7 Elements of Inclusion for Ata Bag Slum

- *The implementation of inclusive policies and legislation-* The local councilor can create inclusive policies and regulations to ensure that special food products and cultural practices are protected and separated from the surrounding vernacular religious practices, with legal safeguards in place.
- The provision of *clean and secure environments for habitation, employment, and leisure activities*, as well as the availability of information and means of communication.
- *Ensuring legal entitlement* to public areas, resources, and essential services, such as education, healthcare, clean water, and sanitation, is crucial. Hence, it is imperative to create local government-funded Bengali medium schools within a radius of 3 km from Urdu medium schools.
- The decision-making process should *prioritize transparency and accountability*, allowing the community to make informed judgments about their problems and receive appropriate resolutions.
- Expressing support for the concepts and values included in the *human rights framework* through participation in local self-government activities.

- The *aforementioned factors* encompass several key elements of academic discourse, including an opportunity for personal development, respect for diversity, freedom in various aspects such as choice and religion, participation in decision-making processes, social protection, and solidarity.

6.8 Addressing Problems to Social Inclusion: Elimination and Modification of Government Policies

Numerous instances of exclusion arise from discriminatory practices targeting individuals or collectives due to their specific characteristics or limitations, whether they be social, economic, or physical. Discrimination is deemed to be a transgression of international human rights standards, as these standards ensure that all individuals are entitled to the full enjoyment of their rights, free from any form of discrimination on grounds such as race, color, gender, language, religion, political or other opinion, national or social origin, wealth, birth, or any other status. The fundamental basis of human rights lies in the recognition and appreciation of the intrinsic dignity and worth of every individual, and their application is characterized by consistency and the absence of prejudice toward all individuals. The initial and crucial measure in fostering an inclusive society is the elimination or modification of discriminatory customary norms or practices.

The United Nations human rights system encompasses a collection of international human rights treaties that possess legally binding force, thereby offering a viable means to advance the engagement of marginalized populations (Piccone, T., 2021). The Convention on the Elimination of All Forms of Racial Discrimination (CERD, General Recommendation No. 29:), the Convention on the Rights of the Child (CRC, Article 49 2020), the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW, Articles – GOV.UK,2017), the Convention Against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (CAT, United Nations Treaty Collection,2018), and the Convention on the Rights of Persons with Disabilities (CRPD, United Nations Department of Economic and Social Affairs,2020) are international agreements that address various aspects of human rights.

Furthermore, there exists a plethora of additional international human rights instruments, including the Universal Declaration of Human Rights. The following strategies are effective in addressing the concerns of individuals belonging to vulnerable groups. To safeguard the rights of indigenous peoples and minority groups, several key international instruments have been established. These include the Declaration on the Rights of

Indigenous Peoples (2007), the Declaration on the Rights of Persons Belonging to National or Ethnic, Religious and Linguistic Minorities (1992), and the United Nations Principles for Older Persons.

The oversight of these Conventions and Declarations is entrusted to Special Rapporteurs who are responsible for ensuring their effective implementation. The primary objective of the Special Rapporteur on freedom of religion or belief is to conduct inquiries into occurrences and governmental interventions worldwide that deviate from the principles outlined in the Declaration on the Elimination of All Forms of Intolerance and Discrimination Based on Religion or Belief. The Special Rapporteur is also tasked with providing recommendations for appropriate remedial actions. To oversee the compliance of States Parties with their human rights obligations as stipulated in the respective treaty, monitoring Committees and Optional Protocols have been established for each Convention. These mechanisms enable individuals or groups to directly submit their concerns to the Committee. The monitoring of discrimination against minority groups is conducted by the Committee on the Elimination of Racial Discrimination through the evaluation of periodic reports. Furthermore, starting from 1993, the Committee has formulated proactive measures to serve as early warnings to avert significant breaches of the Convention. The primary objective is to mitigate the likelihood of prevailing issues escalating into full-fledged conflicts. Nevertheless, as elaborated upon in the subsequent section, the efficacy of Conventions, International Treaties, and national legislation aimed at eradicating inequality and/or discrimination is constrained by the absence of conducive circumstances, including but not limited to accessible information, suitable mechanisms, and efficient enforcement.

6.9 Conclusion

In the Indian environment, it is commonly ingrained in individuals to perceive religion and politics as subjects that are more suitable to be avoided in social interactions, especially in professional settings. Consequently, there is a notable scarcity of possibilities to engage in candid and open discussions of this subject matter.

Religion plays a significant role in shaping our psychological identity. The discussion or absence thereof has a significant influence on our perspective on life. Numerous academic and theological perspectives exist regarding the concept of religion. However, the Religion and Mediation Action Guide, a publication by the United States Institute of Peace, offers a definition that characterizes religion as a human reaction to a perceived non-physical

reality about the fundamental questions of life's origin, meaning, and purpose. Typically, communities organize themselves into a collective framework consisting of symbols, rituals, institutions, and practices (Varghese R. et. al,2023)

This concept incorporates both established religions and other belief systems, such as atheism, agnosticism, and spiritualism, among others. Due to the profound historical repercussions of religiously motivated violence on a global scale, there has been a tendency to discourage discussions about this topic, especially within professional contexts where it is seen as irrelevant to individuals' professional capabilities. Nevertheless, during this undertaking, we have only stifled discourse about it. The internalized belief systems persistently function within individuals, often at a subconscious level, despite attempts to maintain a neutral stance within organizational contexts. Renowned Swiss psychiatrist and psychotherapist Carl Jung are well-known for his notable statement, asserting that unless individuals bring their unconscious thoughts and feelings into their conscious awareness, these unconscious elements will continue to exert influence over their lives, leading them to perceive such influence as predetermined destiny (Varghese R. et. al,2023). Religion is similarly observed among the majority of professional environments.

This Chapter's conclusion highlights that, based on a specific case study, the Hindu-dominated slum surrounded by the Muslim population exhibits a lower degree of inclusivity in terms of social interactions and daily experiences. However, organizations that demonstrate a strong commitment to fostering Diversity, Equity, and Inclusion (DEI) initiatives can effectively tackle this matter. The subsequent suggestions are provided to support the process of transforming unconscious ideas and emotions into conscious awareness, as posited by psychoanalysts. The following are establishing designated areas for celebratory events, providing the choice for individuals to participate in religious holidays, refraining from imposing religious customs, and fostering platforms for open discussions on matters about religion.

References

Article 49 of the Convention on the Rights of the Child (PDF). Website of the United Nations (in Arabic, Chinese, English, French, Russian, and Spanish). United Nations. 20 November 1989. p. 22 (paper), 52 (this PDF).

[https://www.google.com/search?q=the+Convention+on+the+Rights+of+the+Child+\(CRC\)percent2C&oq=the+Convention+on+the+Rights+of+the+Child+\(CRC\)percent2C&gs_lcrp=EgZjaHJvbWUyBggAEEUYOdIBDzE3MDE2ODc0NzRqMGoxNagCALACAA&sourceid=chrome&ie=UTF-8Archived](https://www.google.com/search?q=the+Convention+on+the+Rights+of+the+Child+(CRC)percent2C&oq=the+Convention+on+the+Rights+of+the+Child+(CRC)percent2C&gs_lcrp=EgZjaHJvbWUyBggAEEUYOdIBDzE3MDE2ODc0NzRqMGoxNagCALACAA&sourceid=chrome&ie=UTF-8Archived) (PDF) from the original on 12 March 2012. Retrieved 6 November 2020.

Chatterjee, S., & Datta, D. (2022). An introduction to Indian philosophy. ISBN 8120840178, 9788120840171 Motilal Banarsidass Publishers Private Limited

<https://books.google.co.in/books?id=SDMyEAAAQBAJ>

Conference of States Parties to the Convention on the Rights of Persons with Disabilities United Nations Department of Economic and Social Affairs. Retrieved 30 July 2020.

<https://social.desa.un.org/issues/disability/cosp>

Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) Articles – GOV.UK. gov. uk. Archived from the original on 16 October 2017. Retrieved 16 October 2017. <https://www.gov.uk/government/publications/convention-on-the-elimination-of-all-forms-of-discrimination-against-women-cedaw-articles>

Danner, H. G. (2014), A thesaurus of English word roots. Rowman & Littlefield, ISBN 978-1-4422-3325-6 (cloth: alk. paper) – ISBN 978-1-4422-3326-3 (ebook), PP-19, <https://www.drnishikantjha.com/papersCollection/A-Thesaurus-of-English-W-265.pdf>

General Recommendation No. 29: Article 1, paragraph 1 of the Convention (Descent):. 01/11/2002.

Gen. Rec. No. 29. (General Comments) General Recommendation XXIX, Article 1, paragraph 1, (Descent) (Sixty-first session, 2002), Convention Abbreviation: CERD, <http://www.unhchr.ch/tbs/doc.nsf/percent28Symbolpercent29/f0902ff29d93de59c1256c6a00378d1f?Opendocument>

Kolkata Municipal Corporation, Slum Development Report May 2022

Lal Bazar Crime Report (Women Violation Cell) Kolkata, June 2022

Piccone, T., 2021. UN Human Rights Council: As the US returns, it will have to deal with China and its friends, Brookings Institution. United States of America. Retrieved from

CID:20.500.12592/kjnwfg <https://policycommons.net/artifacts/4143827/un-human-rights-council/4952539/on08Aug2023>

Pratt, D. (2007). Excluvism and Exclusivity: A contemporary theological challenge. *Pacifica*, 20(3), 291-306. Volume 20, Issue 3 <https://doi.org/10.1177/1030570X0702000304>

The UN Declaration on Minorities. An Academic Account on the Occasion of its 20th Anniversary (1992-2012)". Ed. by U. Caruso, R. Hoffmann Brill–Nijhoff 2015. ISBN 978-90-04-25155-7.

https://en.wikipedia.org/wiki/Declaration_on_the_Rights_of_Persons_Belonging_to_National_or_Ethnic,_Religious_and_Linguistic_Minorities

The United Nations Declaration on the Rights of Indigenous Peoples is contained in the annex to the present resolution. 107th plenary meeting 13 September 2007.

https://www.un.org/development/desa/indigenouspeoples/wpcontent/uploads/sites/19/2018/11/UNDRIP_E_web.pdf

United Nations Treaty Collection: Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment. Retrieved on 26 June 2018.

https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=IV-9&chapter=4&clang=en

Varghese R. and Iyer R. (2023), Religious exclusion incorporates: Unspoken realities, Deccan Herald Editorial, May 2, 2023, pp-23. <https://www.deccanherald.com/education/religious-exclusion-in-corporates-unspoken-realities-1215026.html>

Chapter 7: Fire Hazard Proneness Basis Inclusion of Slums

This chapter explores inclusive strategies based on hazard assessment, focusing on three types of slums: Registered, Unregistered, and Transforming. These slums are selected to assess their susceptibility to fire hazards based on their inclusion status. Among them, one is unregistered, another is registered, and the third is a transforming slum, previously unregistered but now registered. The final selected slum, having transformed, showcases a varied profile in terms of fire hazard presence. Its transition sets a precedent for other slums across Kolkata.

7.1 Introduction

Kolkata has experienced a consistent influx of individuals migrating from rural areas of Bengal, with a particular emphasis on those economically disadvantaged and seeking employment opportunities within the urban center. The origin of slums in Kolkata can be traced back to the colonial era of Calcutta before the onset of industrialization. However, the establishment of persistent patterns of slum formation and expansion occurred as a result of the demand for labor generated by industrial activities. The individuals in question were unable to meet the cost of high rents for their accommodations due to their inability to allocate funds towards frequent train or road excursions, and their consequent inability to maintain a regular commuting schedule. The individuals were compelled to dwell in regions with relatively lower costs of living, which were unsuitable for human habitation. These areas were situated in shanty parts of the city, characterized by unsanitary and substandard living conditions, and were near industrial sites. Before the onset of industrialization, the emergence of slums on the periphery of European residences to cater to domestic labor needs (Purkait and Halder, 2016) serves as evidence that slums have existed as a socio-economic phenomenon predating contemporary Kolkata. Several of these slums are more than one hundred years old. According to the World Bank (2011), Kolkata is home to 2011 registered and 3500 unregistered slums, which are distributed throughout 16 Boroughs and 144 Wards. The preponderance of slums is primarily concentrated in the eastern, midwestern, and central districts of Kolkata, which function as pivotal centers for commerce and industry. Most of the slums are highly populated and situated in perilous regions unsuitable for human habitation, such as near canals and railway tracks. The population density is very high, and most of these houses are improvised; the roof is usually covered with plastic, tali, tin, or asbestos; and the walls are not properly made of brick; instead, they are made with wood or plastic, bamboo, or torn bedsheets, all of which are highly combustible materials. In addition, residents of slums tend to store highly combustible materials such as kerosene, cooking gas, and wood within their dwellings. The majority of individuals residing in the slums utilize illicit power connections facilitated by hooked cables, thereby posing a significant risk of fire outbreak.

7.2 History of Kolkata Slum Fire Hazards

The slums of Kolkata have experienced a significant number of incidents, with a documented total of 107 major fires occurring between the years 2010 and 2020. (Ghosh

and Mondal, 2019). Table 7.1 and Plate 7. a list some of the most dangerous fires in Kolkata's slums during the previous ten years (2010-2020).

Table 7.1: Some Devastating Fires in Slums of Kolkata – 2010 to 2020

Sl. No.	Slum name	Date and time	Cause	Effect
1	Basanti Colony	January 13, 2010, 1.18 pm	Electrical short-circuit	Around 2000 people became homeless, 30 people were injured and 1 casualty was reported.
2	Tiljala Slum	December 20, 2011,08:10 A.m.	Short circuit	2 people were injured and no report of casualties so far.
3	Kalikapur slum	22nd January 2012,22:10 Hours	Burst Of Gas Cylinder	5 people were injured and 1 casualty reported so far.
4	Park Circus Railway Station slum	7th April 2014,22:00 Hours	Short Circuit	More than 300 houses got burnt,10 people were injured and 1 casualty was reported so far.
5	Dumdum Park slum	26th December 2015,20:41 Hours	Burst Of Gas Cylinder	10 people got injured and 1 got died.
6	Brace Bridge Railway Station Slum	11 TH January 2016,3.15 pm	According to the Focused Group Discussion due to political issues, it was a manmade or planned hazard	10-12 people got injured and no casualties reported so far.
7	Baranagar Gopal Lal Thakur slum	November 12, 2017,5:22 pm	The explosion of gas cylinders	Around 3- 4 people got injured no report of casualties so far.
8	Burra Bazar slum	September 16, 2018,08:19 p.m.	Short circuit	No reports of injuries and casualties so far, but lots of property loss.
9	Dutta bad slum (Near Bengal Chemical)	22 nd December 2020,6.38 pm	Firewood during winter	30-35 people got injured, but no report of casualties.
10	Topsia slum	10 th November 2020,6.30 pm	The fire caught up from Oil Factory	110 families became homeless, and 10-15 people got injured, but no casualties were reported.
11	Bag bazar Hazari Bustee	January 13, 2021, 9:24:12 pm	Short Circuit	The office of Sarada Mayer Bari, the residence of Sarada Devi, was severely damaged; 40 families whose houses have been gutted in the fire.

Source: Web References



Plate 7.a: Some Devastating Fires in Slums of Kolkata – 2010 to 2020

Source- <https://www.indiatoday.in/india/story/kolkata-slum-fire--huts-burnt-1739790-2020-11-10>

7.3 Background of Slum and Resilience Planning Study

There is a dearth of research on disaster resilience in slums, specifically regarding the potential hazards of fire. The significance of social networks within slums and their linkages to external organizations cannot be overstated in the process of rehabilitating and reorganizing a slum area in the aftermath of a calamity (Islam and Walkerden, 2014). Resilience is defined as the ability to withstand, assimilate, react to, and recuperate from the effects of adversity. According to Cutter, Burton, and Emrich (2010), disaster resilience comprises five distinct components: social, economic, institutional, infrastructural, and community capital. The social and communal aspects hold great significance in slum areas. Frequently, the capacity of governmental infrastructure to

manage fire disasters is constrained, particularly in slum areas where access is hindered by narrow thoroughfares. Consequently, it is imperative for the community to proactively engage in mitigating the risks posed by potential fire hazards. Cohen et. al. (2013) posits that disaster preparedness is contingent upon the presence of community resilience. According to Arup (2018), communities that are resilient to fire are capable of withstanding, reacting to, and recuperating from significant fire incidents, thereby contributing to the general welfare and sustainable development of their residents.

The topic of investigation is the vulnerability of Kolkata and its urban areas to fire incidents for the past decade. The city of Kolkata lacked a formal plan for its development. The city has been severely impacted by fires. Fire safety-based hazard-specific structural design concepts and safety measures are infrequently utilized by hospitals, companies, and residential buildings. The implementation of fire protection measures may not be prioritized in informal settlements such as slums and informal markets. The concept of resilience necessitates the acceptance of risk, minimization of consequences, and prompt recovery. The present study aims to investigate fire incidents in Kolkata and analyze the impact of resilience. Acquiring knowledge regarding the fire resilience of a city could facilitate the establishment of novel laws and regulations, as well as enable prospective research on the fire resilience of comparable cities.

Purkait et. al. (2016). The author's work pertains to the occurrence of fire accidents in the vicinity of slum neighborhoods located in Kolkata. A fire incident occurred in Kolkata. This study examines the phenomenon of slums, with a specific focus on the Ultodanga Basanti Colony and Tangra Slum. The causes and effects of these slums are analyzed and potential mitigation techniques are explored. The present study investigated fires that occur in slum areas. 50 samples were obtained from the two slums through questionnaires, simple random sampling, and in-person interviews. The aforementioned data underwent scrutiny and were presented utilizing various statistical techniques. The investigations conducted were able to identify the sources of fire and the potential consequences that may arise as a result. The present article examines the factors contributing to fire accidents and potential strategies for their prevention and control.

According to Mondal et al. (2019), urban fire is a prevalent and perilous human-induced hazard that results in substantial damage to property and loss of life. However, the authors suggest that it is preventable. The prevalence of such a phenomenon is often observed in urban areas characterized by high population density and lack of proper planning. Since

the era of colonialism, the subject of study has undergone uncontrolled expansion, excessive population growth, and a lack of planning. Fire prevention is frequently integrated with environmental conservation, management of riparian zones, preservation of aesthetic values, and protection of historical monuments in urban areas by fire managers. The intricate land utilization patterns in Kolkata give rise to a potential fire hazard throughout the Kolkata Municipal Corporation (KMC) region, particularly in areas with high population density. Based on statistical data gathered over the previous decade, there has been a significant increase in the number of KMC fires resulting in substantial property damage and fatalities. The implementation of a comprehensive fire control system is imperative in urban settings. The application of contemporary geomatics technology has the potential to aid in the management of fire hazards. The application of geomatics has the potential to mitigate fire hazards within the KMC region.

Mbiggo et al. (2018) reported that UN-HABITAT has estimated the number of individuals residing in slums in developing urban areas to be nearly one billion. The annual growth rate of sub-Saharan Africa is recorded to be 5 percent, which is twice the growth rate of Latin America and Asia, resulting in a total of 187 million people living in slums. Kampala, the capital city of Uganda, is dependent on slums as a means of providing affordable housing. According to the Uganda Bureau of Statistics (UBOS), a significant percentage of Kampala's populace, specifically 60 percent, resides in slum areas. For the past ten years, municipal authorities in Kampala have encountered difficulties in addressing the issue of fire hazards in the city's slums. The present study assesses the efficacy of fire safety measures in slums and proposes potential enhancements. The research revealed that the most commonly occurring household size comprised one room accommodating three to five individuals. Ninety-four percent of the participants reported utilizing charcoal as a cooking fuel either indoors or on their verandas. Furthermore, inadequate cable connections were identified as the primary cause of the majority of fires in impoverished urban areas. The findings of this study propose that constructing edifices with a minimum distance of 1 meter between them can effectively mitigate the propagation of fire from its origin to adjacent constructions. It is recommended that the fire department employ backpack bikes equipped with firefighting apparatus to access remote slum regions that are inaccessible to fire engines.

This chapter's primary objective is to ascertain the level of preparedness of slum residents in mitigating fire incidents. Additionally, the study aims to identify strategies for

minimizing property damage and saving lives in the event of a fire outbreak which fulfills the main objective.

The investigation will also encompass an examination of the significance of community engagement and disaster management planning in mitigating the tragedy. This study aimed to investigate strategies for managing novel or unforeseen hazards, such as the Amphan super cyclone and COVID-19, and to explore potential approaches for implementing safety measures and preparedness techniques in the future.

The study's fundamental objectives were met by procuring secondary information and data from various sources, including archives of multiple newspaper offices, the Kolkata Municipal Corporation, Borough offices, and Ward offices 32, 66, and 80. The research commenced by evaluating the susceptibility of slums to fire hazards, taking into account factors such as proximity to the closest water source, availability of emergency exits, the average distance from the nearest fire brigade, inaccessibility of roads during a fire, and the quality of electrical wiring. A Vulnerability Index Map was developed to assess the level of vulnerability in the slums of Kolkata, with a focus on key variables that contribute to effective fire management. The data about the aforementioned subject matter was procured from a survey report that delved into the likelihood of fire hazards within the KMC Slum Area (KMC, 2018a).

Three informal settlements situated in a high vulnerability zone, characterized by diverse ethnic compositions, were selected for a comprehensive investigation (Map 7.2-7.7). The primary data was collected through home surveys, interviews with key informants, and extensive observation. The utilization of focus group discussions was employed to enhance comprehension of social and communal involvement and resilience in the context of fire hazards.

7.4 Study Area

Here, three slums have been selected to determine the fire hazard proneness based on inclusion status. One of the slums is an unregistered slum, another is a registered slum, and the third is a metamorphic slum, which was formerly an unregistered slum but has since become a registered one. A diversified modification in the presence of fire hazards has been demonstrated by this final selected slum, which has become a pioneer for other slums throughout Kolkata. Here all three slums have been discussed below. The Brace Bridge Slum is situated in Borough No. 9, Ward No. 80, adjacent to the eastern side of

Brace Bridge Railway Station, within the geographical coordinates of 22°31'3.95"N, 88°18'9.36"E, and 22°31'7.92"N, 88°17'58.18"E (specifically, platform number 2). The area designated as a slum encompasses a land area of 11700 square meters and accommodates 350 households, comprising a collective populace of 1827 individuals. According to KMC's report in 2011, the predominant religious affiliation of the inhabitants of this area is Hindu. This slum is registered. The geographical coordinates of Topsia Slum are situated within Borough 7, Ward 66, spanning from 22°32'8.84"N, 88°23'34.75"E to 22°32'21.85"N, 88°23'17.31"E. The aforementioned site is situated near Baitul Muazam Masjid, towards Topsia, specifically the 4-no. bridge connecting the main road. It is also positioned east of Bagh e Madina, along the canal that runs between Dr. B. N Dey Road in the north and Gulam Jelani Khan Road in the south. The aforementioned urban area encompasses a total of 8901 square meters and accommodates 165 households, which collectively harbor a populace of 667 individuals. According to KMC's report in 2011, the predominant population of the area consists of individuals who practice the Islamic faith. This slum is unregistered. Basanti Colony is situated within the geographical boundaries of Ward 32, which is a constituent of Borough 3. The geographical location is represented by the coordinates of 22° 35' 40" N latitude and 88° 23' 32" E longitude. The area is demarcated in the northern direction by the Canal Circle Road, in the southern direction by the Ultodanga main road, and in the western and eastern directions by the Bidhannagar Railway Station (platform no. 4) and the Bidhannagar Station road, respectively. The total population of the slum is 2012 individuals, comprising 687 males, 599 females, and 816 children. The slum is home to a total of 653 families. The aggregate expanse of the slum is 4506.80 square meters. Before 2012, this particular area was classified as an unregistered slum. However, following a series of fire hazards, the government took action to improve the living conditions by upgrading the kaccha households to pucca households and officially registering the area as a slum.

The sample size for the study is based on 10% of the total population, selected through random sampling. For Brace Bridge Slum, the total population is 1,827, with a sampled population of 183; for Topsia Slum, the total population is 667, with a sampled population of 67; and for Basanti Colony Slum, the total population is 2,001, with a sampled population of 200.

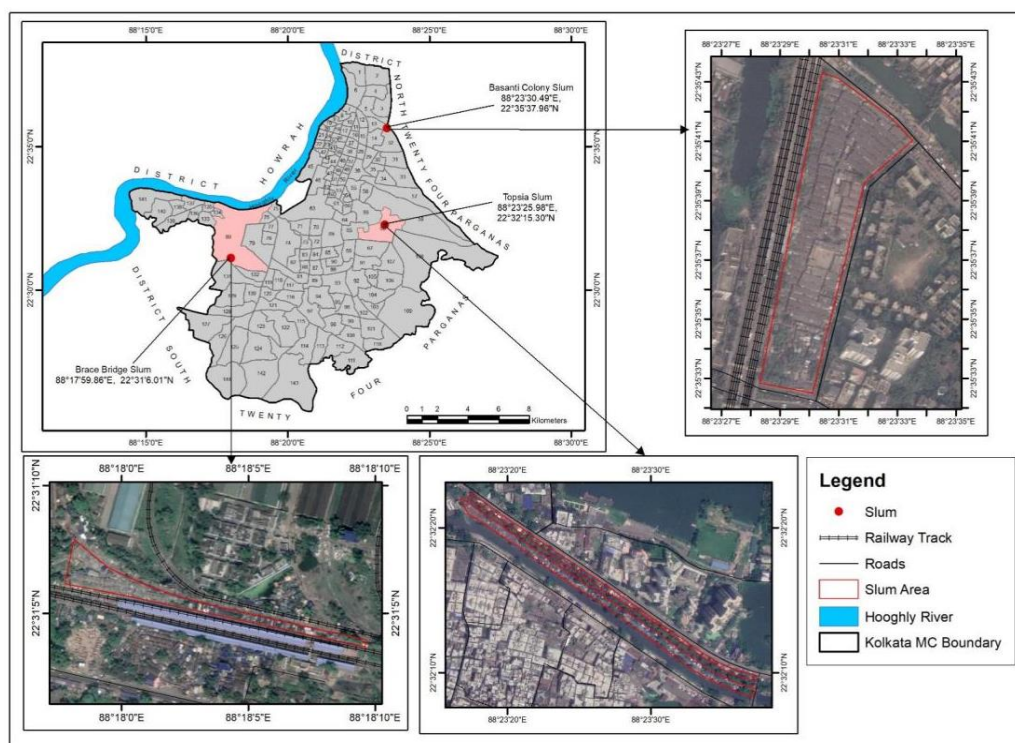


Figure 7.1: Location map of Brace Bridge Railway Slum (Registered Slum), Topsia Slum (Unregistered Slum), and Basanti Colony Slum (Transformation from Unregistered to Registered Slum)

Source: Prepared by the author

7.5 Fire Risk and Vulnerability Assessment of Kolkata

The issue of fire is a persistent concern for residents of slums. Fires can arise from a variety of sources, including electrical malfunctions, ignition of firewood, detonation of firecrackers, rupture of gas cylinders, and other factors. These fires have the potential to rapidly propagate and inflict significant damage upon densely populated residences constructed from flammable materials. Arson is occasionally utilized as a deliberate tactic to displace individuals residing in impoverished urban areas. The subject matter is intellectually stimulating.

According to the data presented in Table 7.1, a significant proportion of fires in Kolkata have occurred during the winter season, which can be attributed to the practice of burning materials for heating purposes during this time of the year. Homes situated in slum areas are often devoid of adequate fire preparedness measures and resources, rendering them highly susceptible to conflagrations that result in significant losses.

7.6 Fire Hazard Vulnerability Measures in Slums

The following Fig. 7.2-7.6 were generated utilizing the five variables. Fig. 7.2 demonstrates that the majority of slums possess water resources within a distance of 240 meters or 0.24 km, which can be utilized for extinguishing fires. The colonial slums

situated in the northern region of Kolkata are equipped with emergency exits, while their counterparts in the southern region lack such provisions (Fig. 7.3). The majority of these impoverished urban areas were constructed to accommodate refugees during the post-independence era. They were characterized by a lack of planning, as they emerged spontaneously in any available vacant space.

The mean proximity to the subsequent fire station is comparatively lower in the central slums of the city, while it exhibits a range of 240 to 480 meters in other localities (Fig. 7.4). The primary obstacle in this context arises from the issue of traffic congestion. Fire trucks are required to traverse narrow alleys within the impoverished neighborhoods of North Kolkata, as depicted in Fig. 7.5, about the aspect of accessibility. The act of connecting electrical wires, which often leads to the occurrence of fire, is a prevalent practice in the majority of slums located in Kolkata (Fig. 7.6).

The aforementioned variables were employed in the production of the Vulnerability Index cartographic representation. Initially, the variables were evaluated individually, followed by the development of a composite index utilizing the weighted ranking system to illustrate the degree of susceptibility (Fig. 7.7). The vulnerability levels in the slums, except for the city center, exhibit a range from moderate to high. The Topsia Slum located in Ward No. 66 and the Brace Bridge Slum situated in Ward No. 80 were selected for a comprehensive analysis owing to their location within the high vulnerability index zone.

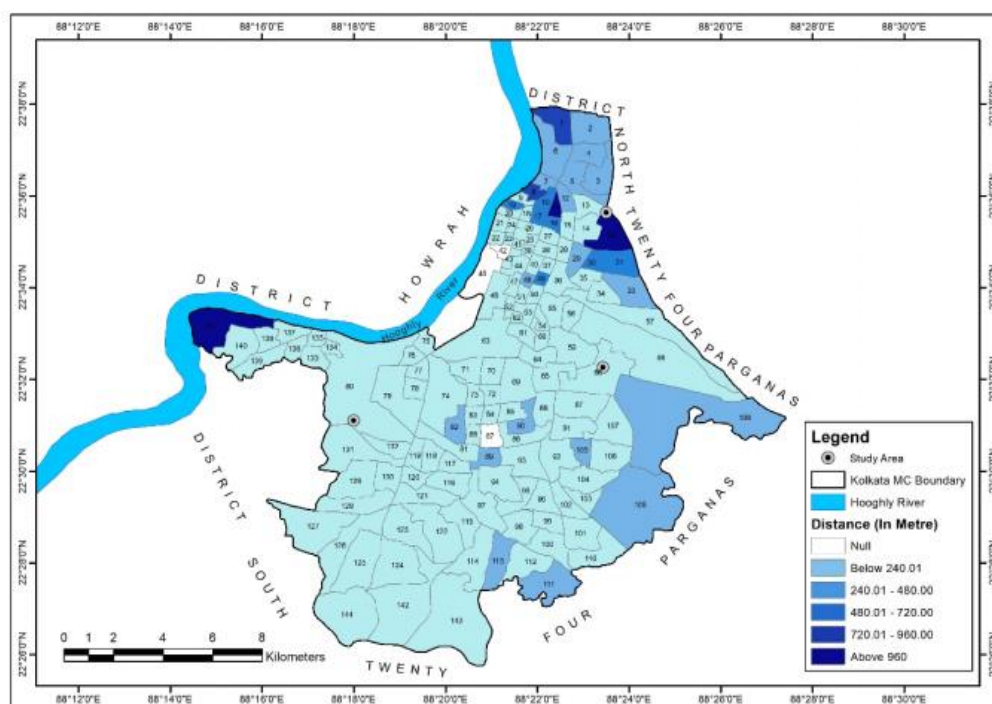


Figure-7.2: Nearness to the Water Source, Kolkata Municipal Corporation

Data Source: KMC, 2021a

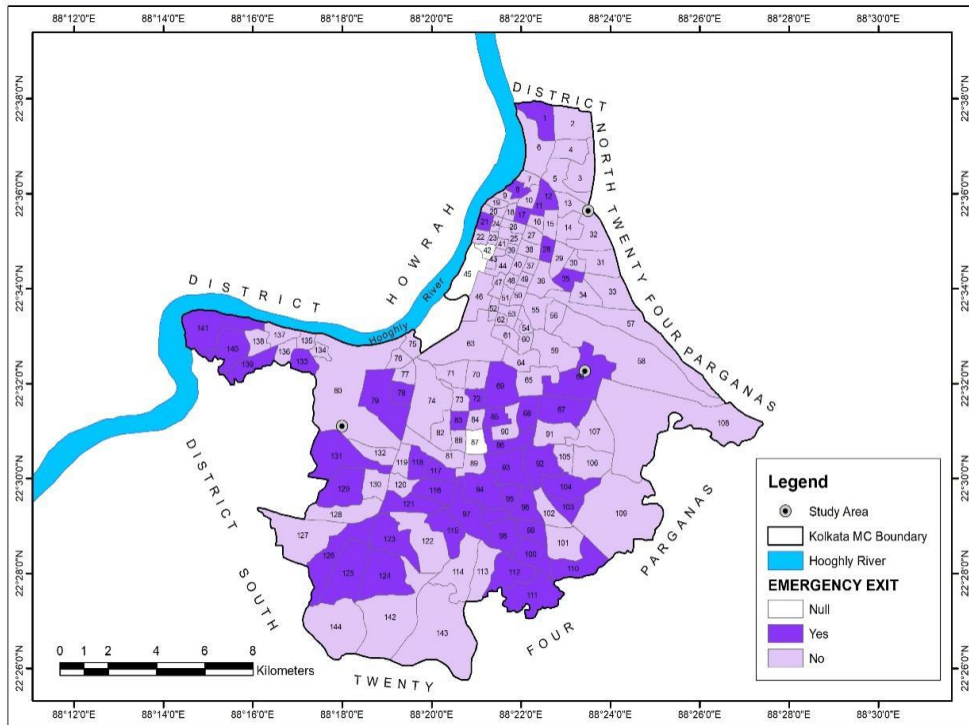


Figure 7.3: Presence of Emergency Exit, Kolkata Municipal Corporation

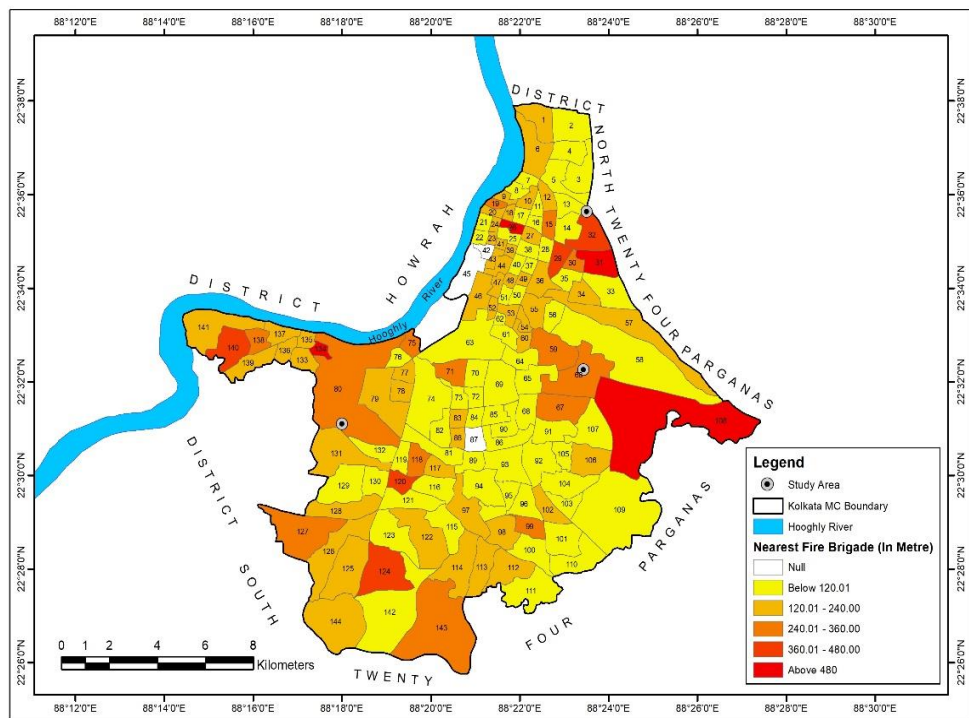


Figure 7.4: Average Distance from the Nearest Fire Brigade, Kolkata Municipal Corporation

Data Source: KMC, 2021a

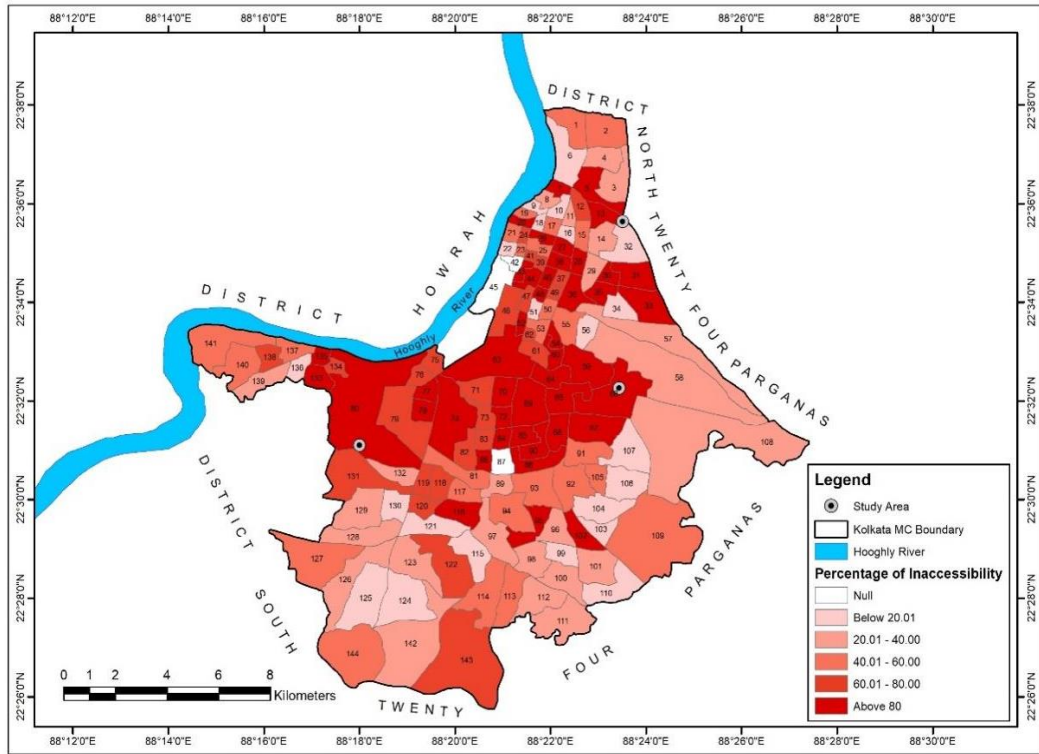


Figure 7.5: Road Inaccessibility During Fire Hazard, Kolkata Municipal Corporation

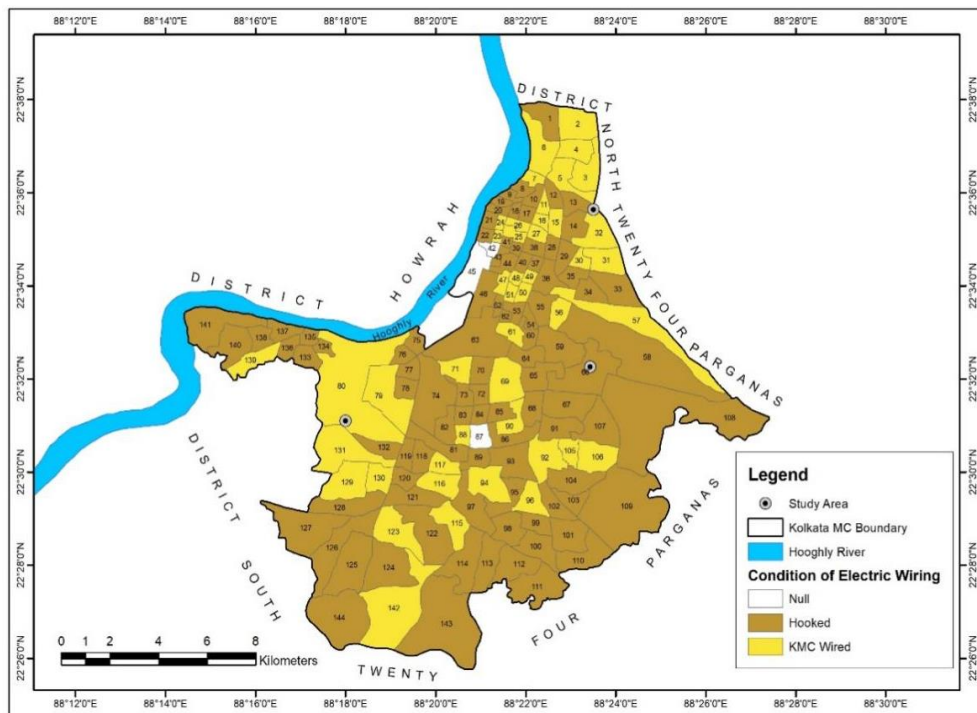


Figure 7.6: Condition of electric wiring, Kolkata Municipal Corporation

Data Source: KMC, 2021a

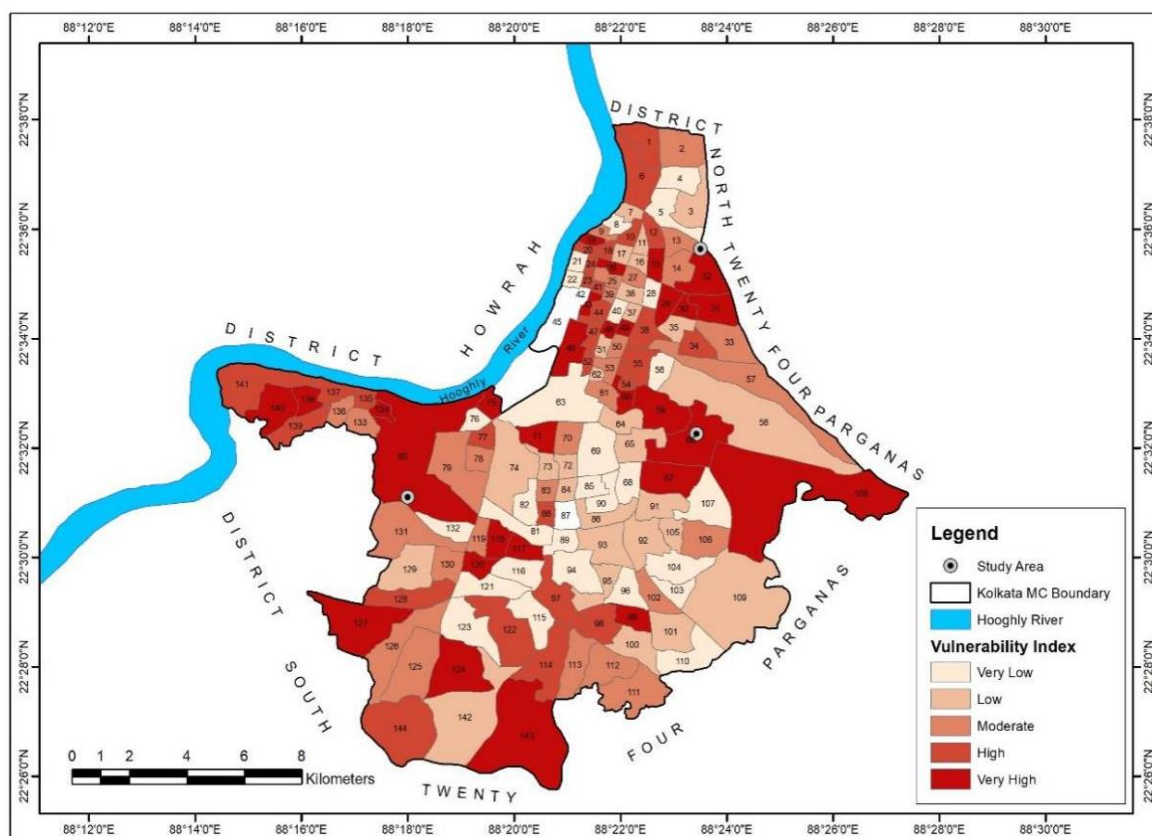


Figure 7.7: Vulnerability Index of Slum, Kolkata Municipal Corporation

Source: Prepared by Researcher

7.7 Brace Bridge Railway Slum

A high population density characterizes the Brace Bridge a registered Slum in Kolkata. The informal settlement is situated adjacent to the second railway station of Brace Bridge. A conflagration of significant magnitude occurred in the year 2016. Despite numerous sources and news reports asserting that the cause of the fire remains unknown, the findings of the focus group discussion conducted during the primary survey indicate that it was a deliberate act of arson motivated by political goals. The veracity of this claim was ascertained upon completion of the survey, which revealed that the fire was not sustained, but rather confined to specific locations. Based on empirical evidence gathered from the field, it can be inferred that the conflagration was intentionally initiated from several points along the periphery of the slum. If the fire had been accidental, it would have persisted without interruption. The issue of overcrowding and congestion resulted in the displacement of 600 individuals who were rendered homeless overnight, and several individuals sustained injuries.

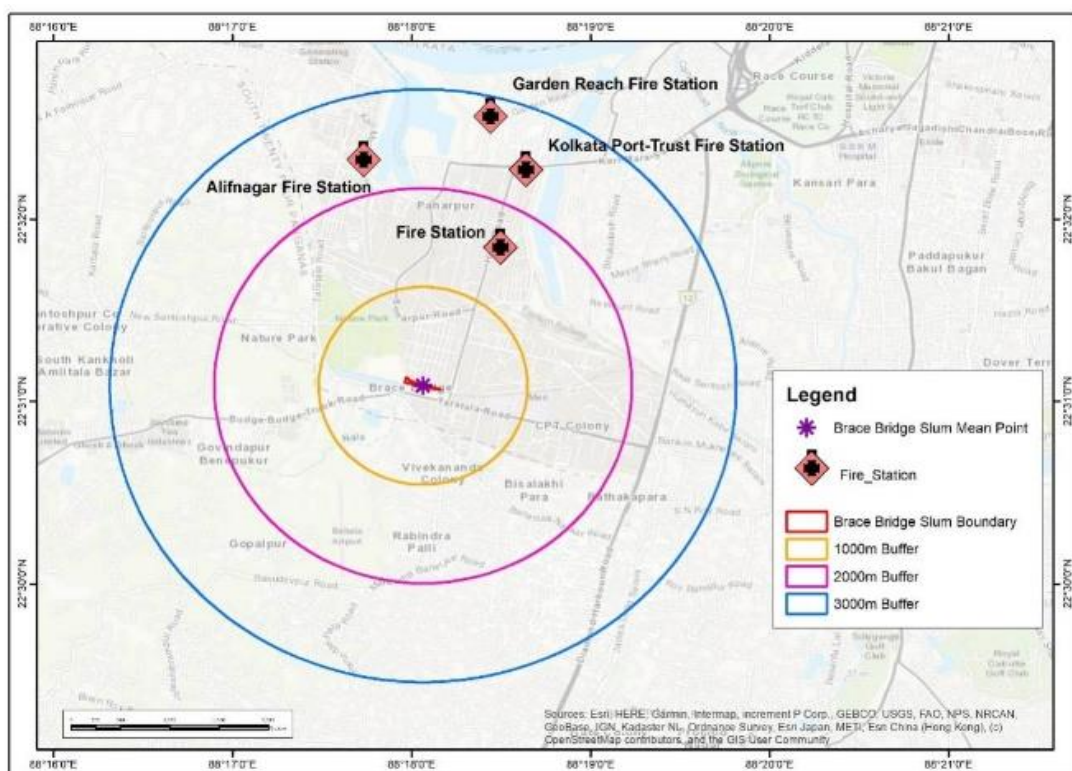


Figure 7.8: Accessible Fire Stations Near the Brace Bridge Railway Slum

Source- Prepared by Researcher

They were incapable of escaping rapidly. For two months, the government provided sustenance to the affected individuals, who subsequently reconstructed their makeshift dwellings. However, it was evident that certain areas of the impoverished neighborhoods remained unoccupied and had been subjected to fire damage. According to Arpita Mondal, an inhabitant of the slum, the location of the slum is on a property that was purchased from the Railways. It is worth noting that attempts to relocate the slum have been made several times in the past, before the year 2016. The year 2016 can be deemed as a prosperous undertaking. Over the following two months, the government provided food donations to the affected individuals, who then proceeded to reconstruct their shanties. However, it is worth noting that certain sections of the slum remained unoccupied and were subject to fire damage. According to Arpita Mondal, a resident of a slum area, the locality is located on a piece of land that was acquired from the railroads. As a result, there have been several attempts to demolish the slum, not just in 2016 but on multiple occasions. In due course, the year 2016 proved to be a fruitful undertaking. The proximity of a train line poses a significant challenge for this particular slum. During this interim period, the danger level significantly escalates in the event of a passing train. The fire station that oversees the area in question, as depicted in Fig. 7.8, does not have jurisdiction over it. The dockyard fire

station is only utilized as a secondary option. In response to this emergency, the community has established two small water reservoirs within a 25-meter radius of the slum, as illustrated in Fig. 7.9, through a collaborative effort. Thus far, there has been no indication of a potential fire hazard.

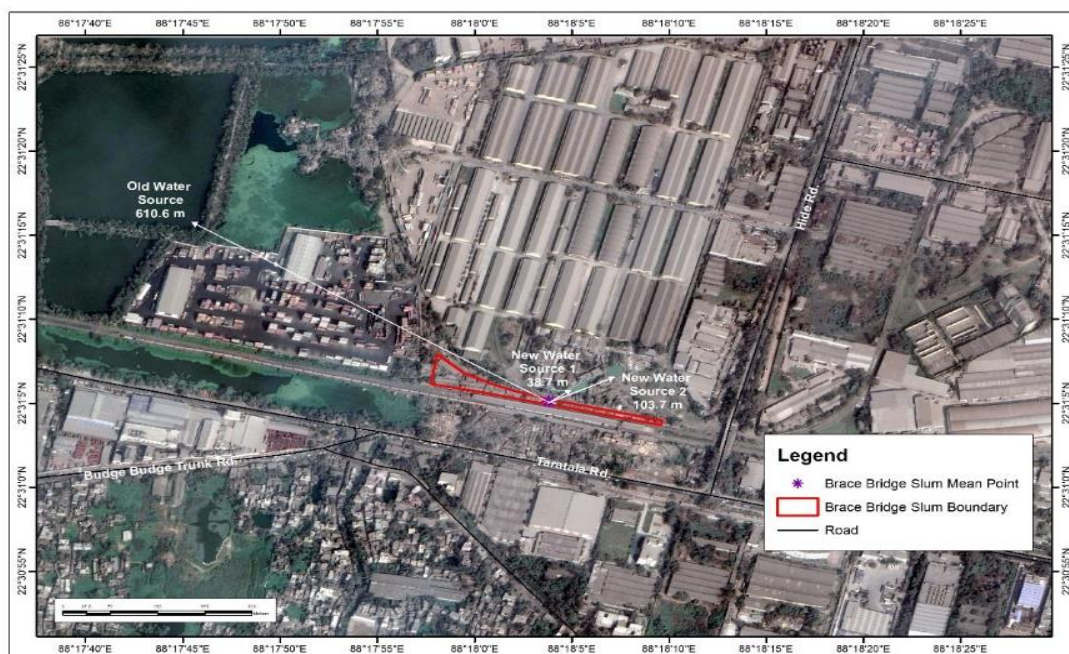


Figure 7.9: An Artificial Source of Water, Created by Slum Community to Combat Fire Vulnerability
 Source- Prepared by the Researcher

7.8 The Topsia Slum

The Topsia unregistered slum, situated adjacent to prosperous commercial establishments along the EM bypass and near a small canal, is among the densely populated slums in Kolkata. Notwithstanding its adjacency to the canal, the conflagration that engulfed this locality on November 10, 2020, rapidly propagated throughout the slum from a relatively minor ignition source in a time frame of under five minutes. Based on the findings of a focus group and primary survey, it has been determined that the conflagration originated from three distinct oil facilities (Fig. 7.10). The ignition of an oil facility was attributed to an electrical short circuit, which resulted in the rapid propagation of flames throughout the surrounding slum area due to the combustible nature of the oil. During a single night, approximately 110 households comprising a total of more than 400 individuals were rendered without a permanent place of residence.

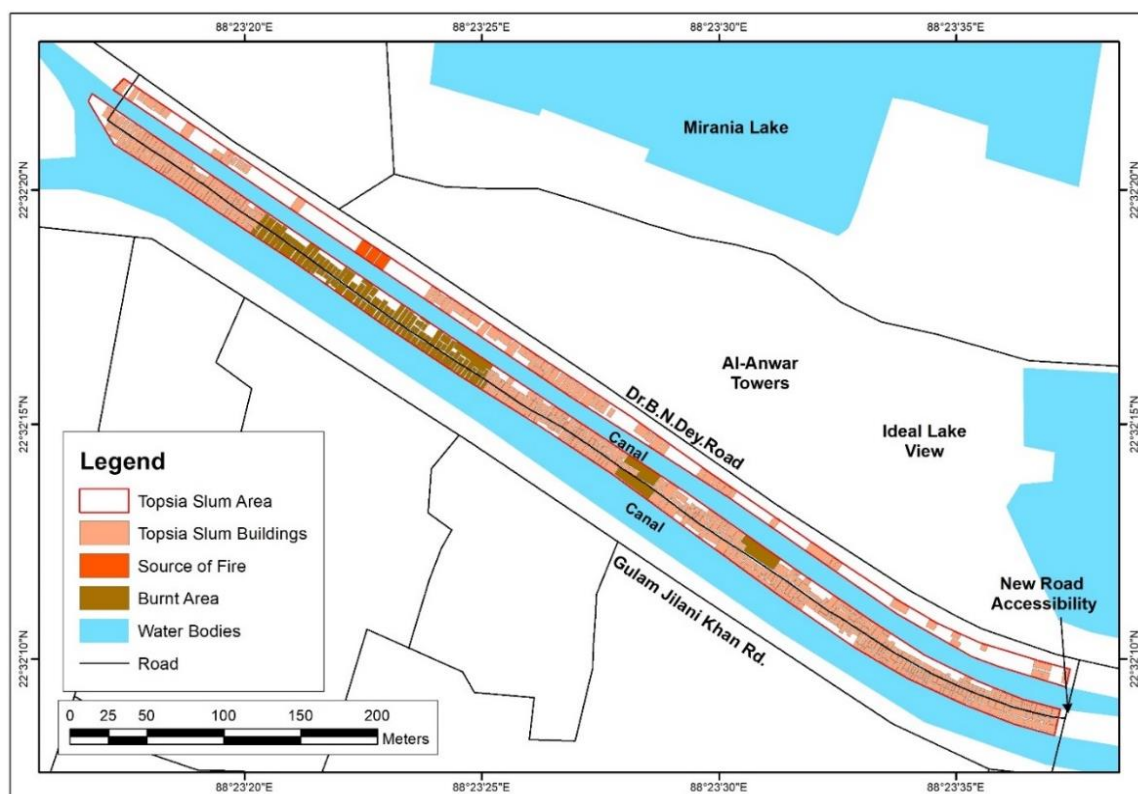


Figure 7.10: Showing Fire Incident Sources and Present Slum Planning of Topsia Slum

Source- Prepared by Researcher

Although no injuries were documented, the properties in question were completely decimated. Around 10 to 15 individuals sustained injuries as a consequence of the incident. The conflagration destroyed slum areas. After this incident, elected representatives of the municipal government paid a visit to the impoverished area and endeavored to furnish the inhabitants with necessities such as sustenance and apparel. In addition, the homeless were provided with supplementary essentials, including tarps, referred to as 'Tripol' in English, and a single economic compensation of Rs. 15,000. Nonetheless, the provision of treatment was discontinued after one month, and the commitment to reconstruct their residences remains unfulfilled as of the conclusion of December 2020. According to Tabiza Rahman, the occurrence of this type of fire hazard is not unprecedented in the slum. Before this incident, the slum experienced several fire mishaps in the years 2003, 2007, and 2012. However, no significant measures were taken in response to these incidents until now (Table 7.2).

Table 7.2: History of Topsia Slum Fire Hazard

SI Number	Year	Cause	Property lost	Casualties
1	2003	Firewood	Almost 40 hutments were burnt	2 died, and 16 injured
2	2007	Short circuit	56 hutments and 10 shops were burnt	No casualties, 9 injured
3	2012	Cooking wood	25-30 hutments and 3 shops burnt	No casualties, 12 injuries

Source: Compiled from Various Newspapers, TOI, AP, CNN, Telegraph, E Bela, Primary survey

The distance between the slum and Pragati Maidan's fire station is approximately one kilometer, equivalent to 657.99 meters. The susceptibility of this particular slum is primarily attributed to its congested nature, with a mere half-meter gap between adjacent dwellings, and inadequate infrastructure in terms of road connectivity and emergency egress during hazardous situations. During the winter, the region is intermittently warmed through cooking and burning of wood. Due to the limited availability of road channels within the slum, the inhabitants are faced with the challenge of safely evacuating the area in the event of a fire. Subsequently, with the aid of the state government, the construction of the second Calvert Bridge was undertaken to mitigate the hazardous possibility of an unforeseen event (Fig. 7.10)

7.9 The Basanti Colony

The Basanti colony, situated adjacent to Bidhannagar platform number 4, was not officially registered until the year 2014. During the period spanning from 2001 to 2013, this colony was frequently cited for fire hazards. Notably, two severe fire incidents occurred in 2010 and 2013, respectively (Table 7.3).

Table 7.3: History of Basanti Colony Slum, Ultodanga Fire Hazard

SI Number	Year	Cause	Property lost	Casualties
1	January 13, 2010 1.18 pm, Tuesday afternoon	Short circuit	Around 2000 people became homeless, and 500-600 shanties were demolished completely	30 people were injured and 1 casualty was reported
2	January 26, 2013 5 a.m.	Firewood	150-180 shanties were demolished	6 people were injured, and no casualties reported so far

Source: Compiled from Various Newspapers, TOI, AP, CNN, Telegraph, E Bela, Primary survey

According to S.K. Purkait et al., in 2010, a total of twenty-six fire tenders were deployed to the site of a fire for two hours. The flames, which reached a height of 35 feet, were successfully contained just before they could spread to the neighboring P&T Colony and Reserve Bank of India quarters. The demise of Shyamal Sardar, a 25-year-old van rickshaw operator, occurred due to a fire that was presumably initiated by a short circuit. The fire was further exacerbated by the presence of kata tel and country spirits outlets in the Ultodanga slum. The BC Roy Hawkers Corner Market located nearby was also subjected to destruction. As reported by local inhabitants, the conflagration commenced at approximately 12:30 pm and rapidly propagated to encompass the entire populace, spanning a region of 1,500 meters by 500 meters (S.k Purkait et.al.). Following a collaborative two-hour endeavor between the fire department and local inhabitants, the conflagration was successfully contained albeit resulting in destruction. In the year 2013, a significant conflagration occurred in a pile of firewood, which was further intensified by a burst of LPG. Similar to the previous occurrence, community members were compelled to combat the blaze for the initial two hours due to the tardiness of the fire department. By the time the fire engines arrived, Maximum Shanties had been destroyed. The conflagration had already engulfed the adjacent marketplace and the edifice of the upper echelon. Following a strenuous struggle lasting two hours, a contingent of 22 fire engines arrived from the proximate fire station at Maniktala, ultimately quelling the flames after three hours. Subsequently, in 2014, the state government-initiated measures to register the unregistered slum and provide all necessary governmental services. As a result, the Basanti colony transformed and was upgraded to a pucca settlement from 2016 onwards, to prevent recurrent fire tragedies. Various measures were implemented to mitigate the risk of fire hazards in the slum area. These included the substitution of cooking wood with LPG and the preference for in-house cooking over roadside cooking. Additionally, the slum was planned with a minimum gap of one meter, as per the 2016 KMC Report, to facilitate safe evacuation in the event of a fire outbreak.

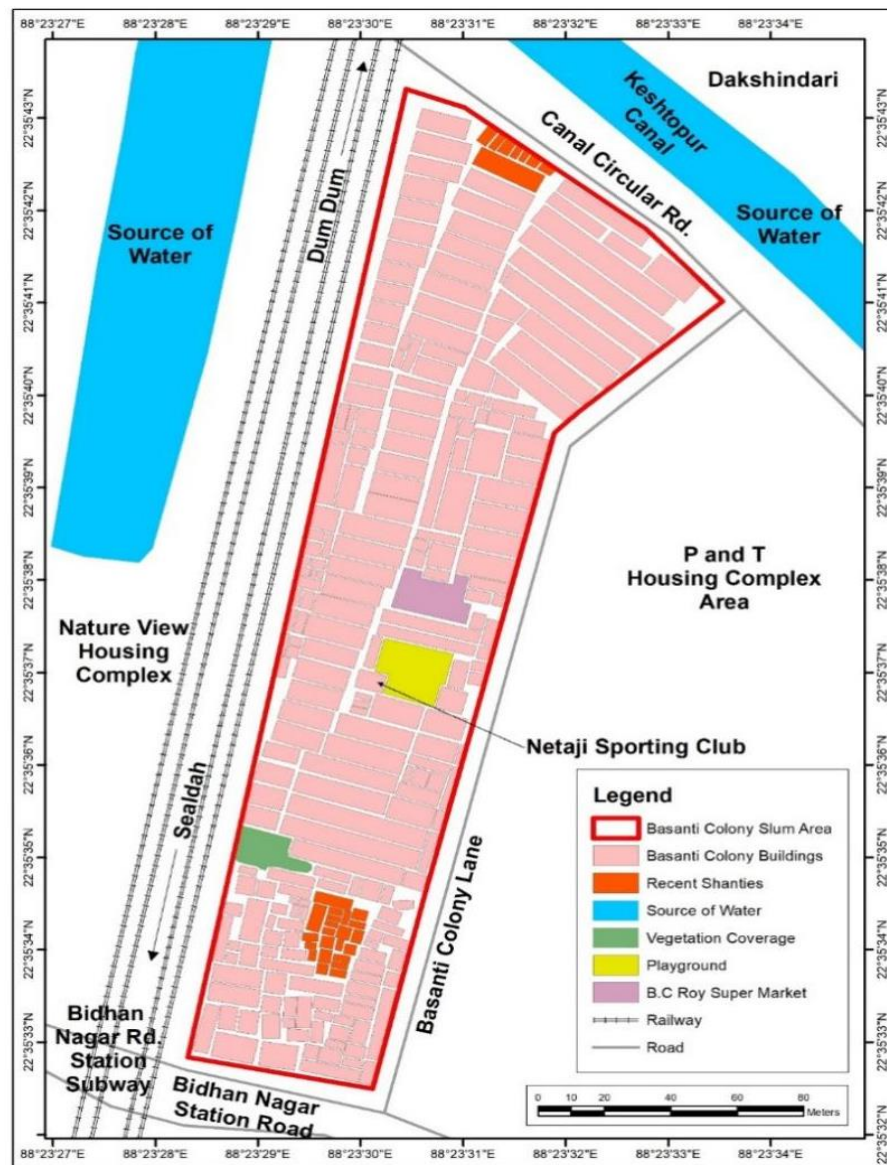


Figure 7.11: Slum Morphology of Basanti Colony, Ultodanga

Source- Prepared by Researcher

7.10 Analysis of Fire Hazard Controlling Parameters

Tables 7.4 to 7.6 were utilized to calculate the Composite Index for the Absolute Fire Hazard controlling parameter, the Composite Index for the Average Fire Hazard controlling parameter, and the Living condition composite Index. This was done to assess the level of fire resistance in the chosen slums. The parameters considered for controlling fire hazards include proximity to water sources in meters, availability of emergency exits, distance from the nearest fire brigade in meters, inaccessibility of roads during fire hazards, and the status of electricity. The aforementioned five parameters are assessed through two distinct approaches: absolute and relative. The controlling parameter for managing the fire hazard in this scenario is the absolute distance to the closest water source

and fire brigade, measured in meters. Other factors that are taken into account include the availability of emergency exits, the accessibility of roads during a fire hazard, and the condition of the electricity infrastructure in the slum area. In contrast, the parameters for controlling Average Fire Hazard determine the average distance and presence of all parameters, not solely those of the selected slums, but rather all slums within the given ward. This approach provides a more comprehensive understanding of the situation. The parameters of Roof Type, House Type, Distance Between Two House, House Holds with Inhouse Kitchen (percent), and House Holds with LPG (percent) are considered in assessing the living conditions and composition of slums, as they are directly controllable factors for fire hazards.

Table 7.4: Absolute Fire Hazard Controlling Parameters

SI No	Name of the Slum	Absolute Nearness to the Water(meter)	Rank	Presence of Emergency Exit	Rank	Absolute Distance from nearest Fire Brigade (Meters)	Rank	Absolute Road Inaccessibility during Fire Hazard	Rank	Condition of Electricity	Rank	Composite Index of Fire Hazard	Avg C. I of Fire Hazard Controlling parameters
1	Brace Bridge Railway Station slum	792.84	4	NO	2	1614.74	3	88.90	3	Hooked	2	14	2.8
2	Topsia Slum	24.68	1	No	2	657.99	1	97.65	4	Hooked	2	10	2.0
3	Basanti Colony Slum	235.06	2	No	2	1095.07	2	45.65	2	KMC wired	1	9	1.8

Source- KMC, Civic Status, August 2022

Table 7.5: Average Fire Hazard Controlling Parameters

SI No	Name of the Slum	Avg. ward-wise Nearness to the Water(meter)	Rank	Avg ward-wise Presence of Emergency Exit	Rank	Average ward wise Distance from nearest Fire Brigade	Rank	Avg. Ward Wise Road Inaccessibility during Fire Hazard	Rank	Avg. Ward-wise Condition of Electricity	Rank	Composite Index of Fire Hazard	Avg C. I of Fire Hazard
1	Brace Bridge Railway Station slum	225	2	No	2	325	4	89.90	9	KMC wired	1	18	3.6
2	Topsia Slum	120	1	yes	1	285	3	95.65	10	Hooked	2	17	3.4
3	Basanti Colony Slum	1200	7	No	2	450	5	3.84	1	KMC wired	1	16	3.2

Source- KMC, Civic Status, August 2022

Table 7.6: Living Condition Composite Index

SI No	Name of the Slum	Roof Type	Rank	House Type	Rank	Distance Between Two House	Rank	HHs with Inhouse Kitchen (%)	Rank	HHs with LPG (%)	Rank	Composite Index of Living Conditions	Avg C.I of Living cond.
1	Brace Bridge Railway Station slum	Tali	1	Semi pucca	2	0.45	3	41.33	6	45.62	6	18	3.6
2	Topsia Slum	Tin	2	kuccha	3	0.21	4	10.12	9	4.36	10	28	5.6
3	Basanti Colony Slum	Tin	2	pucca	1	0.75	2	86.36	2	64.36	4	11	2.2

Source- Primary Survey, April,2022

A Composite Index with Rank has been computed to evaluate the fire-resilient capacity of the slums, utilizing the composite indexes of the three parameters mentioned above (Table 7.7). Upon combining the three parameters, it becomes apparent that the Brace Bridge Railway Station Slum exhibits the highest average absolute C. I of Fire Hazard Controlling parameters, while Basanti Colony Slum displays the lowest. Based on the average composite index of living conditions, the Topsia Slum exhibits the lowest quality of living conditions, while the Basanti Colony Slum demonstrates the highest quality of living conditions. Regarding the average fire hazard control, it can be concluded that Topsia Slum exhibits the lowest performance while Basanti Colony Slum demonstrates the highest level of proficiency. Based on the Ranking Composite Index and the aforementioned characteristics, it can be inferred that the Basanti Colony Slum exhibits the highest level of fire resistance, followed by the Brace Bridge Railway Station Slum, while the Topsia Slum poses the greatest risk (Table 7.7). Conversely, it could be argued that the Basanti colony represents an exemplary paradigm for such informal settlements, as it showcases the potential for a slum to evolve from an unregistered and highly susceptible state to a registered and fire-resistant one.

Table 7.7: Fire Resilience Composite Index

SI No	Name of the Slum	Avg Absolute C.I of Fire Hazard Controlling parameters	Avg C.I of Living cond.	Avg. Fire Hazard controlling parameter	Avg C. I of Fire resistant	Rank	Status
1	Topsia Slum	2.0	3.4	5.6	3.67	3	Underdeveloped
2	Brace Bridge Railway Station slum	2.8	3.6	3.6	3.33	2	Developing
3	Basanti Colony Slum	1.8	3.2	2.2	2.4	1	Developed

Source- Prepared by Researcher

7.11 Slum Dwellers' Preparedness During the Disaster in Brace Bridge Slum, Topsia Slum, and Basanti Colony

- A significant proportion of the residential structures succumbed to the fire within sixty minutes of its inception due to their construction with bamboo fragments and roofing made of tarpaulin or bamboo thatch, thereby facilitating the rapid propagation of the flames. Consequently, the inhabitants were obliged to establish their residence at the railway station, leading to an overabundance of individuals in a confined space and discord among them due to the absence of crucial amenities.
- The railway station had a singular communal lavatory that posed both unsanitary and unsafe conditions for female patrons. The conflagration completely consumed a significant portion of the family's possessions, including their apparel. Due to winter, there was a pressing requirement for blankets and apparel that provided warmth. Certain victims managed to procure some items from ordinary commuters aboard the trains at the railway station.
- Insufficient nourishment, especially among infants and young children. The frequent exposure of children to smoke emanating from flames in the region resulted in respiratory difficulties, leading to suffocation.
- The narrowness of the alleys and lanes that linked the slum areas was significant. The aforementioned circumstance impeded not only the capacity of the residents to expeditiously transfer to a more secure location but also the conduct of the individuals residing in the impoverished urban area during the calamitous event.
- The initial rescue endeavors were spearheaded by the residents of the impoverished urban areas. An endeavor was made to quell the propagation of the conflagration through the utilization of receptacles filled with water. The fire department was dispatched; however, its arrival was delayed by approximately one hour. In the interim, an estimated 300 residences were decimated. Amidst the inclement weather, individuals residing in impoverished urban areas gathered near the Brace Bridge railway station seeking shelter.
- The residents of Topsia Slum lacked access to adequate shelter and were compelled to reside in the open, relying on tarpaulins for protection. The individuals lacked

access to proper sanitation facilities and resorted to utilizing the adjacent open area in proximity to the canal for their excretory needs.

- The children residing in Topsia Slum have faced significant challenges in accessing adequate education. Due to the unfortunate incident of their educational materials being destroyed, they were unable to sit for their final examinations.

7.12 Problems Faced by Slum Dwellers Due to Fire

- The current huts constructed are relatively smaller in size when compared to their pre-accident counterparts. Consequently, there exists a deficit in both spatial capacity and privacy.
- On average, the width of the alley that separates two rows of dwellings is scarcely 0.5 meters. Consequently, the prevailing concern encompasses not only the matter of mobility but also that of asphyxiation and overcrowding. Moreover, there is no spatial gap between adjacent dwellings within a given row. Several newly constructed residences have been erected near drainage systems. Consequently, following intense precipitation, the accumulation of water in low-lying areas is a significant issue. Several health issues, such as cholera and gastrointestinal disorders, have arisen among the female and juvenile populations.
- The financial crisis has ensued due to the significant loss of property experienced by impoverished slum dwellers, who have not yet received any monetary assistance.
- A considerable proportion of the population's means of subsistence have been entirely impeded. The affected individuals have not been provided with any form of occupational instruction as a means of restoring their means of subsistence. The hazard has led to a significant number of families being compelled to discontinue their children's education.

7.13 Steps Taken by the Government and NGOs During the Disaster

- Approximately twenty firefighters engaged in a firefighting operation for a duration of five to six hours.
- A provisional structure made of bamboo poles was erected to provide refuge for the affected individuals.

- The victims were provided with sustenance from the government for two months, and Century Ply supplied them with potable water.
- Emergency medical technicians were dispatched to the impacted location to administer initial medical treatment to individuals who had incurred minor burns and blisters.

7.14 Post-Disaster Preventive Measures

- Several shelters were constructed to rehabilitate individuals affected by a fire incident. These shelters were subsequently transferred to the beneficiaries after four months, specifically in May of the year 2016. Sanitary amenities have been provided to the dissatisfied inhabitants.
- In the aftermath of the calamity, power supply was reinstated and public lighting infrastructure was erected, while select households received provisions such as garments and culinary utensils.

7.15 The Resilience of Slum Dwellers to Fire Accidents

To enhance the resilience of slums, it is imperative to engage in future planning efforts that address not only fire hazards but also the challenges posed by COVID-19 and Amphan. Several measures can be implemented to mitigate the issue, including:

- Recreating water sources near the slum may aid in mitigating the detrimental impact of the hazard.
- To mitigate the impact, certain basic measures can be taken, such as ensuring proper preservation of kerosene oil or firewood storage or transitioning to less harmful cooking oils.
- The primary fuel for combustion in fires is typically the slum wall, which is commonly constructed using wood, whereas the roof of the edifice is frequently coated with plastic. Consequently, the Pradhan Mantri Awas Yojna and state government housing loans can facilitate the conversion of kaccha dwellings into pucca houses.
- In instances where slums are situated at a considerable distance from the nearest fire station, it is recommended that a fire operation or a fire officer equipped with

basic equipment be dispatched with the aid of the nearest ward officer to expedite the process.

- To mitigate potential disasters, it is recommended that organizations conduct regular inspections of their electrical wire connections.
- The current width of roads between slums is inadequate and should be expanded. In numerous instances, the intermediate road between slums measures less than one meter in width, which poses a significant risk to public safety in the event of a fire or accident due to limited space. In the majority of cases, slums lack viable escape routes, thereby exacerbating the loss of both human life and property.
- The internal configuration of the impoverished urban area serves as a further indication of destitution. While limited options exist for improving the interior, governmental aid could potentially provide fire alarms as a means of increasing residents' preparedness for potential fires.
- Efficient measures, such as ensuring an ample supply of sand and providing fire extinguishers sponsored by the government, ought to be implemented in a manner that is conducive to the needs of slum dwellers, to ensure prompt response in the event of a fire outbreak.

Finally, individuals must exercise mindfulness and promptly seek assistance in the event of a fire emergency.

7.16 SWOC/ SWOT Analysis

A SWOC/SWOT analysis was conducted in the slums to examine the impact of ethnic status on community participation and its contribution to resilience building.

Table 7.8: SWOC/ SWOT Analysis

Slum Name	Parameter- Strength
Brace Bridge Railway Slum	<ul style="list-style-type: none"> • The slum in question benefits from favorable road access and connectivity, as it is situated near a well-maintained metaled road and is also linked to the EM Bypass. • Amidst the crisis, there was a significant level of community engagement. The Topsia Maulana Azad Sporting Club is near a neighboring slum, with a distance of only 10 meters. Other sporting clubs in the vicinity include the Topsia Boys Slum Club, which is situated within a 500-meter radius, the Jugni Sporting Club, which is located 300 meters away, and the Topsia Azad Sporting Club, which is situated within a 300-meter radius at a distance of 1 kilometer. All individuals participated in fire and personnel management. • This particular site is near a water source. The canal traverses solely through the area designated as a slum, which is encompassed by other areas also classified as slums.
Topsia Slum	<ul style="list-style-type: none"> • This particular slum exhibits a larger and more spacious layout due to its proximity to the railway station and adjacent railway car shed. Consequently, the simplification of transport during disasters yields benefits to the aforementioned slum. • The extent of community involvement in times of calamity is restricted, as the only local organization within a radius of 1 kilometer, namely Yuvasakti, solely rendered assistance in the aftermath of the catastrophe through provisioning food supplies. • The accessibility of railway lines is notable, as there are tracks that connect Ballygunge (up) and Budge Budge within a proximity of 10 meters (Down).

Slum Name	Parameter- Strength
Basanti Colony	<ul style="list-style-type: none"> • The state government's provision of aid was noteworthy, as it involved utilizing government funds to construct affordable housing complexes for individuals residing in slums, thereby preventing their displacement. • Amidst the crisis, there was a significant degree of community involvement. The B.C. Roy market area witnessed a significant event where an auto puller and a rickshaw puller, along with members of the neighboring community, were actively engaged in responding to a fire outbreak. Their efforts were focused on notifying the fire department, extinguishing the flames, and evacuating individuals and objects from the affected shanties, including women and children. In addition, the Nataji Sporting Club (Ultodanga), situated in the slum area, has consistently demonstrated exceptional management in its endeavors to quell fire outbreaks. • This location is in proximity to a water source, with one conduit situated adjacent to the canal's embankment and an additional water supply system positioned above the railway channel, which could be employed in case of an urgent situation.

Table 7.8 (a): Strength Analysis -SWOC/SWOT

Slum Name	Parameter- Weakness
Brace Bridge Railway Slum	<ul style="list-style-type: none"> • The spatial predicament had a significant influence on the nation. The distance separating the two houses is below 0.5 meters. • The proximity of the nearest fire station is relatively distant, as it is situated at a distance of 5.9 miles. • The absence of an emergency egress point.
Topsia Slum	<ul style="list-style-type: none"> • The closest water source to this impoverished urban settlement is situated at a distance exceeding 5 kilometers. • The acquisition of land by the railway company has resulted in the preclusion of any prospective residential constructions that may have been eligible for government assistance. • A region targeted for political objectives in the long run. • Insufficient Availability of Potable Water: Due to the absence of a corporate water supply in the slum, inhabitants are compelled to travel a distance of 1.5 kilometers to access the closest source of safe drinking water.
Basanti Colony	<ul style="list-style-type: none"> • After making adjustments, it can be observed that the vulnerability experienced by slum dwellers in the area is primarily attributed to political instability, which is compounded by high rates of unemployment and a significant rise in family size resulting from the densely populated environment.

Table 7.8 (b): Weakness Analysis -SWOC/SWOT

Slum Name	Parameter- Opportunities
Brace Bridge Railway Slum	<ul style="list-style-type: none"> Due to its favorable location, the government has provided affordable housing options, and various non-governmental organizations intermittently assisted, indicating the potential for a prosperous settlement in the future.
Topsia Slum	<ul style="list-style-type: none"> The potential for future developments within the slum is limited. However, two small artificial bodies of water have been constructed within the confines of the slum to serve as a contingency measure in the event of future fire hazards.
Basanti Colony	<ul style="list-style-type: none"> Due to the upscale location of the area, the government has implemented measures to provide affordable housing, including policies such as in-house kitchens and LPG subsidies. However, the proposal for a governmental toilet is still pending. Additionally, various non-governmental organizations have intermittently assisted with fire hazard awareness programs, which may contribute to the potential for a thriving settlement in the future.

Table 7.8 (c): Opportunities Analysis -SWOC/SWOT

Slum Name	Parameter- Threats/Challenges
Brace Bridge Railway Slum	<ul style="list-style-type: none"> In the absence of essential fire safety measures in a densely populated region, the occurrence of a hazard could lead to a catastrophic event resulting in the loss of both human life and property.
Topsia Slum	<ul style="list-style-type: none"> The presence of political objectives, the lack of caution in crucial attributes, and the susceptibility of slum areas to fire hazards, could potentially lead to the loss of both human life and property.
Basanti Colony	<ul style="list-style-type: none"> The emergence of additional makeshift dwellings in proximity to the recently altered shanties poses a potential hazard to the overall stability of this impoverished urban area as population density increases. The aforementioned urban settlement is situated within the jurisdiction of the Maniktala Fire Station. Given the vast expanse of the Maniktala fire station's coverage area, it is plausible that accessing this particular slum with the requisite resources and expediency has posed a challenge on numerous occasions.

Table 7.8 (d): Threats/Challenges Analysis -SWOC/SWOT

7.17 Building Future Resilience in Slums for Disasters like COVID-19 and Amphan

The recent occurrences of COVID-19 and Amphan have highlighted several concerns that require attention to enhance the capacity of slum residents to withstand adverse circumstances. In impoverished urban areas, there tends to be a greater concentration and magnitude of familial units. The practice of communal use of essential resources, such as water and sanitation facilities, is prevalent. This suggests that the slums did not meet the World Health Organization's (WHO) fundamental requirement for pandemic resilience. The individuals in question were inadequately equipped to face the cyclonic event. Although they were successfully evacuated to a secure location, their residential dwellings were decimated. Given that poverty is the prevailing determinant in slum areas, the implementation of permanent measures such as the installation of mobile toilets and water tankers for water is often hindered by limited resources and space. As an alternative, the application of sanitizers through spraying or the construction of sanitizer tunnels at strategic locations within the slums can serve as a viable means of mitigating the spread of diseases. The provision of masks, sanitizers, and soap is also feasible. Raising awareness in the slums is of utmost importance. Efforts ought to be made to formalize these areas to incorporate them into forthcoming development endeavors, such as fundamental infrastructure. The prioritization of health and cleanliness is imperative in impoverished urban areas. The presence of slums in municipal areas is an intrinsic aspect that necessitates their incorporation into the urban planning process as a means of addressing these unfortunate circumstances.

7.18 Conclusion

The present investigation has brought to the fore the susceptibility of slum inhabitants to the perils of fire hazards in the slums under the jurisdiction of the Kolkata Municipal Corporation. The statement showcases the level of readiness exhibited by individuals in the face of catastrophic events, while also highlighting their susceptibility to potential hazards.

The study suggests that community engagement has played a significant role in mitigating the impact of the calamity. Although the slums have experienced substantial losses in property and livelihood, the loss of life has been minimal. As per the findings of the SWOT

analysis, community engagement has been identified as a significant strength that enhances the resilience of the community in the face of adverse events. Finally, the Basanti colony exemplifies the concept of inclusivity by transitioning from an unregistered, makeshift slum to a registered, permanent settlement. It is not uncommon for political parties to issue threats, as they lack official authorization. The primary concern is the formalization and legalization of slums to ensure the equitable distribution of benefits from urban development initiatives.

References

- Arup (2018): A Framework for Fire Safety in Informal Settlements, https://reliefweb.int/sites/reliefweb.int/files/resources/FS_in_Informal_Settlements_2018.pdf doi, 31.12.2020.
- Census of India, West Bengal (2011): District Census Handbook, Kolkata SERIES-20 PART XII-B, Directorate of Census Operations, West Bengal.
- Cohen, O., Leykin, D. and Lahad, M. (2013): The conjoint community resiliency assessment measure as a baseline for profiling and predicting community resilience Towards Disaster-Resilient Slums in Kolkata 315 for emergencies, *Technological Forecasting & Social Change*. Elsevier Inc., vol80(9), pp. 1732–1741. doi 10.1016/j.techfore.2012.12.009.
- Cutter, S. L., Burton, C. G. and Emrich, C. T. (2010): Disaster resilience indicators for benchmarking baseline conditions. *Journal of Homeland Security and Emergency Management*, vol-7(1). Article no-51. doi: 10.2202/1547-7355.1732
- Ghosh, S. and Mondal, M. (2019): Risk analysis for a recommendation of an effective fire hazard management system: A study in Kolkata Municipal Corporation (KMC) area, West Bengal, India. *International Journal for Research in Engineering Application & Management*, vol-05(02), May 2019.
- Islam, R. and Walkerden, G. (2014). How bonding and bridging networks contribute to disaster resilience and recovery on the Bangladeshi coast. *International Journal of Disaster Risk Reduction*, vol-10, pp. 281–291, December 2014.
- KMC Portal Basic Statistics (2022c): www.kmcgov.in/KMCPortal/jsp/BasicStatistics.jsp Kolkata Municipal Corporation (2022a): Slum Fire Hazard Parameters and Civic Status, Kolkata: Slum Department, KMC.
- Kolkata Municipal Corporation (2022b): Ward Office Data Collection Centre KMC, Kolkata: Slum Department.
- Purkait, S. K. and Halder, S. (2016): Fire accident in Kolkata slums: A case study of Basanti colony and Tangra slum-causes, consequences and possible ways to mitigation. *International Journal of Humanities & Social Science Studies (IJHSSS)*, vol-III(I), July 2016, pp. 266–278, Published by Scholar Publications, Karimganj, Assam, India, 788711.
- World Bank (2011): India's vulnerability of the Kolkata metropolitan area to increased precipitation in a changing climate. Report No. 53282-IN, p. 10.

Web References

Archives of Anadabazar Patrika, (www.abplive.com/news/india/kolkata-fire-massive-blaze-breaks-out-at-slum-area-in-topsia-6-fire-tenders-rush-to-the-spot-1634158)

Archives of CNN-IBN, (<https://timesofindia.indiatimes.com/city/kolkata/fire-breaks-out-in-slum-area-of-kolkatas-topsia/articleshow/79151500.cms>)

Archives of Ebela, (<https://ebela.in/state/glimpses-of-state-news-1.262394>)

Archives of Telegraph, (www.telegraphindia.com/india/fire-at-ultadanga/cid/555789)

Archives of Times of India, (<https://timesofindia.indiatimes.com/city/kolkata/Slum-gutted-by-major-fire-in-Taratala/article-show/50569072.cms>)

Chapter 8: Economic Resilience of Slums during COVID-19

This chapter examines two specific slums located in separate containment zones of COVID-19 and analyses their economic strategies. The focus was on examining the economic resilience of these slums amidst the COVID-19 pandemic, specifically through the enhancement of their labor capabilities. In addition, the survival strategies have been shared with other slums to serve as a model for survival.

8.1 Introduction

Economic resilience refers to an economy's capacity to withstand, adjust to, and quickly recover from different shocks, disruptions, or unexpected obstacles while preserving its stability, functionality, and potential for growth. The country possesses a varied economic framework, strong infrastructure, adaptable policies, innovation, social welfare systems, and effective government. Economic resilience refers to an economy's ability to withstand the effects of negative events, adjust to new situations, and recover efficiently. It promotes sustainability, expansion, and stability amid uncertainties and shocks. The economic resilience of slums refers to their ability to endure and bounce back from economic shocks and crises, despite facing constraints such as scarce resources, informal employment, congested housing, and insufficient access to essential services. Slum communities, despite being highly vulnerable, frequently exhibit adaptive resilience mechanisms such as communal support networks, informal economies, and resourceful entrepreneurial activity. Nevertheless, the absence of defined safety measures, limited availability of healthcare services, and insufficient government assistance exacerbate difficulties during disasters such as the COVID-19 pandemic, impeding economic recovery and stability. To enhance economic resilience in slums, it is crucial to implement focused interventions, inclusive policies, and infrastructural enhancements, while simultaneously empowering the community. These measures will bolster the ability of these regions to withstand and recover from challenges, while also fostering long-term and environmentally responsible progress for the people living there. Amidst the COVID-19 epidemic, slums saw substantial difficulties in preserving their economic stability as a result of the unequal effect of the crisis on these already susceptible groups. The denizens of slums, predominantly dependent on informal and daily wage occupations, encountered significant interruptions in their means of subsistence due to the imposition of lockdowns and restrictions that impeded their capacity to engage in labor and generate revenue. The insufficiency of sufficient healthcare access, congested living circumstances, and restricted social safety nets exacerbated the economic stress. Nevertheless, despite these challenges, certain slum communities have exhibited resilience by building indigenous support networks, adapting informal economic frameworks, and pioneering novel methods to produce revenue. The pandemic has highlighted the need for specific actions, such as customized assistance programs, increased access to healthcare, and strengthened social

support systems, to improve the ability of slums to withstand crises and address the underlying vulnerabilities that worsen their difficulties.

The economic fortitude of slums during the COVID-19 pandemic has posed a multifaceted and arduous predicament. During the pandemic, slums, which are characterized by densely populated living conditions, restricted access to essential services such as clean water and sanitation, and frequently informal or insecure sources of income, experienced increased susceptibility.

8.2 Several Determinants Impacted the Economic Robustness of Slums Amidst the COVID-19 Pandemic

8.2.1 *Informal Economy:* Within slum areas, the informal economy acts as a crucial source of support for several inhabitants, enabling them to continue their livelihoods through diverse methods such as daily wage labor, street vending, or providing informal services. Nevertheless, the implementation of lockdowns and rigorous limitations on travel as a response to the COVID-19 pandemic had a significant negative impact on these economic endeavors, leading to a chain reaction of financial instability for residents in slums. As a result of limitations limiting movement and trade, persons who depend on daily wage labor experienced abrupt unemployment and had difficulties in obtaining even essential items. Street vendors, who are frequently the main source of income for many families, experienced closures and reduced client flow, leading to a significant decline in profits. In addition, those providing informal services, such as household chores or minor repairs, experienced a decrease in demand as households reduced their spending due to economic uncertainty. As a result, the decrease in earnings had a devastating impact, causing numerous families residing in slums to experience extreme difficulties. This worsened the problem of inadequate access to food and made it difficult for them to afford housing or healthcare. The economic consequences of the pandemic exposed the weaknesses associated with depending exclusively on the informal economy in these regions, highlighting the pressing requirement for customized interventions and enduring solutions to protect against comparable catastrophes. Efforts aimed at enhancing social safety nets, encouraging alternative income-generating opportunities, and offering specific financial assistance could be crucial in promoting economic resilience among slum

dwellers. These measures would help them withstand unexpected challenges while preserving a sense of stability and security in their lives.

8.2.2 Lack of Social Safety Nets: The lack of strong social safety nets or official support systems inside slum communities intensifies the vulnerabilities of its residents, which is notably obvious during the COVID-19 pandemic. These marginalized communities sometimes function beyond the scope of official assistance or relief systems, intensifying the difficulties experienced by locals. The lack of access to sufficient healthcare, unemployment benefits, or financial aid worsens the economic consequences of the epidemic in these already disadvantaged areas. Government relief efforts frequently face challenges in efficiently reaching these densely populated and physically isolated places. As a result, residents in these areas are confronted with the harsh reality of limited resources to alleviate the economic hardships caused by the crisis. Households confront the severe dilemma of choosing between fundamental essentials such as sustenance, housing, and medical care, intensifying their economic vulnerability and perpetuating the cycle of impoverishment. The absence of institutional support networks exacerbates the socioeconomic inequalities, underscoring the pressing need for focused initiatives and inclusive policies to narrow this divide. Strategies that prioritize enhancing access to social safety nets, extending healthcare facilities, and adopting community-driven initiatives could play a vital role in promoting resilience within slum communities. To effectively address the severe economic obstacles encountered by slum residents during crises, governments and aid organizations can provide targeted support mechanisms and prioritize their inclusion in relief efforts. This approach will contribute to a more equitable and durable recovery.

8.2.3 Housing Insecurity: The COVID-19 epidemic exacerbated the already tenuous housing conditions in slum regions, heightening housing insecurity among their inhabitants. The abrupt decline or decrease in earnings as a result of pandemic-induced limitations worsened the pre-existing difficulties, rendering it a challenging task for several residents to afford essential costs, especially rent obligations. Amidst declining financial resources, families were confronted with the harsh truth of possible evictions or an increased vulnerability to homelessness. The combination of economic hardship and the inability to pay rent has increased the susceptibility of slum residents, with many at risk of being forced out of their

already precarious living conditions. Individuals residing in informal settlements or improvised shelters faced an even greater risk, as the absence of official tenancy agreements or legal safeguards made them particularly vulnerable to forceful evictions or intrusions into their living areas. The economic upheaval caused by the pandemic has exposed significant disparities in housing security, highlighting the pressing requirement for comprehensive approaches that tackle both immediate issues and the underlying systemic obstacles that perpetuate housing instability in marginalized communities. By implementing measures such as affordable housing programs, tenure regularization, and supporting policies, we can provide crucial support to people, protecting them from the severe consequences of eviction and homelessness. This will help to promote resilience and stability within slum regions.

8.2.4 Healthcare Access: The combination of inadequate healthcare access and crowded living conditions in slums during the COVID-19 pandemic worsened the susceptibility of people to the spread and effects of the virus. The limited availability of healthcare facilities and resources in these regions exacerbated the hazards, leaving residents struggling with insufficient help to mitigate the spread of the infection. The cramped conditions and excessive population density commonly found in slums provided an ideal environment for the rapid spread of the virus, making it extremely difficult to implement effective social distancing measures and intensifying the severity of the outbreak. As a result, disease ceased to be solely a matter of health and instead became a significant economic menace, disrupting the citizens' means of living as they fought against sickness. For several individuals, becoming sick not only entails dealing with physical difficulties but also confronting the hard truth of being incapable of working and generating an income, exacerbating their financial instability. The convergence of health and economic crises highlights the urgent requirement for focused programs that tackle both healthcare accessibility and economic support in slum communities. To alleviate the combined challenges of health and economic difficulties faced by slum residents during crises, it is crucial to improve healthcare infrastructure, enhance access to medical resources, establish community-based healthcare programs, and guarantee income support for individuals impacted by disease. Concurrently, it is necessary to make efforts to strengthen healthcare institutions

and provide support for livelihoods to build resilience within these communities. This will ensure both their health security and economic stability in the face of future problems.

8.2.5 Community Support Networks: Amidst significant difficulties, the community networks and solidarity inside slum areas demonstrated remarkable tenacity, serving as a source of hope and assistance during the turbulent period of the COVID-19 pandemic. The interlinked networks of reciprocal assistance served as vital resources for the inhabitants, epitomizing the essence of collective resilience. In these tightly-knit communities, a remarkable network of support emerged, as neighbors and community members united to offer relief, exchange resources, and provide mutual assistance to alleviate the profound economic consequences of the pandemic. Instances of benevolence and collaboration thrived, encompassing the exchange of vital resources and joint endeavors in creating improvised healthcare programs or networks for distributing food. The grassroots solidarity not only offered immediate assistance but also cultivated a feeling of inclusion and determination among the inhabitants, strengthening their shared resolve to endure the difficult situation. The organic community-driven solutions showcased the efficacy of grassroots initiatives and local resilience in addressing the deficiencies left by institutional support systems. They emphasized the significance of acknowledging and utilizing the natural capabilities of these communities during times of emergency. Nevertheless, although these community endeavors were extremely helpful, they also underscored the crucial requirement for further support from official institutions and government programs. To enhance the effectiveness, inclusivity, and sustainability of strategies for supporting slum areas during crises, policymakers and aid organizations can recognize, amplify, and collaborate with these grassroots networks. This will enable them to utilize the inherent strength and resilience of these networks and ensure that grassroots solidarity remains an essential component of the overall support framework.

8.2.6 Innovative Solutions: In the face of difficult circumstances, several slum groups have shown exceptional resilience, demonstrating their capacity to create new ideas and adjust to overwhelming obstacles. In response to the economic difficulties caused by the epidemic, resilient individuals in these areas adapted their methods of making a living, adopting creative techniques to support themselves. A

significant number of citizens demonstrated exceptional resourcefulness by expanding their sources of income, shifting from conventional employment to adopting other methods of obtaining revenue. Certain individuals have ventured into new opportunities, such as establishing home-based businesses, participating in micro-entrepreneurship by creating handcrafted products, or starting small-scale local services to address the changing demands of their community. Moreover, the implementation of digital platforms has emerged as a revolutionary remedy, allowing slum dwellers to overcome geographical obstacles and reach wider markets. By harnessing technology, enterprising individuals flourished by utilizing internet platforms to sell items or provide services, thereby surpassing geographical limitations and accessing a broader client base. These adaptive tactics not only ensured survival but also demonstrated the resilience and resolve of these societies to overcome challenges. Although these new attempts are praiseworthy, they also highlight the urgent requirement for comprehensive support structures that promote and enhance these efforts. Providing these efforts with resources, skills, and infrastructure could enhance the potential of these resilient communities, promoting sustained economic growth and increasing their ability to succeed even in the presence of future uncertainties. It is crucial to acknowledge and support these local initiatives to develop inclusive policies that utilize the natural capabilities and adaptability of slum communities, ultimately leading to more resilient and prosperous societies.

8.3 A Comprehensive Approach is necessary to strengthen the economic resilience of slums in the face of an epidemic, both during and after.

This approach entails specific measures that include enhanced healthcare accessibility, comprehensive social support systems, and customized financial assistance. It requires improvements to infrastructure, enabling activities driven by the community, and promoting novel economic prospects. It is crucial to implement sustainable policies that effectively tackle housing instability, education, and skill development. The establishment of inclusive and resilient systems necessitates the collaboration of governments, non-governmental organizations (NGOs), and local stakeholders. This all-encompassing approach seeks to strengthen slum communities by prioritizing both immediate relief and long-term investments. Its objective is to empower these communities to

effectively overcome problems, recover from crises, and promote sustainable socio-economic development.

8.3.1 Policy Support: Efficient governance necessitates customized policies that address the distinct needs of slum communities. This imperative involves implementing measures to ensure equal access to healthcare, enhancing fundamental services such as clean water and sanitation, and implementing specific economic support programs. It is essential to implement resilient social safety nets, cheap housing projects, and skill development initiatives. Governments must engage in collaboration with local organizations, utilizing the knowledge and perspectives of the community to develop inclusive policies. By giving priority to these customized strategies, we enhance the ability of slum dwellers to cope with challenges, promote long-lasting progress, and reduce socio-economic disparity. By targeting specific requirements, these strategies facilitate the achievement of inclusive economic expansion and improved welfare within these marginalized populations.

8.3.2 Community Empowerment: Strengthening resilience and promoting self-sufficiency relies on empowering local leadership and grassroots efforts in slums. This strategy enhances the influence of community voices, harnessing local expertise, and fostering inventive solutions. By strengthening the capabilities of community-led initiatives and supporting the leadership of individuals within slum areas, a feeling of ownership and empowerment thrives. It fosters self-reliance and promotes a feeling of solidarity, allowing inhabitants to collaboratively develop customized strategies to tackle their obstacles. Working together with these local leaders is essential, since their advice guarantees inclusive strategies that align with the community's goals, ultimately resulting in long-lasting development and resilience.

8.3.3 Investment in Infrastructure: Improving the quality of infrastructure in slum areas, including access to clean water, sanitation, and affordable housing, is crucial for strengthening community resilience against future shocks. Improved access to potable water and upgraded sanitation facilities not only reduces health hazards but also strengthens the community's resilience to health emergencies. Furthermore, allocating resources towards inexpensive and secure housing reduces susceptibility, establishing a solid basis for

stability in times of hardship. Infrastructure improvements are crucial in establishing a stronger and more sustainable environment that enables slum people to overcome obstacles, promoting increased resilience and setting the foundation for a more secure future.

8.3.4 Social Protection Programs: Implementing customized social protection programs that explicitly target marginalized people, especially those living in slum areas, plays a vital role in providing a needed safety net during times of crisis. These specialized programs serve as crucial resources, providing vital assistance to at-risk communities during times of crisis. By prioritizing accessibility and inclusivity, such efforts not only alleviate immediate difficulties but also promote resilience within these marginalized populations. Providing them with healthcare, financial assistance, and social welfare helps mitigate the effects of crises, strengthens community stability, and fosters a fairer society. Enhancing these programs is crucial, as it protects against inherent weaknesses, fostering sustainable welfare and strengthening societal resilience.

The pandemic exposed the pre-existing weaknesses inside slums and underscored the immediate requirement for comprehensive and inclusive initiatives to bolster the economic resilience of these communities in anticipation of future adversities.

8.4 Indian Scenario during the Covid-19 Pandemic (February 2020)

The Indian economy, like the global economy, has been severely impacted by the recent coronavirus outbreak, commonly referred to as COVID-19. The Covid-19 epidemic has caused global impacts on institutions, professions, economies, and communities (Asad, A. et al, 2020). In early 2020, towards the end of February, the first cases of Covid-19 were reported in India. Subsequently, the virus rapidly spread across the country, leading cities to enforce lockdown measures by mid-March. By the beginning of April, the entire country had implemented lockdown measures as the number of confirmed cases reached 12,781 in West Bengal and 185,390 nationwide. As of June 2020, there were 38,195,651 verified instances of COVID-19 worldwide. The process of internment, on both a national and regional level, was still ongoing (Asad, A. et al, 2020). India's and the world's GDP experienced a daily decline, disproportionately affecting individuals with the lowest income. The majority of low-income demographics experienced economic neglect during

the Pandemic since a significant number of them lost their daily wage jobs or had to close down their businesses. While the decrease in paid work hours is directly proportional to the increase in unpaid care work hours, the International Labour Organization (ILO) forecasts that the decline in the number of employees will persist due to factors such as the closure of educational institutions, reductions in public services for individuals with disabilities and the elderly, and the challenges posed by home assistants during the Covid-19 pandemic. According to the International Labour Organisation, India first had a 10.3 percentage point increase, but this has since decreased to 5.6 (Hannon, C. W, 2021). Nevertheless, a significant number of employed individuals seem to be advocating for reductions in their wages, potentially as a result of agreements established through collective bargaining (Primary Survey, February 2021).

The presence of a pandemic requires the strengthening of economic resilience. Several researchers (Noy et al., 2020; Jenny F., 2020; Jethwaney J., 2020) have highlighted economic risk, economic resilience, and socioeconomic risk as significant factors. Resilience, as defined by Fiksel J. (2003), refers to the ability of a system to withstand and accept stresses while maintaining its fundamental structure and functioning. Resilience, as described by Jun and Conroy (2014), refers to an individual's ability to endure and flourish in the face of many challenges, regardless of whether they come from within themselves or from other sources.

8.5 Kolkata Slums during the Covid-19 Pandemic (February 2020)

The COVID-19 pandemic has had the greatest impact on nations with middle and high incomes. From late February to June 2020, India faced the most severe consequences of the disease and the following implementation of shutdown measures. India has been diligently monitoring the occurrence, death rate, and spread of COVID-19 since February 2020. The cities with the highest population in India, specifically Delhi, Mumbai, Chennai, Kolkata, Nagpur, and Ahmadabad, are situated in regions that have been identified as areas with a high concentration of COVID-19 cases. Mumbai, Delhi, and Kolkata are the three most densely populated urban centers in India, located in regions highly prone to the transmission of the COVID-19 virus. According to Patel A. (2014), over one-third (33%) of the population living in Mumbai and Kolkata are categorized as slum dwellers. Dharavi, the largest informal settlement in the world, is located in Mumbai, which has the highest density of such communities. The research zone of KMC was chosen partly because slums are not present in Ward nos. 42, 43, and 87 of Kolkata, but slums are found throughout the

rest of the city. The juxtaposition of slums and rich neighborhoods near each other is a frequent phenomenon. Therefore, Kolkata faced substantial difficulties during the COVID-19 pandemic. According to the Covid Vulnerability Index (Paul S. et al., 2021; Fig 1), the areas with the highest susceptibility to the virus are the port area (Wards 75 and 80), the Central Business District (Wards 45, 46, and 63), and the eastern fringe (Wards 58, 108, and 109) (Ray S. et al, 2020).

This study aims to develop a theoretical framework for family economic resilience by examining the tactics taken by persons with restricted financial means to maintain their living standards during the epidemic. This research will specifically investigate the transition from formal to informal economic activities and the acquisition of new skills as strategies for dealing with economic difficulties.

8.6 Case Study for Analysis

Kolkata has been designated as a vulnerable region for the transmission of Covid-19 inside the state of West Bengal. This thesis examines fourteen slums, focusing on four specific factors. For the first parameter, Spatio-Temporal categorization, five slums have been selected: Baniatola Street Bustee, New Tangra Lane Bustee, Baghajatin Colony Bustee, Sahid Smrity Colony Bustee, and Adhikary Para Colony Bustee. Four slums have been selected for the second parameter, which is the classification of Site and legal status. These slums include Narkel Danga Canal East Road Bustee (Registered), Narkel Danga Canal West Road Bustee (Unregistered), Panchanantala Bustee (Registered), and Madhabtala Lane Bustee (Unregistered). For the third criterion, which is religion categorization, two slums have been selected: Ata Bag Bustee and Smith Hoe Lane Bustee. For the fourth parameter, which is the classification of fire hazard proneness, three slums have been selected: Brace Bridge Bustee, Topsia Bustee, and Basanti Colony slum.

Adhikary Para Colony Bustee was the only slum that did not experience severe financial difficulties during the COVID-19 pandemic. The indigenous population of Baniatola Street Bustee has engaged in commercial endeavors from ancient times, with a substantial portion of individuals working in international trade, both importing and exporting goods. Additionally, others have focused on internal commerce, namely within the textile sector. Amidst the COVID-19 pandemic, numerous textile enterprises were disrupted and forced to shut down, resulting in significant financial losses. Regarding the New Tangra Lane Bustee, the majority of its residents continue to be employed as tannery workers,

nevertheless, Amid the COVID-19 pandemic, numerous businesses were disrupted and forced to shut down, resulting in significant financial crises. Baghajatin Colony Bustee encompasses many establishments including grocery stores, mechanical workshops, small-scale building enterprises, and metalworking shops. Amidst the COVID-19 outbreak, all establishments were temporarily shuttered, resulting in a lack of adequate economic assistance and a full depletion of their financial resources. Sahid Smrity Colony Bustee predominantly employs males in construction labor, as well as in occupations such as mechanical labor, rickshaw driving, and operating tea stands. In contrast, the majority of female residents in the colony are mostly employed as domestic workers, serving as household servants. Amidst the COVID-19 outbreak, all establishments were temporarily shut down, resulting in a lack of adequate economic assistance and a complete depletion of their financial resources. The residents of Narkel Danga Canal East Road Bustee (Registered), Narkel Danga Canal West Road Bustee (Unregistered), Panchanantala Bustee (Registered), and Madhabtala Lane Bustee (Unregistered), Ata Bag Bustee, Smith Hoe Lane Bustee, Brace Bridge Bustee, Topsia Bustee, and Basanti Colony slum primarily engage in daily wage labor with meager compensation. However, the COVID-19 pandemic has severely impacted their employment opportunities, leading to a complete collapse of their financial infrastructure. Adhikary Para slum stands out from the rest in terms of its economic standing.

The primary objective of this study is to analyze the Adhikary Para slum located in Thakurpukur, Kolkata. Thakurpukur is a recently established residential suburb in Kolkata, situated precisely in the Adhikary Para locality. The geographical coordinates of the location are 22°27'36" N and 88°18'36" E. James Long Sarani functions as the western boundary, M.G. Road defines the southern limit, and Senpara Road divides the area into eastern and northern halves. A metal road enables efficient transit for automobiles, buses, and rickshaws around the area. Thika ward encompasses an additional three slums. Nevertheless, the designated slum exhibits the greatest population density and accommodates a significant number of individuals employed in the medical profession. The slums were chosen through a process of selective sampling, with a particular focus on their economic resilience initiatives and the implementation of new skills as tactics. A survey has been conducted on 75% of the individuals employed in every slum. To obtain a deeper understanding of the slums, a focus group discussion and a questionnaire survey

were carried out. The recommended approach for analysis, in this case, is a combination of qualitative and quantitative methods, namely utilizing a comparison matrix index.

The Adhikary para slum consists of 227 male residents, 184 female residents, and 46 children. Before the 2014 expansion of Kolkata, this area was not governed by the Kolkata Municipal Corporation but instead belonged to the Gramme Panchayet Maheshtala CD block Area (Mishra S.V., 2018). The proprietor possesses a leasehold interest for 99 years on these parcels of land located in the Thika Slum. The inhabitants of this slum, who were previously primarily involved in agriculture, have diversified their work culture to encompass other jobs such as construction, real estate speculation, grocery store employees, automobile drivers, rickshaw pullers, domestic workers, vegetable vendors, and other miscellaneous professions. Since 2010, economic workers have redirected their focus towards the medical services industry, as Thakurpukur has emerged as the main medical center in south Kolkata.

Thakurpukur Cancer Hospital-Saroj Gupta Cancer Centre & Research Institute, BMRI Hospital (P) Ltd, DM Hospitals Pvt. Ltd, Swadesh Basu Hospital, Kasturi Medical Centre Pvt. Ltd., Apollo Clinic Thakurpukur, Humanity Hospital, Narayan Memorial Hospital, Indira IVF Fertility Centre, Command Hospital, St. Jude India Child Care Centres, and several other private hospitals were established in this area. The hospitals represented the majority of new job possibilities. Consequently, the majority of male workers lacking literacy skills abandoned their occupations and transitioned into the healthcare sector as assistants. This neighborhood exhibits a notably elevated employment rate in comparison to other urban ghettos, as demonstrated by a main study.

Out of a total of 227 persons, 214 of them are employed in some capacity, both before and after the COVID-19 pandemic. Among the 214 individuals, 33 are employed as hospital sweepers across different departments, 59 are trained to collect blood and other specimens from households for various pathological laboratories at different hospitals, 45 work in hospital canteens, 15 serve as ward boys, 9 operate tea stalls outside hospitals, 37 are employed at various dispensaries within hospital centers, 7 are ambulance drivers, and 9 are hospital contractors. Conversely, of the 184 females, 67 were engaged in economic endeavors before the onset of the COVID-19 pandemic; this figure increased to 86 during the period of lockdown. The information is shown in Table 8.1

Table 8.1: Shows Economic Structure Before COVID-19 Pandemic, Adhikary Para, Slum

Working Places	Sweeper in Hospitals	Collect Blood from Houses	Hospital Canteens	Ward Boy	Tea Stalls Outside the Hospitals	Dispensaries	Ambulance Workers	Construction Work like Maintenance and Electricals	Maid-come-Nurse	Receptionist	Total
Male	33	59	45	15	9	37	7	9	0	0	214
Female	0	0	0	0	0	7	0	0	53	4	67
											281

Source- Prepared by the Authors, Primary Survey (June 2022)

Fifty-three of the 67 women now work as nurses. Still, they previously had positions as hospital cleaners, seven in the hospital's dispensary, three in the hospital cafeteria, and four in reception. Several hospitals became quarantine centers during the COVID-19 pandemic, increasing the demand for medical professionals who could serve as COVID warriors.

When the crisis was over, 19 women from the area joined the isolation hospitals; several remained employed there as various medical assistants. New slum residents have taken advantage of improved job prospects by learning and applying cutting-edge medical expertise to engage in more conventional forms of economic activity (Table 8.2).

Table 8.2: Shows the Economic Structure after the COVID-19 Pandemic, Adhikary Para, Slum

Working Places	Sweeper in Hospitals	Collect Blood from Houses	Hospital Canteens	Ward Boy	Tea Stalls Outside the Hospitals	Dispensaries	Ambulance Workers	Construction Work like Maintenance and Electrical	Maid-come-Nurse	Receptionist	Isolation worker	Total
Male	33	59	45	15	9	37	7	9	0	0	0	214
Female	0	0	0	0	0	7	0	0	53	4	19	86
												300

Source- Prepared by the Authors, Primary Survey (June 2022)

The economic conditions in the slum during the COVID-19 epidemic have been discussed further (Table 8.3)

Table 8.3: Conditions in the slum during the COVID-19 epidemic

Parameter/Slum Name	Adhikary para, Thakurpukur
Job role during Covid-19	Medical assistance mostly.
Share of male Economic workers during COVID-19	94% of the male population and 100% of the working population
Share of Female economic workers during Covid-19	86, which is 47% of the total female population and 128 % of the total working population before Covid
Average monthly income after the Covid-19 pandemic	Rupees 7250
Average per-head male worker wage	Rupees 4750
Average per-head female worker wage	Rupees 2500
Losing job during the pandemic (Male)	0%
Losing a job during the pandemic (Female)	0%
New Recruitment (male) in the Pandemic	Nil
New recruitment (Female) in the Pandemic	28
Resilience Planning	Through skill development and enhancement to better employment opportunities.

Source- Prepared by the Authors

The Adhikary Para Slum has seen no decline in male employment and a rise in the average monthly income. Significantly, the percentage of women employed in economic roles in both slums increased throughout the COVID-19 pandemic. The crucial distinguishing element between these two slums, about their ability to withstand the COVID-19 pandemic, resides in the degree to which their residents have obtained vital expertise. Furthermore, it was noted that in the Adhikary Para slum, there has been no decline in either the number of employment opportunities for men or their mean monthly earnings. There has been an unforeseen rise in the number of women participating in economic labor throughout the COVID period. Adhikary Para, a slum located in Thakurpukur, demonstrates a higher level of resilience. The primary distinction between Adhikary Para slum and other slums in coping with the COVID-19 pandemic is in the enhancements made in education and training, a substandard level of material well-being.

8.7 Conclusion

This study investigates the influence of the COVID-19 epidemic on organizational choices to close down businesses, lay off employees, and enforce salary freezes. The proliferation of the COVID-19 virus has resulted in disruptions to diverse corporate processes. The development of improved skills has been recognized as a crucial element in effectively navigating the most challenging circumstances. This study examines the survival methods utilized by the Adhikary Para slums throughout the COVID-19 lockdown. The study specifically examines how these slums adjusted their economic activities and enhanced their skill sets to withstand the limits imposed by the pandemic. Moreover, the adoption of specific measures could bolster the resilience of individuals living in slums from a governmental standpoint.

References

- Asad, A., Srivastava, S., & Verma, M. K. (2020). Evolution of COVID-19 pandemic in India. *Transactions of the Indian National Academy of Engineering*, 5(4), 711-718. <https://doi.org/10.1007/s41403-020-00166-y>
- Berman EL. (2009). Small business resilience. *Industrial Management*. 51(1):6 Burchill J. (2013). CFOs need to be at the center of risk. *Financial Executive*. 29(6):22
- Fiksel J. (2006). Sustainability and resilience: toward a systems approach. *Sustainability: Science, Practice, & Policy*. Vol. 2. Issue 2, 14-21, <https://doi.org/10.1080/15487733.2006.11907980>
- Fiksel, J. (2003). Designing resilient, sustainable systems. *Environmental Science and Technology* 37(23):5330–5339, <https://doi.org/10.1021/es0344819>
- Hannon, C. W., McCourt, C., Lima, H. C., Chen, S., & Bennett, C. (2021). Interventions for cutaneous disease in systemic lupus erythematosus. *Cochrane Database of Systematic Reviews*, (3). <https://doi.org/10.1002/14651858.CD007478.pub2>
- Husmann E, Aldridge G. (2007). The IBM resiliency model. New York (US): IBM Corporation[ILO] International Labor Organization. (2020). The impact of the COVID-19 pandemic on jobs and incomes in G20 economies. ILO-OECD paper prepared at the request of G20 Leaders Saudi Arabia's G20 Presidency 2020
- Jenny F. (2020). Economic resilience, globalization, and market governance: Facing the Covid-19 test. *Covid Economics*. Issue 1. No. 3. Pp 64-78, <https://ssrn.com/abstract=3563076> or <https://dx.doi.org/10.2139/ssrn.3563076>
- Jethwaney, J. (2020). COVID-19g Disaster: Interdependence of Crisis Communication and Socio-Economic Resilience. In *Disaster Management for 2030 Agenda of the SDG* (pp. 333-358). Palgrave Macmillan, Singapore. Online ISBN 978-981-15-4324-1, https://doi.org/10.1007/978-981-15-4324-1_20
- Jun, H. J., & Conroy, M. M. (2014). Linking resilience and sustainability in Ohio township planning. *Journal of Environmental Planning and Management*, 57(6), 904-919. <https://doi.org/10.1080/09640568.2013.775061>
- McCourt M. (2008). The 2008 Security 500: Trends show an expanded and more integrated role. *Security*. 45(11):22 McCourt M. (2011a). Self-reliance drives resilience. *Security*. p.22, <http://dx.doi.org/10.33021/icfbe.v1i1.1357>

- McCourt M. (2011). Measuring up how the best security leaders deliver business value. Security., HR must reduce bureaucracy to improve business resilience. Personnel Today. p.4- p22, <http://dx.doi.org/10.33021/icfbe.v1i1.1357>
- Millar, R. (2004). The role of practical work in the teaching and learning of science. Commissioned paper-Committee on High School Science Laboratories: Role and Vision. Washington DC: National Academy of Sciences, 308.
- Mishra S.V (2018), Urban deprivation in a global south city-a neighborhood scale study of Kolkata, India, Habitat International, 80 (2018), pp. 1-10, [10.1016/j.habitatint.2018.08.006](https://doi.org/10.1016/j.habitatint.2018.08.006), <https://doi.org/10.1016/j.habitatint.2018.08.006>
- Noy, I., Doan, N., Ferrarini, B., & Park, D. (2020). Measuring the Economic Risk of COVID-19. *Global Policy*, 11(4), 413-423. <https://doi.org/10.1111/1758-5899.12851>, <https://doi.org/10.1111/1758-5899.12851>
- Patel A., Koizumi N., Crooks A. (2014), Measuring slum severity in Mumbai and Kolkata: A household-based approach, Habitat International, 41 (2014), pp. 300-306, [10.1016/j.habitatint.2013.09.002](https://doi.org/10.1016/j.habitatint.2013.09.002), <https://doi.org/10.1016/j.habitatint.2013.09.002>
- Paul, S., Bhattacharya, S., Mandal, B., Haldar, S., Mandal, S., Kundu, S., & Biswas, A. (2021). Dynamics and risk assessment of SARS-CoV-2 in urban areas: a geographical assessment on Kolkata Municipal Corporation, India. *Spatial Information Research*, 29(3), 365-378. <https://doi.org/10.1007/s41324-020-00354-6>
- Ray S, Khanna R, Yengkhom S. & Ghose D (2020), Congested Belgachhia slum emerges as ground zero of Covid-19. TNN / Updated: Apr 14, 2020, 07:45 IST, The Times of India, http://timesofindia.indiatimes.com/articleshow/75131631.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

Chapter 9: Findings and Suggestions

A thesis's findings comprise the results and analysis obtained from either collecting empirical data or exploring theoretical concepts. The findings are usually structured based on the research questions or objectives specified in the thesis, offering an in-depth understanding of the phenomena being studied. The findings portion of a research report may contain statistical analysis, qualitative interpretations, or a combination of both, depending on the chosen research approach. It displays the unprocessed data or evidence gathered and provides explanations or interpretations that clarify the importance of the findings in connection to the wider study framework. In essence, the purpose of the results section is to give evidence that supports the main arguments or hypotheses of the thesis. It also forms the foundation for drawing conclusions and making suggestions.

9.1 Introduction

The research aims and objectives serve as the guiding principles that direct the focus and intention of the investigation. The thesis on "Inclusive Slum Planning in Kolkata" may encompass a diversified strategy to achieve its defined aims and objectives. This entails analyzing the present condition of slum settlements in Kolkata to comprehend their socio-economic circumstances, identifying the pivotal factors that impact inclusivity in these settlements (such as spatial planning, socio-economic factors, situation condition, religious influences, and vulnerability to hazards), assessing the efficacy of current urban planning strategies aimed at promoting inclusivity, and ultimately, suggesting recommendations and strategies to improve inclusive and sustainable urban development practices in Kolkata's slum areas. These objectives function as a strategic plan, directing the research toward a thorough comprehension of the intricacies involved in inclusive slum design. The importance of inclusive slum planning in Kolkata resides in its ability to tackle the complex obstacles and inequalities experienced by the residents of slum communities. It involves guaranteeing fair access to essential resources, raising the quality of living situations, fostering social inclusion, and strengthening the ability to withstand different forms of vulnerability. The implementation of inclusive slum planning is crucial since it not only promotes social fairness but also facilitates sustainable urban development. It promotes a fair and strong city, adheres to human rights principles by guaranteeing access to vital services for all residents, and empowers communities by engaging them in the process of planning and decision-making. This design method has extensive consequences, enhancing the general welfare and respect of marginalized communities living in slums. The thesis scope defines the parameters and constraints of the investigation. It delineates the scope of coverage and delineates what will be included and excluded. The scope of "Inclusive Slum Planning in Kolkata" could involve analyzing the spatial characteristics of slum settlements, investigating the socio-economic factors that impact inclusivity, assessing the role of religion, evaluating vulnerability to hazards, and providing recommendations for inclusive urban planning practices. Concurrently, the thesis structure delineates the organizational framework of the investigation. A typical structure of a document consists of chapters, sections, and subsections that are organized logically to effectively meet the goals and objectives. The format functions as a navigational aid for readers, providing a distinct trajectory to navigate through the research. This includes an introductory section that presents the background, a literature review, the technique

employed, the findings obtained, and a concluding section that succinctly summarizes the main findings and offers recommendations. The detailed explanations offer a thorough understanding of the defined goals and objectives, importance, extent, and organization of the thesis on inclusive slum planning in Kolkata.

This stage of the research entailed a thorough investigation and examination of several theoretical frameworks that provide the basis for inclusive urban design. The analysis involved exploring many theoretical viewpoints, including social equity theories, participatory governance models, spatial justice frameworks, and sustainable development paradigms. The study examined the role of these frameworks in comprehending and tackling urban difficulties, namely in marginalized communities such as slum settlements. The research aims to gain insights into effective techniques, tools, and approaches that promote inclusion, equitable resource allocation, and social cohesion within urban settings by examining these theoretical foundations. This portion of the study aimed to precisely define and clarify key terms that are essential for understanding inclusion in urban environments. The term 'inclusivity' in this context refers to the idea of including all individuals and groups in urban environments. It also includes concepts such as 'social inclusion,' 'equity,' 'accessible,' 'participation,' and other related ideas that are important for understanding how inclusive urban environments function. This phase established a common understanding among researchers, policymakers, and stakeholders by offering precise definitions and conceptual clarity. This phase was crucial in promoting coherent conversations and achieving consensus in developing strategies and policies to promote inclusive cities, especially in the context of slum settlements in Kolkata. This study component situated the selected research problem within the wider framework of inclusive city principles that are prominent in global urban discourse. The process entailed creating connections between the particular research issue (related to the inclusion of slums in Kolkata) and wider conversations, literature and approaches concerning inclusive urbanism on a global scale. This phase highlighted the need to match the research problem with established theories and practices of inclusive cities. It emphasized the study's findings' relevance, significance, and potential contributions. The objective was to offer valuable perspectives and remedies that can be applied not just to the slums of Kolkata, but also to other urban environments facing comparable issues concerning inclusivity and social justice.

Here according to the chapter's findings are discussed below

9.2 Evolution of Inclusive Slum Planning in Kolkata: A Historical Perspective

9.2.1 *Mapped the historical evolution of Kolkata's slum settlements from the colonial period to modern times-* The investigation of Kolkata's slum settlements entailed a thorough cartography of their historical development, charting their path from the colonial period to the present day. This historical mapping revealed the significant evolution of these communities, emphasizing their expansion, alterations in spatial arrangement, and socio-economic changes throughout the years. The text explored the historical period of the city's colonial era, providing a detailed account of the development of early colonies that later transformed into the current slums. This investigation examined alterations in urban design, land utilization patterns, migratory tendencies, and socio-economic factors that impact the establishment and growth of these communities. Through the process of mapping, this research has revealed the complex stages of Kolkata's slum development. It has provided valuable knowledge about the elements that influence their contemporary socio-spatial dynamics and has laid the foundation for comprehending their existing situation within the city's urban structure.

9.2.2 *Analyzed the ward wise location and density of slums within the Kolkata Municipal Corporation (KMC) area in 1966 and expanded wards in 2022-* The study examined the geographical distribution and population density of slums in several wards of the Kolkata Municipal Corporation (KMC) area in 1966. It then compared these findings with the current situation in 2022, providing a detailed understanding of the spatial patterns and shifts in slum distribution throughout time. The study rigorously analyzed the spatial distribution of slum settlements in several wards within the KMC region in 1966, emphasizing the clustering, scattering, and intensity characteristics of these communities. By comparing historical data with the current situation in 2022, taking into account the growth and modifications in ward boundaries, the study identified changes in the locations of slums, variations in population density, and the development of new settlement patterns. This comparative analysis has provided a detailed understanding of how slum distributions have changed within the expanding administrative boundaries of Kolkata. It has given valuable insights into the shifting spatial dynamics of these

settlements and their implications for urban planning and inclusive development initiatives in the city.

9.2.3 *Explored several slum planning initiatives aimed at fostering inclusiveness in Kolkata-* The study of different slum planning projects in Kolkata focused on promoting inclusivity. It entailed a thorough analysis of various strategies, policies, and programs that were undertaken to address the requirements and challenges of slum settlements. The study examined efforts to enhance social, economic, and infrastructural progress in these disadvantaged regions. It included efforts to improve access to fundamental necessities such as shelter, sanitation, healthcare, education, and employment opportunities. In addition, the study examined participatory planning methods, community engagement initiatives, and policy interventions designed to empower individuals and cultivate a sense of ownership among slum dwellers. The research examined various initiatives aimed at enhancing the living conditions, social integration, and overall well-being of slum communities in Kolkata. It revealed both successful practices and areas that require further attention for more effective inclusive slum planning.

9.3 Chapter IV: Inclusivity among slums developed over different periods in kolkata covering five zones

9.3.1 *Ranking of the Slums Based on Amenities Available-* A composite index has been developed to analyze the accessibility patterns of many factors, including literacy, living conditions, health care facilities, economic conditions, transportation and communication, and disaster facilities. where it would be visible The Baniatola Street Slum is characterized by extreme poverty, which hinders its inclusivity. Similarly, the New Tangra Lane Slum is becoming less inclusive due to inadequate healthcare facilities and economic conditions. The Baghajatin Colony Slum is also experiencing a decline in inclusivity due to insufficient disaster facilities. In addition, the Sahid Smriti Colony Slum is facing challenges in inclusivity due to low literacy rates and poor economic conditions. Lastly, the Adhikary Para Colony Slum is also witnessing decreased inclusivity primarily due to low literacy rates. By addressing these issues, the integration of slums could be enhanced.

9.3.2 *Developing a comprehensive design for a ward that includes slum areas -* A prototype might be developed to ensure comprehensive inclusion of slums,

providing all necessary services. To establish an inclusive slum community inside a ward, it is essential to provide adequate educational institutions, healthcare facilities, economic amenities, markets, financial activity, social acceptability, ecological equilibrium, and various other necessities. From an administrative perspective, it is suggested that a prototype presented in Chapter IV be implemented, since it would be beneficial for society.

9.4 Chapter-V: Physical Location (Site) as Basis for Inclusion of Slums

9.4.1 *Ranking of the Slums based on Amenities Available-* A composite index has been created by considering amenity factors for both registered and unregistered slums. Among the registered slums, the Panchanantala Road slum is more inclusive than the Narkel Danga Canal East Road slum. Among the unregistered slums, Madhobtala Lane Bustee, Dhakuria is more inclusive than Narkel Danga Canal West Road Bustee. In terms of physical location, Panchanantala Road slum is ranked first, Narkel Danga Canal East Road slum is ranked second, Madhobtala Lane Bustee, Dhakuria is ranked third, and Narkel Danga Canal West Road Bustee is ranked fourth in terms of inclusivity.

9.4.2 *Relocation Slum Planning Suggestions for Unregistered Slum-* Through relocation planning, it is evident that the utilization of vertical slum architecture results in a significant portion of the slum area remaining unoccupied. This allows for the incorporation of essential amenities such as schools, hospitals, water supplies, parks, companies, and environmental spaces. The available amenities provided to both slums contribute to their inherent inclusiveness. Due to the ongoing effort to replace slums with permanent structures, it is expected that these areas will exhibit improved resilience to fire and atmospheric dangers. Enhancing construction infrastructure will result in a concomitant enhancement of sewerage systems. Therefore, by addressing the issues of water logging and congestion caused by garbage, we can improve the health conditions of urban slum people. This is because it would decrease their exposure to a polluted environment.

9.4.3 *Rehabilitation Slum Planning Suggestions for registered slums-* According to the restoration planning, it is clear that this region is located near inexpensive educational facilities that serve both girls and boys, including primary, secondary, and high secondary schools. This region is located near healthcare institutions,

such as health centers and hospitals. The location may be accessed through well-maintained thoroughfares on both sides, namely Raja Dhirendra Street and Narkel Danga Main Road. The location of this site is on land controlled by the government, which is typified by unused and uncultivated land. As a result, the legal process for relocating will be relatively straightforward.

9.4.4 *Strengths and Challenges of Relocation and Rehabilitation Model Planning-*

To examine their strengths and challenges, two slums have been selected as real-life case studies: the Nonadanga slum and the Monoharpukur Road slum.

9.4.4.1 Strengths of Relocation Model Planning: Pucca households are a more secure option when it comes to withstanding climatic challenges. The transition to vertical housing has prevented the unlawful and violent occupancy of horizontal land, preserving it. Replacing communal bathrooms with individual toilets mitigates the transmission of infections. Planning for water sources, sanitation, and other amenities becomes easier for the planner after relocation due to their compact nature.

9.4.4.2 Challenges of Relocation Model Planning- The available transport options are inadequate, especially during morning and evening hours, which makes relying on private transport extremely burdensome for individuals. The absence of filtered water and the existence of canals contribute to water scarcity and contamination of subsurface water sources. The absence of subterranean drainage coupled with the presence of superficial open drainage results in the inundation of the vicinity. The new hamlet, located far from the typical economic hubs, lacks ample livelihood alternatives. Currently, the government has not established any self-help groups, female cooperatives, or male employment opportunities.

9.4.4.3 Strengths of Rehabilitation Model Planning- With the transition from horizontal settlement to vertical settlement, there is now a large unused area that might be utilized to provide more amenities for the urban poor. The substitution of communal toilets with individual toilets has diminished the transmission of diseases. The strategic positioning of this slum in a highly developed urban region makes it a prime candidate for enhanced inclusivity.

9.4.4.4 Challenges of Rehabilitation Model Planning- As these people are culturally backward than the rest of the region a constant social distance and discrimination are always faced by them.

9.5 Chapter-VI: Religion as a Basis for Inclusiveness in the Slums

- i) Examined the influence of religious factors on inclusivity within slum communities-* Based on this chapter, it can be determined which religion dominates in the two selective boroughs ward-wise. Specifically, borough 15 has a dominant religion. The Muslim religion is the predominant faith in both the Borough and the ward. In Borough 6, this dominance is evident from the population composition chart, which shows a significant Hindu population.
- ii) Conducted buffer zoning maps and analyses to understand the spatial distribution and impacts of religious influences on slum inclusion-* A buffer zoning map consisting of eight zones has been created to determine the distances between Hindu slums, Muslim slums, bi-religion slums, and other slums, about specific individual slums. The Ata Bag slum has a high concentration of Muslim residents, making it a predominantly Muslim area. Conversely, Smith Hoe Lane is not dominated by Muslims.
- iii) Explored the amenities and satisfisfactory Index of the slum dwellers-* As a result of the determination of the Cumulative and comparative amenities satisfaction index, it has been discovered that the level of satisfaction in Bag Slum is somewhat lower than that in Smith Hoe Lane Slum.
- iv) Explored strategies for inclusive planning in religiously diverse slum areas-* Several strategies have been devised to enhance the inclusivity of the slum, focusing on social cohesion, social inclusion, and social participation. Moreover, by implementing inclusive policies and legislation, ensuring access to public spaces, prioritizing inclusive decision-making processes, fostering academic discourse and personal development opportunities, promoting respect for diversity, safeguarding freedom of choice and religion, encouraging participation in decision-making, providing social protection, and fostering solidarity, inclusiveness can be enhanced.

9.6 Chapter VII: Fire Hazard Proneness as Basis for Inclusion of Slums

- i)** *Assessed the Fire Vulnerability Index of Kolkata ward-wise-* This chapter presents the Fire Vulnerability Index of slums in Kolkata, which is determined by factors such as proximity to water sources, availability of emergency exits, average distance from the nearest fire brigade, road accessibility during fire hazards, and average distance from the nearest fire brigade in the slums. The analysis reveals that thirty wards are classified as being at a high vulnerability stage for fire hazards, while fourteen wards fall into the low vulnerability zone. Furthermore, upon examining the general state of the KMC map, it becomes evident that the slums in the northern region of Kolkata, namely the older ones, are more susceptible to vulnerability as compared to the southern or newer areas of Kolkata.
- ii)** *Assessed the Resilience Index of slum settlements to fire hazards-* This chapter focuses on three selected slums and generates a Resilience Index based on specific criteria. These criteria include the proximity to water, the presence of emergency exits, the distance from the nearest fire brigade, road accessibility during fire hazards, the condition of electricity, the type of roofs and houses in the slums, the average distance between houses, the percentage of households with in-house kitchens, and the percentage of households with LPG. The analysis reveals that the Basanti Colony Slum is the most developed, the Brace Bridge Railway Station registered slum is in the developing stage, and the Topsia Unregistered Slum is in the underdevelopment stage.
- iii)** *Conducted evaluations on preparedness measures, proximity to resources, and infrastructure accessibility during fire hazards-* To address the conditions in slums, it is important to maintain preparedness that aligns with the specific needs of the community. This includes fostering community resilience and participation during times of hazard, constructing artificial water bodies near the slum area to mitigate risks, and establishing emergency exits throughout the slum zone to ensure the safe evacuation of residents during hazardous events. To meet the needs of slum dwellers, it is important to implement measures such as proper storage of kerosene oil or firewood, switching to less harmful cooking oils, converting temporary dwellings into permanent houses with the assistance of Pradhan Mantri Awas Yojna and state government

housing loans, conducting regular inspections of electrical wire connections, ensuring sufficient supply of sand and providing government-sponsored fire extinguishers.

9.7 Chapter-VIII: Economic Resilience of Slums during COVID-19

- i) Examined the economic vulnerabilities and resilience of slum communities during the COVID-19 pandemic-* The primary discovery in this chapter is the economic susceptibilities brought about by the COVID-19 epidemic across India, with a specific focus on West Bengal and Kolkata. During that period, various regions in India, such as West Bengal and Kolkata, managed to sustain themselves economically by enhancing their skills and transitioning to different areas of work, as described in the Adhikary para chapter of Thakurpukur Slum.
- ii) Conducted case studies to understand coping mechanisms, vulnerabilities, and adaptive strategies employed by slum dwellers during-* The case study of Adhikary para slum exemplifies the resistance and survival strategies employed during the COVID-19 outbreak in Kolkata. Through the acquisition of new skills and adapting to different professions as needed, even individuals with minimal job security can ensure their survival during times of societal fragility. Their success hinges on their ability to upgrade mechanisms, which they have achieved through educational understanding and mental acceptance.
- iii) Identified the economic impacts of crises on slum settlements and suggested measures for bolstering economic resilience-* The comprehensive analysis also highlighted the economic challenges faced by slums, particularly older ones such as Baniatola and Ahiritola. It is recommended that abandoning outdated practices, which are no longer effective, and embracing new practices promptly can help uplift the slums and keep them updated. Otherwise, the majority of individuals will be left behind, experiencing job loss in their fundamental economic pursuits, and receiving no compensation due to the absence of adaptability in their chosen professions. This vulnerability will be further exacerbated in the event of any social hazard, where their minimal economic activity will also cease entirely or be forcibly halted.

Chapter 10: Conclusion

The thesis conclusion functions as a concise and cohesive overview of the primary discoveries, arguments, and contributions made through the conducted research. The conclusion of a study usually restates the research questions or objectives stated in the introduction, provides a concise summary of the primary findings and insights obtained from the analysis or investigation, explores their implications and importance within the wider academic framework, and may propose potential directions for future research. Furthermore, the conclusion frequently restates the thesis statement and emphasizes the overall importance of the study's findings in furthering knowledge and comprehension of the topic of investigation.

The thesis extensively examines the intricate framework of Kolkata's slum communities, offering a comprehensive understanding of the various challenges and opportunities inherent in these marginalized urban areas. The research has analyzed multiple aspects, such as spatial, socio-economic, religious, physical location, and vulnerability factors, uncovering the complex network that impacts the inclusivity of slum communities. This study emphasizes the need to adopt a holistic approach to urban planning, particularly the pressing need for methodologies that surpass traditional models and promote community engagement and equitable allocation of resources.

The thesis employs spatial and temporal analyses to provide a comprehensive historical account of slum settlements in Kolkata, documenting their evolution from the colonial period to the current urban landscape. An examination of buffer zones, and spatial distribution yields crucial insights into the unique characteristics of these communities. However, the reliability of past data and the dynamic nature of urban surroundings create limitations, necessitating a more adaptable and continuous monitoring approach. The study highlights the constraints of relying on secondary data sources. It suggests that future research should employ primary data collection methods to comprehensively capture the real-time dynamics and local perspectives inside these communities.

The investigation of the physical placement or site selection of slums highlights the complex interaction between spatial dynamics and inclusivity in urban environments. Examining appropriate strategies for relocating and rehabilitating slum communities, using the Composite Index Ranking Score, reveals the intricate influence of physical location on the social structure of these communities. Although this analysis has some limitations in relying on historical data and dealing with dynamic urban environments, it emphasizes the significant impact of location-based elements on influencing religious influences, social cohesiveness, and planning initiatives. To develop inclusive planning solutions suited to the different spatial settings of slum settlements, it is crucial to conduct additional studies on the intricate interplay between physical sites, socio-economic conditions, and cultural factors.

Religious influences exert a substantial influence on the level of inclusion inside the slums of Kolkata. The thesis delves into the complexities that result from religious divisions, analyzing their influence on social cohesion and strategic pursuits. The buffer zoning maps and neighborhood assessments offer valuable information on the spatial concentration of religious impacts, necessitating culturally suitable design decisions. Nevertheless, the

thesis acknowledges the intricate nature of religious dynamics and proposes more exploration of the interplay between religion, social capital, and urban architecture for a more thorough understanding.

The susceptibility to fire hazards is a significant issue that affects the ability of slum settlements to recover and adapt. Immediate attention is required for vulnerability assessments, proximity to resources, and preparation evaluations, as they are crucial areas that need to be addressed. Nevertheless, there are still difficulties in obtaining full data on the accessibility of infrastructure and indices of living conditions, which necessitates additional empirical research. The thesis promotes the implementation of proactive strategies, emphasizing the importance of strong infrastructure, community-led disaster management, and government assistance in reducing fire risks in these susceptible areas.

The COVID-19 epidemic has revealed the vulnerability and flexibility of slum populations, highlighting their economic resilience during crises. Case studies provide insight into the complex socio-economic dynamics, adaptive strategies, and susceptibilities experienced by residents in slums during crises. Nevertheless, the research acknowledges the constraints in data accessibility and suggests additional investigations to have a thorough understanding of the many economic factors and their consequences for inclusive planning initiatives.

The thesis highlights the pressing and intricate nature of inclusivity in Kolkata's slums, underscoring the need for a comprehensive and collaborative approach to tackle their difficulties. This emphasizes the significance of targeted interventions that consider the diversity, historical development, and current dynamics within these communities. Although the research provides essential insights, it is important to recognize its limits, such as the restrictions imposed by the available data, issues regarding generalizability, and the always-changing nature of urban surroundings.

The findings derived from this thesis are crucial in developing strategic suggestions for policymakers, urban planners, and stakeholders. The findings support the implementation of flexible and situation-specific interventions that prioritize the improvement of infrastructure, fair distribution of resources, socio-economic empowerment, resilience to hazards, and solutions that focus on the needs of the community. The thesis proposes that different stakeholders work together to ensure the successful implementation of inclusive

policies and programs promoting fair and sustainable urban development in Kolkata's diverse slum settlements.

Ultimately, the thesis on inclusive slum design in Kolkata provides a fundamental investigation of the various complex factors that affect these marginalized groups. It requires a fundamental change in urban design, promoting comprehensive policies that prioritize the well-being of individuals and address various factors such as spatial distribution, socioeconomic conditions, religious aspects, and vulnerability to hazards. The research recognizes its limitations and encourages future studies to use diverse methodologies, include primary data collection, and adopt longitudinal approaches. This will improve the comprehensiveness and applicability of inclusive slum planning strategies in Kolkata and other areas.

Appendix

Appendix -A

Questionnaire Survey

A. Identification of the slum:

1. Name of the slum:
2. Ward no: Borough no:
3. Police station:
4. Total area:
5. Total population: Male Female:
6. Total households:

Module 1: Demographic Characteristics

1. Name of the head of the family:_____
2. Age:_____
3. Gender: Male Female
4. No. of family members: Male:_____ Female:_____
5. Type of family: Joint Nucleated
6. Details:

Age group	Number of members	Male	Female
Child (0-6 years)			
Preteens (6-12 years)			
Adult (18-60 years)			
Old (above 60 years)			

7. Residing in this place since:
 - Birth
 - 50 years
 - 25-50 years
 - 10-25 years
 - 5-10 years
 - <5 years

8. Whether migrated from elsewhere? Yes no
9. From where have you migrated? _____
10. Reason for migration: _____
11. How long have you migrated? _____
12. Family dominated by: Male Female
13. Religion: Hindu Muslim Others
14. Caste: General Scheduled Caste Scheduled Tribe OBC
15. Language: _____
16. Physical location of the household in the slum: -
- a) Along the canal line b) Along the Railway line
- c) Along a water body d) Another slum household
17. Land tenure status: -
- a) With patta b) Possession certificated occupancy right
- c) Encroached private land d) Encroached public land
- e) On rent f) Others
18. Education
- a) Total number of literates: Male - Female-
- b) School dropouts (if any): (within 6-14 years)
- Male - Female -

19. Education Qualification:

Age	Male/Female	Upto Primary level	Upto Class 8	Upto Class 10	Upto Class 12	Graduation	Master Degree	Vocational Training	Illiterate	Dropout	Medium of instruction

20. Distance from your residence to the nearest:-

- a) Primary school (km) –
- b) Secondary school (km) –

21. Mode of Journey:

22. Type of pre-schools available –

Municipal govt. private

23. Types of primary schools available –

Municipal govt. private

24. Types of high schools available –

Municipal govt. private

Module 2: Occupational Characteristics

1. Economic status (monthly income in Rs.)

Less than 500	500-1000	1000-1500	
1500-2000	2000-3000	3000 – 5000	More than 5000

2. Employment status: Self-employed/casual labor/ salaried/regular wage

3. Type of work:

4. Place of work:

i) Within the slum:

ii) Within 0.5 km:

iii) 0.5 - 2 km:

iv) 2-5 km:

v) More than 5 km:

5. Time of work:

6. If, a major earning member is female, state whether she is:

----Married/unmarried/widowed/abandoned

7. No. of earning adult members: - Male/Female.

8. No. of non-earning adult members: - Male/Female

9. No. of dependents in the family:

10. Is your family below the poverty level: - Yes/no

11. Debt outstanding as of date of survey(approx.):

12. Total family income (monthly): _____

13. Annual: _____

Rent	Education	Food	Health	Transport	Others

14. Household expenditure (in rupees): _____

Module 3: House Types and Basic Amenities

1. House Types: Pucca/Semi-Pucca/Kutchra
2. No. of rooms:
3. Structure: Single Storied /Double Storied
4. Roof Type:
5. Type of flooring:
6. Type of wall:
7. Is there a bathroom in your house? Yes No
8. Do You Use a Community Bathroom? Yes No
9. Is there a separate toilet for males and females:
10. Source of drinking water: Tap at home/Community tap/ Well/Tube Well/Others
11. How long does it take to reach the source of water? _____
12. If the municipal corporation's piped water supply is available, state the duration: - < 1 hour daily / 1-2 hours / once a week / twice a week / not regular / no supply.
13. Source of fuel: LPG/ Kerosene/Coal/Firewood and leaves/ Others.
14. Is your house electrified? Yes No
15. Condition of electric supply in this area: Regular/ Irregular/ Intermittent.
16. Water Supply (a) 24 hrs. (b) 12 hrs. (c) less than 12 hrs.
17. Water storage (a) Choubacha (b) drum (c) bucket
18. Whether water is adequate:
19. Drainage Type: (a) Open drain with no lining (b) lined surface drain (c) cover (d) lined surface drain with cover (e) underground.
19. Solid waste disposal: (a) Municipality bin (b) Individual bins (c) Community bin (d)Open

Module 4: Road condition

1. Type of road:
2. Existence of lamp post/connection of electricity:
3. Frequency of spacing of the lamp post:
4. Type of street light:
5. Road approaching the residence:
 - a. Lanes (..... meter/ feet) b. Bylanes (.....meters / feet)
6. Width of the road:

Module 5: Health Condition

1. Type of health facility access: Primary Health Centre/ Government hospital/ Private clinic
2. Distance of nearest health care center from: -
Within the slum area/distance less than 0.5 km / 0.5-2km / 2-5km / More than 5 km
3. Type of diseases: Common cold and Fever / Stomach Problem / Malaria / Dengue / Gastro-Intestinal / Others
4. Frequency of occurrences of diseases: every month / every 6 months/ every one year/ every five years
5. Where is the ill person treated? Home/ Dispensary/Hospital
6. How far is the health clinic located?
7. Are doctors available all the time? Yes No
8. Availability of medicinal shop: Within the locality /Within 1km/ Beyond 1km
9. Monthly expenditure on medicine (approx.) Rs. _____
10. Solid waste management issue: -_____
11. Frequency of garbage disposal: -
12. Daily/ once in 2 days / once in a week / once in a fortnight / No clearance
13. By whom is the garbage collected? Municipality / Residents/others
14. Frequency of clearance of open drains: - Daily / once in 2 days / once in a week / once in a fortnight / No clearance.
15. Do you have your dumper bin? Yes / No

Module 6: Perception

1. Satisfactory Index

Parameter	Good	Satisfactory	Below Satisfactory
Living Condition			
Transport Facilities			
Educational Facilities			
Medical Facilities			
Water Supply			
Power Supply			
Drainage and Sanitation			
Waste Disposal			

2. Do you have any conception about environmental pollution? Yes/No

Module 7: Types of disaster within the slum

A. Fire Hazard

1. Whether any fire hazard has taken place within : 1 year /2 year/ 5 years
2. Cause of fire :
3. Extent of damage: (a) loss of lives
4. Loss of shelter:.....
5. Loss of assets:.....
6. How did they escape from fire hazard:
7. Where did they take shelter during such a hazard:
8. What do they face the problems now:.....
9. What do children and women face health problems due to fire and smoke:.....
10. What are the measures taken by them at the time of hazard:.....
11. What are the measures or assistance given by the govt:.....
12. Requirements they need now:
13. Any kind of safety measures taught to them about saving themselves from fire disaster: Yes/No

B. Flood and waterlogging

1. Whether the slum area is prone to flood and water logging:
2. Cause of such disaster:

-
- Low-lying area / No drains / Bad Drainage system / Congestion of existing drains / Other reasons / All of the above
3. Frequency of such disasters.....
 4. Conditions of Drains: No pucca drains / Drains with congestions /Open drains / Others
 5. Problems faced by them.....
 6. Types of diseases which they suffer due to water logging and flood:
 7. Where do you take shelter during such a hazard:
 8. Any loss of life or property:
 9. Suggestions.....

Module 8: Morbidity / Occurrences of Diseases

1. Types of Epidemic and Chronic Diseases:
2. Frequency of such diseases:
Every month/ Every 6 months/Every one year/ Once every five years
3. Cause of such diseases: Malnutrition / Unhygienic environment /
Transmitted from outside the slum / other reasons:
4. Loss of life:
Male: Female: Child (below 5 years): Old aged(Above 60 years):
5. Other losses: Like loss of jobs/loss of property/loss of assets / other social concerns or losses.....
6. Type of treatment: Own / Government
7. Place of treatment: Within the slum health center / Within the city / Outside the city
8. Suggestions
9. Any governmental help or measures are taken:

Module 9: Crime and Insecurity:

1. Any occurrences of crime within the slum: Theft / Kidnapping / Crime / Drugs / Others
2. How many are involved approximately:
Male: Female: Child:
3. Reasons for committing such crime: Poverty / Bad Companion / Illiteracy / Other
4. Any kind of problem they face due to this: Harassment from the police / Isolation from the community / Jail or Imprisonment /
Others:
5. Recommendations:
6. Any help or rehabilitation from the government or local body or NGOs.....

Module 10: Domestic Violence

1. Type of domestic violence they face in their house: Verbal abuse / Physical Abuse / Both / Mental Abuse / Molestation / Marital Rape / ANY Other
2. Who abuses them: Husband / Father / Son / Other family members / Friends / Mother-in-law / Father-in-law / others
3. Reason for such abuse: Due to financial demand / due to dowry / due to alcohol addiction / due to drug addiction / due to family conflict / others
4. Frequency of such abuse: Daily / Weekly / Monthly / Yearly
5. Any steps taken by them to save themselves from such abuse:
6. Any legal actions taken by them to stop such abuse:
7. Any suggestions to stop such abuse or assistance they want from the govt.....

Module 11: Gender Related Issues

- Slum Name:
- Ward No:
- Total number of populations in the slum: Male Female
- Name of the respondent:
- Age of the respondent:

A. Quality of House

1. Type of house: Pucca / Semi Pucca / Tarpaulin / Asbestos / Other Type mention it.
2. Number of rooms:
3. Number of people living in the room/ house:
4. Whether room shared by other families – Yes / No
5. What are problems they face while sharing their room: Loss of privacy / Lack of space / Other
6. Type of flooring:
7. Type of roof:
8. Availability of electricity: Yes /No If Yes Then Whether: Legal / Illegal
9. Type of electric appliances: Fan / Tube light / Bulb/ TV/ Others
10. Type of family: Nucleated / Joint
11. Whether kitchen inside the house: Yes /No
12. Whether separate kitchen inside the house: Yes /No
13. Type of cooking mode: Kerosene / LPG / Wood / Coal /Other
14. What type of problems they face due to cooking inside the house or related health problems:
15. From where they collect wood/ coal for cooking: And who collects it :
16. Whether water supply inside the house:

17. Distance from where they get cooking materials and water:
18. Distance of drinking water supply:
19. Source of drinking water:
20. Quality of water: Good / Bad/ Doesn't Know
21. Whether toilet is there within the house: Yes /No
22. Type of toilet:
23. Whether water supply or tap water is there within the toilet: Yes /No. If No Then from where do they have to carry the water specify the distance:
24. Whether water sweeps inside the house during rainy seasons or after heavy shower:
25. From where does the water sweeps inside:
26. The reason:
27. Does the water from the road come inside the house?
28. Whether the female sleeps on the ground surface or in the bed:
29. How many windows are there within the house or within a room:
30. Whether well-lit or ventilated rooms or dampness prevails within the house:
31. Are they satisfied of their living or housing conditions: If no give the reasons or their suggestions:
32. Are they aware that their living conditions or housing are prone to disasters; Yes /No
33. What are the steps taken by them to prevent themselves from disasters like-
 - a.Flood / Water logging:
 - b.Fire:
 - c.Diseases or unhygienic conditions:
33. Any type of advice or training given to them from govt or NGOs for preventing themselves from disaster:
34. Whether any shelter / relief place / open space is there within their slum where they can take shelter at the time of emergency:
35. Any financial assistance given by the govt. to improve their housing conditions:

B. Location of the house/ slum:

1. Location of the slum:
2. Any specific reason for residing in this place: Cheap / Nearness or accessibility / Employment/ education / other
3. Problems they face for residing in this locality: Crowded / Unhygienic / Water logging / Flood / Diseases / Crime / Unhealthy ambiance / Low standard of living /Others.
4. Width of the main road (meters /feet):
5. Width of the by lanes (meters/ feet)
6. Type of the road: By lanes:

7. Conditions of the road and by lanes: Good / Average / Bad / worse
8. Whether drains are there: Yes /No
9. Type of drain: Open / Covered / Pucca and covered / Kutcha but covered/ Kutcha but uncovered / Underground drainage system/ Surface drain but covered/ surface drain but uncovered.
10. Frequency of clearance of drains: Weekly/ Monthly/ Yearly/ Not done at all
11. Where is the waste dumped: Vat/ Corporation Vats/ Open space/ Road/ Canal nearby/ other
12. Frequency of cleaning of the solid waste: Weekly/ Daily/ Once in a month/ other / Not at all
13. What are the problems they face due bad drainage system and solid waste:
14. Whether water logging is seen in the slum: Yes /No Give Reason:
15. For how much time water is logged in the roads: Less than 1 hour / 1 to 2 hours / 2 to 5 hours / One day / Two days/ one week
16. Whether street light/ lamp post is there: yes /no
17. Whether the lamp post are working: yes / no
18. Frequency of their maintenance:
19. Connectivity / How far is the distance to the main road / public transport / railway
20. How far is the nearby hospital: By what means they travel: How much time is required:
21. How far is the nearby school: By what means they travel: How much time is required:
22. How far is the nearby fire brigade station: How much time is required to reach there:
23. Type of ownership:
24. Any developmental work done within the slum by the local bodies / govt / NGO:

C. Storage of food and water:

1. Where do you store the drinking water and water for domestic use? Tub/ Chowbacha / Drums / Bottles/ Tank /other
2. Who brings the water:
3. How many times they have to fetch the water:
4. What are the problems they have to face for fetching the water :
5. Quality of water:
6. What are the problems they face in rainy season or in flood conditions:
7. What are the health problems due to the bad quality of water:
8. How many times they clean the storage space or by what they clean the storage places to keep water:

9. Does there is prevalence of malaria / dengue / diaherrea / stomach problems:
10. Occurrence of the above-mentioned diseases during last one year:
 - a. Number of Persons affected by Malaria: Male: Female:Child:
 - b. Number of Persons affected by Dengue:Male: Female:Child:
 - c. Number of Persons affected by Diaherrea: Male: Female:Child:
 - d. Number of Persons affected by Stomach Problems: Male: Female: Child:
11. Where do they store their food:
12. Any problem faced for storing the food during hot seasons and rainy seasons:
13. Any suggestions or requirements for adequate drinking water supply:

D. Less Mobility:

1. How frequent they go outside their slum:
2. Reason: Shopping / Work / Education / Health care or check up / other reasons / recreation
3. Where do they go for shopping / Distance of the local market:
4. How frequent:
5. By means of; Problems they face while going for shopping:
6. Where do they go for work/ Distance:
7. For how many hours:
8. By means of:
9. Problem they face while travelling:
10. Usually with whom they travel: Alone / With husband / With father / With Son / By Mother / By Family or friends
11. What are the problems they face while travelling alone:
12. What are the problems they face during rainy season/ water logging :
13. Any objections from male members for travelling alone and why:
14. Requirements and Suggestions:

E. Social and Cultural Aspects:

1. Whether they have gone to school: Yes /No
2. If No then state the reasons:
3. Upto which class they have studied:
4. Educational Qualification:

Age	Upto Primary level	Upto Class 8	Upto Class 10	Upto Class 12	Graduation	Master Degree	Vocational Training	Illiterate	Dropout	Medium of instruction

5. Reasons for dropout: : Financial / Lack of interest from family members / due to poverty they have to work for income generation / social cause like early marriage / social cause like importance to boy child / no separate school for girls / due to distance and inadequate public transport / lack of interest of themselves / other causes.
6. Distance of the nearby primary school:
7. How many schools are there in the slum:

School	Number of schools	Distance in Km	Total Students	Total Girl students
Primary				
Upto Class 8				
Secondary				
Higher Secondary				
Adult literacy centre				
Vocational Training centre				

8. How do they go to school:
9. Medium of instruction:
10. What are the facilities they get in school:
11. What are the problems they face
12. Any adult literacy Centre or vocational Centre:
13. Any financial assistance they get from govt.:
14. Any type of disaster training given to them:
15. Do they know how to swim or climb trees:
16. Do they watch T.V.
17. What type they watch:
18. Do they watch or hear news:
19. Do they read newspaper:
20. Do they have or received any warning about any storms, flood, heavy showers, awareness of hygienic conditions etc.
21. From where do they get information regarding this disaster:
22. Do they participate in decision making in their own house:
23. What type of decision they make or are responsible:
24. If no, who takes the decision in the family:
25. Do they participate in community decision making in their own locality:
26. What type of work they perform in the locality: Planting trees / Training of hygienic conditions to others /training family planning / cleaning of solid waste and other wastes / other community works

27. If no, what are the reasons for their exclusions?
28. What are the responsibilities they have to look after : Cooking / Domestic work like washing of clothes, utensils / teaching their children / looking after their children and elders / to earn income / other responsibilities
29. Do they have any training for awareness of family planning / aids / hiv / malaria / dengue / child birth / others:
30. Age of their marriage:
31. Type of their marriage:
32. Age of them during the birth of 1st child:
33. Place of birth of the child:
34. What type of health problems they had to face during their pregnancy and child birth:
35. Weight of the child:
36. Any problem of the child reported:
37. Any taboo of having preference of male child and why:
38. Number of children they have: Male: Female:
39. Whether taken any family control measures and what are those measures:
40. Number of births during last one year / five years:

Number of births	Male or Female child

41. Number of deaths during last one year or five years:

Number	Male / Female	Age of death	Reason

42. What are the problems they face related to toilet, sanitation and water supply.
43. Any suggestions:
44. Frequency of occurrences of diseases:
- a. Types of diseases: Fever / cold and cough / gastro-intestinal / female related problems / stomach problem / malaria / dengue / reproductive problems or child birth related problems / iron deficiency/ pain / thyroid / mal nutrition / any others.
- b. Frequency of diseases:
- c. concurrences of diseases during last one year or five years:

Type of diseases	Number of occurrences	Reason of such diseases	Number of females affected	Number of child affected	Treatment type	Whether loss of life

- d. Where they go for treatment and how far is the centre: Primary health centre (Distance) / Govt. Hospital (Distance) / Private Nursing home (Distance)/ Any other
 - e. Reasons for the occurrences of diseases: Unhygienic living conditions / low standard of living / mal nutrition / infected from outside sources / Lack of medicines / lack of money or due to poverty / any other reason
45. Any suggestions:

F. Economic aspects

- 1. Type of ownership:
- 2. How owns the house or land:
- 3. Any property by your name:
- 4. Whether earning or not:
- 5. Type of occupation:
- 6. Monthly income average:
- 7. How do they travel to their work place:
- 8. Do they think that their income is less than their male counterparts:
- 9. Problems they face while working:
- 10. Do they have taken any loan in their own name : Do they face any problem in availing the loan from bank or any other institutions:
- 11. From where they have taken loan and for what purpose:
- 12. During any disaster what type of hardship they have to face: Loss of job / less payment due to absent / break of continuity / any other
- 13. Do they know to save themselves from the disaster :
- 14. Amount of expenditure per month:
- 15. Whether they are able to save their money and where do they save like bank / post office / in the house / any other:
- 16. Whether they are harassed in the house by male members due to their work:
- 17. What are the types of harassment they have to face on the house from the male members:
- 18. Any kind of addiction from which they suffer: drugs / cigarettes / biri / pan / alcohol /etc
- 19. Reason for such addiction:
- 20. From when they are addicted to this:
- 21. Any problem they face due to this addiction:
- 22. Any measures taken by the family members to prevent them from such addictions:
- 23. Any kind of addiction from which their family members suffer: drugs / cigarettes / biri / pan / alcohol /etc
- 24. Reason for such addiction:

-
25. Problems faced by them due to such addictions:
 26. Any measures taken by them to prevent their family members from such addictions:
 27. Any suggestions regarding their improvement of life financially:
 28. Any assistance given to them from govt. /NGO
 29. The developmental works which are carried on by the govt in their slum locality:
 30. What are their suggestions for saving themselves from any kind of disaster:
 31. What will be the safety measures or steps taken by them during any kind of disaster:
 - a. Fire outbreak:
 - b. Flood:
 - c. Water logging:
 - d. Diseases:
 32. Any kind of training or advice given to them related to such disasters:
 - a. Fire outbreak
 - b. Flood and water logging:
 - c. Spread of diseases:

Module 12: Covid-19 Pandemic and slum

A. Demographic Information:

1. Age:

- Below 18
- 18–30
- 31–45
- 46–60
- Above 60

2. Gender: Male /Female/ Other (please specify): _____

3. How many people live in your household?

- 1–3
- 4–6
- 7 or more

3. What is your main source of income during the pandemic?

- Daily wage labor
- Self-employment (e.g., small business)
- Government aid/relief programs
- No income
- Other (please specify): _____

B. Health and Safety:

1. Have you or anyone in your household been affected by COVID-19?
Yes, I have tested positive
Yes, someone in my household tested positive
No
I don't know
2. Have you been able to access healthcare during the pandemic?
Yes, easily
Yes, but with difficulty
No, I could not access healthcare
3. Do you have access to COVID-19 vaccines?
Yes, I am fully vaccinated
Yes, I have received one dose
No, I have not received any vaccine
I do not know how to access the vaccine
4. Do you have access to personal protective equipment (PPE) such as masks and sanitizers?
Yes, always
Yes, sometimes
No, never
5. How often do you wash your hands with soap and water?
Always, after every activity
Sometimes, when it's possible
Never

C. Social Impact:

1. Have you experienced any of the following challenges due to the pandemic? (Check all that apply)
Loss of employment
Food insecurity
Lack of access to clean water and sanitation
Increased violence or conflict within the household
Mental health issues (e.g., stress, anxiety, depression)
Limited access to education (for children)
Other (please specify): _____

2. Has your community received any assistance from local government or NGOs during the pandemic?
Yes, regularly
Yes, once or twice
No assistance at all
3. What kind of assistance would be most helpful to you right now? (Check all that apply)
Financial aid or support
Access to food or food distribution
Health care or medical supplies
Access to clean water and sanitation
Education or child care support
Mental health or counseling services
Other (please specify): _____

D. Living Conditions:

1. How would you describe your living conditions during the pandemic?
Comfortable with sufficient resources
Manageable, but with some struggles
Difficult, lacking essential resources
Very difficult, inadequate living conditions
2. Do you have access to clean drinking water?
Yes, always
Sometimes, but not regularly
No, never
3. What is your main source of water during the pandemic?
Tap water
Borewell
Community water point
Water tankers or vendors
Other (please specify): _____
4. How far is the nearest healthcare facility from your home?
Less than 1 km
1–2 km
More than 2 km

E. Community Support:

1. Have you received any community-based support during the pandemic (e.g., mutual aid groups, community leaders)?
Yes, regularly
Yes, occasionally
No, never
2. Are you aware of any local COVID-19 prevention programs or awareness campaigns in your area?
Yes
No
I don't know
3. How would you rate your community's overall response to the pandemic?
Very strong, everyone is cooperating
Fair, but there are challenges
Weak, many are not following safety measures
Not sure

F. Final Thoughts:

1. What would you suggest to improve living conditions or support for slum dwellers during the COVID-19 pandemic?
2. Any additional comments or concerns you would like to share?

Appendix -B

(Calculation Data Tables)

Table 1: Ranking Status of the Literacy Index Among all the Selected slums

Literacy Rate Class (%)	Rank	Vocational Training (%) Class	Rank	Dropouts (%) Class	Rank
0-10	10	0-2	10	0 - 5	1
10-20	9	2-4	9	5 - 10	2
20-30	8	4-6	8	10 - 15	3
30-40	7	6-8	7	15-20	4
40-50	6	8-10	6	20-25	5
50-60	5	10-12	5	25-30	6
60-70	4	12-14	4	30-35	7
70-80	3	14-16	3	35-40	8
80-90	2	16-18	2	40-45	9
90-100	1	18-20	1	45-50	10

Table 2: Ranking Status of the Living Conditions Among all the Selected Slums

**Crowding Index= no. of persons/ no. of rooms*

*Crowding Index Class	Rank	House Type Class	Rank	Water Quality Class	Rank	House Holds with In-house Kitchen (Percentage) Class	Rank	House Holds with LPG (Percentage) Class	Rank
0-1	1	Pucca	1	Fresh	1	0-10	10	0-10	10
1-2	2	Semi pucca	2	Semi Fresh	2	10-20	9	10-20	9
2-3	3	Kaccha	3	Semi Brackish	3	20-30	8	20-30	8
3-4	4	-	-	Brackish	4	30-40	7	30-40	7
4-5	5	-	-	-	-	40-50	6	40-50	6
5-6	6	-	-	-	-	50-60	5	50-60	5
6-7	7	-	-	-	-	60-70	4	60-70	4
-	-	-	-	-	-	70-80	3	70-80	3
-	-	-	-	-	-	80-90	2	80-90	2
-	-	-	-	-	-	90-100	1	90-100	1

Table 3: Ranking Status of Health Care and sanitation Conditions Among all the Selected Slums

Prevalence Rate of Chronic Diseases (%) Class	Rank	Frequency of General Diseases Class	Rank	percent of an underweight child at birth Class	Rank	Maternal Age at the First Delivery Class	Rank	Medical Expenses/House Holds Class	Rank	Garbage Clearance Frequency Class	Rank
0-5	6	Every 6 months	1	0-10	1	15-17	6	0-200	1	Daily	1
5-10	5	Every month	2	10-20	2	17-19	5	200-400	2	Weekly	2
10-15	4	Every week	3	20-30	3	19-21	4	400-600	3	Once in a Fortnight	3
15-20	3	Every Day	4	30-40	4	21-23	3	600-800	4	Monthly	4
20-25	2	-	-	40-50	5	23-25	2	800-1000	5	Once in a six-month	5
25-30	1	-	-	50-60	6	25-27	1	1000-1200	6	Once in a year	6
				60-70	7						
				70-80	8						

Table 4: Ranking Status of Economic Conditions Among all the Selected Slums

Income Level Class	Rank	No. of Earning Members/Household Class	Rank	No. of Dependents/Household Class	Rank	BPL% Class	Rank
0-2000	6	0-1	6	0-1	1	0-20	1
2000-4000	5	1-2	5	1-2	2	20-40	2
4000-6000	4	2-3	4	2-3	3	40-50	3
6000-8000	3	3-4	3	3-4	4	50-60	4
8000-10000	2	4-5	2	4-5	5	60-80	5
10000-12000	1	5-6	1	5-6	6	80-100	6

Table 5: Ranking Status of Transport and Communication Facilities Conditions Among all the Selected Slums

Road Type Class	Rank	Access to media (Newspapers, Mobile & Television) Class	Rank
pucca	1	0-10	10
semi pucca	2	10-20	9
kaccha	3	20-30	8
		30-40	7
		40-50	6
		50-60	5
		60-70	4
		70-80	3
		80-90	2
		90-100	1

Table 6: Ranking Status of Disaster Facilities Among all the Selected Slums

percent of HHs aware of disasters Class	Rank	Frequency of waterlogging Class	Rank	Occurrence of last fire hazard (if any) Class	Rank
0-10	10	Never	1	more than 5 years	1
10-20	9	Only during monsoons	2	1-2 years ago,	2
20-30	8	Always during light showers	3	6 months ago,	3
30-40	7			1 month ago,	4
40-50	6			Less than a week	5
50-60	5				
60-70	4				
70-80	3				
80-90	2				
90-100	1				

Table 7: Ranking Status of Slum Inclusivity based on the Average Composite Index of Satisfaction Index

Average Composite Index for Slum Inclusivity based on religious parameters like Literacy, Food accessibility, Cultural tolerance, Female Security	Rank
0-20	5
20-40	4
40-60	3
60-80	2
80-100	1

Table 8: Ranking Status of Absolute Fire Hazard Controlling Parameters of the selected Slums

Absolute Nearness to the Water(meter) Class	Rank	Presence of Emergency Exit Class	Rank	Absolute Distance from Nearest Fire Brigade (Meters) Class	Rank	Absolute Road Inaccessibility during Fire Hazard Class	Rank	Condition of Electricity Class	Rank
0-200	1	Yes	1	0-700	1	0-30	1	Legal (KMC Wired)	1
200-400	2	No	2	700-1400	2	30-60	2	Hooked	2
400-600	3			1400-2100	3	60-90	3		
600-800	4					90-120	4		

Table 9: Ranking Status of Average Fire Hazard Controlling Parameters

Avg. ward-wise Nearness to the Water(meter)	Rank	Avg ward-wise Presence of Emergency Exit	Rank	Average ward wise Distance from nearest Fire Brigade	Rank	Avg. Ward Wise Road Inaccessibility during Fire Hazard	Rank	Avg. Ward-wise Condition of Electricity	Rank
0-200	1	Yes	1	0-100	1	0-10	1	Legal (KMC Wired)	1
200-400	2	No	2	100-200	2	10-20	2	Hooked	2
400-600	3			200-300	3	20-30	3		
600-800	4			300-400	4	30-40	4		
800-1000	5			400-500	5	40-50	5		
800-1000	6			500-600	6	50-60	6		
1000-1200	7					60-70	7		
						70-80	8		
						80-90	9		
						90-100	10		

Table 10: Ranking Status of Actual Fire Hazard Controlling Parameters

Roof Type	Rank	House Type	Rank	Distance Between Two House (Metre)	Rank	HHs with Inhouse Kitchen (%)	Rank	HHs with LPG (%)	Rank
Tali	1	Pucca	1	0-0.25	4	0-10	10	0-10	10
Tin	2	Semi Pucca	2	0.25-.50	3	10-20	9	10-20	9
Plastic	3	Kuccha	3	0.50-.75	2	20-30	8	20-30	8
				0.75-1.00	1	30-40	7	30-40	7
						40-50	6	40-50	6
						50-60	5	50-60	5
						60-70	4	60-70	4
						70-80	3	70-80	3
						80-90	2	80-90	2
						90-100	1	90-100	1

Appendix -C

Pic: Sudipto Das

STRIVING FOR EXCELLENCE



- > Giri Babu Lane slum houses close to 4,500 residents
- > CU will provide books, school uniform, bags, etc
- > Children will be helped with their homework
- > Slum dwellers will be apprised about

- health amenities
- > Regular health check-up camps will be held
- > CU will provide garments
- > The kids will be taken for excursions
- > They will also be taken out during Durga Puja

CU starts community service project, adopts city slum

TOI report on Jan 10


3 If successful, the project will be replicated in other areas. This is our commitment towards the society

Sonali Chakravarti Banerjee |
CALCUTTA UNIVERSITY VICE-CHANCELLOR

Source-The Times of India/ Somdatta Basu / TNN / May 14, 2018, 12:52 IST
http://timesofindia.indiatimes.com/articleshow/64156821.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

Graphic: Dipankar Chanda

WHAT'S CHOKING KOLKATA?






Highrises encroaching upon the wetlands has blocked the way out for polluted air, leaving it trapped in pockets

WHY IS AIR QUALITY DECLINING?

- > **Shrinking open space** | From **13%** in 2000 to **5.5%** now
- > **Shrinking green cover** | City has **5.5%**, whereas the national average is **19.49%**
- > **Green open space per dweller** | **0.57sqm** in city while WHO prescribes 9sqm
- > **Shrinking waterbodies** | From **20%** a decade back to **9%** now
- > **Rise in vehicular density** | **65%** in a decade

SOURCES OF CITY'S AIR POLLUTION

- 51.40%** | Vehicular emission 
- 24.50%** | Industrial Pollution 
- 21.10%** | Dust particles from construction and road dust 

- > **Rise in PM2.5 count** | Over **300** in five months
- > **On the outskirts** | **4 coal-fired** thermal power stations

Air quality most foul even in green zone

CITY LEFT GASPING FOR BREATH

The TOI report on Wednesday

Source-The Times of India/ Krishnendu Bandyopadhyay / TNN / Dec 6, 2018, 05:58
http://timesofindia.indiatimes.com/articleshow/66962638.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

Photo: Amit Moulick

WHY TONGUES OF FIRE LEAPT FROM SECTION TO SECTION



MIND OF ITS OWN: Firemen battle the flames that re-emerged in the top floors on Monday evening. Late at night, portions of the first-floor parapet of the ravaged building began crumbling

Access Denied | Had fire started inside, firefighters would have gone in and controlled it. Here, fire started outside and spread inside, blocking off access

Trapped Gas & Heat | Poor ventilation trapped gases and smoke inside, raising inside temperature. When total temperature reaches equilibrium, there are flashovers (these can reach 1,200°C to 1,400°C) by which fire spreads rapidly



Market Maze | No symmetry in any floor. Building has numerous compartments with

hundreds of shops, which are again haphazardly partitioned

Unused Hydraulic Ladder

Could have been used to flood higher floors to prevent fire from spreading, but couldn't be opened because of a mesh of overhead wires. Why firemen could not cut the wires isn't clear



Other Equipment | Fire retardant suits that offer thermal and moisture barrier can be used barely for 10-12 minutes. The intense heat and humidity has affected sustained operations by firemen

Uneven Heat Transfer

The 3-inch or less partition walls between shops couldn't curb heat radiation. So, even if a shop next to one that was aflame did not catch fire, goods stocked two or three stalls away with lower ignition temperature went up in flames, causing the fire to jump and spread

Inflammable Materials

Goods stocked ranged from perfumes and deodorants to paper and plastic. As they degrade in the heat, the fire intensifies



Source -The Times of India, [Tamaghna Banerjee](#) & [Zeeshan Javed](#) / TNN / Sep 18, 2018, 05:44 IST

<https://timesofindia.indiatimes.com/city/kolkata/kolkata-200-firemen-battle-for-over-48hours-to-tame-bagri-flames/articleshow/65849583.cms>

Bibliography

Bibliography

- Arputham, J., & Patel, S. (2010). Recent developments in plans for Dharavi and for the airport slums in Mumbai. *Environment and Urbanization*, 22(2), 501-504.
<https://doi.org/10.1177/0956247810379936>
- Bose, N.K Calcutta: 1964- a social survey review by: Nitish r. De, printed in india by s. R. Krishnan at inland printers, victoria mills building, gamdevi road, bombay - 7, and published by s. P. Lalvani, lalvani publishing house, 210 dr. D. N. Road, bombay 1, published in 1965 <https://www.jstor.org/stable/27760884>
- Buite E., Moroni S., Franco A.D., (2021), Building obsolescence in the evolving city. Reframing property vacancy and abandonment in the light of urban dynamics and complexity, *Elsevier: Cities*, Volume 108, January 2021, 102964, ISSN 0264-2751, <https://doi.org/10.1016/j.cities.2020.102964>.
<https://www.sciencedirect.com/science/article/pii/S0264275120313123>
- Chalana M., & Rishi S. (2015). Twilight in Delhi: The Failure of Slum Rehabilitation Programs in Creating a Healthier City. *Transforming Distressed Global Communities: Making Inclusive, Safe, Resilient, and Sustainable Cities*, 245-264.
[https://books.google.co.in/books?id=H-oPDQAAQBAJ&lpg=PA155&ots=YVaeQd13dt&dq=Chalana%20M.%2C%20%26%20Rishi%20S.%20\(2015\).%20Twilight%20in%20Delhi%3A%20The%20Failure%20of%20Slum%20Rehabilitation%20Programs%20in%20Creating%20a%20Healthier%20City.%20Transforming%20Distressed%20Global%20Communities%3A%20Making%20Inclusive%2C%20Safe%2C%20Resilient%2C%20and%20Sustainable%20Cities%2C%20245-264.&lr&pg=PA155#v=onepage&q&f=false](https://books.google.co.in/books?id=H-oPDQAAQBAJ&lpg=PA155&ots=YVaeQd13dt&dq=Chalana%20M.%2C%20%26%20Rishi%20S.%20(2015).%20Twilight%20in%20Delhi%3A%20The%20Failure%20of%20Slum%20Rehabilitation%20Programs%20in%20Creating%20a%20Healthier%20City.%20Transforming%20Distressed%20Global%20Communities%3A%20Making%20Inclusive%2C%20Safe%2C%20Resilient%2C%20and%20Sustainable%20Cities%2C%20245-264.&lr&pg=PA155#v=onepage&q&f=false)
- Chaudhuri S. 1990 Calcutta The living City Vol I The past and Vol II The present and future, ISBN-13: 978-0-19-563696-3 and ISBN-13:978-0-19-563697-0.
https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Chaudhuri+S.1990+Calcutta+The+living+City+Vol+I+The+past+and+Vol+II+The+present+and+future%2C+ISBN-13%3A+978-0-19-563696-3+and+ISBN-13%3A978-0-19-563697-0&btnG=
- Cronin V. (2013). A sustainability evaluation of slum rehabilitation authority housing development at Nanapeth, Pune, India. *Environment and Urbanization Asia*, 4(1), 121-134.
<https://journals.sagepub.com/doi/abs/10.1177/0975425313477567>

- Gans, H. J. (1959). The human implications of current redevelopment and relocation planning. *Journal of the American Institute of Planners*, 25(1), 15-26. <https://www.tandfonline.com/doi/abs/10.1080/01944365908978294>
- Ghertner, D. A. (2012). Nuisance talk and the propriety of property: Middle class discourses of a slum-free Delhi. *Antipode*, 44(4), 1161-1187. November 2011 <https://doi.org/10.1111/j.1467-8330.2011.00956.x>, <https://onlinelibrary.wiley.com/doi/full/10.1111/j.1467-8330.2011.00956.x>
- Ghosh, S and Mondal, M. (2019): Risk Analysis for Recommendation of an Effective Fire Hazard Management System: A Study in Kolkata Municipal Corporation (KMC) Area, West Bengal, India, *International Journal for Research in Engineering Application & Management*, Vol-05, Issue-02, May 2019, https://www.researchgate.net/profile/Madhav-Mondal/publication/335777386_Risk_Analysis_for_Recommendation_of_an_Effective_Fire_Hazard_Management_System_A_Study_in_Kolkata_Municipal_Corporation_KMC_Area_West_Bengal_India/links/5d7a96c892851c87c37b0d03/Risk-Analysis-for-Recommendation-of-an-Effective-Fire-Hazard-Management-System-A-Study-in-Kolkata-Municipal-Corporation-KMC-Area-West-Bengal-India.pdf
- Greenfield, S. M. (2010). A FAITH-BASED MENTAL HEALTH AND DEVELOPMENT PROJECT FOR SLUM DWELLERS IN BRAZIL. *NAPA Bulletin*, 33(1), 91-104. <https://anthrosource.onlinelibrary.wiley.com/doi/full/10.1111/j.1556-4797.2010.01042.x>
- Lubell H., 1974. "Urbanisation and employment; insights from a series of case studies of third world metropolitan cities," ILO Working Papers 991598933402676, International Labour Organization. RePEc:ilo:ilowps:991598933402676, http://www.ilo.org/public/libdoc/ilo/1974/74B09_837.pdf
- Mbiggo, I., & Ssemwogerere, K. (2018). An Investigation into Fire Safety Measures in Kampala Slums—A Case of Katanga-Wandegeya. *Civ. Environ. Res*, 10, 30-34. ISSN 2224-5790 (Paper) ISSN 2225-0514 (Online) Vol.10, No.3, 2018, <https://core.ac.uk/download/pdf/234678678.pdf>
- Mc Granahan, G., Schensul, D., & Singh, G. (2016). Inclusive urbanization: Can the 2030 Agenda be delivered without it?. *Environment and Urbanization*, 28(1), 13-34. Environment & Urbanization Copyright © 2016 International Institute for Environment and Development (IIED). 1 3 Vol 28(1): 13–34. DOI: 10.1177/0956247815627522 www.sagepublications.com, <https://journals.sagepub.com/doi/full/10.1177/0956247815627522>

- Mondal, M., & Bhowanipur, S. J. Risk Analysis for Recommendation of an Effective Fire Hazard Management System: A Study in Kolkata Municipal Corporation (KMC) Area, West Bengal, India. ISSN : 2454-9150 Vol-05, Issue-02, May 2019, https://www.researchgate.net/profile/Madhab-Mondal/publication/335777386_Risk_Analysis_for_Recommendation_of_an_Effective_Fire_Hazard_Management_System_A_Study_in_Kolkata_Municipal_Corporation_KM_C_Area_West_Bengal_India/links/5d7a96c892851c87c37b0d03/Risk-Analysis-for-Recommendation-of-an-Effective-Fire-Hazard-Management-System-A-Study-in-Kolkata-Municipal-Corporation-KMC-Area-West-Bengal-India.pdf
- Purakait. S.K, Halder S., Fire Accident in Kolkata Slums: A Case Study of Basanti Colony and Tangra Slum-Causes, Consequences and Possible Ways to Mitigation , *International Journal of Humanities & Social Science Studies (IJHSSS) A Peer-Reviewed Bi-monthly Bi-lingual Research Journal* ISSN: 2349-6959 (Online), ISSN: 2349-6711 (Print) Volume-III, Issue-I, July 2016, Page No. 266-278 Published by Scholar Publications, Karimganj, Assam, India, 788711 Website: <http://www.ijhsss.com> https://www.researchgate.net/profile/Sanat-Purkait/publication/358071997_Fire_Accident_in_Kolkata_Slums_A_Case_Study_of_Basanti_Colony_and_Tangra_Slum-Causes_Consequences_and_Possible_Ways_to_Mitigation/links/61eed56f9a753545e2f3b6c2/Fire-Accident-in-Kolkata-Slums-A-Case-Study-of-Basanti-Colony-and-Tangra-Slum-Causes-Consequences-and-Possible-Ways-to-Mitigation.pdf?_sg%5B0%5D=started_experiment_milestone&origin=journalDetail
- Racine J. (1990) Calcutta 1981: The City, Its Crisis, and the Debate on Urban Planning and Development Hardcover – 1 December 1988 Concept Publishing Company Pvt. Ltd., Publication date- 1 January 1990 ISBN-10 8170221935, ISBN-13 978-8170221937, https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Racine+J.+%281990%29+Calcutta+1981%3A+The+City%2C+Its+Crisis%2C+and+the+Debate+on+Urban+Planning+and+Development+Hardcover+%E2%80%93+1+December+1988+Concept+Publishing+Company+Pvt.+Ltd.%2C+Publication+date-+1+January+1990+ISBN-10+8170221935%2C+ISBN-13+978-8170221937+&btnG=
- Refaat, A. (2021). Lexical Variation in the Cairene Slum Vernacular and Its Impact on the Prestigious Variety. *International Journal of Linguistics, Literature and Translation*, 4(4), 05-13. <https://www.al-kindipublisher.com/index.php/ijllt/article/view/1520>

- Roy N R, 1986, Calcutta the profile of a city, 1986, West Bengal Public Library, Publisher K. P. BAGCHI AND COMPANY, CALCUTTA, digitallibraryindia;JaiGyan,
<https://cir.nii.ac.jp/crid/1130282273326033792>
- Roy, A. (2009). Civic governmentality: The politics of inclusion in Beirut and Mumbai. *Antipode*, 41(1), 159-179. January 2009 <https://doi.org/10.1111/j.1467-8330.2008.00660.x>,
<https://onlinelibrary.wiley.com/doi/full/10.1111/j.1467-8330.2008.00660.x>
- West Bengal Public Library Network Source Identifier: handle/10689/12465,013-09-18T08:28:12-2013-09-18T08:28:12,
https://www.google.com/search?q=West+Bengal+Public+Library+Network+Source+Identifier&sc_esv=c36154a2d2ecdf1d&sxsrf=ACQVn09w28M2A6RDdvvVKdUqBh5ykUZuCQ%3A1709636078077&ei=7vnmZZqrBLfVseMPueKU0A0&ved=0ahUKEwia2oPZ-tyEaxW3amwGHTkxBdoQ4dUDCBA&uact=5&oq=West+Bengal+Public+Library+Network+Source+Identifier&gs_l=egxnd3Mtd2l6LXNlcnAiNFdlc3QgQmVuZ2FsIFB1YmxpYyBMaWJyYXJ5IE5ldHdvcmVscU291cmNlIElkZW50aWZpZXIyBBAjGCdI1CJQAFjNG3AAeACQAQCYAc0BoAG-BKoBBTAuMi4xuAEDyAEA-AEBmAIBoALTAZgDAJIHAzItMaAHzgQ&scient=gws-wiz-serp

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