

## INVESTIGATING THE CONDITIONS OF PHYSICAL ENVIRONMENT IN BHOPAL (INDIA) SLUMS

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(Received 23 November, 2024; Accepted 21 January, 2025)

### ABSTRACT

The physical environment plays a very important role in all our lives, because without it, life is impossible. “The condition of the physical environment in Bhopal’s slums is a serious concern, which has a negative impact on the health and quality of life of residents. In this research we have examined the condition of the physical environment in slums, which includes the condition of housing, sanitation, water, electricity and environmental pollution. The pollution of this physical environment is increasing day by day which is making the quality of life poor and very poor. This research comprehensively investigates the physical environment in Bhopal’s slums, highlighting the deplorable conditions and complex challenges faced by residents. A mixed-method approach was used, integrating surveys, interviews and observation to collect data from 250 households in five slums. The study identifies key factors contributing to these conditions, including: -Lack of infrastructure Inadequate housing conditions, Poor sanitation and hygiene facilities, Limited access to clean water and basic services. The research highlights the urgent need to improve the physical environment to enhance the health, well-being and quality of life of slum dwellers in Bhopal. Our findings show that the physical environmental conditions in slums are very poor, which negatively impacts the health and quality of life of residents. Recommendations for policy interventions and community-led initiatives are proposed to address these challenges and promote sustainable urban development.

**KEY WORDS** : Physical environment, Slums, Housing, Sanitation, Infrastructure.

### INTRODUCTION

In any region of any country in the world, every person, whether rich or poor or slum dweller, wants to live a healthy life. It is said that the first happiness is a healthy body. Unless a person is physically healthy, he cannot enjoy any other happiness, because to enjoy any happiness, both body and mind must be healthy. Health is an essential condition of human well-being. Lack of sanitation and environmental pollution affects human health in many ways and there is a possibility of many health problems or infectious diseases. Environmental pollution contributes so many types of diseases in slum area. A “slum” or “jhopdi” is an area located in a city or town, which is highly overcrowded and unhygienic, and which is

populated by very poor people. Environmental pollution affects human health, such as lack of proper sanitation in slums, open drains, poor water quality and excessive waterlogging are the main reasons. Efforts should be made to overcome these problems in slums. Unless a person is mentally and physically healthy, he cannot enjoy any kind of happiness in life because the most important thing in human life is health. If it deteriorates then that person cannot take interest in any field. He feels disturbed, unhappy and depressed all the time.

Bhopal, the capital of Madhya Pradesh, India, has many slums that are facing serious challenges in their physical environment. The pathetic conditions in these slums have a serious impact on the health, well-being and quality of life of their residents. The purpose of this research is to comprehensively

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investigate the physical environment in Bhopal slums and identify the major challenges and factors contributing to these conditions. This research paper examines the quality of life of families in slums of Bhopal city in terms of selected parameters. The aim of this research is to examine the physical environmental conditions in slums and identify the main challenges and factors that contribute to these conditions. We have surveyed 250 slum residents and found that slum families live in unhygienic and overcrowded places, deprived of basic amenities for a healthy life. Women and children are the most affected, and they are affected physically, mentally and emotionally. A comprehensive approach must be adopted, which includes measures to improve the urban environment and health conditions. We should develop effective policies and programs to improve the physical environmental conditions in slums, which can improve the health and quality of life of residents.

**Study Area**

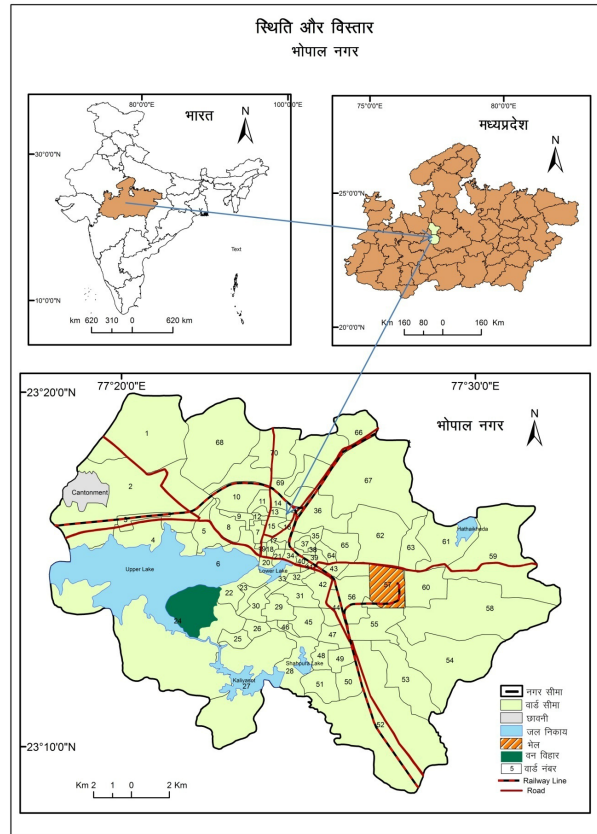
Madhya Pradesh is called the heart of India, whose capital is Bhopal. The administrative headquarters of the state is in Bhopal. The geographical area of Bhopal is situated between 23°7' to 23°54' north latitude and 77°12' to 77°40' east longitude. Its maximum height above sea level is 495.76 meters and minimum height is 180 meters. The average annual rainfall is 992 mm. Therefore, tropical monsoon climate is found here. The total area of Bhopal city is 285 square kilometers (B.M.C.2011). According to Census 2011, the population of Bhopal is about 17,98,218 out of which 4,91,860 population lives in slums.

**Objectives**

- To check the housing conditions in slums.
- To check the condition of sanitation and hygiene facilities in slums.
- To check the condition of water supply in slums.
- To check the condition of Physical infrastructure in slums.

**MATERIALS AND METHODS**

In this study, both primary and secondary data have been used. Secondary data has been collected from Census 2011, Madhya Pradesh Census 2011 Gazette Register, Municipal Corporation, newspapers, magazines, articles, research papers, and books etc.



Primary data have been obtained from 250 household of 5 slums situated in 5 different zones of Bhopal city these slums are Anna Nagar, Afzal Colony, Baanganga, Naya Basera, Islampur. This study relied on a mixed-method approach where 250 household were surveyed, interviewed, and observed. For this interview schedule is used, the survey was aimed at assessing housing, sanitation, hygiene, and access to clean water. In resident interviews, difficulties experienced in the slums were revealed. The environment and community activities were also observed. An observation form was used to collect information about the physical environment and community activities. Variation analysis and qualitative analysis were applied in analyzing the data gathered. The study findings include the descriptions of the hardship of residents and slum conditions.

**RESULTS AND DISCUSSION**

The findings reveal alarming conditions in Bhopal’s slums such as Inadequate housing conditions, Poor sanitation and hygiene identified, poor ventilation, and dilapidated structures characterize the housing conditions in these slums. Inadequate sanitation and

hygiene facilities lead to the proliferation of water-borne diseases. There are limited access to clean water and electricity, residents face significant challenges in accessing clean water and electricity, exacerbating health risks. Inadequate waste management and industrial activities result in excessive environmental pollution.

### Structure of the dwelling place

More than one billion people around the world live in housing that does not meet their basic needs. These people mostly live in slums and illegal settlements, where living conditions are very poor and services are also limited. In developing countries, one in every four urban housing units is a temporary structure, and more than one-third of the buildings are not built according to building codes (Sundari, 2003). This problem is most severe in sub-Saharan Africa, where 60 percent of urban housing units are temporary structures. These figures show that people living in slums face the problem of lack of housing and temporary structures. This is a serious problem that governments and organizations must work to solve World Resources (1999).

A staggering 20.8 percent of households in the sample area were left without a roof over their heads at the time of the survey, forced to inhabit public

spaces, temporary shelters, and makeshift dwellings near bridges, lake, and railway stations.

A further breakdown reveals that 19.6 percent of households resided in kutcha (non-durable) structures, while 34 percent made do with semi-pucca (partially durable) house. Alarming, only a quarter (25.6%) of migrant households had the security of pucca (durable) homes.

These statistics paint a grim picture of the struggles faced by slum dwellers, who are denied the basic human right of safe and secure housing. It is imperative that governments and organizations take immediate action to address this critical issue.

### Source of Drinking Water

More than 1.4 billion people in developing countries do not have access to safe drinking water, which is vital for their health. As a result, about 2.3 billion people worldwide suffer from waterborne diseases. About 4 billion cases of diarrhea occur every year, resulting in 3 to 4 million deaths, most of them among children World Resources (1999). This is a huge health crisis. In urban slums – home to approximately 1 billion people worldwide - access to clean drinking water is woefully inadequate despite the United Nations' declaration that access to safe water is a fundamental human right (Price *et al.*, 2019). In the slums of Bhopal city no one has

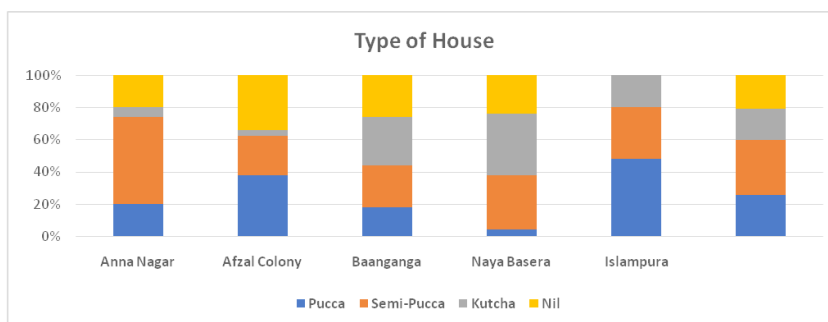


Fig. 1.

**Table 1.** Distribution of Slum Households on the basis of the Type of House

S. No.	Slum's Name	Type of House				Total
		Pucca	Semi-Pucca	Kutcha	Nil	
1	Anna Nagar	10	27	03	10	50
2	Afzal Colony	19	12	02	17	50
3	Baanganga	09	13	15	13	50
4	Naya Basera	02	17	19	12	50
5	Islampura	24	16	10	00	50
	Total No.	64	85	49	52	250
	%	25.6	34	19.6	20.8	100

Source: Based on primary survey

personal tap water connection, about 48.4 percent of households have access to public tap water, but this water is not safe to drink. About 28.4 percent of households get water from tubewells/hand pumps, and less than 6.8 percent get water from wells.

However, despite having municipal taps, the water quality is poor and unsuitable for drinking on rainy days. Therefore, slum dwellers have to wait for water carts, which are irregular and have to stand in line to use this facility. Many times, they have to return home disappointed with empty vessels. This is a huge social and health crisis that needs immediate action to solve it. Afzal Colony has the highest 60 percentage of households relying on tap water. Naya Basera has the highest 46 percentage of households using tube wells/hand pumps. Baanganga has a significant 42 percentage of households using tube wells/hand pumps.

### Toilet Facility in slums

Toilet is as important as the room in the house, because defecation is done in it. There are many types of toilets like septic tank, dry pit, simple latrine etc., but still this facility is not available in many houses and such people defecate in the open environment/field. Due to which the environment



gets polluted and many diseases arise.

Dirty community toilets are a health risk for users in urban Slum settlements. Access to improved sanitation is a key preventive measure against sanitary-related gastro-enteric diseases such as diarrhea Tumwebaze *et al.* (2013).

After housing and safe water, sanitation is important not only for healthy living but also for ensuring a non-polluted environment. According to WHO, about two-thirds of the urban population in developing countries do not have adequate

**Table 2.** Distribution of Slums Households by Source of Drinking Water

S. No	Slum's Name	Source of Drinking Water					Total
		Personal Tap Water	Public Tap Water	Tube well/hand pump	Well	Other	
1	Anna Nagar	0	22	09	03	16	50
2	Afzal Colony	0	30	12	00	08	50
3	Baanganga	0	19	21	05	05	50
4	Naya Basera	0	23	13	09	05	50
5	Islampura	0	27	16	-	07	50
	Total No.	0	121	61	17	41	250
	%	0	48.4	28.4	6.8	16.4	100

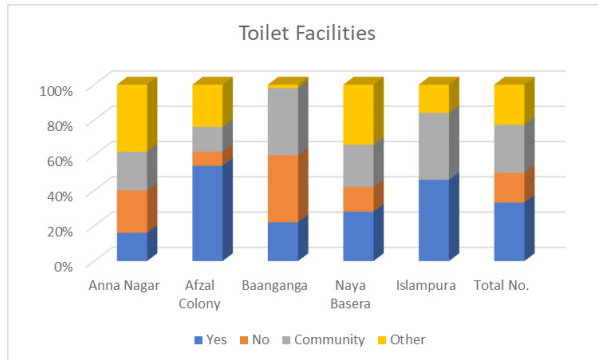
Source: Based on primary survey

**Table 3.** Distribution of Slums on the Basis of Toilet Facilities

S. No.	Slum's Name	Type of Toilet Facilities				Total
		Yes	No	Community	Other	
1	Anna Nagar	08	12	11	19	50
2	Afzal Colony	27	04	07	12	50
3	Baanganga	11	19	19	01	50
4	Naya Basera	14	07	12	17	50
5	Islampura	23	00	19	08	50
	Total No.	83	42	68	57	250
	%	33.2	16.8	27.2	22.8	100

Source: Based on primary survey

sanitation – they do not have a flush toilet, a sanitary latrine or a pit that can be covered. Above Table-3 shows the distribution of slums by type of toilet facility. The sample survey shows that about 16.8 percent of slum households did not have access to



any type of toilet facility and had to use open fields. About 33.2 percent of slum households had access to toilet facility.

About 27.2 percent of slum households used community toilets provided by the corporation/municipality. About 22.8 percent of slum dwellers used other types of toilets. Thus, we can say that the condition of slum dwellers is very pathetic as they do not have access to even the most essential facility.

### Sewerage System in slums

Sewerage system refers to the infrastructure that uses sewers to remove sewage or surface runoff (stormwater, meltwater, rainfall). It consists of components such as receiving drains, manholes, pumping stations, stormwater overflows, and screening chambers for combined sewers or sanitary sewers. Sewerage ends at the entrance to the sewage treatment plant or at the point of discharge into the environment.

“Urban wastewater management relies heavily on well-functioning sewer networks, which are

**Table 4.** Distribution of Slums on the Basis of Sewerage System

S. No.	Slum's Name	Sewerage System		
		Yes	No	Total
1	Anna Nagar	31	19	50
2	Afzal Colony	27	23	50
3	Baanganga	35	15	50
4	Naya Basera	19	31	50
5	Islampura	29	21	50
	Total No.	141	109	250
	%	56.4	43.6	100

Source: Based on primary survey

critical for ensuring public health and environmental protection WHO (2018). Key performance indicators include structural reliability, operational efficiency, and resilience to user-induced stresses, guaranteeing uninterrupted wastewater transport to treatment plants (WWTP) EPA (2020). However, escalating population pressures and neglect of sewer maintenance undermine system performance UN-Habitat (2019).

Above Table 4 shows the distribution of slums on the Basis of Sewerage System. It is observed that Sewerage System was totally absent in about 43.6 percent of slum households, whereas around 56.4 percent had sewerage system. Out of 250 households surveyed across 5 slums, 141 (56.4%) have a sewerage system, while 109 (43.6%) do not. Baanganga Slum has the highest percentage (35/50, 70%) of households with a sewerage system. Naya Basera has the lowest percentage of households with a sewerage system out of fifty only nineteen (38%) have the sewerage facility. Afzal Colony and Islampura have similar percentages of households with sewerage systems (54% and 58%, respectively). It is observed that significant disparities exist in access to sewerage systems across different slums. Nearly half of the households surveyed lack access

**Table 5.** Distribution of Slums on the Basis of Type of Sewerage System

S. No.	Slum's Name	Type of Sewerage System			Total
		Yes		No	
		Open	Under-ground		
1	Anna Nagar	20	11	19	50
2	Afzal Colony	18	09	23	50
3	Baanganga	10	25	15	50
4	Naya Basera	12	07	31	50
5	Islampura	16	13	21	50
	Total No.	76	65	109	250
	%	30.4	26	43.6	100

Source: Based on primary survey

to proper sanitation, increasing health risks. So it can be concluded that targeted interventions are needed to improve sanitation infrastructure in these areas.

Table 5 shows the distribution of slums on the Basis of Type of Sewerage System. Out of 250 about 76 households(30.4%) have open drains with no underground system, only 65 households (26%) have underground sewerage systems and other side 109 households (43.6%) have no sewerage system. It

**Table 6.** Distribution of Slums on the Basis of Health Disease

S. No.	Slum's Name	Type of Health Disease		Total
		Yes	No	
1	Anna Nagar	32	18	50
2	Afzal Colony	41	09	50
3	Baanganga	38	12	50
4	Naya Basera	43	07	50
5	Islampura	47	03	50
	Total No.	201	49	250
	%	80.4	19.6	100

Source: Based on primary survey

is observed in Slum-wise distribution Baangangaslum has the highest percentage of underground sewerage systems (25/50, 50%). Naya Basera slum has the Sevier condition 62 percentage (31/50) households not have any type of sewerage system. Anna Nagar (20) and Afzal Colony (18) have similar distributions of open sewerage systems.

Table 3 shows the distribution of slums on the basis of health status. It is found in primary survey that 80.4 percent (201) house hold are facing disease only 19.6 percent (49) have response not availability of any type of disease during the survey. In sample slum pocket Ishlampura have highest number of poor health about 47 household have disease case out of 50 which is serious situation in slum area. Similarly in Naya Basera slum area out of total 50 household 43 facing health issues. It is also reveals according to responses maximum suffering due to water borne diseases such as diarrhea, cholera, typhoid etc. The condition of dirtiness and consequently the hazardous impacts on people's health and the environment require improvements in the sanitation of city slums. Bad sanitation forms a cycle of poverty because of disease, illness, and low productivity Genser *et al.*(2008). Rutstein (2000), Victora *et al.* (1988).Due to limited access of essential services and physical infrastructure as well as Ineffective waste disposal as a result severe environmental degradation became in slum area. The study identifies key factors contributing to these conditions such as Lack of infrastructure and basic services, ineffective policy implementation and limited community engagement and participation in decision-making processes.

**Recommendations**

- Prioritize upgrading open drains to underground systems.

- Focus on providing sewerage infrastructure to slums with none (e.g., Naya Basera)
- Maintain and improve existing underground systems.
- Targeted interventions are needed to improve sanitation infrastructure in these areas.
- Improve municipal water supply infrastructure and quality.
- Monitor groundwater usage and implement sustainable management practices.
- Enhance access to reliable and safe drinking water sources.
- To address these challenges and promote sustainable urban development, the research should be proposed.
- Improve infrastructure, enhance basic services, and implement effective policies.
- Encourage community engagement and participation in decision-making processes for improvement of slum dwellers.

**CONCLUSION**

The physical environment have crucial role in overall life, because without it, life is impossible. but in recent decade physical environment is deteriorate day by day in urban area and it is in severe situation in slum area. The condition of the physical environment in Bhopal's slums is a serious concern there are so many issues and crises of physical environment is identified. although physical environment effects the health as well as quality of life. Substandard Living Conditions, Inadequate Sanitation and Hygiene is a common characteristic of these slums. Residents struggle to access basic necessities like clean water and reliable electricity. Insufficient sanitation facilities and poor hygiene standards facilitate the spread of water and air borne disease. The sample survey shows that 19.6 percent of households living in kutcha (non-durable) structures house, also reveals that about 16.8 percent of slum households facing the unavailability any type of toilet facility and forced to use open fields and 22.7 percent household are using community toilet facility. Nearly half of the households surveyed lack access to proper sanitation, increasing health risks. Out of 250 households 109 households (43.6%) are suffering absence of any type of sewerage system. Significant disparities exist in access to sewerage systems across different slums. This research highlights the urgent need for improvements in the physical environment

to enhance the health, well-being, and quality of life for slum dwellers in Bhopal. By addressing these challenges and promoting sustainable urban development, we can create a better future for the residents of Bhopal's slums.

#### ACKNOWLEDGMENT

I am thankful to Director, Census of India, Bhopal, Madhya Pradesh and Dr. Rajeev Sir, Bhopal Municipal Corporation Bhopal, Madhya Pradesh. I express my heartfelt gratitude to Dr. Archana Sen, Assistant Professor, Department of Regional Planning and Economic Growth, Barkatullah University, Bhopal and I am also very thankful to my guide Prof. Vijay Kumar Singh, Department of Higher Education, Bhopal, Madhya Pradesh.

#### Conflict of interest

Bhopal has 378 slum pockets, which are growing rapidly, leading to significant environmental deterioration in the city as well as society. My research interest focused on social issues such as slums and poor peoples. Wish to find out level of life degradation and crises in slum areas. My goal is to bring about change in society from slum free city.

**Conflict of Interest - None**

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