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SLUM ENVIRONMENT AND ITS IMPACT ON HUMAN HEALTH IN NAGESH NAGAR SLUM OF AKURDI AREA IN PIMPRI CHINCHWAD URBAN AREA, PUNE, MAHARASHTRA, INDIA.

R. T. Birajdar A. D. Andhale D. P. Mane

Abstract:

The Pimpri Chinchwad Municipal Corporation is one of prosperously growing urban area having near about 76 slum Pockets which Contribute 12.85% population out of total population of the city. In Pimpri chinchwad municipal corporation (Census of India 2011).

The growth of slums in city is one of the major problems for city development. Slums in a city completely situated with lack of sanitation facility, lack of drinking water facility, lack of garbage collection system and management. This paper is basically made to study Slum environment with their amenities in Nagesh Nagar Slum of Akurdi area. The study was carrying out on the basis of primary data including the field survey, secondary data from Pimpri Chinchwad Municipal Corporation and also computer based technique. There many problems in slum of Nagesh Nagar in Akurdi area such as, air pollution, land pollution, lack of latrine facilities, lack of medical facilities and so on. The polluted water, insanitation and its impact on human health of slum population in Nagesh Nagar of Akurdi area studied to get some results.

Key Wards – Field Work, GPS Survey, area measurement, status of environmental amenities, water borne diseases.

1. Introduction:

Slums have come to form an integral part of the phenomena of urbanization in India. About 640 cities and towns in India, 26 states and union territories have reported the slum population, out of that the Andhra Pradesh has largest number of cities it is 77, Uttar Pradesh 69 cities, Tamil Nadu 63 Cities and Maharashtra there are 61 cities with slum population (Census of India 2001).

There are many problems associated with urban growth of Indian cities such as, air pollution, land pollution, lack of latrine facilities, lack of medical facilities and so on. This research paper examines impacts of polluted water on the human health in slum of Nagesh Nagar in Akurdi area.

2. Hypothesis:

The basic foundation of research work is based on the hypothesis. It is a pre-supposition of research work to be carried out on a particular problem. The systematic study of the present problem will be carried out on the basis of following hypothesis.

"Slums in a cities a cause of deteriorating quality of urban environment"

3. Aims & Objectives of Study:

The present study of slum of Nagesh Nagar in Akurdi urban area will be based on following objectives.

1. To study the slum environment in Nagesh Nagar slum of Akurdi area.
2. Find out the status of deterioration in Nagesh Nagar slum of Akurdi area.
3. Find out the status of water borne diseases in study area.

3. Selection of Site:

One slum Area is selected for study in Pimpri chinchwad urban area. Selection slum pocket with base of stratified random sampling method were performed in the ratio of 1:5. Nagesh Nager slum is located in Akurdi area. This slum is presently situated on the hillock location and under M.I.D.C. Zone. Due to this slum emergence domestic as well as industrial pollution including solid waste, water, land pollution & it's more impact on their living population.

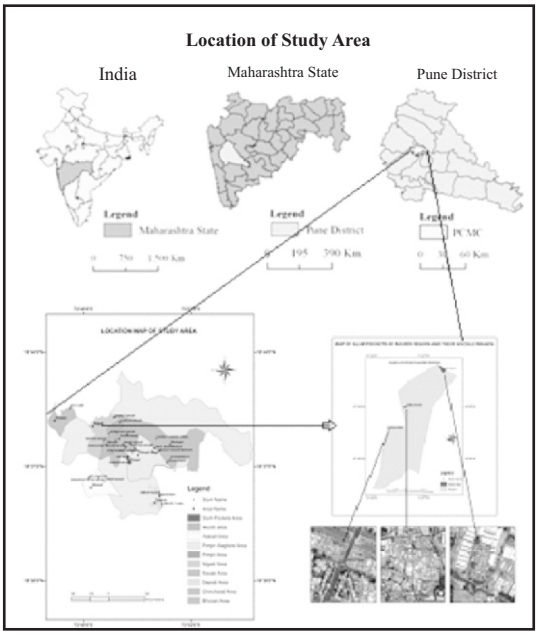
4. Data Collection:

Data collection with the help of the interviews, observations, areal measurements, photos, Google images, questionnaires prepare for get information of garbage collection system, environmental health, environmental awareness, social status. However this paper will be mostly focus on their living environment, insanitation, solid waste pollution, water pollution & its impact on human health with the help of graphs, figures, areal Google images.

5. The Location of Study Area:

Pimpri Chinchwad lies between 18° 35' north to 18° 42' North latitude and 73° 42' east to 73° 56' East longitude with an area covers 177.3 $km^{2.}$ The city is located $18^{0}37'0"$ North Latitude and $73^{0}48'0"$ E Longitude. Pimpri Chinchwad area is bounded by three rivers Pavana, Mula, and Indrayani.

Figure No.1: Location Map of Study Area.



Source: *GPS Surveyed by Researcher.*

6. The Location of Slums in Akurdi Area:

The slope of area decrease from North to south by 2.21%. There are about thirteen small streams. All these streams originate at North side and flows from north to south towards Pawana river. The streams following through Akurdi area is third order according ordering rank of Strahler methods. The total length of these all streams is 9636.89mt. (9.64kms.). Out of all streams, few streams are located at south side of the area and other few streams are located at Middle East side of the area. In general the Akurdi area is situated on hillock at left bank of Pawana river.

6.1. Akurdi Area:

This area is located at northern side of the city on 18^0 40' North Latitude and 73^0 47' East Longitude. Height from mean sea level is 575mt. It is also close to NH. No.4 (old Mumbai-Pune Road) and Mumbai-Pune railway line. It is relatively developed area with official help center and most industries are settled in this area.

6.1.1. Ajanta Nagar:

This slum is located at Northern side of the Akurdi area on 18^0 39'45" North Latitude and 73^0 47' 30" East Longitude. Height from mean sea level is 604mt. Some industrial units are developed in this area like Thermax Industries it is situated at southern side and Talawade is situated at northern side of this slum.

6.1.2. Nagesh Nagar:

This slum is located at Western side of the Akurdi area on 18^0 38'39" North Latitude and 73^0 46' 12" East Longitude. Height from mean sea level is 590mt. The railway line (Akurdi railway station) on northern side of this slum and Chinchwad Area is situated at southern side of this slum.

6.1.3. Jay Malhar Nagar:

This slum is located at Western side of the Akurdi area on 18^0 39'06" North Latitude and 73^0 47' 14" East Longitude. Height from mean sea level is 588mt. Old Mumbai- Pune highway is western side of this slum and Khandoba Temple of the northern side of this slum.

7. Classification of slums on the basis of site characteristics:

Table No.: 1: Classification of slums on the basis of site characteristics

Sr. No.	Site Characteristics	Name of Slum Area	Name of Slum Huts
1.	Hill Location	Akurdi	Ajanta Nagar Nagesh Nagar
2 .	Small Stream Side Location	Akurdi	Jay Malhar Nagar

Source: *Own Sample Surveyed*

8. Slum environment and its impact on human health in NNS of Akurdi area:

This Paper examines slum environment and its impact on human health in Nagesh Nagar slum area. There are many problems in slum of Nagesh Nagar such as, compactness, air pollution, land pollution, lack of latrine facilities, lack of medical facilities, Lack of educational facilities and so on. The water pipelines which passing and crossing bellow the drainage channels in the slum areas causes the water pollution. This may results to pollute the drinking water in pipelines many times the public water taps are very near to garbage collection locations and drainage system (gutter, cannel) this nearness causes the contamination of water. Many diseases are water born diseases. This causes due to polluted or contaminated water. *(Rajesh T. Birajdar & Dr. Arun D. Andhale, 2014).*

The Polluted water, insanitation and its impact on human health of slum population in Akurdi areas studied to get some results.

8.1. Akurdi Area:

There are three slum pockets in Akurdi area it is Jay Malhar Nagar, Nagesh Nagar and Ajanta Nagar slum. The details explanation of status in Nagesh Nagar slum with the help of Solid waste pollution, water pollution, dirty polluted stream affecting slums insanitation and associated health problems are as follows.

8.1.1. Nagesh Nagar Slum:

The Nagesh Nagar Nagar slum is also facing the environmental problems like solid waste pollution, water pollution and air pollution due to Tin Bin kept near to slum, leakage water taps and nearness of Toilet seats. This can deteriorate the slum environment and impact on the human health.

8.1. 1.1. Tin Bin Causing Solid Waste Pollution:

In Nagesh Nagar slum area, There are about two tin bin kept at different sites. This has been already showing in the Figure no.3. The daily maintenance of tin bin is a very important aspect from the point of view of sanitation in the Nagesh Nagar slum areas. The measurement of spread of solid waste pollution around tin bin was pointed at the time of field work. The details of same were presented in Table no. 2 and Figure No. 3. This shows that the total area under solid waste pollution in 17sq.mts and the adjacent slum huts to it are 28 which include the 76 population.

Table No. 2: Status of Tin Bin Causing Solid Waste Pollution in NNS.

Location of Tin Bin Point	Dirty area covered with expelled solid waste material in sq.mts.	No. of huts near to tin bin dirty area	Total Population	Average distance of tin bin from huts in Mts.
1	09	12	28	02
2	08	16	48	03

Source: *Own Sample Surveyed.*

8.1.1.2. Drinking water taps- surrounding wet marshy places to cause water pollution:

The cleanness of drinking water taps and location of water taps is a very important aspect for sanitation in Nagesh Nagar slum. There are about four drinking water taps. These are situated at different sites which are shown in Figure no.3. The observation of daily cleanness and maintenance regarding drinking water pipeline, water taps point, measurement of the covered marshy area and water pollution around the drinking water taps were observed the time of field work. The details of same were presented in Table no.3and Figure no.3. This shows 65sq.mts of marshy and water pollution area which is adjacent 99 slum huts, which include the 191 population.

Table No. 3: Status of Drinking water taps- surrounding wet marshy places to cause water pollution in NNS.

Location of Common water tap point	Marshy area caused due to common water supply point (sq.mts.)	No. of huts Adjacent to the common water supply point	Total Population	Distance of water tap point from huts in Mts.
1	16	32	62	03
2	15	22	48	04
3	16	20	39	03
4	18	25	42	03

Source: *Own Sample Surveyed.*

8.1.1.3. Toilet Seats Causing solid waste & water pollution:

In Nagesh Nagar slum there are about two toilet seats kept at different site which are shown in Figure no.3. At the time of field visit observation of toilet seats these are create solid waste and water pollution. This pollution also spread around the toilet seats. The details of same were shown in Figure no.3 and Table no. 4. This shows that the total area under solid waste, water pollution and land pollution is about 25sq.mts and the adjacent slum huts to this area are 22 which include the 62 population.

Table No. 4: Status of Toilet Seats Causing solid waste & water pollution in NNS.

Location of Toilet seat point	Dirty area covered due to toilet seats water Sq.mts.	No. of huts near to toilet seat	Total Population	Average distance of toilet seat from hut in Mts.
1	09	12	32	04
2	16	10	30	03

Source: *Own Sample Surveyed.*

8.1.1.4. Water borne disease reported in 2014:

In Nagesh Nagar slum emergence environmental problems like Solid waste pollution, land pollution, water pollution and air pollution due to lack of latrine facilities, poor sanitary condition and poor quality of water leads to various water borne diseases. According to the analysis with table and graph to study area among water borne diseases are affected on child, young and oldest population in Nagesh Nagar slum. 10.17% population is affected or illness by the Helminths disease due to dirty polluted water stream is flowing and lack of maintenance of drinking water pipe lines. Also these water borne diseases are dangerous for human health of living slum population Nagesh Nagar slum. The details of same were presented in Table no.5 and Figure no.2. This shows that the water borne disease with age group wise total affected population. Out of the total population 30.63% population are affected due to various water borne diseases in Nagesh Nagar slum.

Table No. 5: Status of Water borne diseases in NNS.

Diseases	Age Group Wise Classification								T. A. P.	T.A. P. (%)
	Below 5 Years Age Group		5 to 14 Years Age Group		15 to 59 Years Age Group		Above 60Year Age Group			
	A.P.	A. P. (%)	A. P.	A. P. (%)	A. P.	A. P. (%)	A. P.	A. P. (%)		
Diarrhea	24	1.40	21	1.23	28	1.64	32	1.87	105	6.14
Typhoid	14	0.82	17	0.99	22	1.29	12	0.70	65	3.80
Cholera	10	0.58	14	0.82	20	1.17	06	0.35	50	2.92
Jaundice	28	1.64	23	1.34	37	2.16	23	1.34	111	6.49
Malaria	04	0.23	03	0.18	08	0.47	04	0.23	19	1.11
Helminths	32	1.87	42	2.45	52	3.04	48	2.81	174	10.17
Total	112	6.55	120	7.01	167	9.76	125	7.31	524	30.63
	Total Population is 1711									

Source: *Own Sample Surveyed.*

Figure No.2: Affected Population of Water borne diseases in NNS.

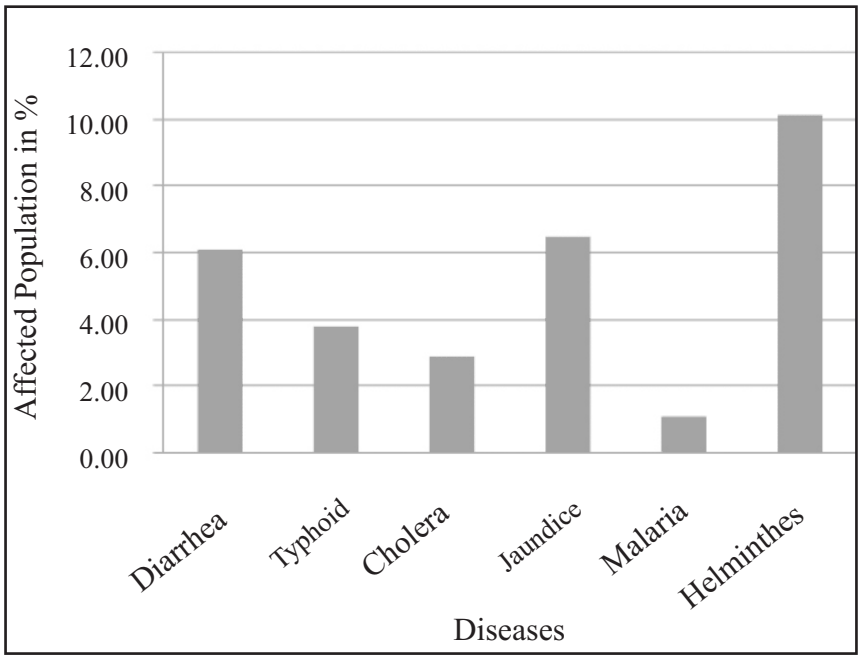


Figure No.3: Google image of NNS in Akurdi Area.

9. Conclusion:

There many problems in slum of Pimpri Chinchwad urban such as, air pollution, land pollution, lack of latrine facilities, lack of medical facilities and so on. The polluted water, insanitation and its impact on human health of slum population in Akurdi area studied to get some results.

The table shows the insanitation, responsible factors for water pollution, land pollution, air pollution and associated water borne diseases in sample slums of Akurdi area.

Table No. 6: Responsible factors and Conclusions of site characteristics.

Sr. No.	Site Characteristics	Number of slum Pockets	Concluding Remarks
1.	Hill Location	2	• Maximum height from sea level is 612mts. & minimum height from sea level is 555mts. • Average slope of surface ranging between 1.90% to 4.17%. • An average in every slum pockets and major slum huts are on top of the hill and few slum huts are on the slope. • Some slum pockets are located on left bank of the Pawana river and other slum pockets are situated on plain area with hillock on the right bank of Indrayani river.

Source: *Own Sample Surveyed.*

Table No.7: Responsible factors for deterioration of Urban slum environment.

Slum Area	Slum Pockets Name	Huts for per Tin Bin Point	Huts for per Common water tap	Population for per Toilet seat Point	Population affected by Water Borne Diseases in %	Concluding Remark
						1. Lack Of Latrine Facilities.
Akurdi	Nagesh Nagar	188	94	856	30.63	2. Lack of Garbage collection point and system.
						3. Less number of public water taps.

Source: *Own Sample Surveyed.*

10. Abbreviations:

NNS	Nagesh Nagar Slum	
PCUA	Pimpri Chinchwad Urban	Area
sq	Square	
mts	Meters	
TAP	Total Affected Population	
AP	Affected Population	

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*** Dr. R. T. Birajdar**
Assistant Professor,
Mahatma Phule Mahavidylaya,
Pimpri, Pune, (MH), India.

**** Dr. A. D. Andhale**
Principal, Mahatma Phule
ACS college, Panvel,(MH), India.

***** Mr. D. P. Mane**
Research Scholar, Tilak Maharashtra
Vidyapeeth, Pune, (MH), India.