

# Final Project Report For GIS Based Survey of Urban Homeless Population in the Wards under the Jurisdiction of Kolkata Municipal Corporation (Zone-IV)

Prepared by:

**KARMICK**  
SOLUTIONS  
IT. INNOVATION. DIGITAL  
ISO 9001:2015 Certified Company

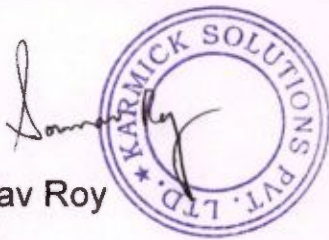
To  
Chief Manager (SW&UPA)/Zn-IV  
Kolkata Municipal Corporation  
5, S.N. Banerjee Road  
Kolkata 700013

**Ref: CM/UHP\_Survey/VO/Zn-IV/1/2017-18**

Dear Sir,

With reference to the aforesaid Work Order, it is being conveyed that Karmick Solutions Pvt Ltd has been completed the entire assignment of GIS based Homeless Population Survey within jurisdiction of Zone-IV (Br-X, XI, XII), KMC. We are submitting a "Final Project Report" regarding the above mentioned work for Zone-IV.

Thanks & Regards



Sourav Roy  
CEO  
Karmick Solutions Pvt Ltd  
116A Purbalok, Kolkata 700099

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# Executive Summary

## INTRODUCTION

As per the guidelines issued by The Ministry of Housing and Urban Affairs, Government of India, as communicated by SUDA, KMC is implementing "Shelter for Urban Homeless" component by providing shelter with all essential services to the Urban Homeless people in KMC area under NULM.

To assess the actual number of homeless, number of shelters required for Homeless in the KMC area, and for their rehabilitation, it is proposed by KMC to conduct a GIS based survey of the homeless in the wards under it.

Homelessness is a state of utter helplessness. Most people think they are not real people and they are in such a state because of their own deeds. Fundamental rights are denied to them. They for the remaining part of their lives live under make-shift shelters. Sometimes, they are forced to spend nights on railway platforms, pavements, pipes, and so on. No wonder, they are often subjected to extreme violence and continuous threat of exploitation. Due to rapid urbanization, homelessness has grown over the past year in many urban cities across the world.

In order to measure the magnitude of the problem, Karmick Solutions have been entrusted by Kolkata Municipal Corporation to conduct a survey of zone IV of KMC which consists of Borough X to Borough XII. A custom-made mobile app named 'Thikana' was developed, pre-loaded with a structured questionnaire. The application was used for the survey purpose. The survey was conducted at night hours.

## Significant findings that emerged from our survey are:

### High Concentration points

A total number of 99 homeless people were interviewed, out of which maximum were found to be staying alone and few with their respective families. A high percentage of homeless people were found living on the New Alipore Road, New Alipore Railway Station, Deshpran Sashmol Road, Baghajation Station Road, and E.M. Bypass.



Borough	Ward Number	Road Name
X	81	NEW ALIPORE ROAD
X	81	NEW ALIPORE RAILWAY STATION
X	89, 94	DESHPRAN SASHMOL ROAD
XII	101	BAGHAJATION STATION ROAD
XII	108	E.M.BYPASS

### **Family composition**

Out of the homeless people interviewed by Karmick Solutions, there were few male children and few female children belonging to an age group of 1-14 years. It was also found that 40-50% respondents are married.

### **Magnitude of vulnerability**

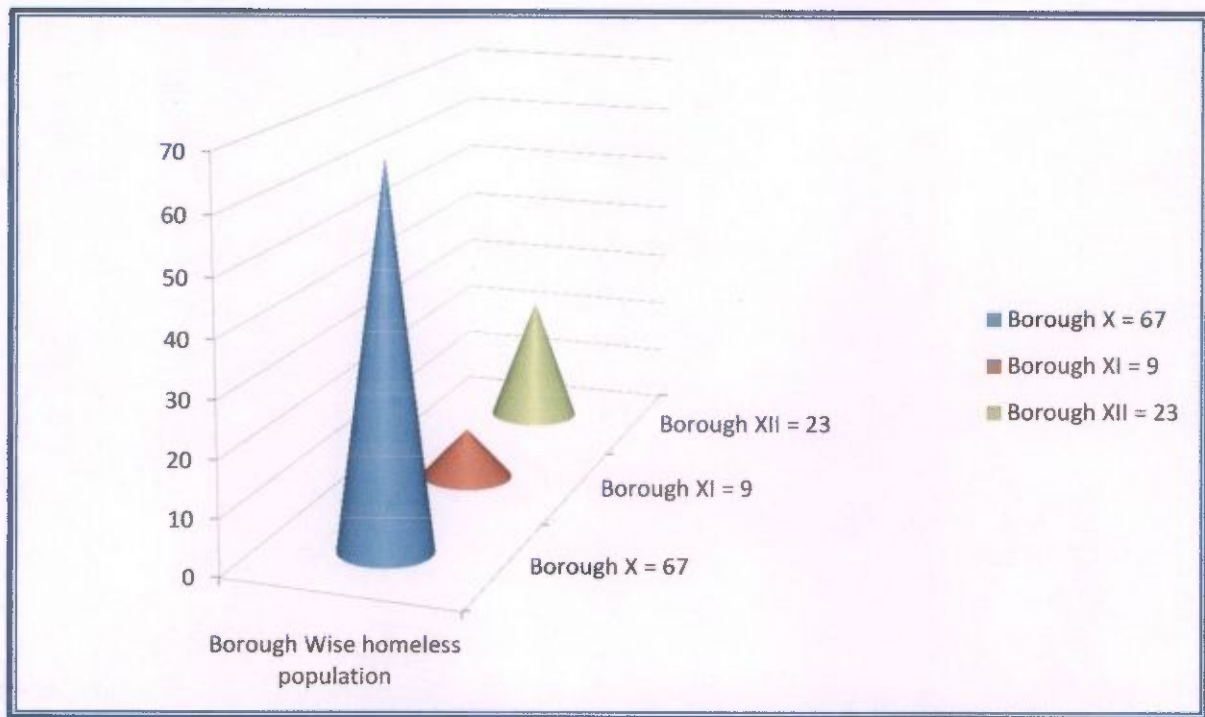
The matter of concern is most for those homeless people who were found to be with children or aged people (above 60 years). While such children remain deprived of education and a normal childhood, aged people experience the challenges of coping with their health ailments without or with negligible access to medical facilities. Some were even found to be physically or mentally challenged.

### **Migration**

The survey findings revealed that most people are currently living in a state of homelessness in Zone IV of Kolkata migrate for economic reasons with a belief that they will find better work opportunities. While in borough X, XI, XII some persons were found to have migrated from other state.

### **Entitlement status**

The survey revealed that out of the 99 respondents, none possess BPL card, Voter card, Aadhar card, or any type of photo ID card issued by Government entities.



#### PROJECT AREA:

The present assignment covers the wards under Zone -IV of KMC (Borough X, XI, and XII). This includes New Alipore, Jadavpur, Santoshpur, Garia, Tollugaunge, Mukundapur, Kalikapur, and Baghajatin. Each of these boroughs are further classified into several administrative wards. E.M. Bypass, Prince Anwar Shah Road, Raja Subodh Mallick Road, Tollugaunge Circular Road are one of the major roads that pass through maximum number of Wards in these Boroughs. Zone-IV is situated in South-East part of Kolkata & maximum area covered by self-owned house & residential apartments. Few numbers of Govt. & Non-Govt. offices are situated in this area.

#### Objectives of the Survey:

Survey would ensure following objectives, to

- Provide planners a detailed geo location based mapping of concentration areas of homeless populations in the wards under KMC.
- Establish the demographic profile of homeless populations within project AOI (Area of Interest)
- Identify official resources such as land and vacant buildings that can be deployed to provide the required infrastructure for shelters in appropriate location of each city/town.
- Establish the location and type of shelters needed in each city/town by gauging the specific needs of the beneficiaries



## Roles of GIS in Urban Homeless Population Survey

1. Geographical Information System commonly termed, as GIS is a technology to monitor, plan, & analyze geographical data to yield meaningful results. It essentially consists of two types of data namely spatial data & non spatial data. Spatial data consists of an electronic vector map converted from paper maps/scanned images. This process is known as vectorization & can be done through any GIS software. The non-spatial data consists of attributes data regarding a map entities attached to the vectorized objects on the map. This spatial & non spatial data together consists of a GIS system on which analysis can be done by performing queries & other GIS operations such as buffering & thematic generation.
2. One of the major advantages of GIS system is viewing of locations of Homeless Population & Proposed Urban Homeless Shelters in different layers & accordingly shortest route monitoring.
3. GIS mapping supports spatial decision making & strategic planning. It is a rapidly evolving area that continues to expand. Everybody wants information in usable formats & this has led to continual increase in GIS as it is easier to use, more intuitive, more analytic & more embedded within a variety of technologies.
4. Urban Homeless population spatial data can even be used for **territory planning** for future development of Urban Homeless Shelter, meaning that management will know how to deploy funds & manpower so that they don't overlap with each other territories.

## Advantages of the GIS based Survey

The Benefits of the system are as follows:

### Functional:

- Allows the user to see the geographic location of the entire homeless population concentration within the Area of Interest (AOI).
- Enable viewing of layers & related information through maps and web based interfaces.
- Provide information on click.
- The users can enquire & generate report as per the attribute data.
- Enhance the process of decision making in a more appropriate and scientific manner.
- Attach any kind of data like photo, documents for the different locations.
- Can use color- coded thematic maps for better understanding.

- Entry & updating of data through web based interfaces for system administrators for the non-spatial attribute.
- Generates customized report as per Zone wise, Ward wise & even Road wise.
- The system would be capable of giving color coded information regarding potentially high populated & low populated zones.
- Gives correct depiction of linear, polygon and point features using GPS data.
- The entire information will upload in a Web based /Mobile application & need not be installed in any kind of desktop software.
- The solutions are deployed at a central server as designated by the client and access rights are given to client to various users to connect and work on it from anywhere using the internet or intranet as per the desire of the organization's desire.

#### **Technical:**

- Avoids duplication, misuse and data error using a centralized database.
- Highly secure with privileges to authentic users
- The authentic users can insert, update, delete maps & attribute data.
- Facility to set map layers
- Facility to click on map and get layer information
- Displays legends
- Identifies attributes attached to geographic features
- Use the clear section tool
- Generates MIS report based on queries

## **Scope of Work**

#### **The steps to be followed during the survey**

- Identifying the areas with concentration of homeless population,
- Profiling the homeless populations in these areas in terms of gender, age, education, occupation, marital status, number of children, history of illness etc. persons with disability should be categorized separately.
- Identifying the aspirations of the homeless for a shelter and also the deterrents preventing the homeless from using the existing shelters, if any



- Broadly identifying the possible buildings and locations where new shelters can be built and duly display on the map by geo tagging them
- The information should be recorded and collated by each team. To ensure faster survey results, data entry should be done in parallel with the survey along with photograph and Geo tagging of each homeless person.

**The following deliverables are expected out of this process at this stage:**

- Map should indicate the locations of all the scattered as well as clusters of homeless people.
- Collated survey results
- Determination of shelter locations, types, number of shelters required in an area, plus available resources in terms of land and building.
- Finalized resource mapping questionnaire for the next stage of resource mapping.

### **Resource Mapping**

The next step is to conduct a resource mapping exercise. The resources that this phase of the survey seeks to identify are

- a) Existing shelters;
- b) Unutilized or underutilized government buildings that can be possibly redeployed as shelters after suitable refurbishing; and
- c) Vacant lands that are suitable potential sites for new shelter buildings.

**At the end of this process, the following deliverable are expected:**

- Field resource mapping survey of all the identified potential buildings and shelter locations
- Determination of the feasibility of the identified buildings and locations for building/ upgrading shelters, along with government agencies
- Collating results and submitting to KMC.
- Discussions on recommendations to be put forth in the report.

### **Karmick's execution Plan**

- A. We had assigned two persons as one team for the task of field survey for each ward of the selected boroughs. Each team was equipped with one Android smartphone and one hand-held GPS device (Trimble Juno SB) for conducting the task of survey.
- B. An android mobile application (Thikana) was developed by our skilled app developers & this application was successfully installed on the mobile devices of each team members.

- C. We had instructed them to perform this Survey between 10:00 PM and 6:00 AM to reach out to the maximum number of homeless people living in each ward.
- D. We gave through training to each team member involved in the task of survey while keeping in mind the fact that our survey questionnaire was already featured in the mobile app installed on their mobile devices. So, the training was on as follows.....
- Imparted them the knowledge on how they should input data collected from each of the respondents (homeless people) into respective data fields of the questionnaire.
  - Made them understand how they have to capture the images of each homeless people with their Android smartphone after successfully completing their interview process for each. (Note: They need to capture three images of the each people in three different camera angles -Frontal, left and right.)
  - Ensured that they know the right method to make use of the given base map for each ward provided to them by Kolkata Municipal Corporation (KMC) to cover each major and minor road of the respective wards in order to reach each and every homeless person living in those wards.
  - To make it sure that during the survey, survey team members assigned for each ward do not accidentally enter into the neighboring ward and therefore do not cause any overlapping of survey data.

Annexure II QUESTIONNAIRE for SURVEY OF HOUSELESS POPULATION													
Latitude							Longitude						
Name of Corporation/ Municipality: Kolkata Municipal Corporation							Ward		Form No				
Name of Street/Location							Nearest Landmark						
Full Name of Respondent							Father/ Husband's Name in Full						
Present Living Status: (Mention Name of the Street/Railway Platform/Bus Shed Stop/Flyover/Market Name etc.)							Street/Footpath Railway Bus Shed Under Flyover Marketplace Other Landmark(Please Specify)		Place of Origin				
Living in Static Location							Yes/No		Living Since (Date or Year)				
Whether BPL Card/ Voter Card/ Aadhaar/ any photo identity (Govt. Provided) Holder							Yes/No		Whether any type of ration card Holder (Please mention type and number of card)		Yes/ No		
Whether willing to avail of Govt. Arranged shelter							Yes/No		If No. Please write reason for deterrents from using shelters				

Details of Respondent & Family Member Physically Found															
Full Name	Photo attached	Relation with Respondent	Age	Sex	Marital Status	Physically Challenged	Mentally Challenged	Literate	Educational Qualification	Occupation	Movable assets (Rs.)	Personal Identification Mark	Place of Origin	Habitat	Reason for Stay in KMC area
		Self				Yes/ No	Yes/ No	Yes/ No							
						Yes/ No	Yes/ No	Yes/ No	Pre-primary / Primary						
						Yes/ No	Yes/ No	Yes/ No	English Std / Secondary / HS						
						Yes/ No	Yes/ No	Yes/ No	Graduate / PG						
						Yes/ No	Yes/ No	Yes/ No							

Age on 01/01/2018, Marital Status: N=Never Married, D=Divorced, W=Widow, Widower, DS=Deserted, Sex: M=Male, F=Female, O= Other

Signature of Enumerator



## Survey Instruments Specification

Karmick Solutions used Handheld GPS along with installed Mobile App for Homeless population survey.



### Features

- 4G cellular data and voice call capability
- Feature packed, fully integrated solution
- 5 megapixel camera
- High-sensitivity GPS receiver
- Long life battery for all-day use

## Karmick's Methodology

Karmick Solutions involved 56 people for the task of field survey, Map preparation, Web & Mobile Application Development & data hosting.

### A. Development of Mobile & Web Application "THIKANA"

At first a web & mobile based database handling system is developed by Karmick for handling the above mentioned spatial and non-spatial data for the entire AOI of KMC.

Development of web and expansion of the internet provided to key capabilities that can greatly help KMC. First, the web allowed visual interaction with data. By setting up a web server, client can produce maps. Since the map and charts are published on the internet, other clients can view the updates, helping to speed up the evaluation process. Second because of the near ubiquitous nature of the internet, the geospatial data can be widely accessible, clients can work on it from almost in any location. Both these features will alter the way GIS specialists will do their work in the very near future. The combination of easy access to data and visual presentation addresses some of the primary difficulties in performing GIS specialists' evaluations.

The application provides user friendly WEB based GUI (Graphic User Interface), which is very intuitive and user friendly such that the most important features are available with a few mouse clicks or a few keystrokes.

The application is completely network compliant and fetches and updates data from server via normal networking protocols. The software would be able to connect to any network database and performs database modifications corresponding to the locking protocols as per the RDBMS concepts. The software connects to an existing user and to existing database simultaneously.

### **Features of the developed application:**

#### **General Features**

- Take Picture of Homeless people with a click
- Helps in layout and printing
- Gives information on click
- Spatial and non-spatial Queries
- Search Facilities
- Generates various MIS Report

The developed application different kinds of information in various layers and retrieve information on clicks. It has search facilities. The users would have the facility to search from the existing database. The search facility would be provided in combination of different fields. It also has the features to include further surveyed data in future. The web system is such that on taking the cursor to the entity it the relevant information and photograph wherever available.

### **Overview of the Web & Mobile Application**

#### **Admin Login page Desktop Application**





## Desktop Application Home page



The screenshot shows the desktop application's home page. It features a sidebar with a logo and navigation options. The main area displays a table titled 'Application List' with columns for various attributes. The table contains 10 rows of data, each representing a different application. The columns are: S/N, Latitude, Longitude, Name of Water quality, Water No., Type No., Name of Source location, Watered Condition, Full Name, Address/Community, District, Upazila, Name of Source, Place of Origin, and Migration Status.

S/N	Latitude	Longitude	Name of Water quality	Water No.	Type No.	Name of Source location	Watered Condition	Full Name	Address/Community	District	Upazila	Name of Source	Place of Origin	Migration Status
1	22.405480	89.922291	Handmade	100	1000	Handmade Water	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade
2	22.405480	89.922291	Handmade	100	1000	Handmade Water	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade
3	22.405480	89.922291	Handmade	100	1000	Handmade Water	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade
4	22.405480	89.922291	Handmade	100	1000	Handmade Water	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade
5	22.405480	89.922291	Handmade	100	1000	Handmade Water	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade
6	22.405480	89.922291	Handmade	100	1000	Handmade Water	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade
7	22.405480	89.922291	Handmade	100	1000	Handmade Water	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade
8	22.405480	89.922291	Handmade	100	1000	Handmade Water	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade
9	22.405480	89.922291	Handmade	100	1000	Handmade Water	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade
10	22.405480	89.922291	Handmade	100	1000	Handmade Water	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade	Handmade

## Admin Login page Mobile application



The screenshot shows the admin login page of a mobile application. The page has a blue header with a logo and the word 'ঠিকানা' (Thikana) in white. Below the header, there is a white login form with fields for 'User Name' and 'Password'. A 'Forgot Password?' link is located below the password field. A blue 'Login' button is at the bottom of the form. Below the login form, there is a link that says 'Don't have an account? Create now!'. The page is displayed on a mobile device screen, with the status bar at the top showing the time as 15:45.

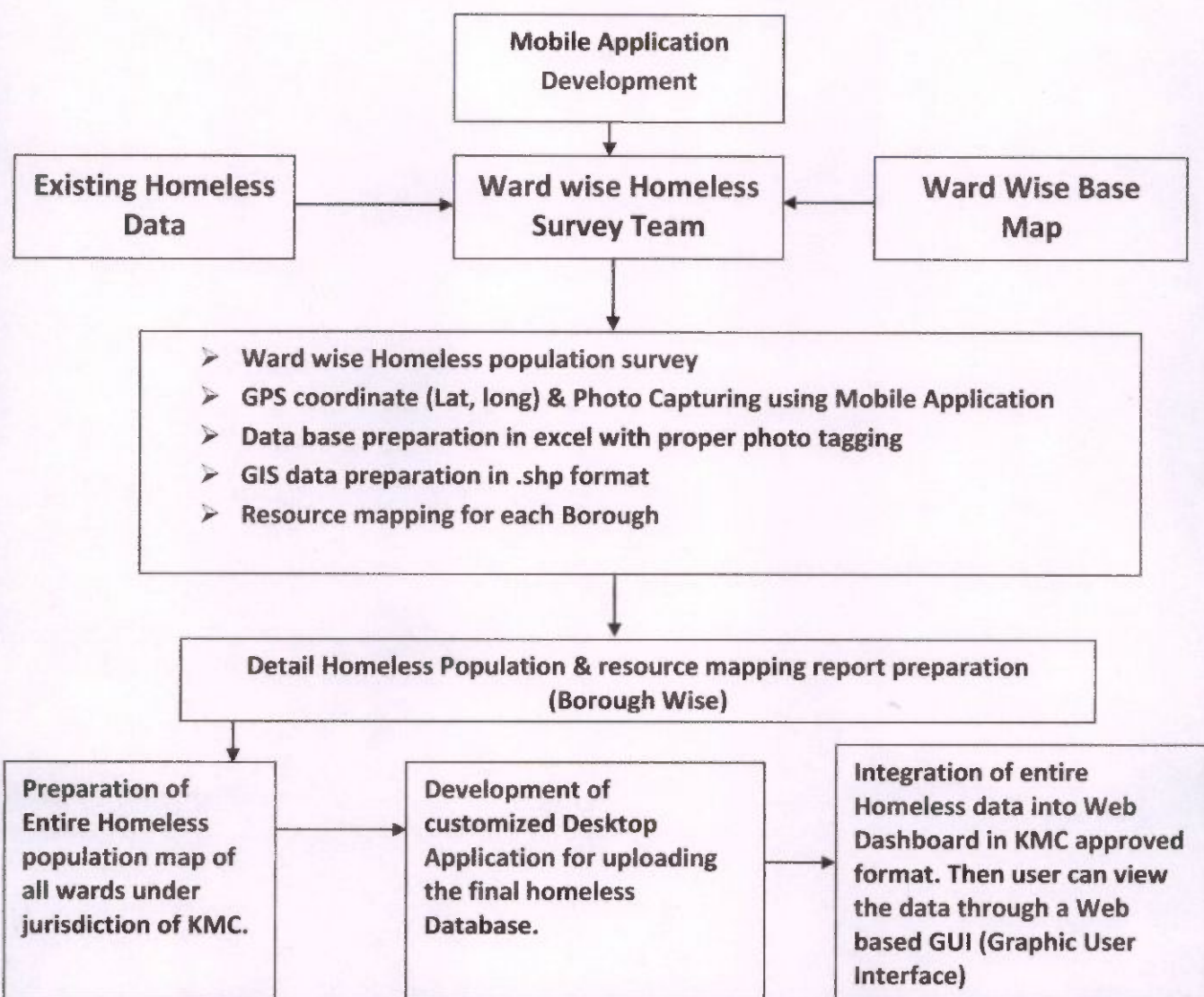
## B. Field Survey & Final Homeless Data Base Preparation

After the development of Mobile application, our survey teams started the task of the field survey from one corner of the ward map assigned to them and the entire survey task was supervised by our skilled professional. They were given the following mobile devices before the commencement of their task:

- Android-based smartphone pre-installed with 'Thikana' app
- Handheld GPS device for finding the GPS coordinates of homeless people.
  - As per the given questionnaire feature in the 'Thikana' app, survey team members interviewed each of the homeless person/head of the homeless family they found on their survey route in each ward assigned to them by their supervisor. They simultaneously entered the answers in respective data fields in the app itself.
  - After successful completion of the interview of each respondent, one member from the two-person team capture three images of the respondent from three distinct camera angles with his Android mobile device.
  - The survey data including the images collected by each team was then used to create borough wise maps in GDB (Geo database) format. Then we create borough wise GDB geo-tagged with photo of each respondent.
  - Then we uploaded all data to previously developed web-based application using PHP technology. We uploaded the collected survey data along with images over there and ensured only authorized users can access that data.



## PROCESS FLOW DIAGRAM



## Karmick's Project execution timeline

Zone No	Borough No	Total Number of Ward	Survey Start Date	Survey Completion Date	Final Data delivery Date (including GIS)	Homeless population Found
IV	Borough X	12	11/3/2018	16/3/2018	20/3/2018	67
	Borough XI	7	9/3/2018	10/3/2018	21/3/2018	9
	Borough XII	7	13/3/2018	14/3/2018	22/3/2018	23
<b>Total</b>		<b>26</b>				<b>99</b>

## System Implementation & Hosting

Our development was completed & the Web application was to be installed. The software would be installed in the Web server of KMC.

Following would be the Technical Requirements & Specification Required:

**Operation System Platform Required** – Linux Server (Apache 2.4), (PHP 7 to be installed)

**Database** – MySQL 5.6

**Server Specification** – HP Proliant DL 360 G6 or Equivalent -- (2 in quantity, one main server & another is backup)

- Quad Core Intel Xeon E5504 Processor (2GHz, 80 Watts)
- 4 MB (1X4MB) Level 3 Cache
- 8 GB (4X2 GB) Standard; PC3 – 10600E (DDR3-1333) Un buffered
- HP Smart Array P410i zero memory Module
- 460W Hot Plug Power Supply
- Redundant RFK Std
- 1 TB SAS HDD

**Internet Lease Line: 6 mbps for 40-50 Concurrent Users** to implement secured internet, department need to put in a proper infrastructure of Router, virus protection and secured layers of both hard devices and software

**User System Specification** – Any System with Internet Connection and Internet Explorer/Mozilla Firefox/Chrome Browser will be able to use the software.

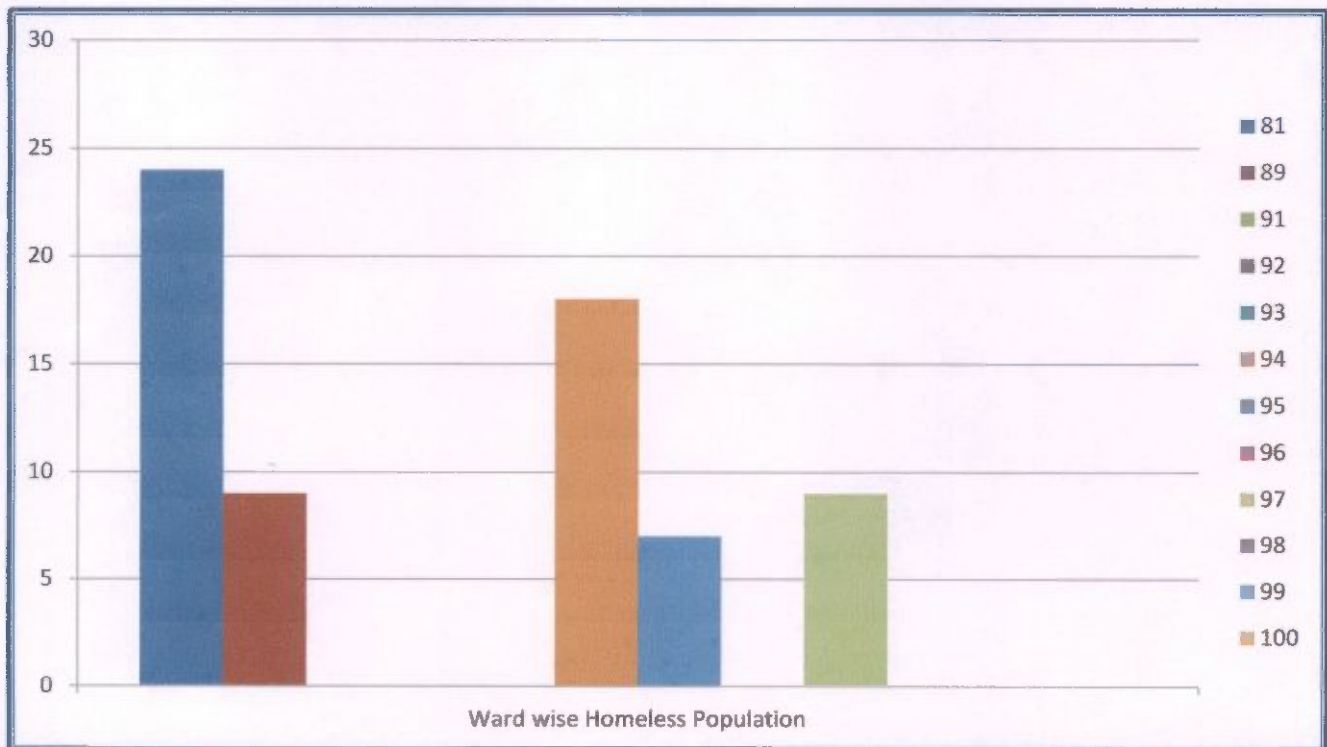


**Borough wise  
Project Output of  
Homeless Population Data  
Zone-IV**

# Detail of Homeless Population Data Borough-X

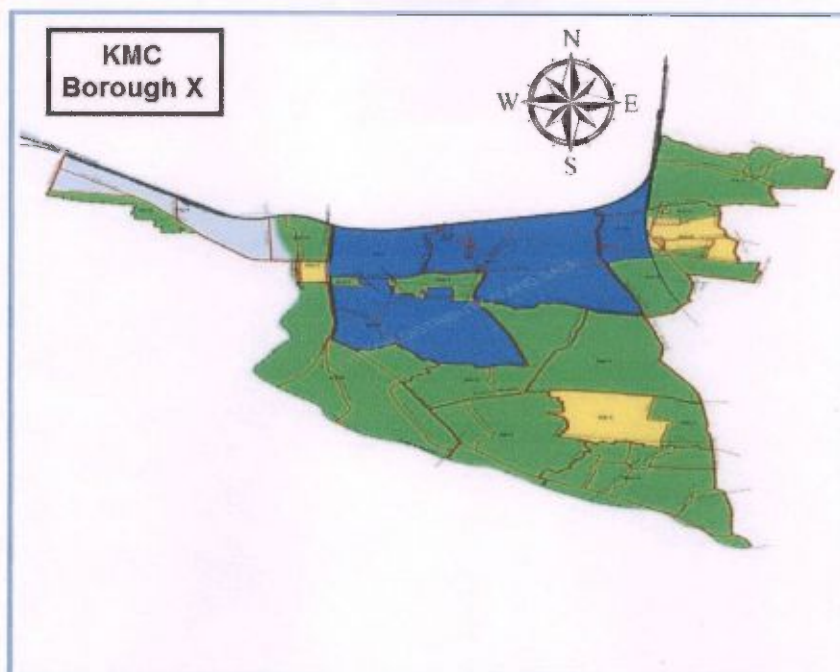
We have started field survey on 11/03/2018 & completed the entire survey job on 16/03/2018. We found following Homeless population data after survey.

Borough	Total number of wards	Ward No.	Homeless People Found during Survey
X	12	81	24
		89	9
		91	0
		92	0
		93	0
		94	18
		95	7
		96	0
		97	9
		98	0
		99	0
		100	0
		<b>Total</b>	<b>67</b>





## Project Area:



Ward No	Boundary	Details
81	North	The Eastern Railway
	South	Circular Road (Tollygunge), Diamond Harbour Road.
	East	Deshpran Sasmal Road
	West	Diamond Harbour Road
89	North	Eastern Railway and Tollygunge Circular Road
	South	Charu Chandra Place East, Prince Anwar Shah Road and a link road between Deshpren Shasmal Road and Tolly's Nullah
	East	Dr. Daudar Rahman Road and Charu Chandra Place East and Deshpren Shasmal Road
	West	Deshpran Shasmal Road and Tolly's Nullah
91	North	Rajkrishna Chaterjee Road and Banku Behari Chatterjee Road
	South	Sarat Ghosh Garden Road and Rajdanga Road
	East	Kasba Road and Rajdanga Road
	West	The Eastern Railway
92	North	Sarat Ghosh Garden Road and the Eastern Railway
	South	Jadavpur Station Road, Garfa Road and Northern Boundary of Haltu Union Board
	East	Kalipada Roy Lane, Jheel Road, Western Boundary of Haltu Union Board and Eastern Railway
	West	Raja Subodh Chandra Mullick Road and Gariahat Road

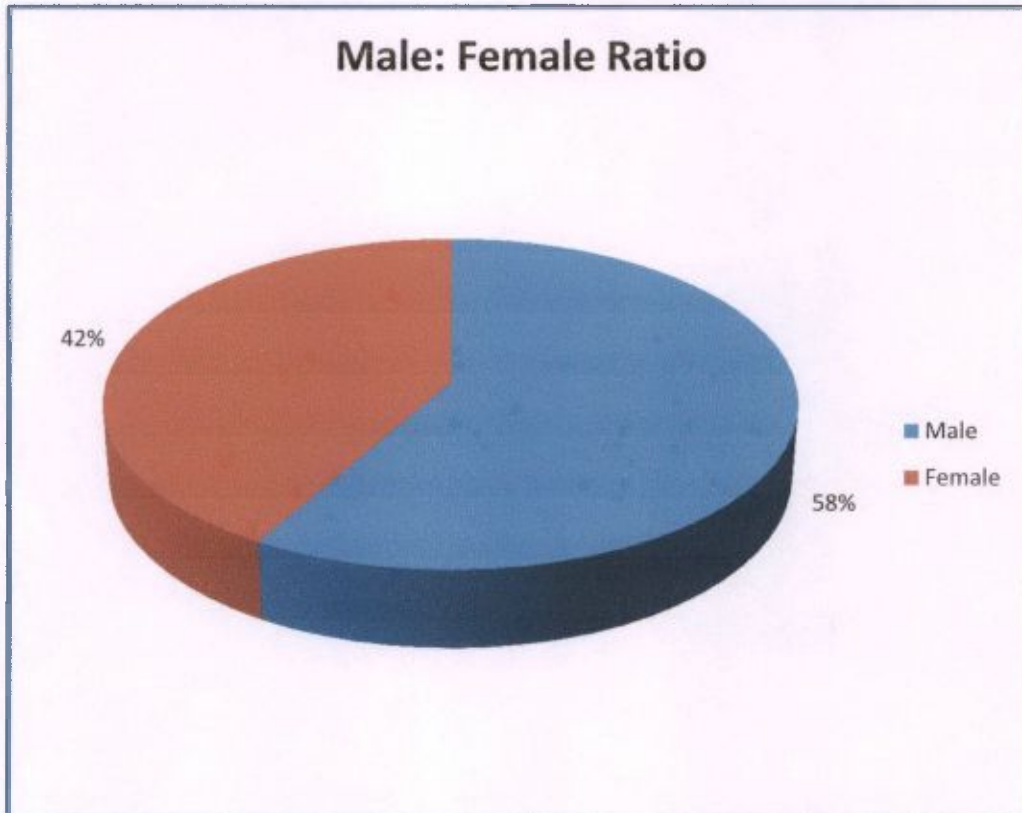
93	North	The Eastern Railway and Charu Chandra Place East
	South	The Jadavpur Central Road, Prince Golam Hossain Shah Road and Prince Anwar Shah Road
	East	Raja Subodh Chandra Mullick Road and Gariahat Road
	West	Prince Golan Mohammad Shah Road, Dr. Daudar Rahman Road and Charu Chandra Place East
94	North	Prince Anwar Shah Road
	South	Netaji Subhas Chandra Bose Road and Graham Road
	East	Prince Golam Mohammad Shah Road
	West	Deshpran Shasmal Road and Graham Road
95	North	Prince Golam Hossain Shah Road and Graham Road
	South	Rajpur Road
	East	Jadavpur Central Road
	West	Prince Golam Mohammad Shah Road and Netaji Subhas Chandra Bose Road
96	North	Jadavpur Central Road
	South	Raipur Road
	East	Raja Subodh Chandra Mullick Road
	West	Jadavpur Central Road
97	North	A link road between Deshpran Shasmal Road and Tolly's Nullah and Graham Road
	South	Graham Road, Nagendra Narayan Dutta Road and Tolly's Nullah
	East	Deshpran Shasmal Road, Graham Road and Netaji Subhas Chandra Bose Road
	West	Tolly's Nullah
98	North	Nagendra Narayan Dutta Road and Raipur Road
	South	Naktala Road, Khanpur Road and a road from Netaji Subhas Chandra Bose Road up to Tolly's Nullah
	East	Raipur Road
	West	Netaji Subhas Chandra Bose Road, Tolly's Nullah and Khanpur Road
99	North	Raipur Road
	South	Raipur Road and Raipur Mondalpara Road
	East	Raja Subodh Chandra Mullick Road
	West	Raipur Road
100	North	Raipur Mondalpara Road and Khanpur Road
	South	Tolly's Nullah
	East	Raja Subodh Chandra Mullick Road
	West	Naktala Road, Khanpur Road and the Road from Netaji Subhas Chandra Bose Road up to Tolly's Nullah



Some more socio-economic findings are evaluated from this homeless people survey data under KMC Borough X.

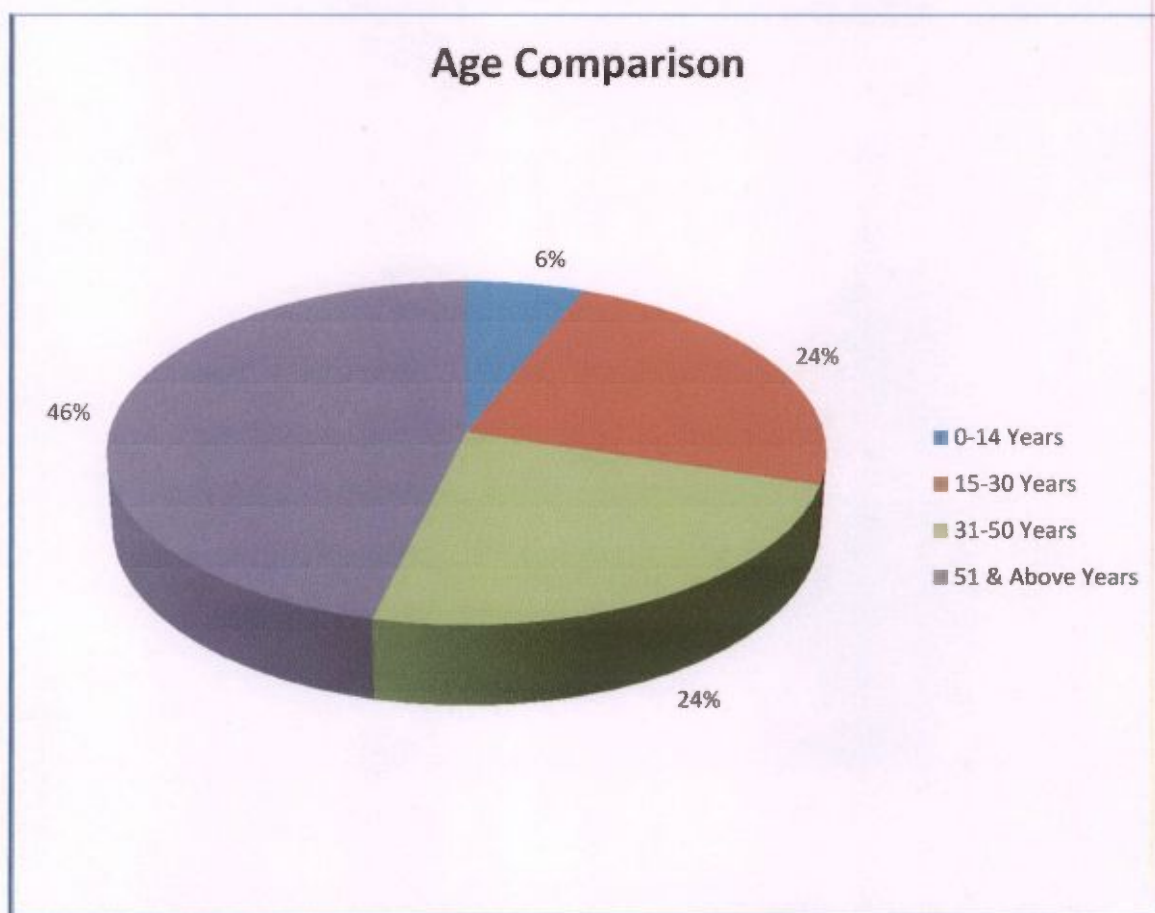
### 1. Sex Ratio:

Borough	Ward No.	Sex Ratio	
		Male	Female
X	81	15	9
	89	5	4
	91	0	0
	92	0	0
	93	0	0
	94	10	8
	95	2	5
	96	0	0
	97	7	2
	98	0	0
	99	0	0
	100	0	0
	<b>Total</b>	<b>39</b>	<b>28</b>



## 2. Age Comparison:

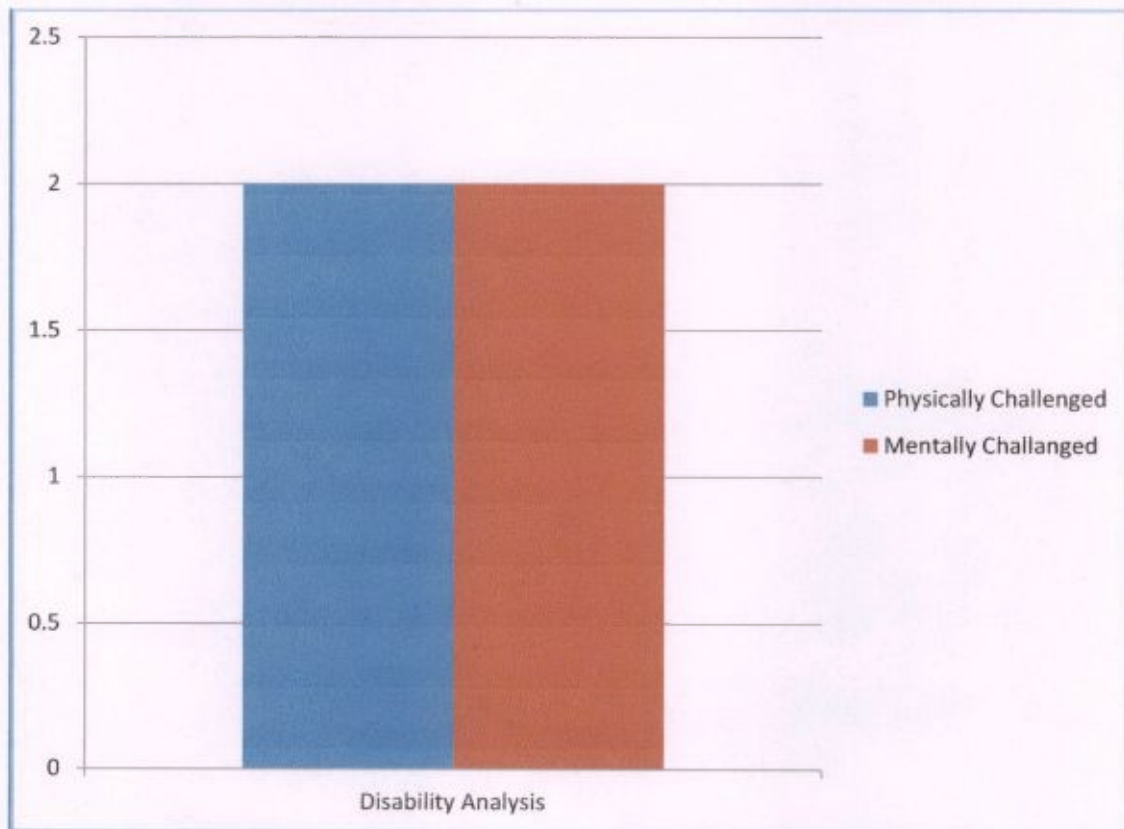
Borough	Ward No.	Age Comparison			
		0-14 Years	15-30 Years	31-50 Years	51 & Above Years
X	81	0	3	9	12
	89	0	2	0	7
	91	0	0	0	0
	92	0	0	0	0
	93	0	0	0	0
	94	0	5	5	8
	95	0	3	1	3
	96	0	0	0	0
	97	4	3	1	1
	98	0	0	0	0
	99	0	0	0	0
	100	0	0	0	0
	Total	4	16	16	31





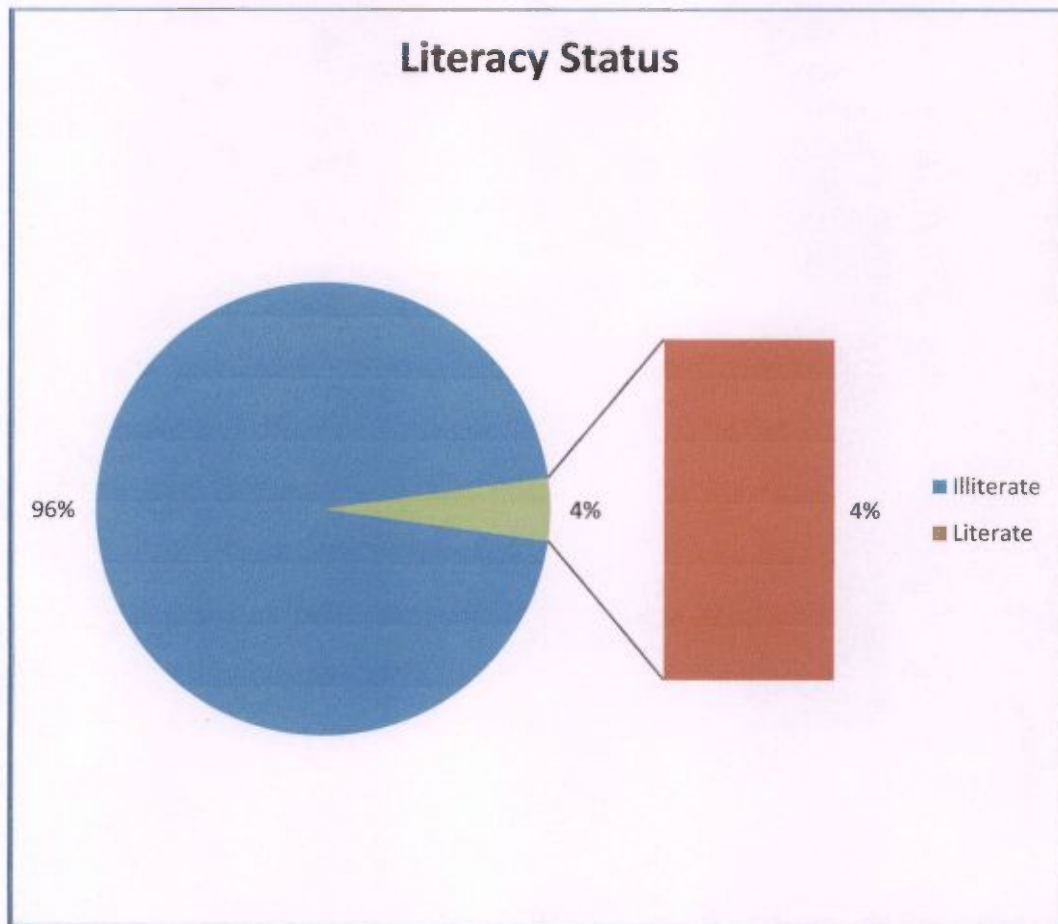
### 3. Disability Analysis:

Borough	Ward No.	Disability Analysis	
		Physically Challenged	Mentally Challenged
X	81	0	0
	89	0	1
	91	0	0
	92	0	0
	93	0	0
	94	0	0
	95	2	0
	96	0	0
	97	0	1
	98	0	0
	99	0	0
	100	0	0
	<b>Total</b>	<b>2</b>	<b>2</b>



#### 4. Literacy Status:

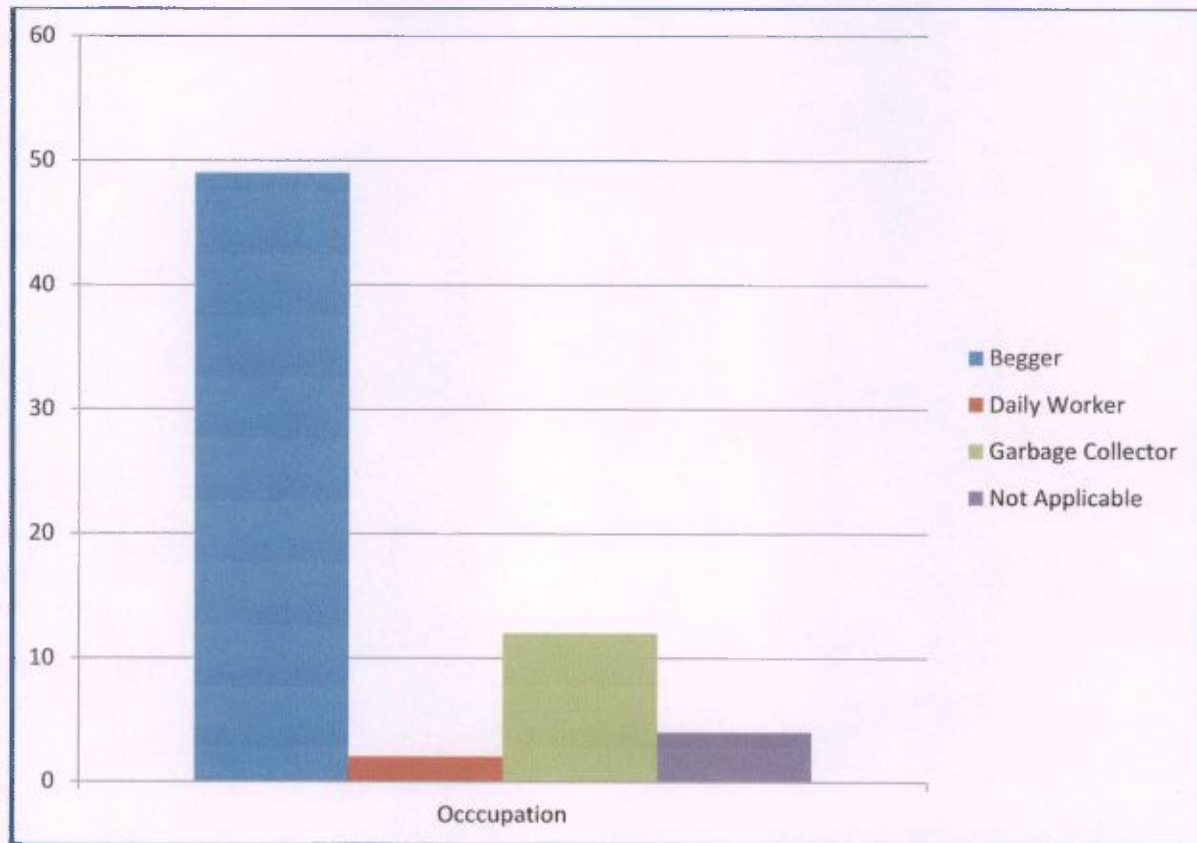
Borough	Ward No.	Literacy Status	
		Illiterate	Literate
X	81	24	0
	89	9	0
	91	0	0
	92	0	0
	93	0	0
	94	18	0
	95	7	0
	96	0	0
	97	6	3
	98	0	0
	99	0	0
	100	0	0
	<b>Total</b>	<b>64</b>	<b>3</b>





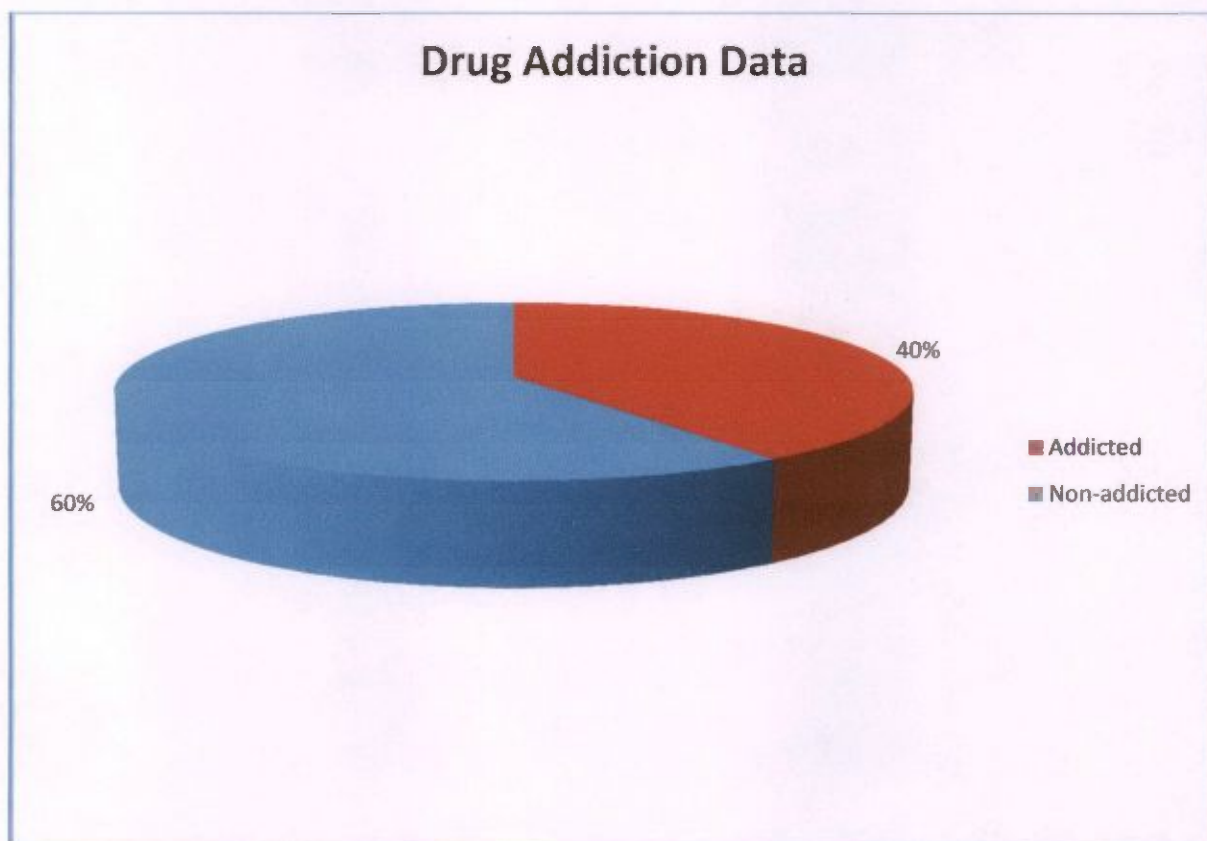
## 5. Occupation Analysis:

Borough	Ward No.	Occupation Analysis			
		Beggar	Daily Worker	Garbage Collector	Not Applicable
X	81	21	1	2	0
	89	8	0	1	0
	91	0	0	0	0
	92	0	0	0	0
	93	0	0	0	0
	94	15	1	2	0
	95	3	0	4	0
	96	0	0	0	0
	97	2	0	3	4
	98	0	0	0	0
	99	0	0	0	0
	100	0	0	0	0
	<b>Total</b>	<b>49</b>	<b>2</b>	<b>12</b>	<b>4</b>



## 6. Drug Addiction Data:

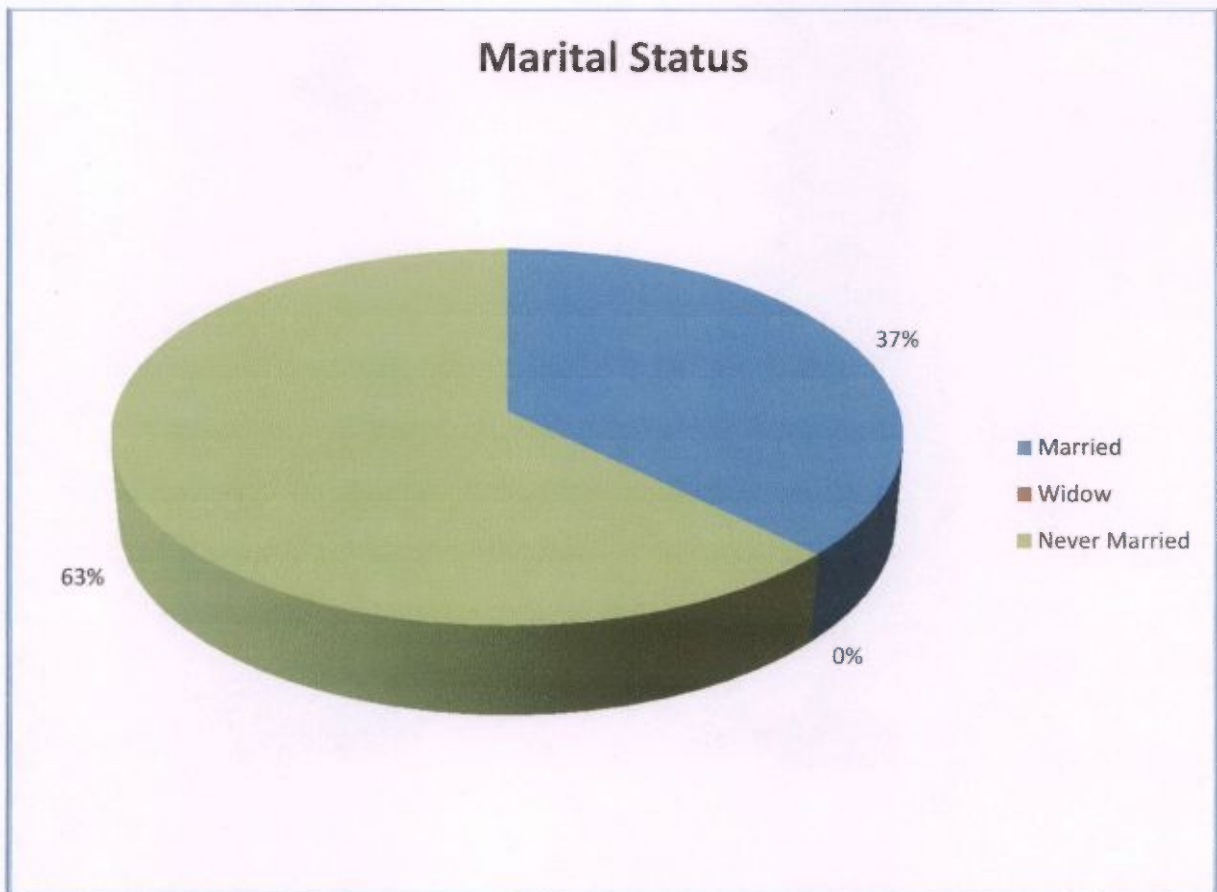
Borough	Ward No.	Drug Addiction Data	
		Addicted	Non-addicted
X	81	9	15
	89	3	6
	91	0	0
	92	0	0
	93	0	0
	94	9	9
	95	4	3
	96	0	0
	97	2	7
	98	0	0
	99	0	0
	100	0	0
	Total	27	40





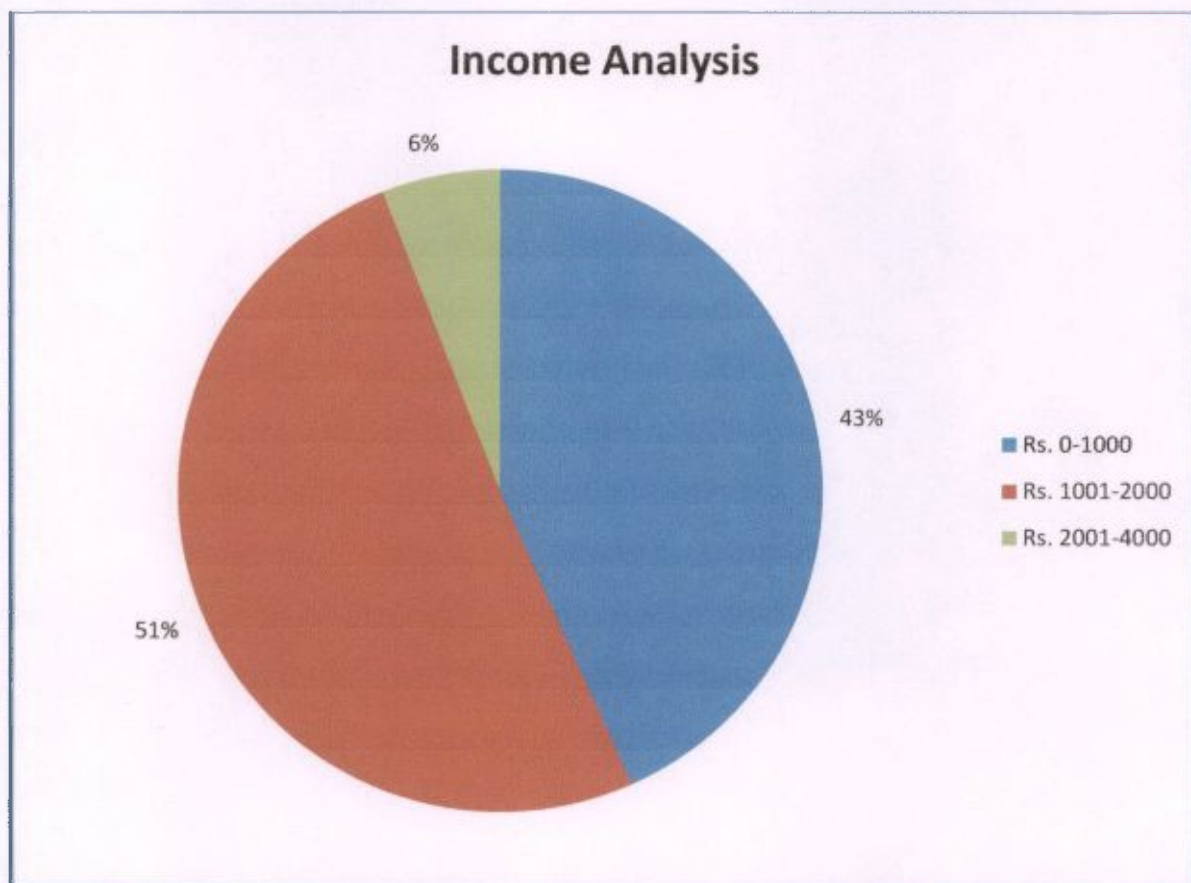
## 7. Marital Status:

Borough	Ward No.	Marital Status		
		Married	Widow	Never Married
X	81	7	0	17
	89	4	0	5
	91	0	0	0
	92	0	0	0
	93	0	0	0
	94	11	0	7
	95	1	0	6
	96	0	0	0
	97	2	0	7
	98	0	0	0
	99	0	0	0
	100	0	0	0
	<b>Total</b>	<b>25</b>	<b>0</b>	<b>42</b>



## 8. Income Analysis:

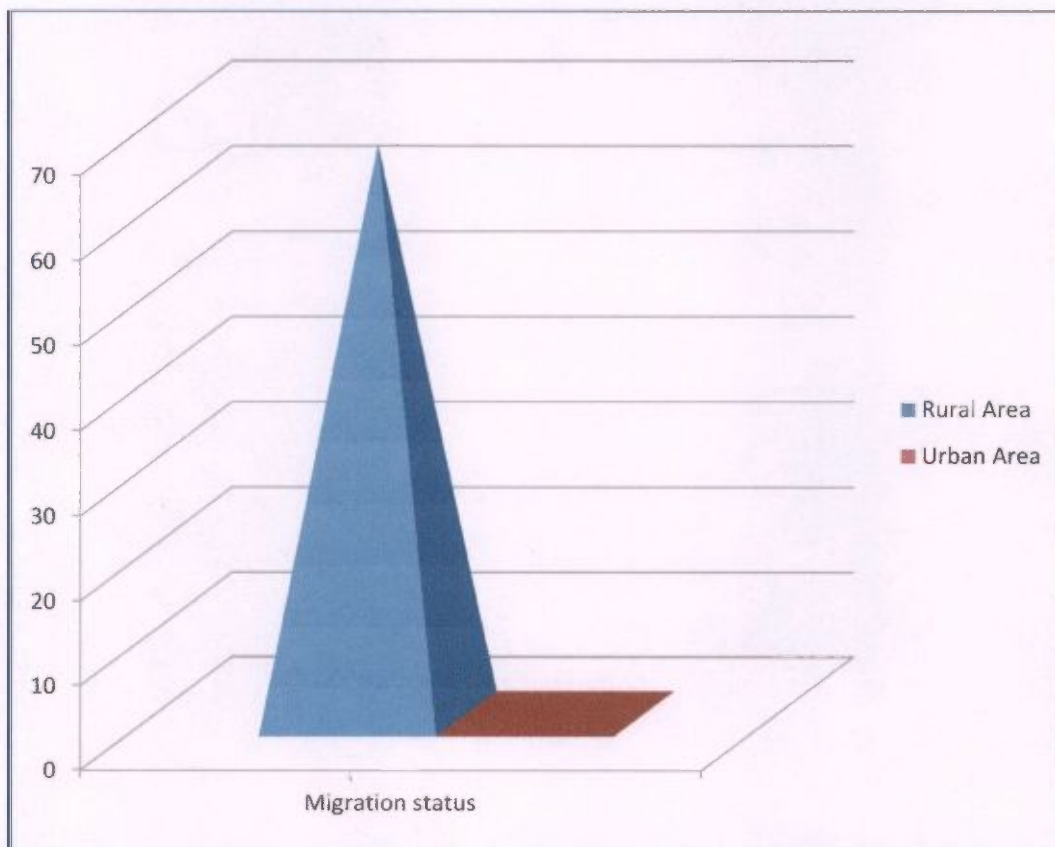
Borough	Ward No.	Income Analysis		
		Rs. 0-1000	Rs. 1001-2000	Rs. 2001-4000
<b>X</b>	81	8	16	0
	89	4	5	0
	91	0	0	0
	92	0	0	0
	93	0	0	0
	94	8	10	0
	95	3	1	3
	96	0	0	0
	97	6	2	1
	98	0	0	0
	99	0	0	0
	100	0	0	0
	<b>Total</b>	<b>29</b>	<b>34</b>	<b>4</b>





## 9. Migration Status

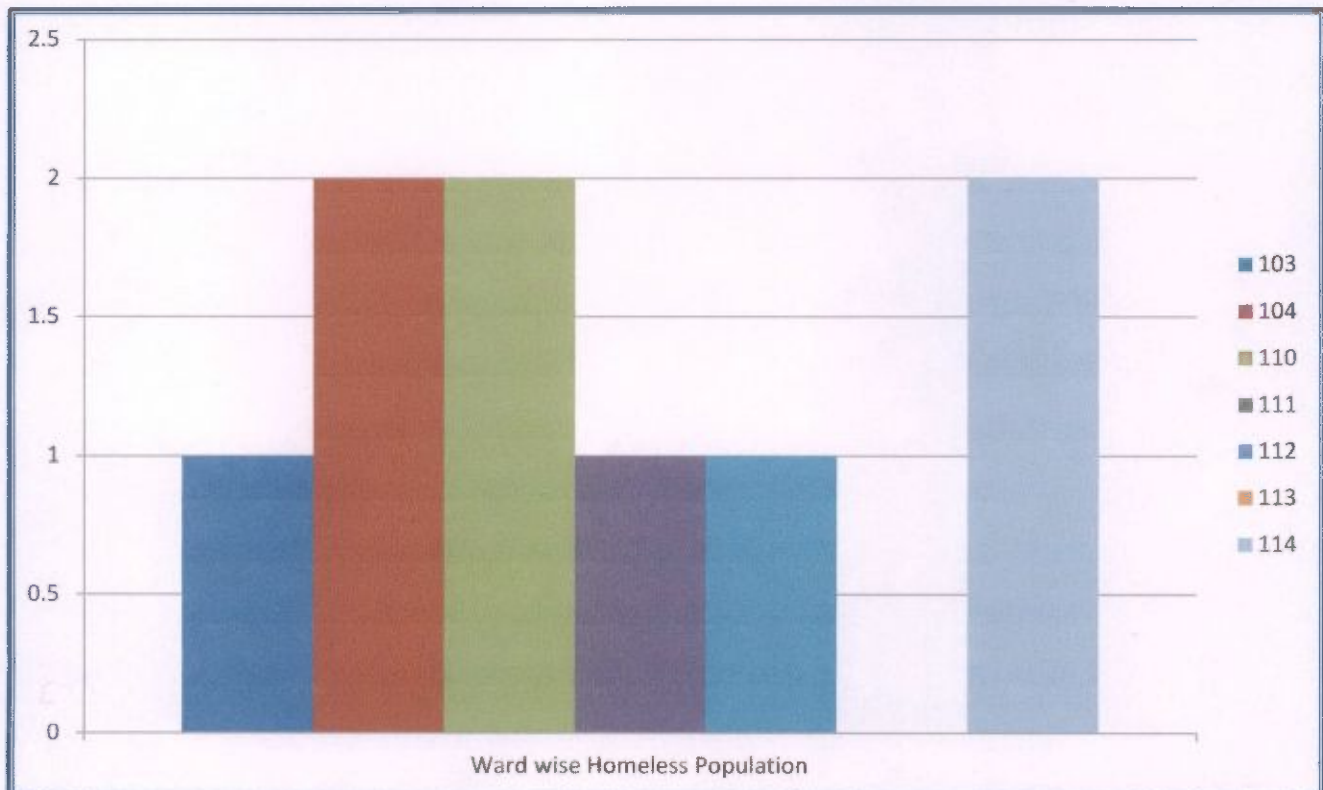
Borough	Ward No.	Migration Status	
		Rural Area	Urban Area
X	81	24	0
	89	9	0
	91	0	0
	92	0	0
	93	0	0
	94	18	0
	95	7	0
	96	0	0
	97	9	0
	98	0	0
	99	0	0
	100	0	0
	<b>Total</b>	<b>67</b>	<b>0</b>



# Detail of Homeless Population Data Borough-XI

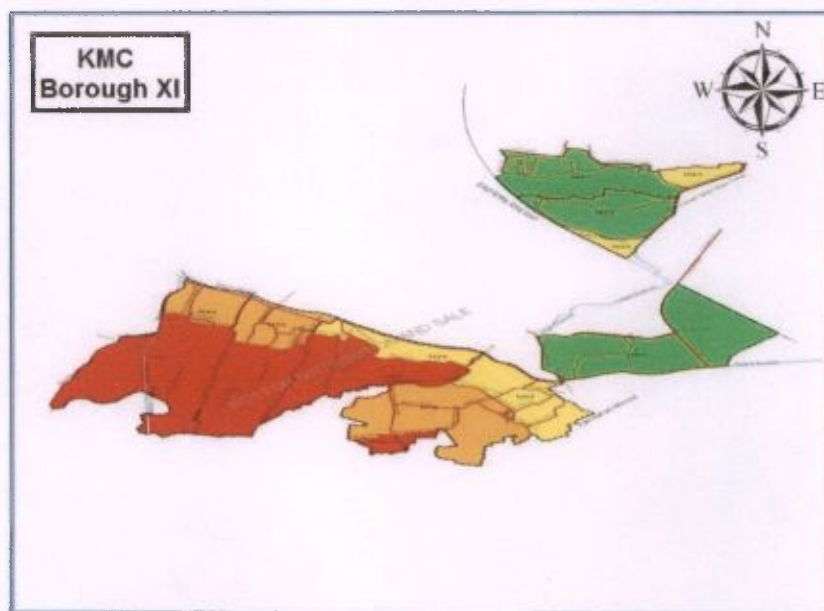
We have started field survey on 09/03/2018 & completed the entire survey job on 10/03/2018. We found following Homeless population data after survey.

Borough	Total number of wards	Ward No.	Homeless People Found during Survey
<b>XI</b>	<b>7</b>	103	1
		104	2
		110	2
		111	1
		112	1
		113	0
		114	2
		<b>Total</b>	<b>9</b>





## Project Area:

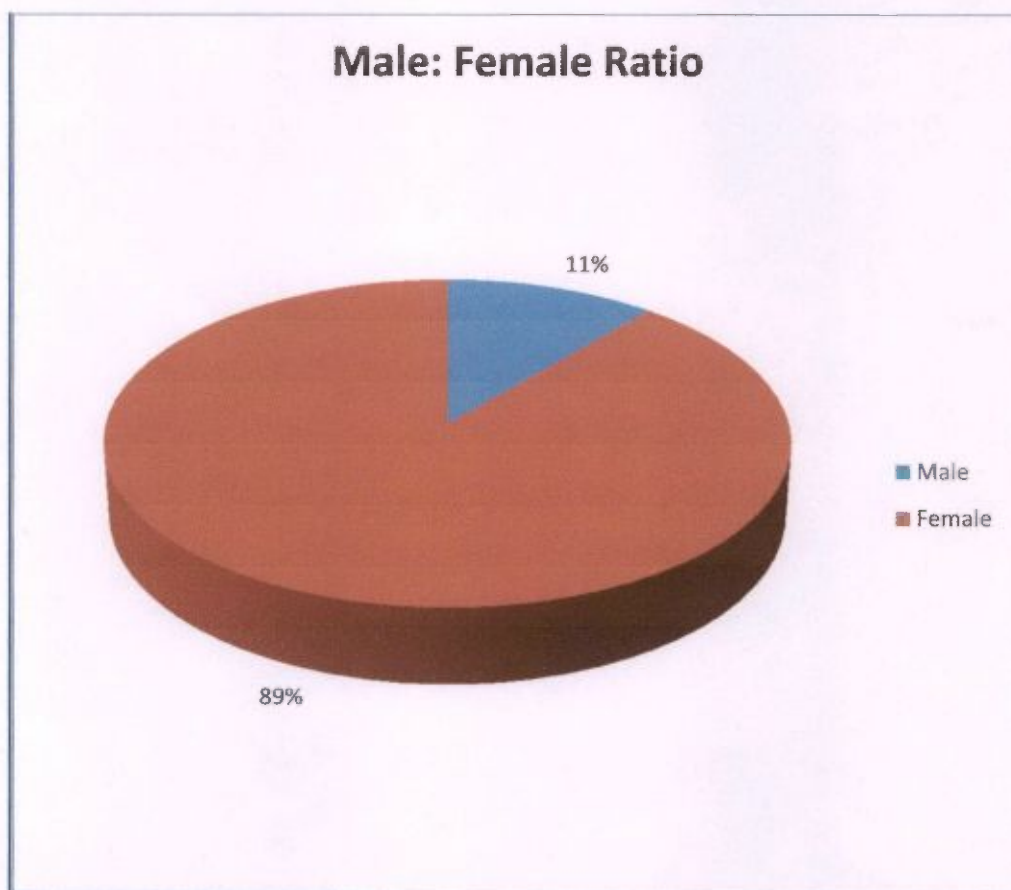


Ward No	Boundary	Details
103	North	Santoshpur Avenue, Kalikumar Mazumdar Road and New Santoshpur Main Road
	South	Crossing of the Eastern Railway and Panchannagram canal
	East	Panchannagram canal
	West	The Eastern Railway and Kali kumar Mazumdar Road
104	North	Northern bank of Northern jheel, Prince Anwar Shah Link Canal, Vivekananda Sarani and Kalikapur Road
	South	Santoshpur Avenue, Kalikumar Mazumdar Road and New Santoshpur Main Road
	East	Panchannagram canal and Kalikumar Road
	West	The Eastern Railway, Jheel Road to the Southern bank of Southern jheel.
110	North	Raja Subodh Chandra Mullick Road and Eastern Metropolitan By-pass
	South	Tolly's Nullah and southern boundary of Briji Mauja
	East	The Eastern Railway
	West	Raja Subodh Chandra Mullick Road and Eastern Metropolitan By-pass
111	North	Nathpara Road and Tolly's Nullah
	South	Southern boundaries of Kamdahari and Brahmapur Mauzas
	East	Eastern boundary of Kamdahari Mauza
	West	Bidhanpally road, Bakshipally Road, Rishi Rajnarayan Road and Sheikhpara road
112	North	Tolly's Nullah
	South	Nathpara Road, Southern boundaries of Brahmapur and Raynagar Mauzas
	East	Bidhanpally Road, Bakshipally road, Rishi Rajnarayan road and Sheikhpara road
	West	H.L. Sarkar Road and Pirpukur Road
113	North	Tolly's Nullah
	South	Southern boundary of Bansdroni Mauza
	East	H.L. Sarkar Road and Pirpukur Road
	West	Bandipur Road and Anandapally Road
114	North	Tolly's Nullah
	South	Southern boundaries of Bansdroni, Chakdaha and Purbaputary mauzas
	East	Bandipur Road and Anandapally Road
	West	Kaorapukur Khai

Some more socio-economic findings are evaluated from this homeless people survey data under KMC Borough XI.

### 1. Sex Ratio:

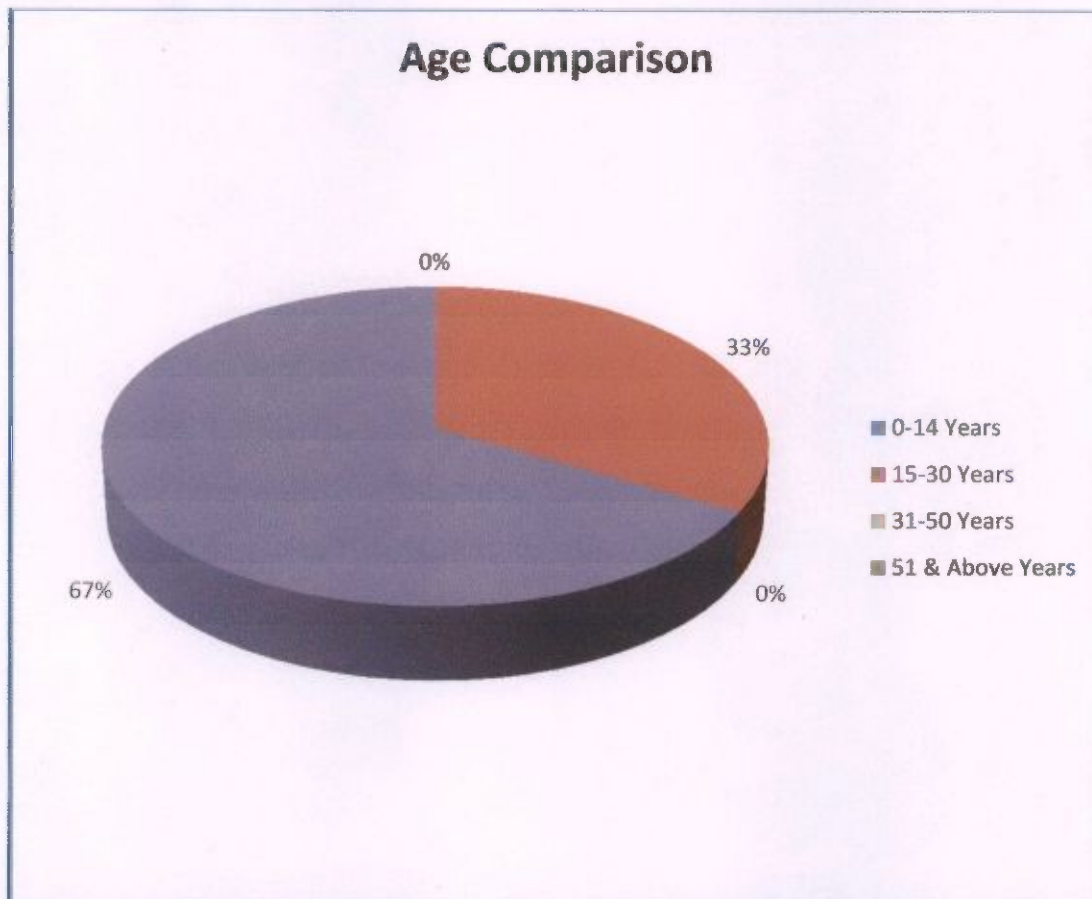
Borough	Ward No.	Sex Ratio	
		Male	Female
XI	103	0	1
	104	0	2
	110	1	1
	111	0	1
	112	0	1
	113	0	0
	114	0	2
	Total	1	8





## 2. Age Comparison:

Borough	Ward No.	Age Comparison			
		0-14 Years	15-30 Years	31-50 Years	51 & Above Years
<b>XI</b>	103	0	0	0	1
	104	0	0	0	2
	110	0	1	0	1
	111	0	1	0	0
	112	0	0	0	1
	113	0	0	0	0
	114	0	1	0	1
	<b>Total</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>6</b>



### 3. Disability Analysis:

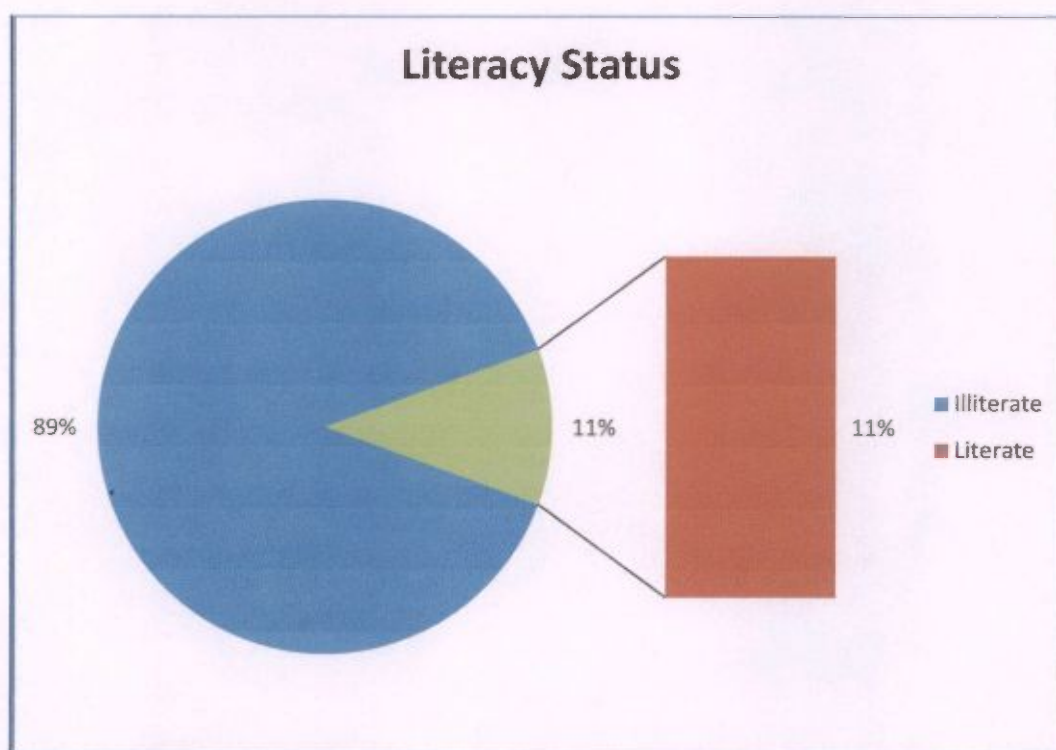
Borough	Ward No.	Disability Analysis	
		Physically Challenged	Mentally Challenged
XI	103	0	0
	104	0	0
	110	0	0
	111	0	0
	112	0	0
	113	0	0
	114	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>





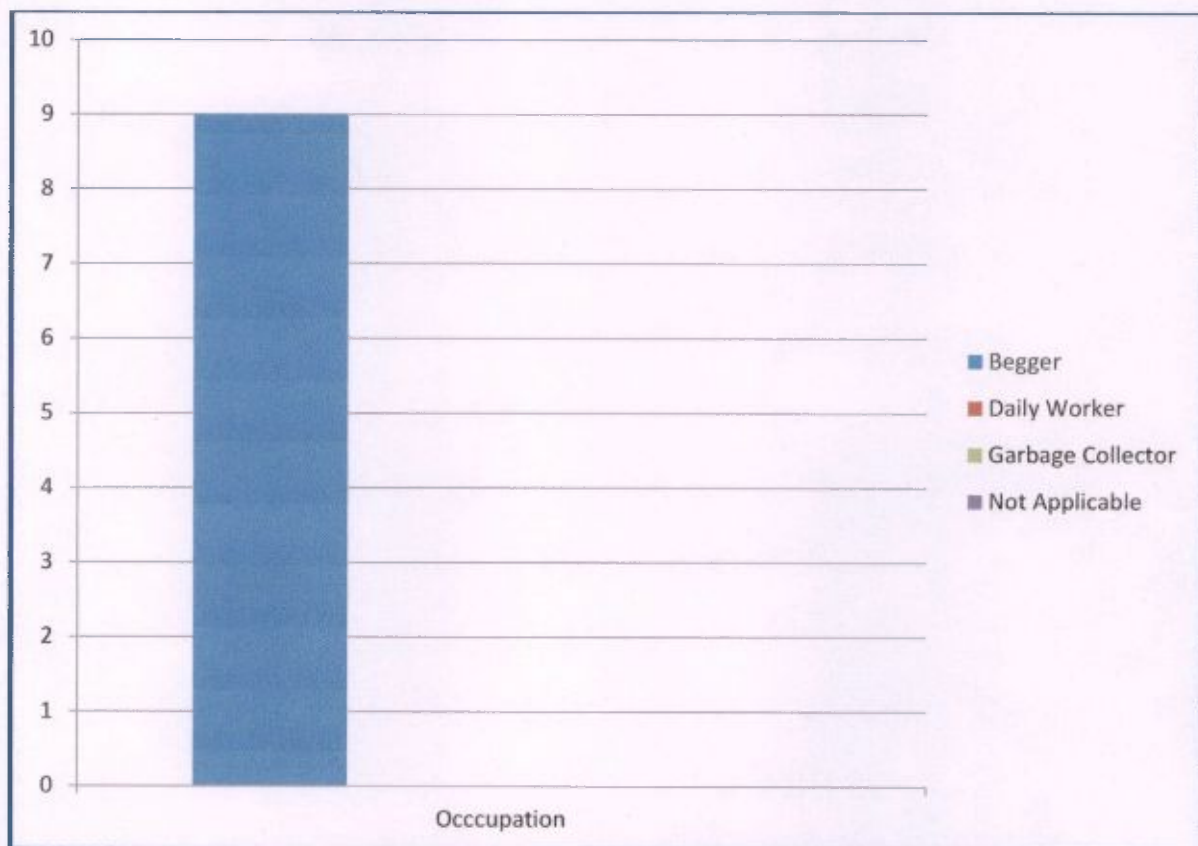
#### 4. Literacy Status:

Borough	Ward No.	Literacy Status	
		Illiterate	Literate
XI	103	1	0
	104	2	0
	110	2	0
	111	1	0
	112	1	0
	113	0	0
	114	1	1
	<b>Total</b>	<b>8</b>	<b>1</b>



## 5. Occupation Analysis:

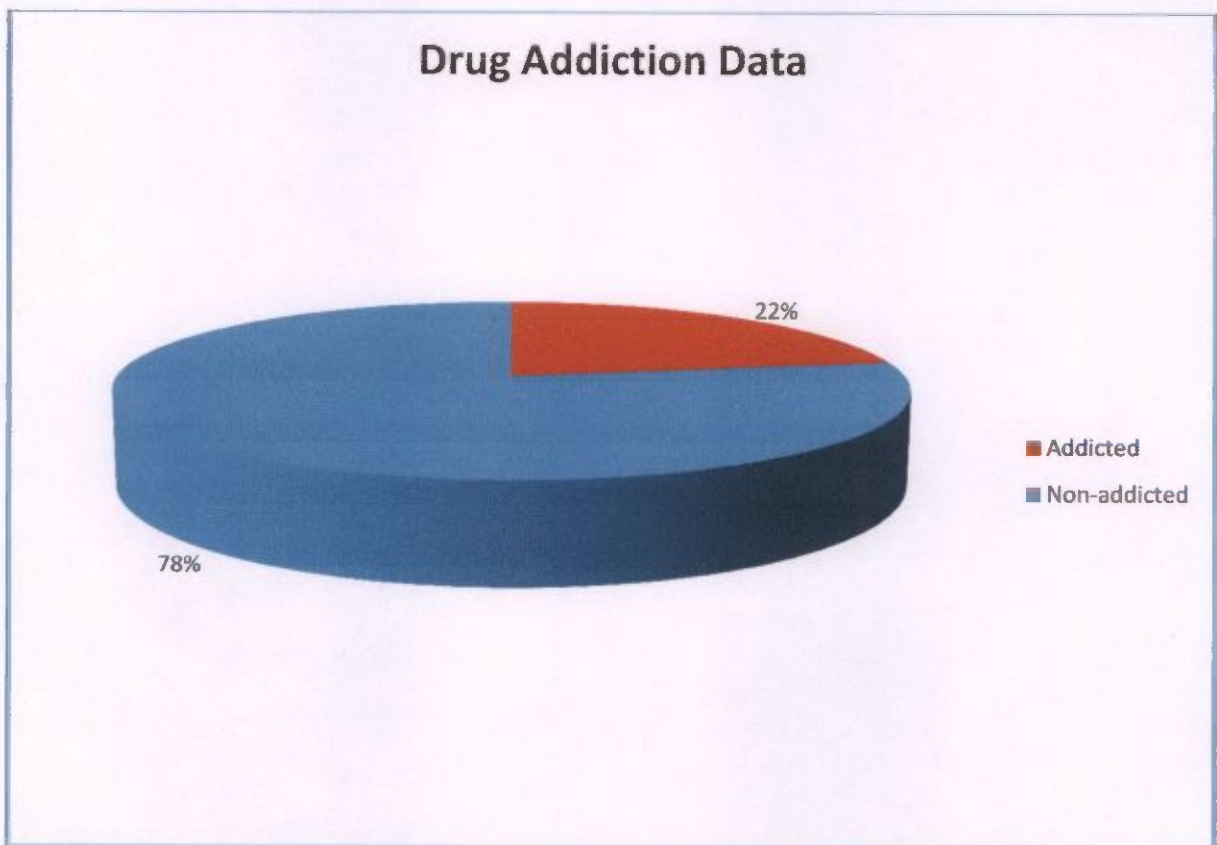
Borough	Ward No.	Occupation Analysis			
		Beggar	Daily Worker	Garbage Collector	Not Applicable
<b>XI</b>	103	1	0	0	0
	104	2	0	0	0
	110	2	0	0	0
	111	1	0	0	0
	112	1	0	0	0
	113	0	0	0	0
	114	2	0	0	0
	<b>Total</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>





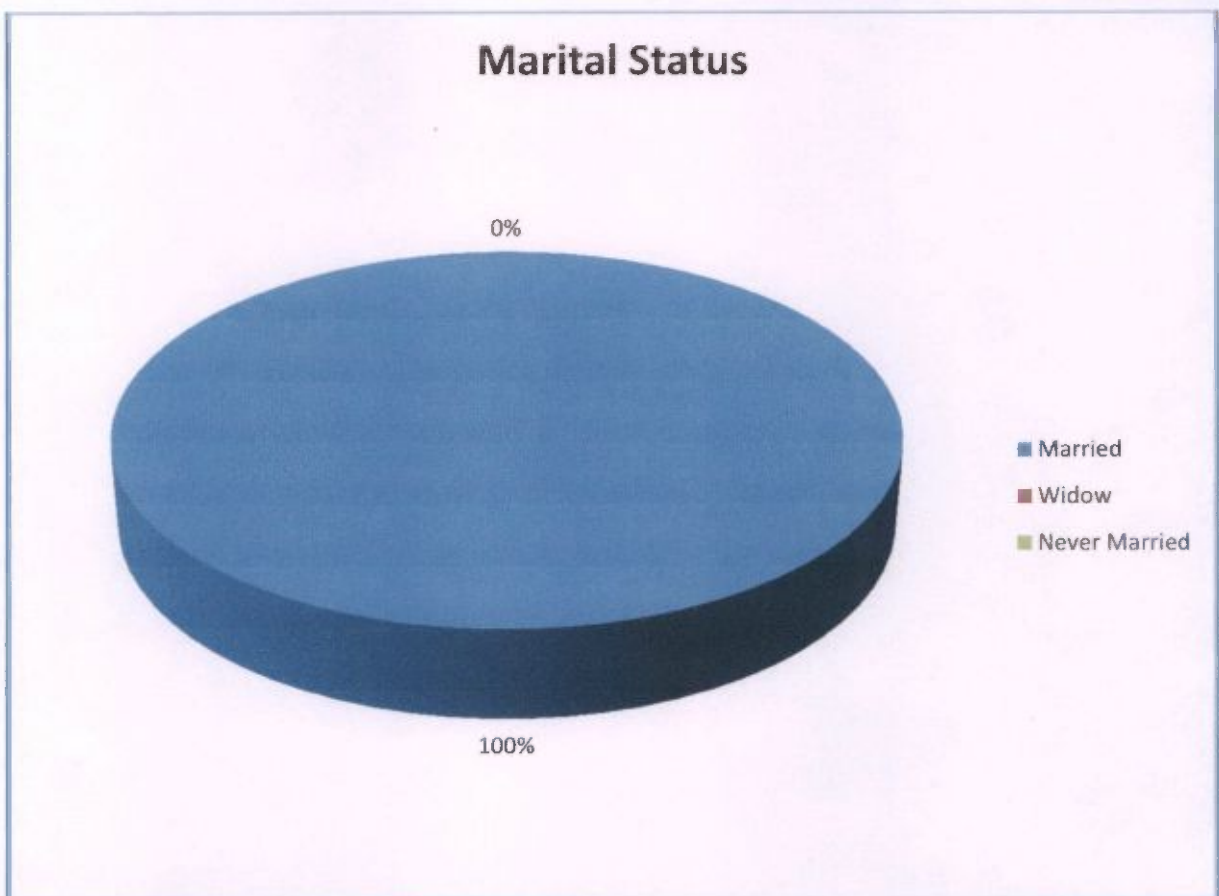
## 6. Drug Addiction Data:

Borough	Ward No.	Drug Addiction Data	
		Addicted	Non-addicted
XI	103	0	1
	104	1	1
	110	1	1
	111	0	1
	112	0	1
	113	0	0
	114	0	2
	<b>Total</b>	<b>2</b>	<b>7</b>



## 7. Marital Status:

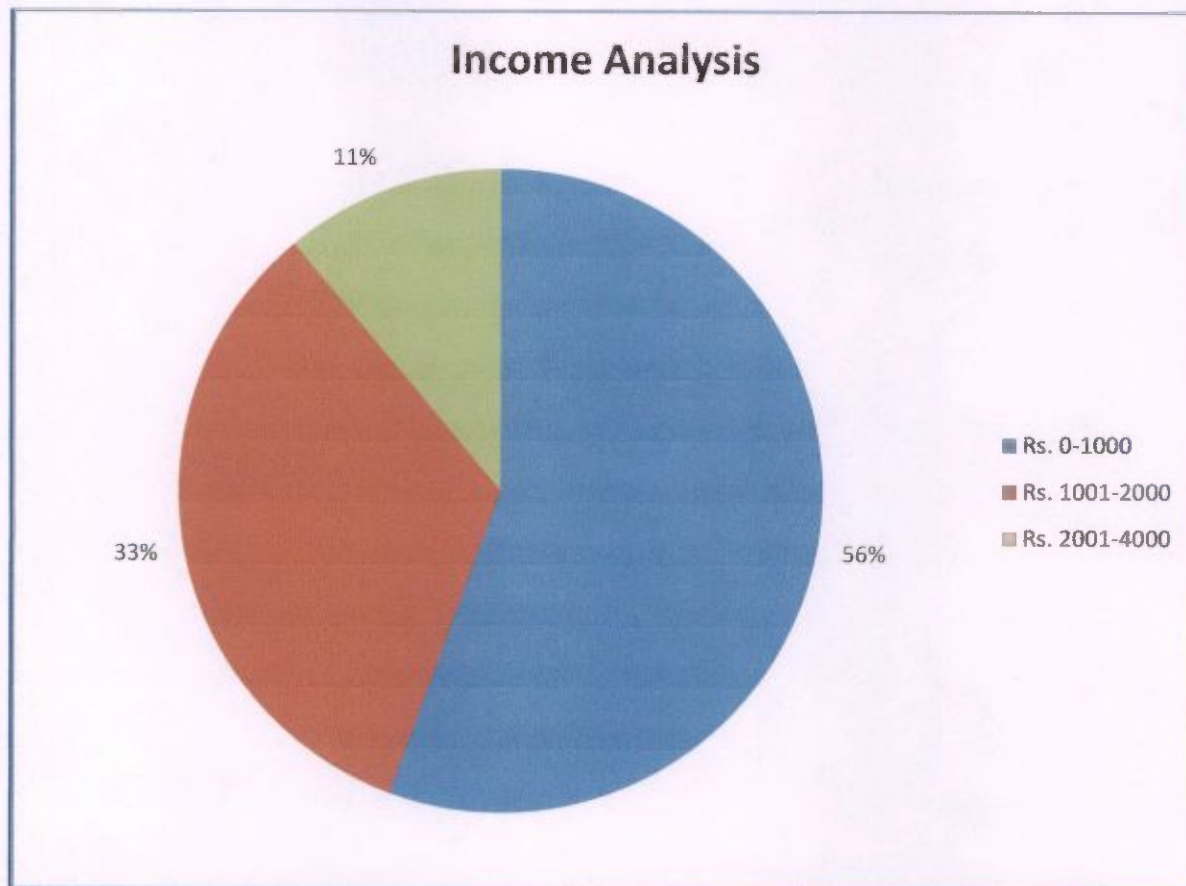
Borough	Ward No.	Marital Status		
		Married	Widow	Never Married
XI	103	1	0	0
	104	2	0	0
	110	2	0	0
	111	1	0	0
	112	1	0	0
	113	0	0	0
	114	2	0	0
	<b>Total</b>	<b>9</b>	<b>0</b>	<b>0</b>





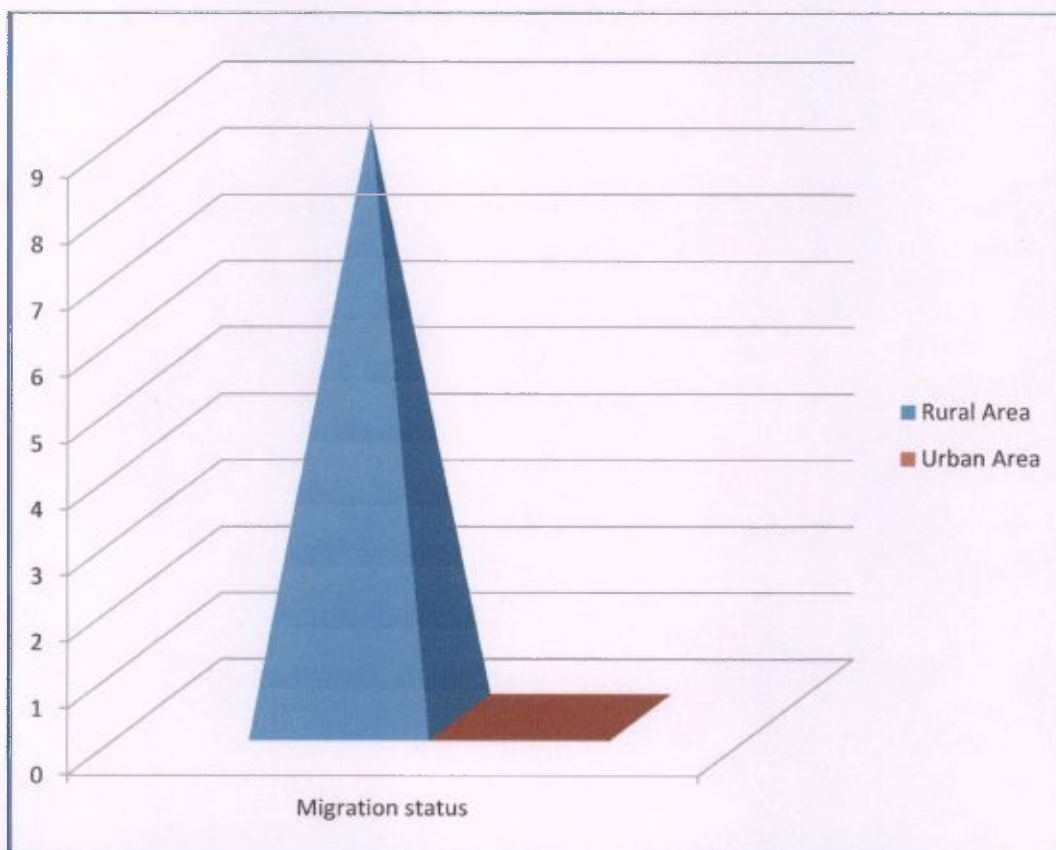
## 8. Income Analysis:

Borough	Ward No.	Income Analysis		
		Rs. 0-1000	Rs. 1001-2000	Rs. 2001-4000
<b>XI</b>	103	1	0	0
	104	1	1	
	110	1	0	1
	111	0	1	0
	112	1	0	0
	113	0	0	0
	114	1	1	0
	<b>Total</b>	<b>5</b>	<b>3</b>	<b>1</b>



## 9. Migration Status

Borough	Ward No.	Migration Status	
		Rural Area	Urban Area
XI	103	1	0
	104	2	0
	110	2	0
	111	1	0
	112	1	0
	113	0	0
	114	2	0
	Total	9	0

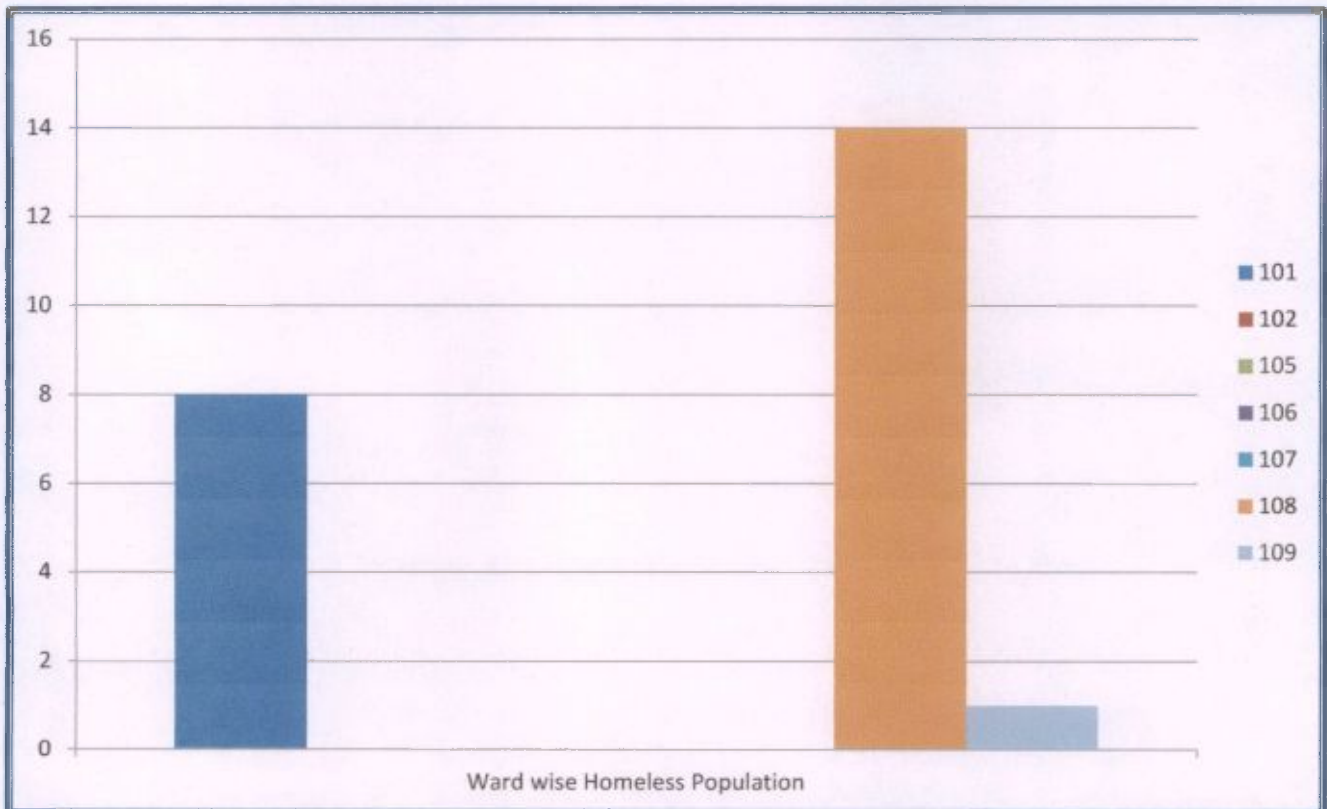




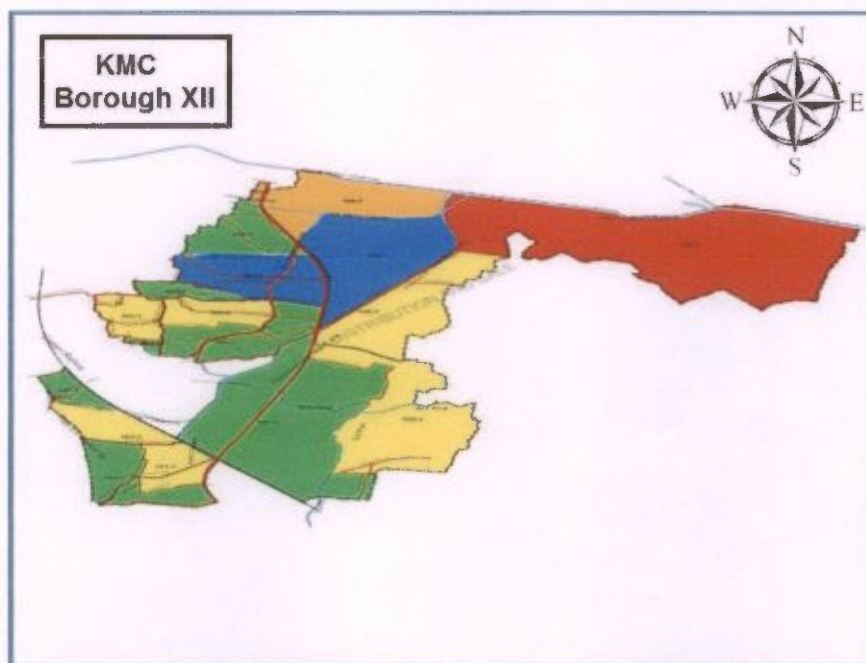
# Detail of Homeless Population Data Borough-XII

We have started field survey on 13/03/2018 & completed the entire survey job on 14/03/2018. We found following Homeless population data after survey.

Borough	Total number of wards	Ward No.	Homeless People Found during Survey
<b>XII</b>	<b>7</b>	101	8
		102	0
		105	0
		106	0
		107	0
		108	14
		109	1
		<b>Total</b>	<b>23</b>



## Project Area:

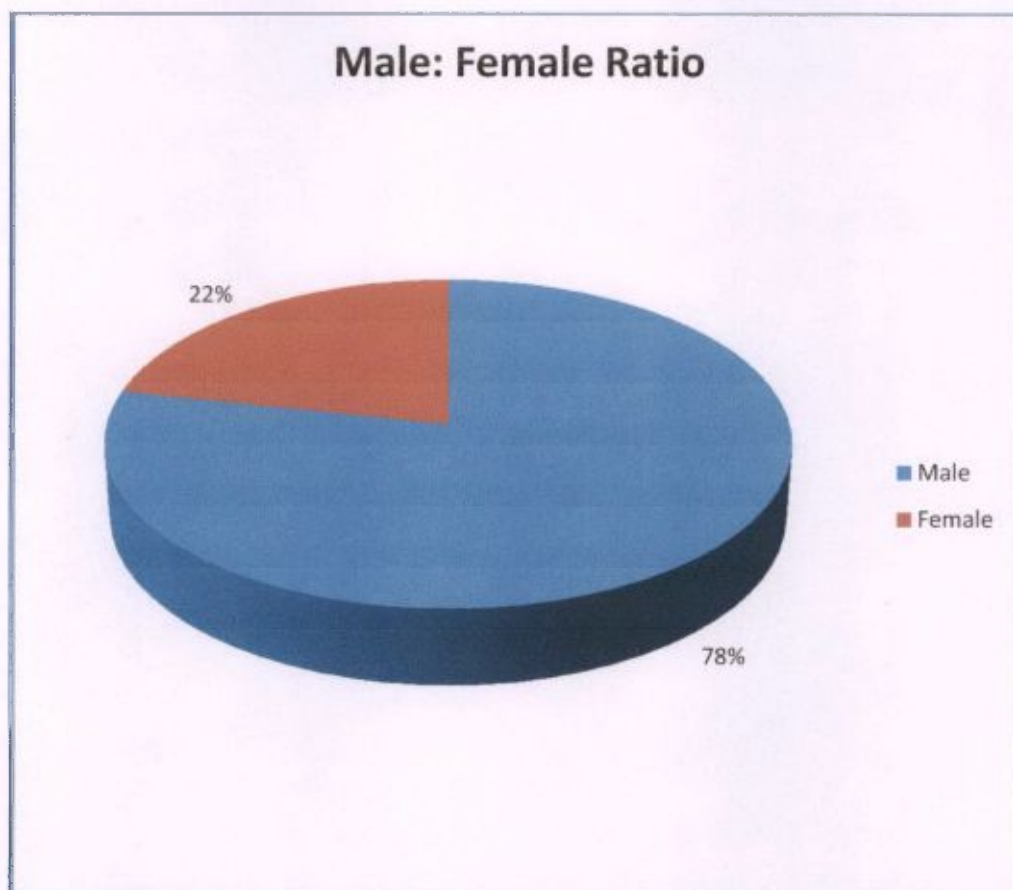


Ward No	Boundary	Details
101	North	Baghajatin Station Road
	South	Link road connecting Raja Subodh Chandra Mullick Road and Eastern Metropolitan By-pass
	East	Eastern Metropolitan By-pass and the Eastern Railway
	West	Raja Subodh Chandra Mullick Road
102	North	Jadavpur Station Road
	South	Baghajatin Station Road
	East	The Eastern Railway
	West	Raja Subodh Chandra Mullick Road, northern bank of northern jheel
105	North	Sarat Ghosh Garden road and Haltu Main Road
	South	Prince Anwar Shah Road link Canal and northern bank of northern jheel
	East	Garfa Main Road and Haltu Main Road
	West	K.P. Roy Lane, Sahidnagar Ward No. 6 <sup>th</sup> Lane and Sahidnagar Ward No. 6th Road Street
106	North	Kayasthpara Main Road, P. Mazumdar Road and the Canal
	South	Prince Anwar Shah Road, Link Canal, Vivekananda Sarani and Kalikapur Road
	East	Panchannagram canal and Eastern Metropolitan By-pass
	West	Garfa Main Road and Haltu Main Road
107	North	Northern Boundary of Nonadanga Mauza and Rajdanga Road
	South	Haltu Main Road, Kayasthpara Main road, P. Mazumdar Road & the canal
	East	Eastern Metropolitan By-pass
	West	Kasba Road, a pucca road (Kasba mauza)
108	North	Northern Boundary of Nonadanga Mauza storm water outlet and northern boundary of Dhapa Mauza
	South	Northern Boundary of Kalikapur Mauza, Southern boundaries of Chowbagha and Dhapa Mauzas
	East	Eastern boundaries of Madurdaha, Nonadanga and Dhapa Mauzas
	West	Eastern Metropolitan By-pass and Western boundary of Paschim Chowbagha Mauza
109	North	Northern Boundaries of Kalikapur and Chakganiagachi Mauza
	South	Southern boundaries of Kalikapur, Nayabad and Chakgaria Mauzas
	East	Eastern Metropolitan By-pass, Kalikapur Barakhola, Chakganiagachi, Nayabad and Chakgaria Mauzas
	West	Panchannagram Canal and the Eastern Railway

Some more socio-economic findings are evaluated from this homeless people survey data under KMC Borough XII.

### 1. Sex Ratio:

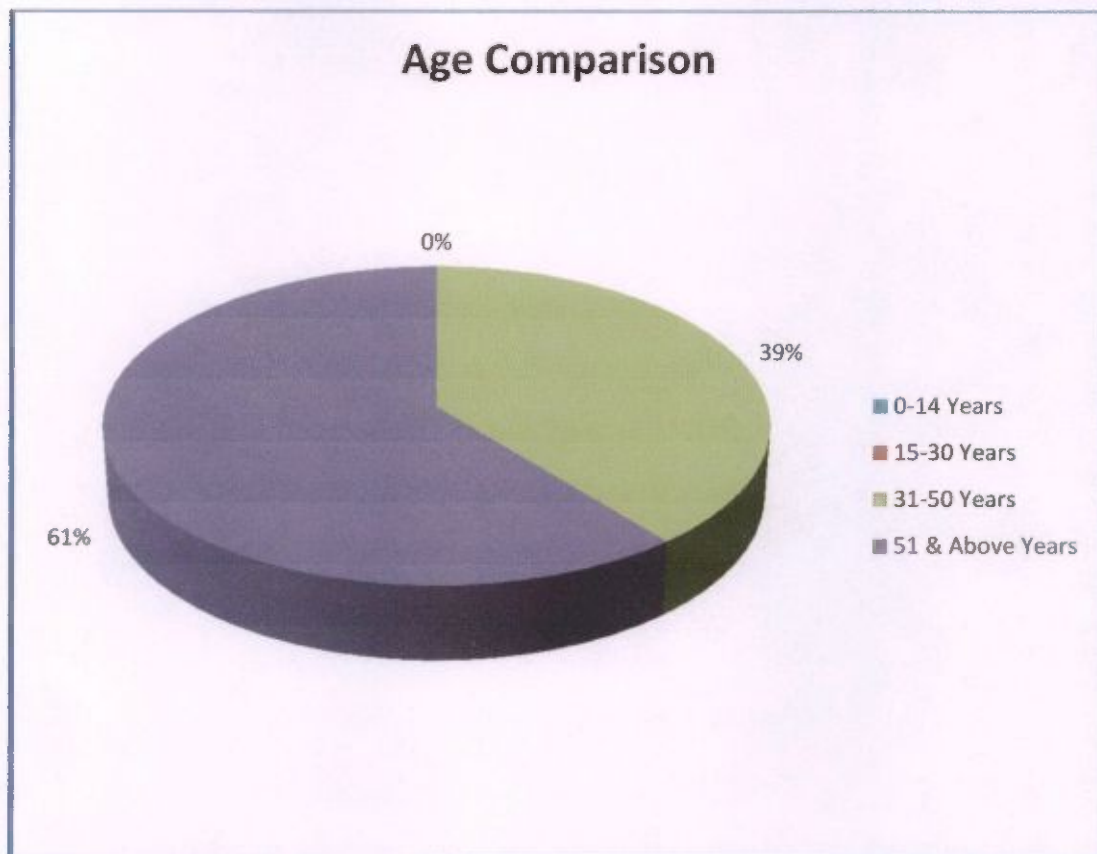
Borough	Ward No.	Sex Ratio	
		Male	Female
XII	101	8	0
	102	0	0
	105	0	0
	106	0	0
	107	0	0
	108	9	5
	109	1	0
	<b>Total</b>	<b>18</b>	<b>5</b>





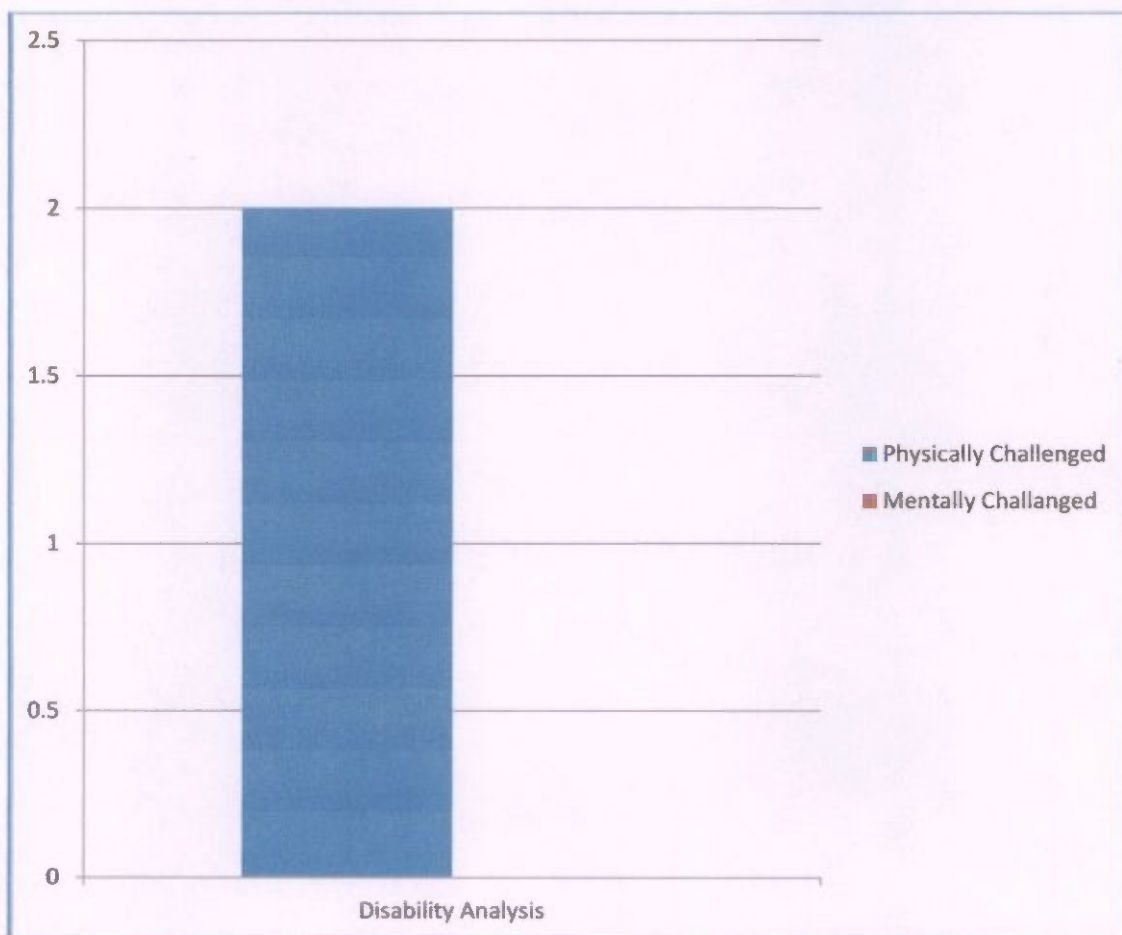
## 2. Age Comparison:

Borough	Ward No.	Age Comparison			
		0-14 Years	15-30 Years	31-50 Years	51 & Above Years
XII	101	0	0	5	3
	102	0	0	0	0
	105	0	0	0	0
	106	0	0	0	0
	107	0	0	0	0
	108	0	0	4	10
	109	0	0	0	1
	<b>Total</b>	0	0	9	14



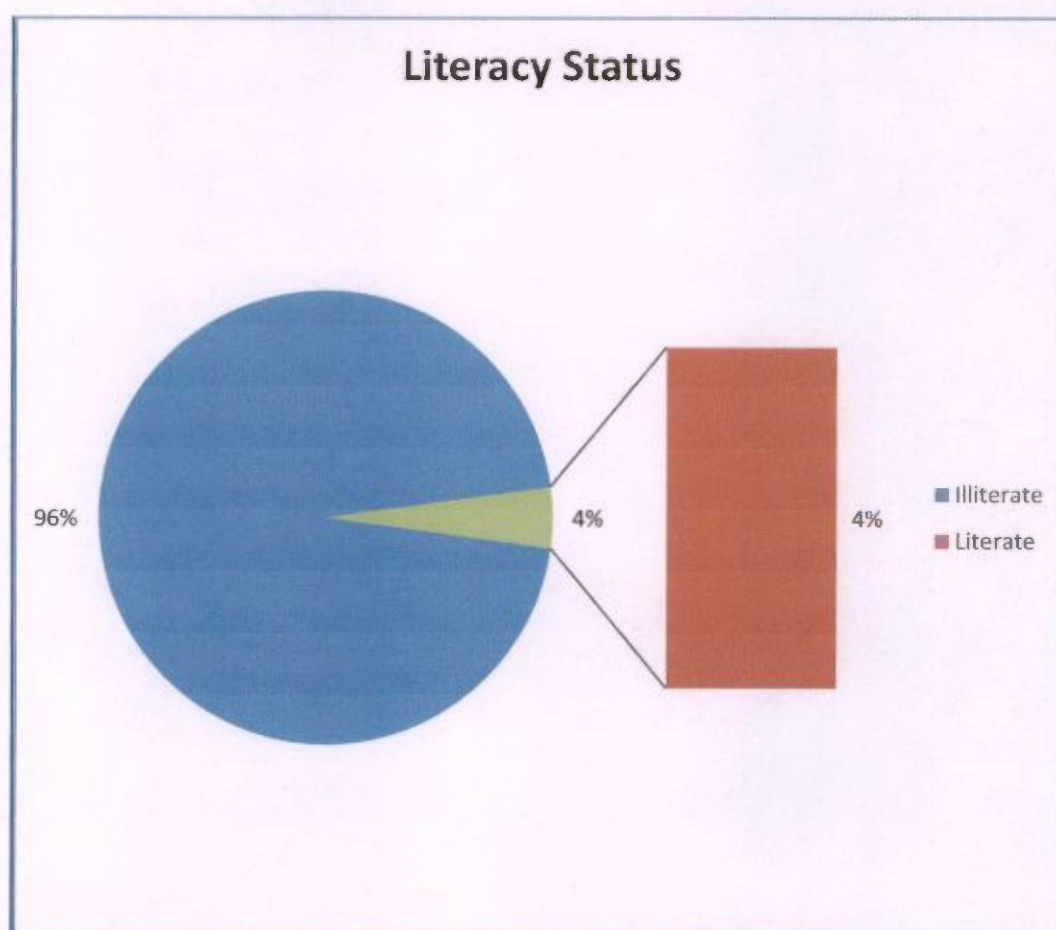
### 3. Disability Analysis:

Borough	Ward No.	Disability Analysis	
		Physically Challenged	Mentally Challenged
<b>XII</b>	101	0	0
	102	0	0
	105	0	0
	106	0	0
	107	0	0
	108	2	0
	109	0	0
	<b>Total</b>	2	0



#### 4. Literacy Status:

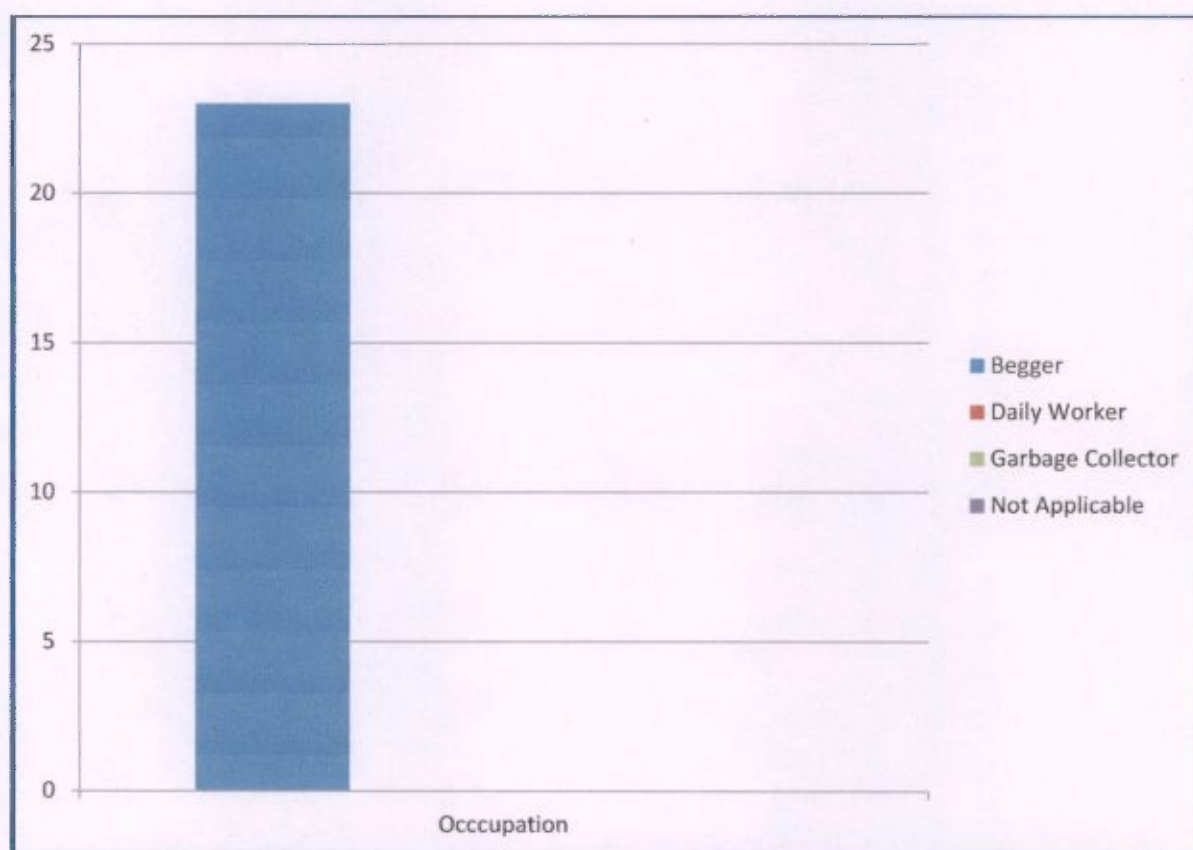
Borough	Ward No.	Literacy Status	
		Illiterate	Literate
XII	101	8	0
	102	0	0
	105	0	0
	106	0	0
	107	0	0
	108	13	1
	109	1	0
	<b>Total</b>	<b>22</b>	<b>1</b>





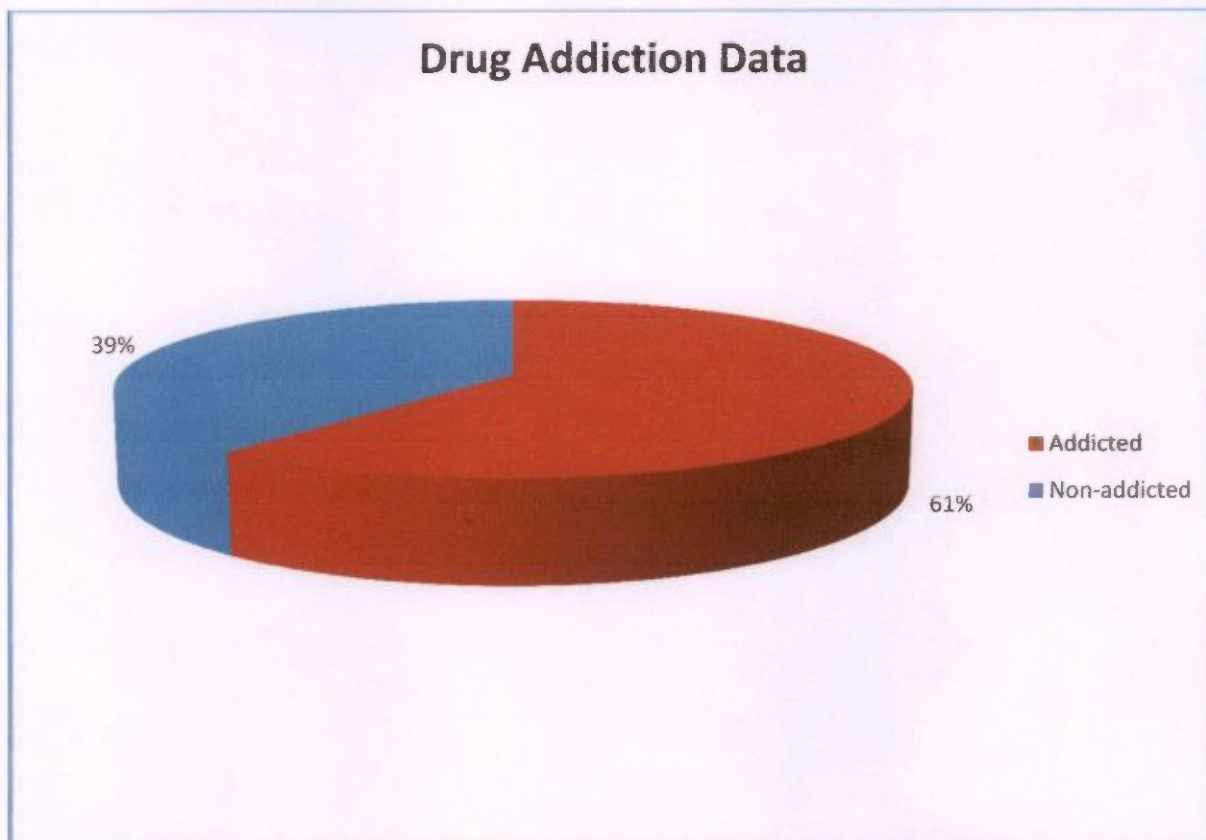
## 5. Occupation Analysis:

Borough	Ward No.	Occupation Analysis			
		Beggar	Daily Worker	Garbage Collector	Not Applicable
<b>XII</b>	101	8	0	0	0
	102	0	0	0	0
	105	0	0	0	0
	106	0	0	0	0
	107	0	0	0	0
	108	14	0	0	0
	109	1	0	0	0
	<b>Total</b>	23	0	0	0



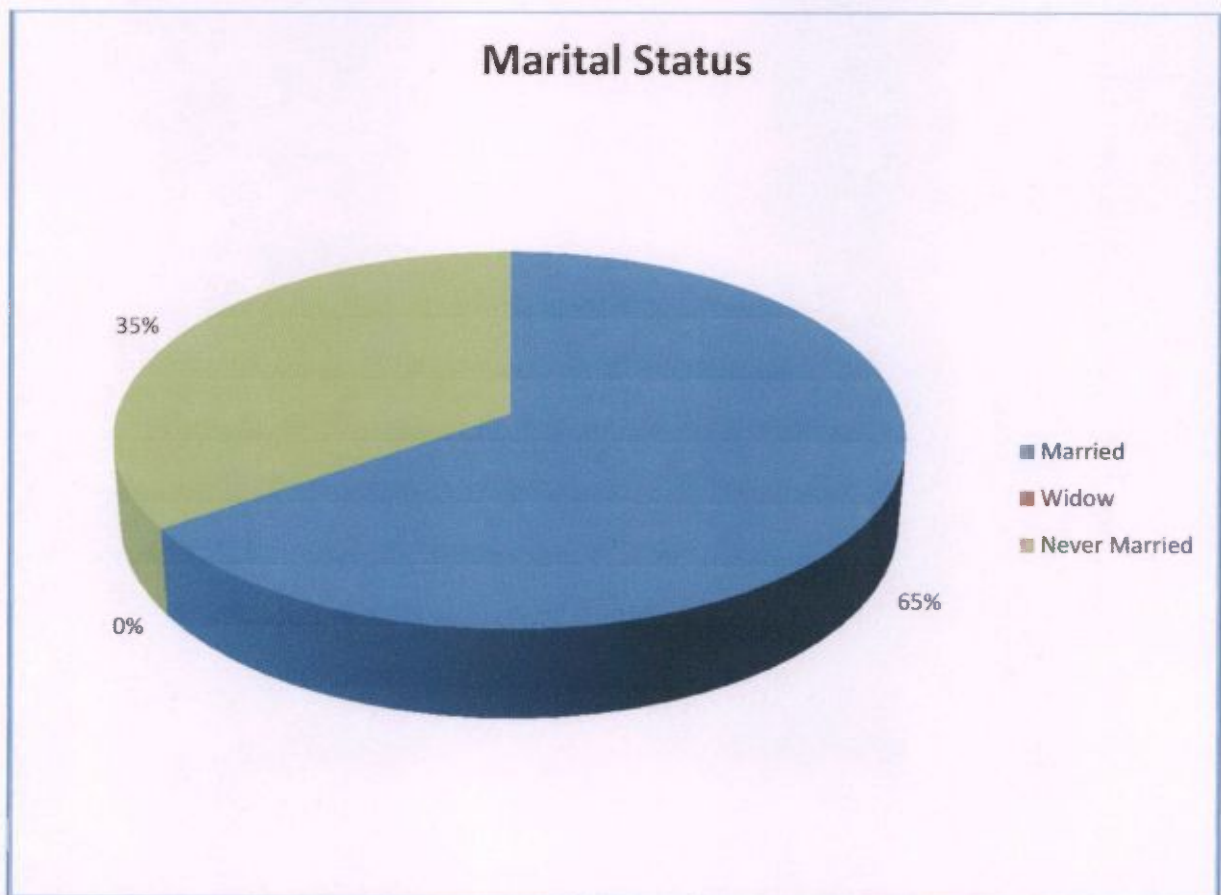
## 6. Drug Addiction Data:

Borough	Ward No.	Drug Addiction Data	
		Addicted	Non-addicted
XII	101	6	2
	102	0	0
	105	0	0
	106	0	0
	107	0	0
	108	7	7
	109	1	0
	<b>Total</b>	<b>14</b>	<b>9</b>



## 7. Marital Status:

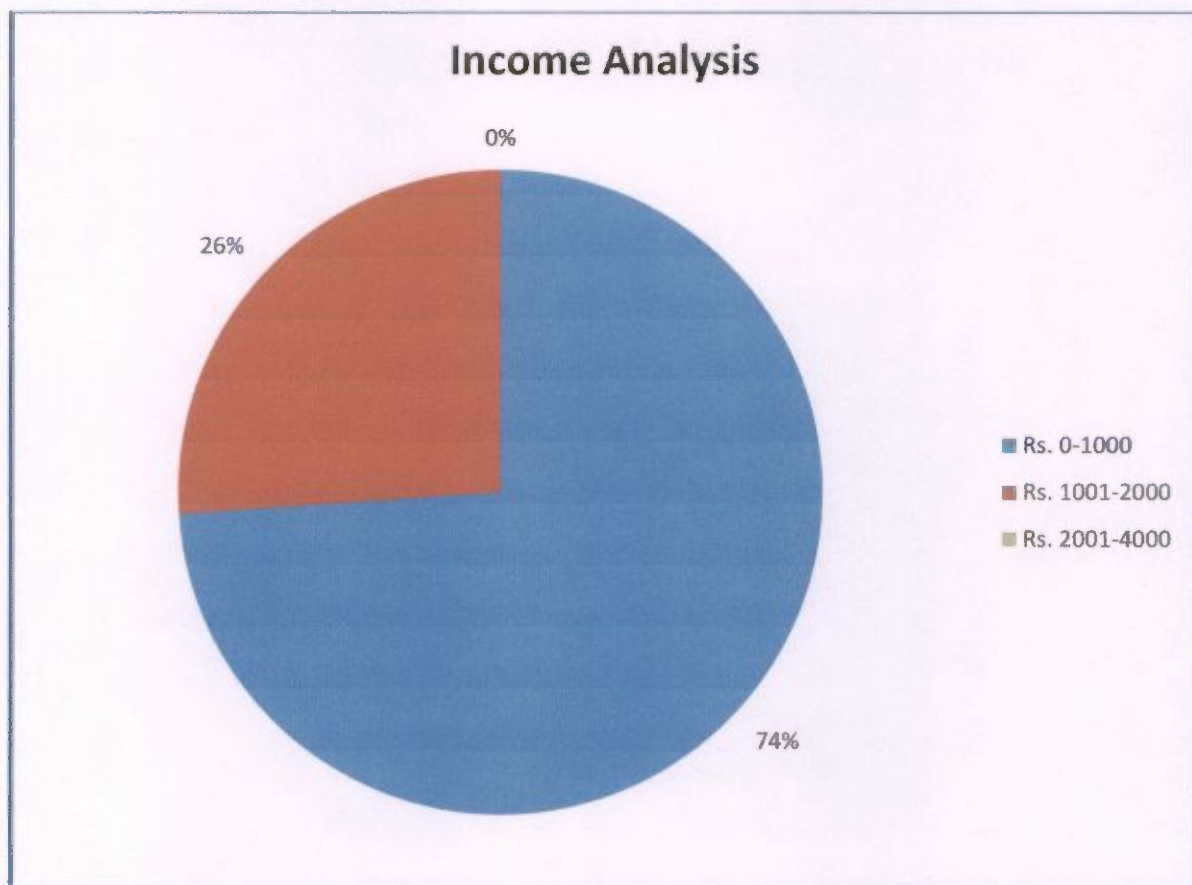
Borough	Ward No.	Marital Status		
		Married	Widow	Never Married
XII	101	8	0	0
	102	0	0	0
	105	0	0	0
	106	0	0	0
	107	0	0	0
	108	6	0	8
	109	1	0	0
	<b>Total</b>	<b>15</b>	<b>0</b>	<b>8</b>





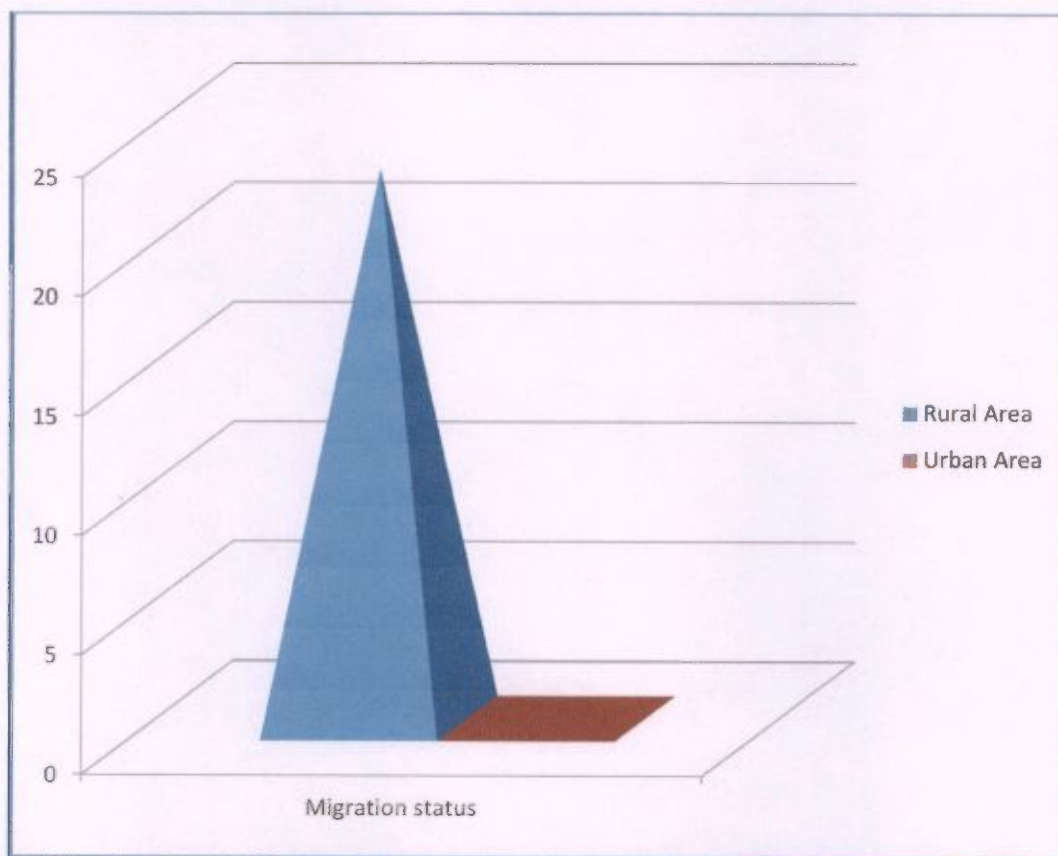
## 8. Income Analysis:

Borough	Ward No.	Income Analysis		
		Rs. 0-1000	Rs. 1001-2000	Rs. 2001-4000
XII	101	7	1	0
	102	0	0	0
	105	0	0	0
	106	0	0	0
	107	0	0	0
	108	9	5	0
	109	1	0	0
	<b>Total</b>	17	6	0



## 9. Migration Status

Borough	Ward No.	Migration Status	
		Rural Area	Urban Area
XII	101	8	0
	102	0	0
	105	0	0
	106	0	0
	107	0	0
	108	14	0
	109	1	0
	<b>Total</b>	<b>23</b>	<b>0</b>



## Resource planning for urban homeless shelter under KMC Zone-IV

As assigned by KMC in conducting GIS Based survey for Urban Homeless population, we had conducted a survey under Zone – IV of KMC.

The objective of the survey was to provide KMC the count as well as analytical report of such Urban Homeless for providing them shelters and other basic amenities.

The shelters may be constructed in the vicinity areas subject to the availability of land and approval of appropriate authority.

Under Zone – IV, we surveyed Boroughs – X, XI & XII and identified some vacant areas which may be utilized for construction of Shelters for Urban Homeless.

In Borough X, we found out that in ward no. 93, the Vacant Land behind National Instrument beside Raja S C Mallick Road. It is 30,000 Sq. Ft. in area and is an Jadavpur University property.

In Borough XI of ward no. 112, we found the area Nichu Ushar Math beside Bidhan Pally Road was vacant. It is under the ownership of Usha Fan Company. The total area of the land is 50,000 Sq. Ft.

In Borough XII of ward no. 108, the vacant land between Madurdaha Main Road & Purbalok North Road is under the ownership of West Bengal Fisheries Development Corporation and has an area of 50,000 Sq. Ft.

The list of the land as identified are annexed hereto:-

Borough Name	Area Details	Ward No	Owner	Area in Sq. Ft (Approx.)	Latitude	Longitude
X	Vacant Land behind National Instrument beside Raja S C Mallick Road	93	Jadavpur University	30000	22.50071900	88.36675300
XI	Nichu Ushar Math beside Bidhan Pally Road	112	Usha Fan Company	50000	22.46622900	88.36660900
XII	Vacant land between Madurdaha Main Road & Purbalok North Road	108	West Bengal Fisheries Development Corporation	50000	22.49879400	88.40515800



## Conclusion:

- The survey of Zone IV revealed the important statistics that there are 99 homeless people in total from all the 3 Boroughs.
- We have given the data collected through the survey to KMC in different formats – Excel Sheets, representation through Map, Web application and mobile app called Thikana. Through Excel, the users can check and compare the data easily, whereas, the map will give a graphical representation of the areas where the homeless people are found. Through the web application we created, any user can login from anywhere to check the data and the app will allow users to access the data with just a click from anywhere anytime.
- The data collected through the survey will enable KMC to prepare several developmental plans for construction of Shelters for Urban Homeless using the statistical analysis that we provided.
- In some areas, the female respondents did not allow us to take their photographs; hence their photos are not available.
- In very few cases, in apprehension of being displaced to other places, the respondents were found reluctant in sharing information.
- Karmick Solutions Pvt Ltd successfully completed the entire project work with active support & kind cooperation of KMC officials (SWUPA HQ), KMC Borough Managers, other Administrative Bodies & local people.

**Borough Map KMC**



# **Final Project Report For GIS Based Survey of Urban Homeless Population in the Wards under the Jurisdiction of Kolkata Municipal Corporation (Zone-III)**



Prepared by:

**KARMICK**  
**SOLUTIONS**

IT. INNOVATION. DIGITAL

ISO 9001:2015 Certified Company



To  
Chief Manager (SW&UPA)/Br-VII, VIII & Br-IX  
Kolkata Municipal Corporation  
5, S.N. Banerjee Road  
Kolkata 700013

**Ref: CM/UHP\_Survey/WO/Zn-III/1/2017-18**

Dear Sir,

With reference to the aforesaid Work Order, it is being conveyed that Karmick Solutions Pvt Ltd has been completed the entire assignment of GIS based Homeless Population Survey within jurisdiction of Zone-III (Br-VII, VIII, IX), KMC. We are submitting a "Final Project Report" regarding the above mentioned work for Zone-III.

Thanks & Regards

*Sourav Roy*



Sourav Roy

CEO  
Karmick Solutions Pvt Ltd  
116A Purbalok, Kolkata 700099



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# Executive Summary

## INTRODUCTION

As per the guidelines issued by The Ministry of Housing and Urban Affairs, Government of India, as communicated by SUDA, KMC is implementing "Shelter for Urban Homeless" component by providing shelter with all essential services to the Urban Homeless people in KMC area under NULM.

To assess the actual number of homeless, number of shelters required for Homeless in the KMC area, and for their rehabilitation, it is proposed by KMC to conduct a GIS based survey of the homeless in the wards under it.

Homelessness is a state of utter helplessness. Most people think they are not real people and they are in such a state because of their own deeds. Fundamental rights are denied to them. They for the remaining part of their lives live under make-shift shelters. Sometimes, they are forced to spend nights on railway platforms, pavements, pipes, and so on. No wonder, they are often subjected to extreme violence and continuous threat of exploitation. Due to rapid urbanization, homelessness has grown over the past year in many urban cities across the world.

In order to measure the magnitude of the problem, Karmick Solutions have been entrusted by Kolkata Municipal Corporation to conduct a survey of zone III of KMC which consists of Borough VII to Borough IX. A custom-made mobile app named 'Thikana' was developed, pre-loaded with a structured questionnaire. The application was used for the survey purpose. The survey was conducted at night hours.

### Significant findings that emerged from our survey are:

#### High Concentration points

A total number of 2899 homeless people were interviewed, out of which maximum were found to be staying alone and few with their respective families. A high percentage of homeless people were found living on the Canal South Road, Gobinda Chandra Khatik Road, Tiljala Road, Abinash Chowdhury Lane, Park Circus Connector Road, Rai Charan Pal Lane, Mother Teresa Sarani, Park Street, Syed Amir Ali Avenue, Kalighat Road, Gariahat Road, Asutosh Mukherjee Road.



Borough	Ward Number	Area Name
VII	57	CANAL SOUTH ROAD
VII	58	GOBINDA CHANDRA KHATIK ROAD
VII	59	TILJALA ROAD
VII	59	ABINASH CHOWDHURY LANE
VII	59	PARK CIRCUS CONNECTOR ROAD
VII	59	RAI CHARAN PAL LANE
VII	63	MOTHER TERESA SARANI
VII	63	PARK STREET
VII	64	SYED AMIR ALI AVENUE
VIII	83	KALIGHAT ROAD
VIII	68, 86	GARIAHAT ROAD
VIII, IX	70, 72, 73	ASUTOSH MUKHERJEE ROAD

### Family composition

Out of the homeless people interviewed by Karmick Solutions, there were some male & female children belonging to an age group of 1-14 years. It was also found that 55-60 % respondents are married.

### Magnitude of vulnerability

The matter of concern is most for those homeless people who were found to be with children or aged people (above 60 years). While such children remain deprived of education and a normal childhood, aged people experience the challenges of coping with their health ailments without or with negligible access to medical facilities. Some were even found to be physically or mentally challenged.

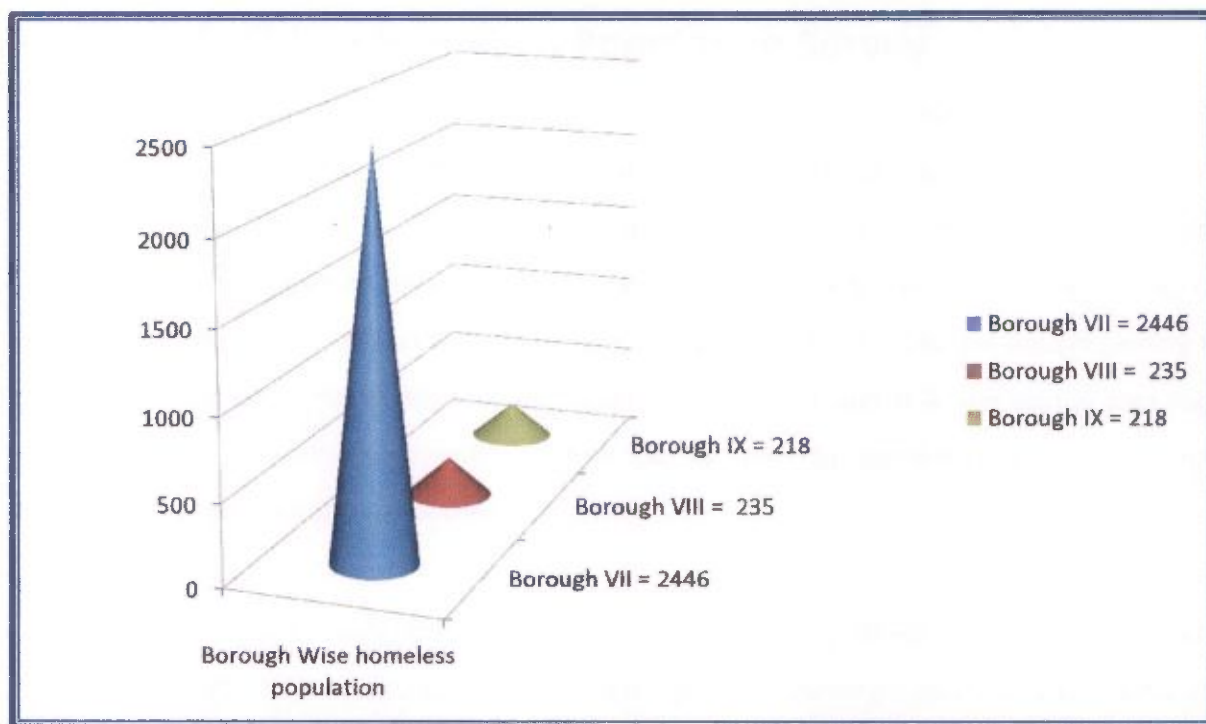
### Migration

The survey findings revealed that most people are currently living in a state of homelessness in Zone VII of Kolkata migrate for economic reasons with a belief that they will find better work opportunities. While in borough VII, VIII, IX some persons were found to have migrated from other state.

### Entitlement status

The survey revealed that out of the 2899 respondents, few people possess BPL card, Voter card, Aadhar card, or any type of photo ID card issued by Government entities.





#### PROJECT AREA:

The present assignment covers the wards under Zone -III of KMC (Borough VII, VIII, and IX). This includes Gariahat, Ballygaunj, Kalighat, Rashbehari, Hazra, Bhawanipore, Park circus, Tiljala, Kasba, Alipore, Khidirpur, Park Street. Each of these boroughs are further classified into several administrative wards. Canal South Road, Gobinda Chandra Khatik Road, Tiljala Road, Abinash Chowdhury Lane, Park Circus Connector Road, Rai Charan Pal Lane, Mother Teresa Sarani, Park Street, Syed Amir Ali Avenue, Kalighat Road, Gariahat Road, Asutosh Mukherjee Road, Karl Marx Sarani, Rashbehari Avenue, Harish Mukherjee Road, AJC Bose Road, SP Mukherjee Road are one of the major roads that pass through maximum number of Wards in these Boroughs. Zone-III is situated in Central-South part of Kolkata & maximum area covered by self-owned house & residential apartments. Huge numbers of Govt. & Non-Govt. offices, Hospitals, Shopping Complex, Commercial Establishments are situated in this area.

#### Objectives of the Survey:

Survey would ensure following objectives, to

- Provide planners a detailed geo location based mapping of concentration areas of homeless populations in the wards under KMC.
- Establish the demographic profile of homeless populations within project AOI (Area of Interest)
- Identify official resources such as land and vacant buildings that can be deployed to provide the required infrastructure for shelters in appropriate location of each city/town.
- Establish the location and type of shelters needed in each city/town by gauging the specific needs of the beneficiaries

- Entry & updating of data through web based interfaces for system administrators for the non-spatial attribute.
- Generates customized report as per Zone wise, Ward wise & even Road wise.
- The system would be capable of giving color coded information regarding potentially high populated & low populated zones.
- Gives correct depiction of linear, polygon and point features using GPS data.
- The entire information will upload in a Web based /Mobile application & need not be installed in any kind of desktop software.
- The solutions are deployed at a central server as designated by the client and access rights are given to client to various users to connect and work on it from anywhere using the internet or intranet as per the desire of the organization's desire.

#### **Technical:**

- Avoids duplication, misuse and data error using a centralized database.
- Highly secure with privileges to authentic users
- The authentic users can insert, update, delete maps & attribute data.
- Facility to set map layers
- Facility to click on map and get layer information
- Displays legends
- Identifies attributes attached to geographic features
- Use the clear section tool
- Generates MIS report based on queries

## **Scope of Work**

#### **The steps to be followed during the survey**

- Identifying the areas with concentration of homeless population,
- Profiling the homeless populations in these areas in terms of gender, age, education, occupation, marital status, number of children, history of illness etc. persons with disability should be categorized separately.
- Identifying the aspirations of the homeless for a shelter and also the deterrents preventing the homeless from using the existing shelters, if any



- Broadly identifying the possible buildings and locations where new shelters can be built and duly display on the map by geo tagging them
- The information should be recorded and collated by each team. To ensure faster survey results, data entry should be done in parallel with the survey along with photograph and Geo tagging of each homeless person.

**The following deliverables are expected out of this process at this stage:**

- Map should indicate the locations of all the scattered as well as clusters of homeless people.
- Collated survey results
- Determination of shelter locations, types, number of shelters required in an area, plus available resources in terms of land and building.
- Finalized resource mapping questionnaire for the next stage of resource mapping.

### **Resource Mapping**

The next step is to conduct a resource mapping exercise. The resources that this phase of the survey seeks to identify are

- a) Existing shelters;
- b) Unutilized or underutilized government buildings that can be possibly redeployed as shelters after suitable refurbishing; and
- c) Vacant lands that are suitable potential sites for new shelter buildings.

**At the end of this process, the following deliverable are expected:**

- Field resource mapping survey of all the identified potential buildings and shelter locations
- Determination of the feasibility of the identified buildings and locations for building/ upgrading shelters, along with government agencies
- Collating results and submitting to KMC.
- Discussions on recommendations to be put forth in the report.

### **Karmick's execution Plan**

- A. We had assigned two persons as one team for the task of field survey for each ward of the selected boroughs. Each team was equipped with one Android smartphone and one hand-held GPS device (Trimble Juno SB) for conducting the task of survey.
- B. An android mobile application (Thikana) was developed by our skilled app developers & this application was successfully installed on the mobile devices of each team members.



- C. We had instructed them to perform this Survey between 10:00 PM and 6:00 AM to reach out to the maximum number of homeless people living in each ward.
- D. We gave through training to each team member involved in the task of survey while keeping in mind the fact that our survey questionnaire was already featured in the mobile app installed on their mobile devices. So, the training was on as follows.....

- Imparted them the knowledge on how they should input data collected from each of the respondents (homeless people) into respective data fields of the questionnaire.
- Made them understand how they have to capture the images of each homeless people with their Android smartphone after successfully completing their interview process for each. (Note: They need to capture three images of the each people in three different camera angles -Frontal, left and right.)
- Ensured that they know the right method to make use of the given base map for each ward provided to them by Kolkata Municipal Corporation (KMC) to cover each major and minor road of the respective wards in order to reach each and every homeless person living in those wards.
- To make it sure that during the survey, survey team members assigned for each ward do not accidentally enter into the neighboring ward and therefore do not cause any overlapping of survey data.

Annexure II QUESTIONNAIRE for SURVEY OF HOUSELESS POPULATION																
Latitude							Longitude									
Name of Corporation/ Municipality: Kolkata Municipal Corporation							Ward		Form No.							
Name of Street/ Location							Nearest Landmark									
Full Name of Respondent							Father/ Husband's Name in Full									
Present Living Status: (Mention Name of the Street/Railway Platform/Bus Shed Stop/Flyover/Market Name etc.)							Place of Origin									
Street/Footpath Railway Bus Shed Under Flyover Marketplace Other Landmark(Please Specify)							Reason for Migration from Place of Origin									
Living in Static Location							Yes/No		Living Since (Date or Year)							
Whether BPL Card/Voter Card/Aadhaar/any photo identity (Govt. Provided) Holder							Yes/No		Whether any type of ration card Holder (Please mention type and number of card)		Yes/ No					
Whether willing to avail of Govt. Arranged shelter							Yes/No		If No, Please write reason for detentions from using shelters							
Details of Respondent & Family Member Physically Found																
Full Name	Photo attached	Relation with Respondent	Age	Sex	Marital Status	Physically Challenged	Monthly Challenged	Literate	Educational Qualification	Occupied	Monthly income(Rs)	Personal Identification Mark	Place of Occupation	Habit	Reason for Stay in KMC area	
		Self				Yes/ No	Yes/ No	Yes/ No	Pre-primary / Primary / Eighth Std / Secondary / HS / Graduate / PG							
						Yes/ No	Yes/ No	Yes/ No								
						Yes/ No	Yes/ No	Yes/ No								
						Yes/ No	Yes/ No	Yes/ No								
						Yes/ No	Yes/ No	Yes/ No								
Age on 01/01/2018, Marital Status: N=Never Married/ D=Divorced/ W=Widow/ Widower/ DS=Deceased, Sex: M=Male, F=Female, O= Others																
															Signature of Enumerator	

## Survey Instruments Specification

Karmick Solutions used Handheld GPS along with installed Mobile App for Homeless population survey.



### Features

- **4G cellular data and voice call capability**
- **Feature packed, fully integrated solution**
- **5 megapixel camera**
- **High-sensitivity GPS receiver**
- **Long life battery for all-day use**

## Karmick's Methodology

Karmick Solutions involved 56 people for the task of field survey, Map preparation, Web & Mobile Application Development & data hosting.

### A. Development of Mobile & Web Application "THIKANA"

At first a web & mobile based database handling system is developed by Karmick for handling the above mentioned spatial and non-spatial data for the entire AOI of KMC.

Development of web and expansion of the internet provided to key capabilities that can greatly help KMC. First, the web allowed visual interaction with data. By setting up a web server, client can produce maps. Since the map and charts are published on the internet, other clients can view the updates, helping to speed up the evaluation process. Second because of the near ubiquitous nature of the internet, the geospatial data can be widely accessible, clients can work on it from almost in any location. Both these features will alter the way GIS specialists will do their work in the very near future. The combination of easy access to data and visual presentation addresses some of the primary difficulties in performing GIS specialists' evaluations.

The application provides user friendly WEB based GUI (Graphic User Interface), which is very intuitive and user friendly such that the most important features are available with a few mouse clicks or a few keystrokes.



The application is completely network compliant and fetches and updates data from server via normal networking protocols. The software would be able to connect to any network database and performs database modifications corresponding to the locking protocols as per the RDBMS concepts. The software connects to an existing user and to existing database simultaneously.

### **Features of the developed application:**

#### **General Features**

- Take Picture of Homeless people with a click
- Helps in layout and printing
- Gives information on click
- Spatial and non-spatial Queries
- Search Facilities
- Generates various MIS Report

The developed application different kinds of information in various layers and retrieve information on clicks. It has search facilities. The users would have the facility to search from the existing database. The search facility would be provided in combination of different fields. It also has the features to include further surveyed data in future. The web system is such that on taking the cursor to the entity it the relevant information and photograph wherever available.

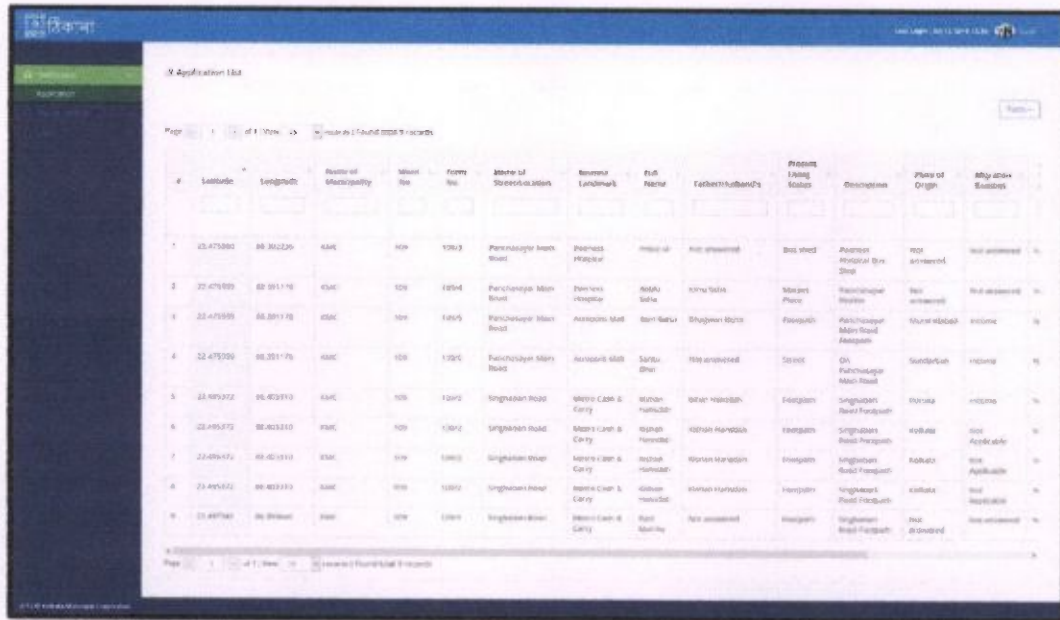
### **Overview of the Web & Mobile Application**

#### **Admin Login page Desktop Application**





## Desktop Application Home page



The screenshot shows the desktop application's home page. It features a sidebar on the left with a 'Home' button. The main area displays a table titled 'Roads' with 12 columns: #, Latitude, Longitude, Road Name, Road Type, Road Status, Name of Street/Location, Address Landmark, Full Name, Telephone Number, Road Status, Description, Place of Origin, and Address Status. The table contains 9 rows of data, including roads like 'Panchsagar Main Road', 'Panchsagar Main Road', 'Panchsagar Main Road', 'Panchsagar Main Road', 'Panchsagar Main Road', 'Panchsagar Main Road', 'Panchsagar Main Road', 'Panchsagar Main Road', and 'Panchsagar Main Road'.

#	Latitude	Longitude	Road Name	Road Type	Road Status	Name of Street/Location	Address Landmark	Full Name	Telephone Number	Road Status	Description	Place of Origin	Address Status
1	23.475883	88.302226	Panchsagar Main Road	100	100/3	Panchsagar Main Road	Panchsagar Main Road	Panchsagar Main Road	88302226	Not assigned	Not assigned	Not assigned	Not assigned
2	23.475883	88.302226	Panchsagar Main Road	100	100/4	Panchsagar Main Road	Panchsagar Main Road	Panchsagar Main Road	88302226	Not assigned	Not assigned	Not assigned	Not assigned
3	23.475883	88.302226	Panchsagar Main Road	100	100/5	Panchsagar Main Road	Panchsagar Main Road	Panchsagar Main Road	88302226	Not assigned	Not assigned	Not assigned	Not assigned
4	23.475883	88.302226	Panchsagar Main Road	100	100/6	Panchsagar Main Road	Panchsagar Main Road	Panchsagar Main Road	88302226	Not assigned	Not assigned	Not assigned	Not assigned
5	23.475883	88.302226	Panchsagar Main Road	100	100/7	Panchsagar Main Road	Panchsagar Main Road	Panchsagar Main Road	88302226	Not assigned	Not assigned	Not assigned	Not assigned
6	23.475883	88.302226	Panchsagar Main Road	100	100/8	Panchsagar Main Road	Panchsagar Main Road	Panchsagar Main Road	88302226	Not assigned	Not assigned	Not assigned	Not assigned
7	23.475883	88.302226	Panchsagar Main Road	100	100/9	Panchsagar Main Road	Panchsagar Main Road	Panchsagar Main Road	88302226	Not assigned	Not assigned	Not assigned	Not assigned
8	23.475883	88.302226	Panchsagar Main Road	100	100/10	Panchsagar Main Road	Panchsagar Main Road	Panchsagar Main Road	88302226	Not assigned	Not assigned	Not assigned	Not assigned
9	23.475883	88.302226	Panchsagar Main Road	100	100/11	Panchsagar Main Road	Panchsagar Main Road	Panchsagar Main Road	88302226	Not assigned	Not assigned	Not assigned	Not assigned

## Admin Login page Mobile application



The screenshot shows the admin login page of a mobile application. The page has a blue header with the 'ঠিকানা' (Thikana) logo and name. Below the header, there is a white login form with the following fields and buttons:

- User Name**: A text input field.
- Password**: A text input field.
- Forgot Password?**: A link to reset the password.
- Login**: A blue button to submit the login credentials.
- Don't have an account? Create now!**: A link to create a new account.

## **B. Field Survey & Final Homeless Data Base Preparation**

After the development of Mobile application, our survey teams started the task of the field survey from one corner of the ward map assigned to them and the entire survey task was supervised by our skilled professional. They were given the following mobile devices before the commencement of their task:

- Android-based smartphone pre-installed with 'Thikana' app
- Handheld GPS device for finding the GPS coordinates of homeless people.
  - As per the given questionnaire feature in the 'Thikana' app, survey team members interviewed each of the homeless person/head of the homeless family they found on their survey route in each ward assigned to them by their supervisor. They simultaneously entered the answers in respective data fields in the app itself.
  - After successful completion of the interview of each respondent, one member from the two-person team capture three images of the respondent from three distinct camera angles with his Android mobile device.
  - The survey data including the images collected by each team was then used to create borough wise maps in GDB (Geo database) format. Then we create borough wise GDB geo-tagged with photo of each respondent.
  - Then we uploaded all data to previously developed web-based application using PHP technology. We uploaded the collected survey data along with images over there and ensured only authorized users can access that data.



### **CASE STUDY 1:**

**Name:** Laltu Samanta (57 years old male)

**Locality:** Our survey team found him opposite footpath of "Belegkata Store Water Housing Corporation" on Canal South Road which is under Ward No 57 of Borough VII, KMC.

Laltu came to Kolkata in the year 2014 from Purulia. He lives at above mentioned place under open sky. He works as a garbage collector in Tangra area & earns Rs. 1200.00 per month. He has no permanent address & used to sleep Road Side/Footpath nearing his present place of Work.



### **CASE STUDY 2:**

**Name:** Sabir Chawmia (38 years old male)

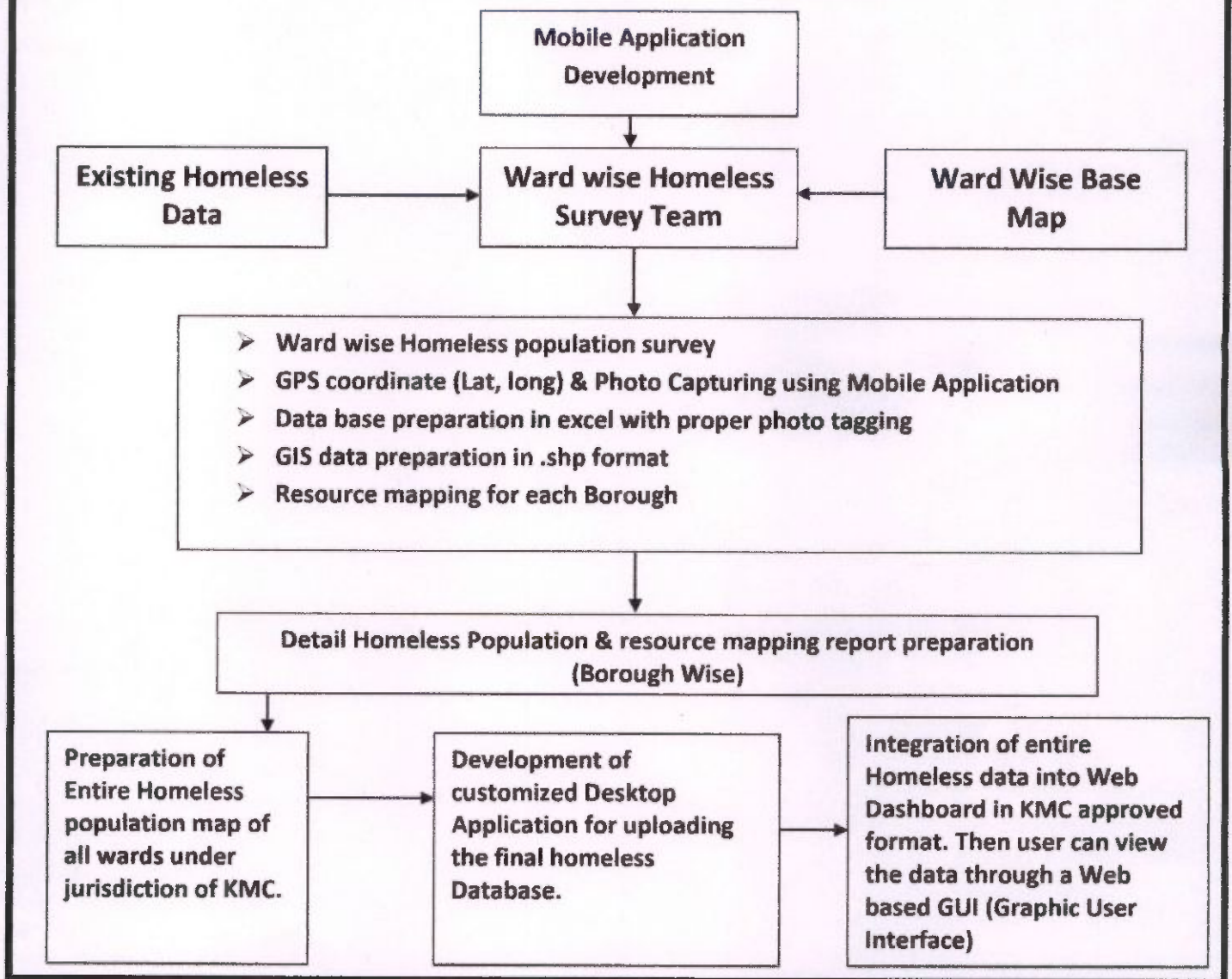
**Locality:** Our survey team found him near "Gariahat Market" on Gariahat Crossing, which is under Ward No 68 of Borough VIII, KMC.

Sabir came to Kolkata in the year 2014 from Purulia. He belongs from farmer family. Then he came to Kolkata for some income. He not knows anything except farming. So, he works as a beggar in South Kolkata & earns Rs. 1000.00 per month. He has no permanent address & used to sleep Road Side/Footpath. At the time of survey he describes his condition & he eagerly looking for a shelter from Govt.





## PROCESS FLOW DIAGRAM



### Karmick's Project execution timeline

Zone No	Borough No	Total Number of Ward	Survey Start Date	Survey Completion Date	Final Data delivery Date (including GIS)	Homeless population Found
III	Borough VII	9	10/3/2018	20/3/2018	24/3/2018	2446
	Borough VIII	11	14/3/2018	20/3/2018	24/3/2018	235
	Borough IX	10	17/3/2018	22/3/2018	24/3/2018	218
Total		30				2899

## System Implementation & Hosting

Our development was completed & the Web application was to be installed. The software would be installed in the Web server of KMC.

Following would be the Technical Requirements & Specification Required:

**Operation System Platform Required** – Linux Server (Apache 2.4), (PHP 7 to be installed)

**Database** – MySQL 5.6

**Server Specification** – HP Proliant DL 360 G6 or Equivalent -- (2 in quantity, one main server & another is backup)

- Quad Core Intel Xeon E5504 Processor (2GHz, 80 Watts)
- 4 MB (1X4MB) Level 3 Cache
- 8 GB (4X2 GB) Standard; PC3 – 10600E (DDR3-1333) Un buffered
- HP Smart Array P410i zero memory Module
- 460W Hot Plug Power Supply
- Redundant RFK Std
- 1 TB SAS HDD

**Internet Lease Line: 6 mbps for 40-50 Concurrent Users** to implement secured internet, department need to put in a proper infrastructure of Router, virus protection and secured layers of both hard devices and software

**User System Specification** – Any System with Internet Connection and Internet Explorer/Mozilla Firefox/Chrome Browser will be able to use the software.

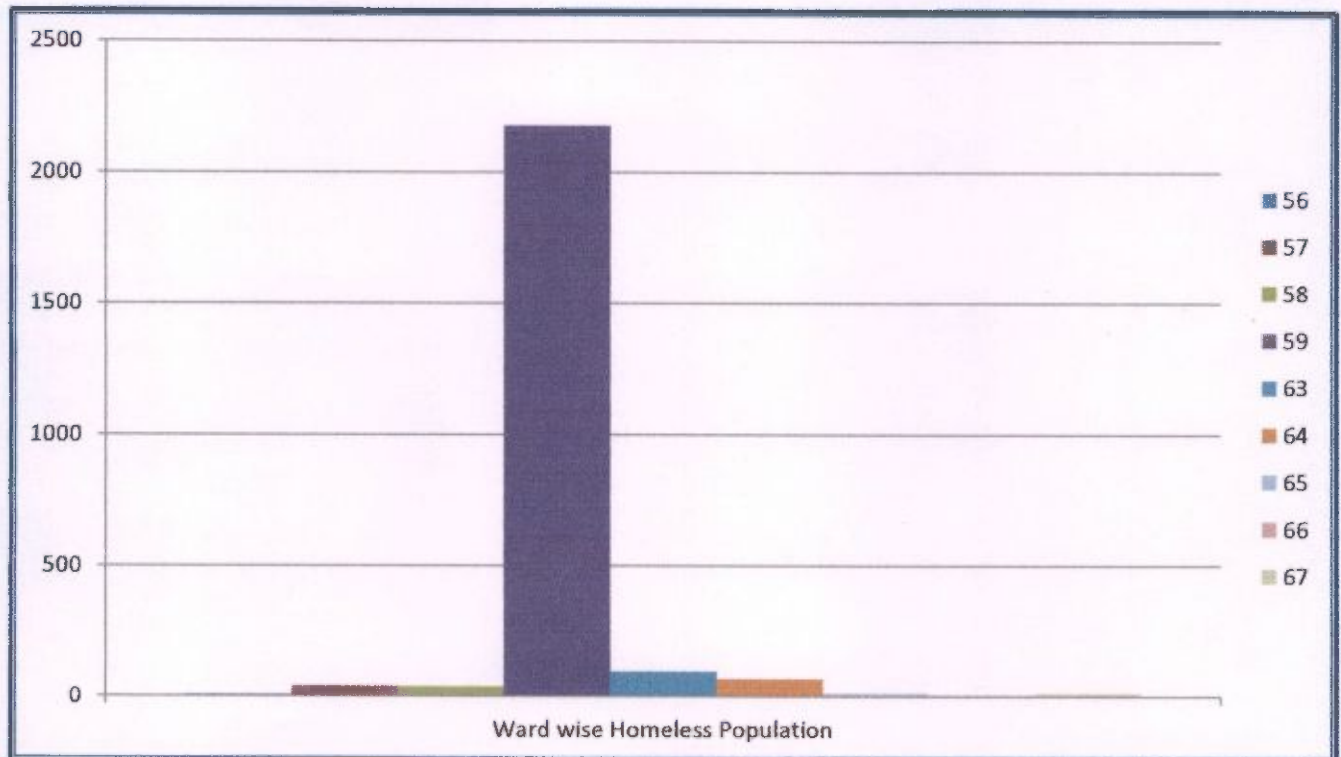
**Borough wise  
Project Output of  
Homeless Population Data  
Zone-III**



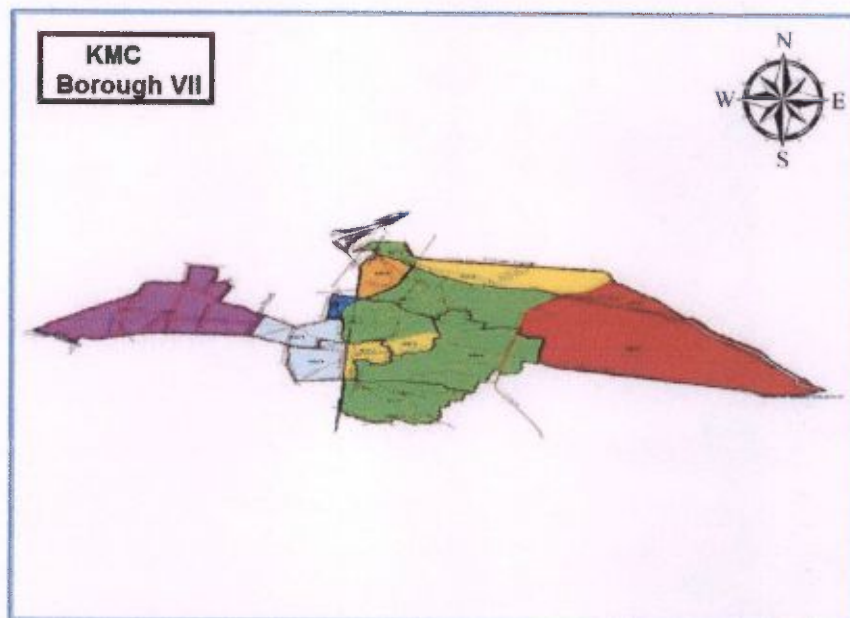
## Detail of Homeless Population Data Borough-VII

We have started field survey on 10/03/2018 & completed the entire survey job on 20/03/2018. We found following Homeless population data after survey.

Borough	Total number of wards	Ward No.	Homeless People Found during Survey
VII	9	56	5
		57	38
		58	36
		59	2177
		63	95
		64	67
		65	10
		66	6
		67	12
		<b>Total</b>	<b>2446</b>



## Project Area:



Ward No	Boundary	Details
56	North	Debendra Chandra Dey Road and Convent Lane.
	South	Christopher Road
	East	Kankurgachi Chord
	West	The Eastern Railway, Convent Lane and Palmer Bazar Road
57	North	Beliaghata Road, Circular Canal and Beliaghata Canal
	South	Guripara Road, Debendra Chandra Dey Road and Sewage Outlet where it meets New Canal
	East	Western side of New Canal
	West	Beliaghata Road and Palmer Bazar Road
58	North	Debendra Chandra Dey Road and Sewage Outlet when it meets New Canal
	South	Christopher Road, Matheswartola Road, The Western Boundary of the former Boinchtola Union Board and Storm Water outlet upto the point where it meets New Canal.
	East	Topsia Road North and Western Boundary of New Canal
	West	The Eastern Railway and the Western Boundary of the former Boinchtola Union Board
59	North	Christopher Road
	South	Topsia Road South, Tiljala Road and Gora Chand Road
	East	Gobinda Chandra Khatik Road and Topsia Road South
	West	Topsia Road South, Tiljala Road and Dr. Sundari Mohan Avenue



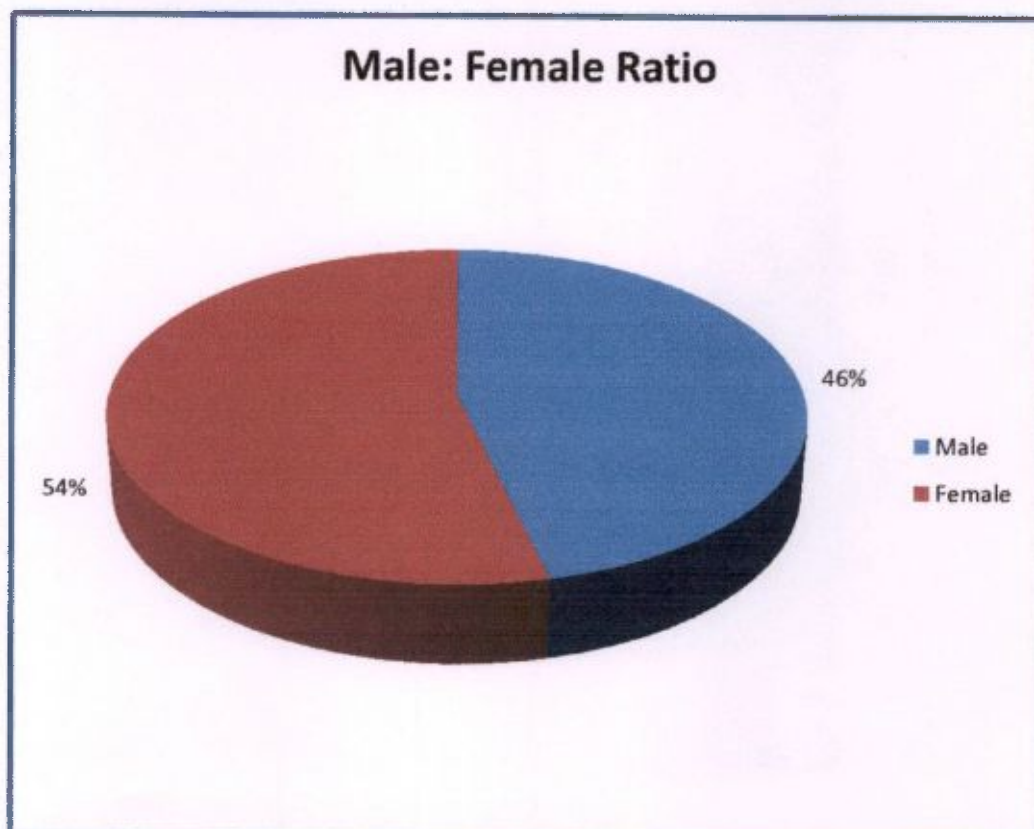
63	North	Outram Road, Nellie Sengupta Sarani, Collin Lane and Park Street
	South	Acharya Jagadish Bose Road and Tolly's Nullah
	East	The Road connecting Acharya Jagadish Bose Road and Bevedere Road and Acharya Jagadish Bose Road, Rafi Ahmed Kidwai Road, Collin Street and Mirza Galib Street
	West	Kidderpore Road, Pronovananda Sarani, Chowringhee Road and Jawaharlal Nehru Road.
64	North	Park street, Suhrawardy Avenue and Gora Chand Road .
	South	Circus Avenue Beckbagan Row, Shamsul Huda Road, Dr. Biresh Guha Street and Park Street
	East	Bright Street and Tiljala Road
	West	Acharya Jagadish Bose Road and Dr. Sundari Mohan Avenue
65	North	Shamsul Huda Road, Park Street and Tiljala Road
	South	Bondel Road, Picnic Garden Road and Tiljala Masjidbari Lane
	East	Tiljala Road, Kustia Road and Topsia Road South
	West	Ashutosh Chowdhury Avenue, Syed Amir Ali Avenue and Bright Street
66	North	Tiljala Masjidbarai Lane, Topsia Road South, Topsia Road North, Tangra Road South and the Southern Boundary of former Boinchtola Union Board
	South	Picnic Garden Road
	East	Western Boundary of paschim Chowbaga and former Boinchtola Union Board
	West	Tiljala Road and Kusia Road, Gobinda Chandra Khatik Road and Topsia Road and Topsia South.
67	North	Picnic Garden Road
	South	Banku Behari Chatterjee Road and Raj Krishna Chatterjee Road
	East	Western boundary of former Boinchtola Union Board and Rajkrishna Chatterjee Road
	West	The Eastern Railway



Some more socio-economic findings are evaluated from this homeless people survey data under KMC Borough VII.

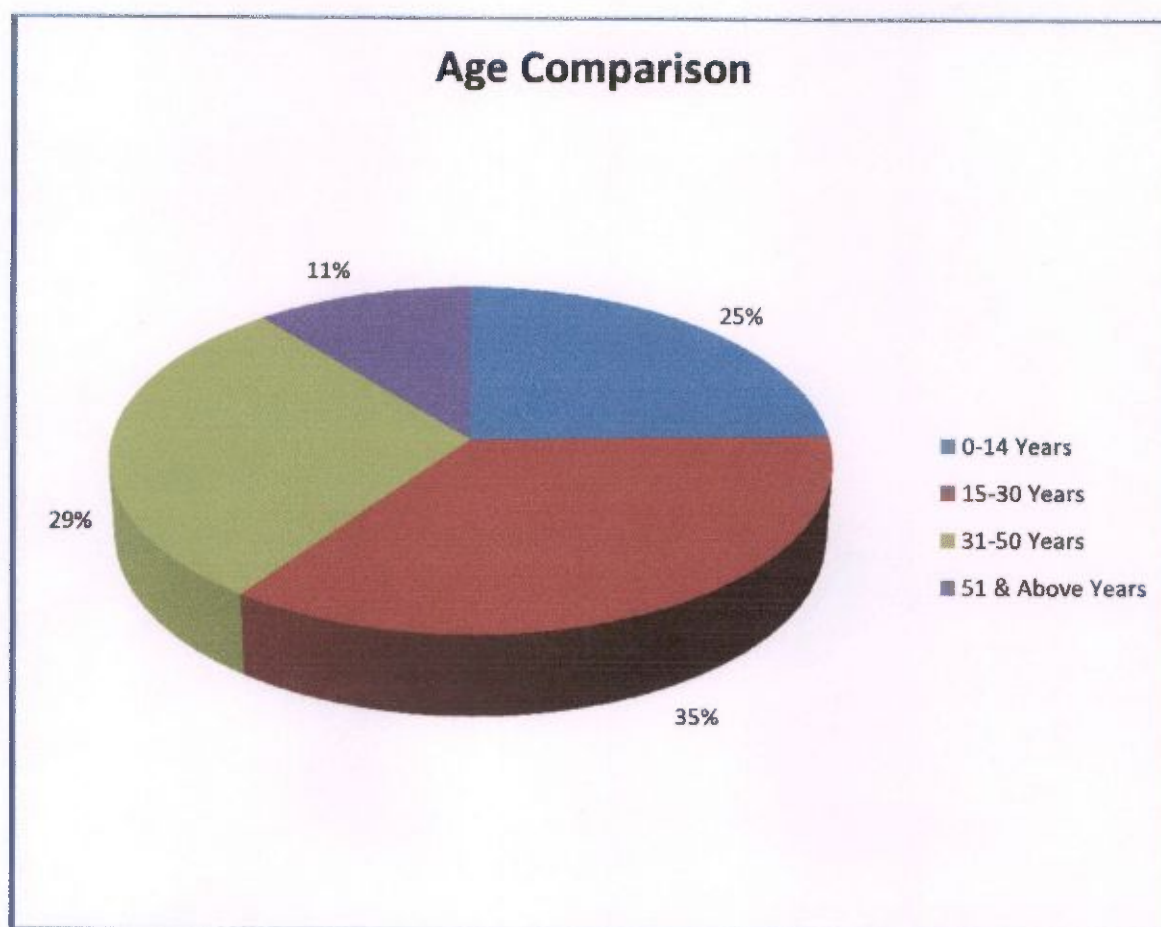
### 1. Sex Ratio:

Borough	Ward No.	Sex Ratio	
		Male	Female
VII	56	3	2
	57	18	20
	58	20	16
	59	981	1196
	63	49	46
	64	45	22
	65	6	4
	66	6	0
	67	3	9
	<b>Total</b>	<b>1131</b>	<b>1315</b>



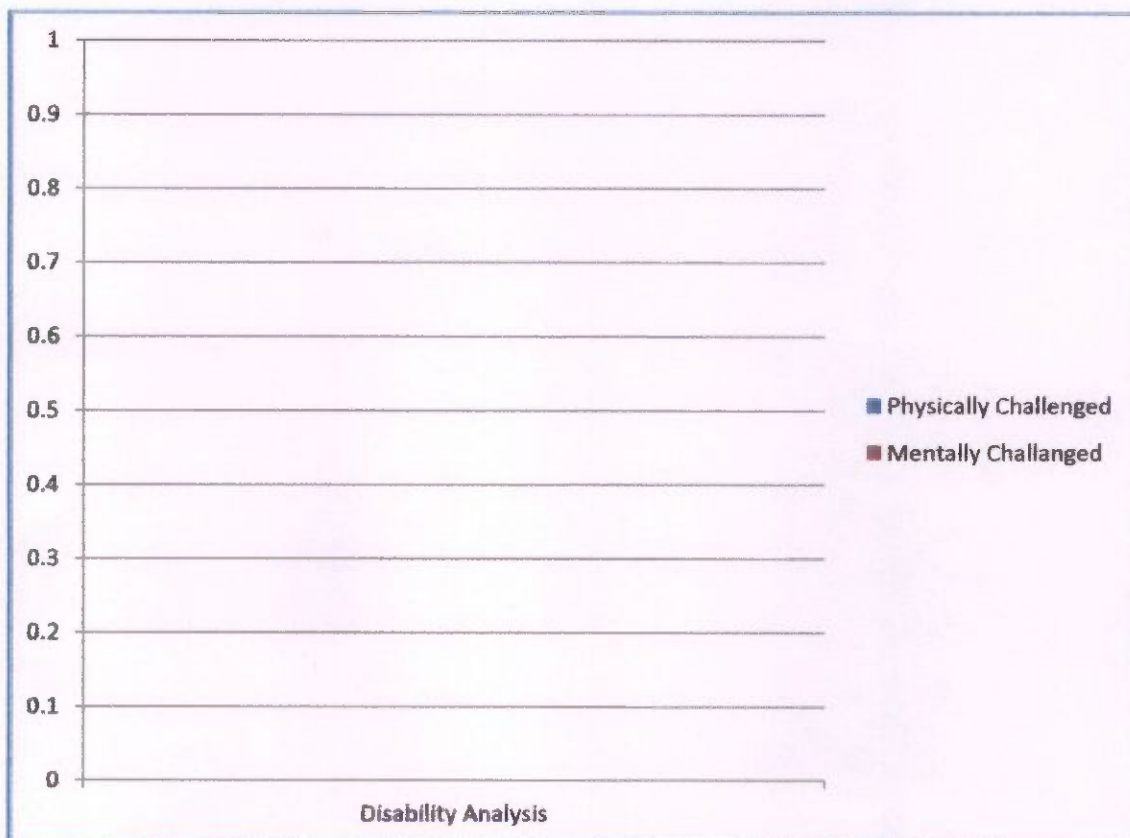
## 2. Age Comparison:

Borough	Ward No.	Age Comparison			
		0-14 Years	15-30 Years	31-50 Years	51 & Above Years
VII	56	0	2	2	1
	57	1	12	6	19
	58	2	10	13	11
	59	565	785	630	197
	63	25	34	27	9
	64	2	12	30	23
	65	4	3	1	2
	66	0	1	2	3
	67	2	2	5	3
	<b>Total</b>	<b>601</b>	<b>861</b>	<b>716</b>	<b>268</b>



### 3. Disability Analysis:

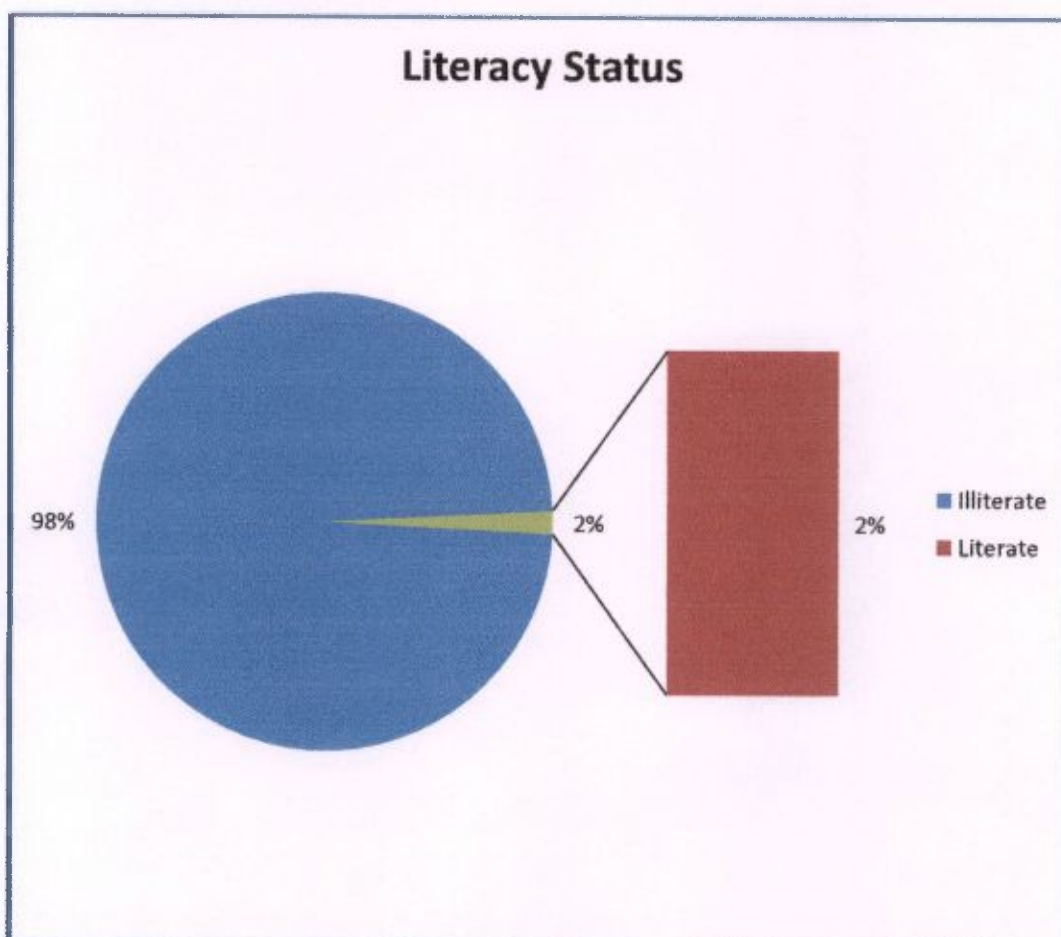
Borough	Ward No.	Disability Analysis	
		Physically Challenged	Mentally Challenged
VII	56	0	0
	57	0	0
	58	0	0
	59	0	0
	63	0	0
	64	0	0
	65	0	0
	66	0	0
	67	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>





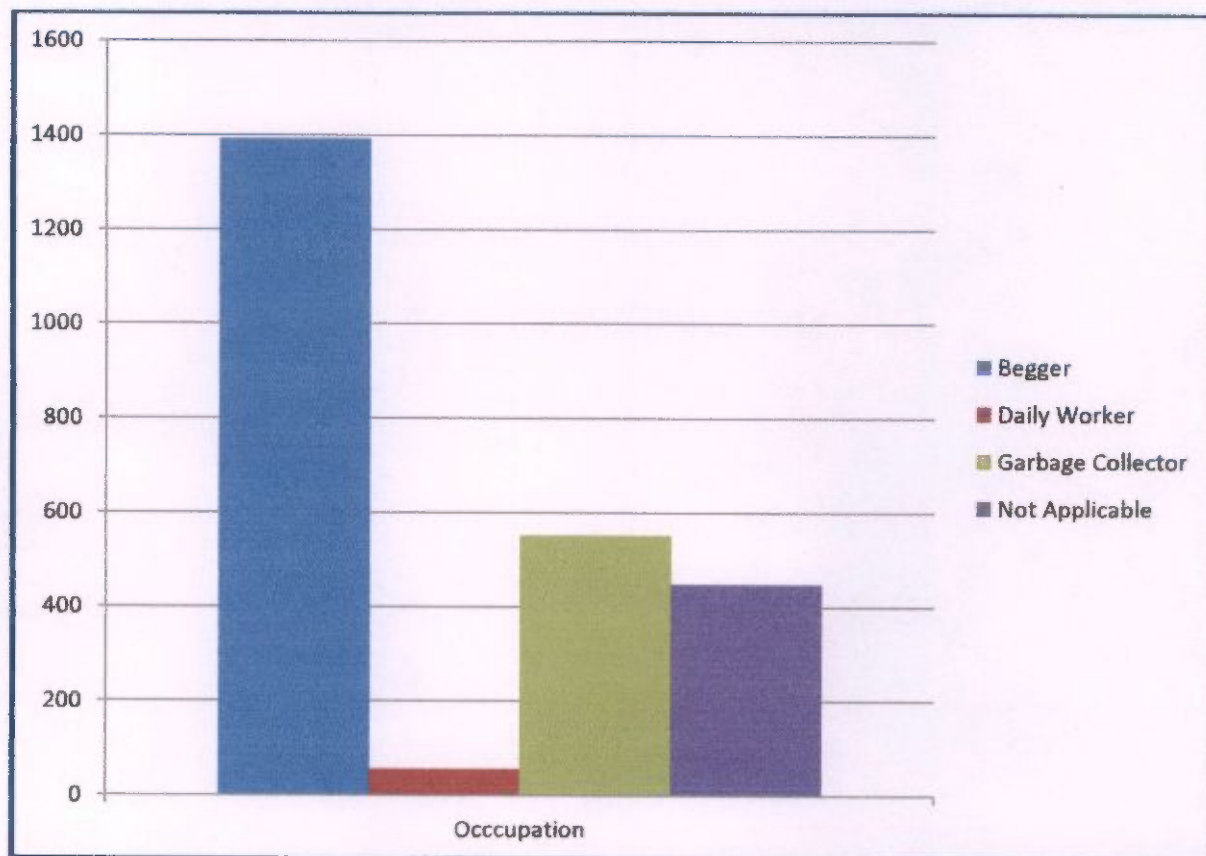
#### 4. Literacy Status:

Borough	Ward No.	Literacy Status	
		Illiterate	Literate
VII	56	5	0
	57	38	0
	58	36	0
	59	2143	34
	63	90	5
	64	67	0
	65	10	0
	66	6	0
	67	11	1
	<b>Total</b>	<b>2406</b>	<b>40</b>



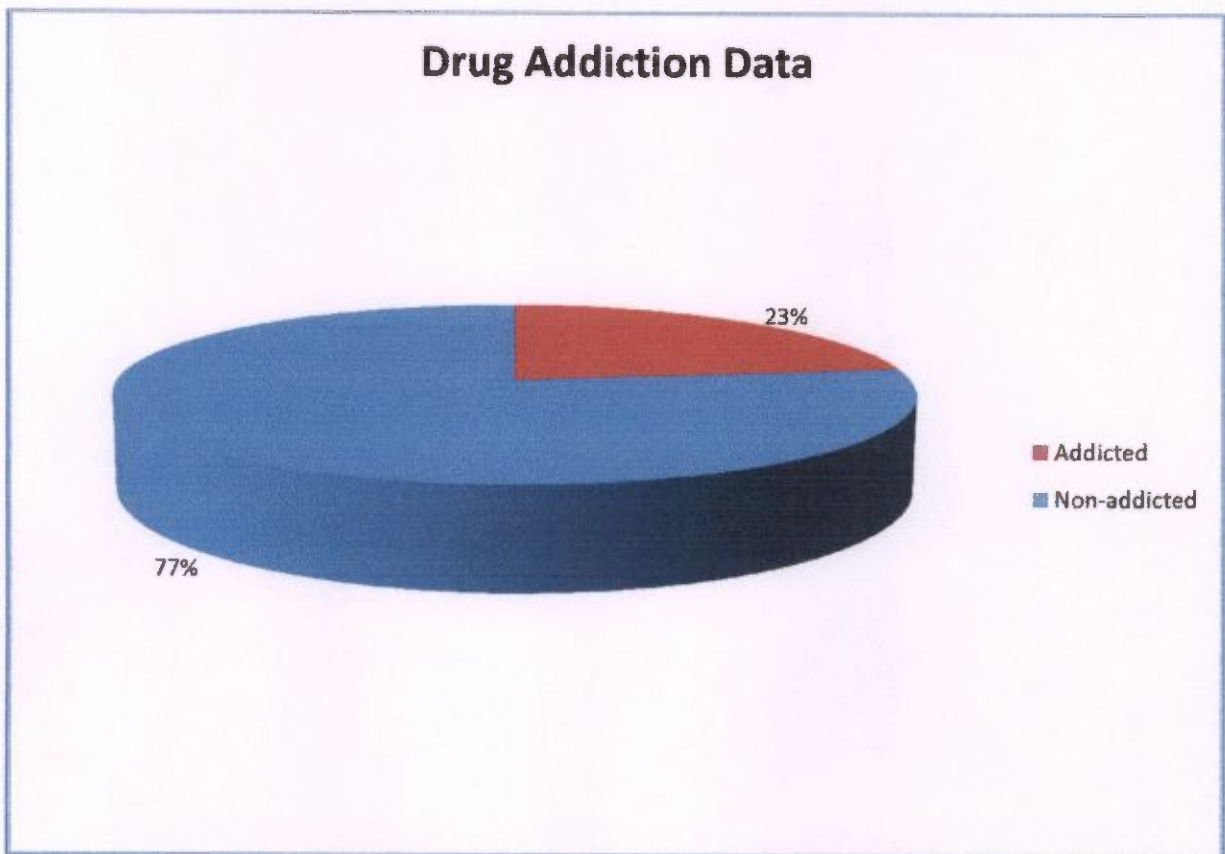
## 5. Occupation Analysis:

Borough	Ward No.	Occupation Analysis			
		Beggar	Daily Worker	Garbage Collector	Not Applicable
VII	56	2	0	3	0
	57	17	0	18	3
	58	16	0	15	5
	59	1264	55	446	412
	63	47	0	26	22
	64	32	0	33	2
	65	4	0	3	3
	66	3	0	3	0
	67	7	0	4	1
	<b>Total</b>	<b>1392</b>	<b>55</b>	<b>551</b>	<b>448</b>



## 6. Drug Addiction Data:

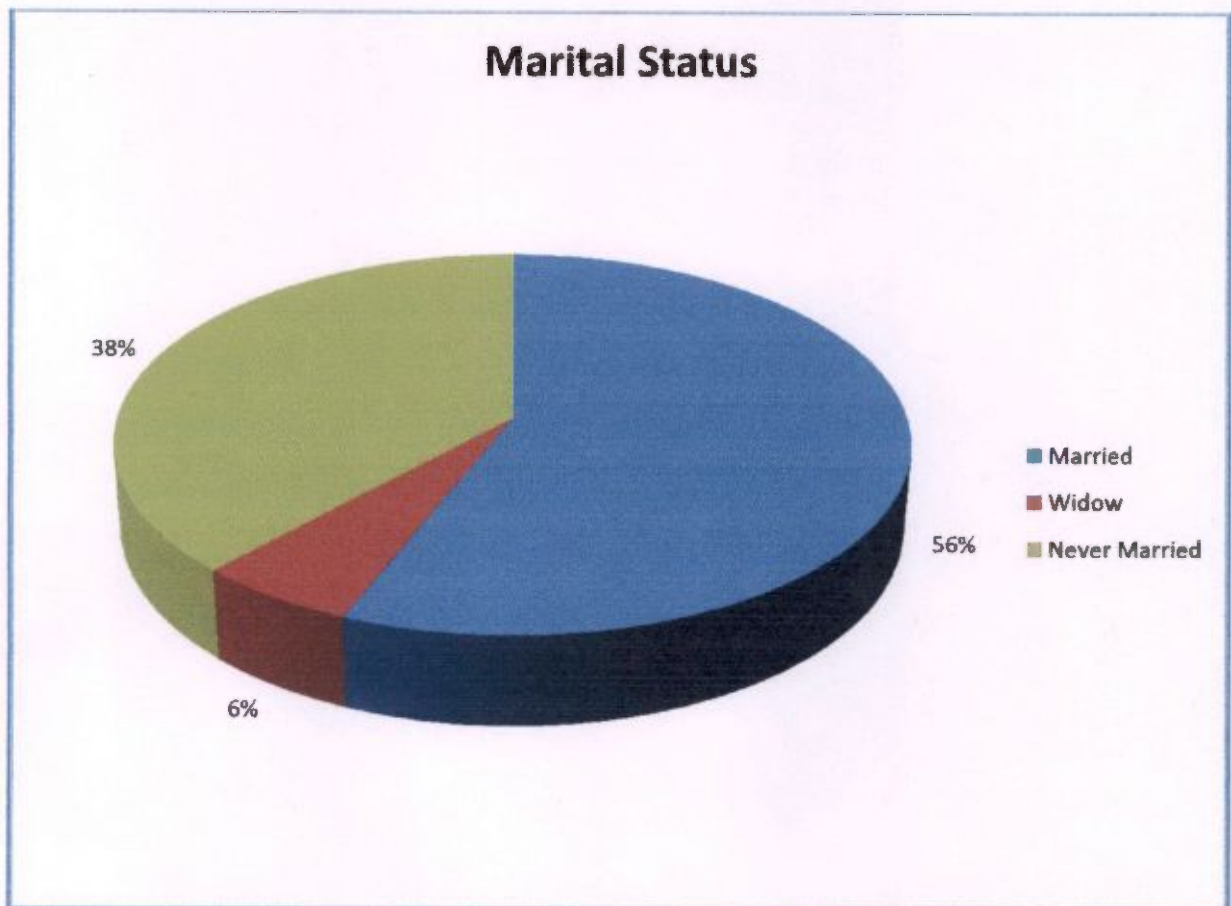
Borough	Ward No.	Drug Addiction Data	
		Addicted	Non-addicted
VII	56	5	0
	57	7	31
	58	4	32
	59	541	1636
	63	0	95
	64	0	67
	65	0	10
	66	0	6
	67	0	12
	Total	557	1889





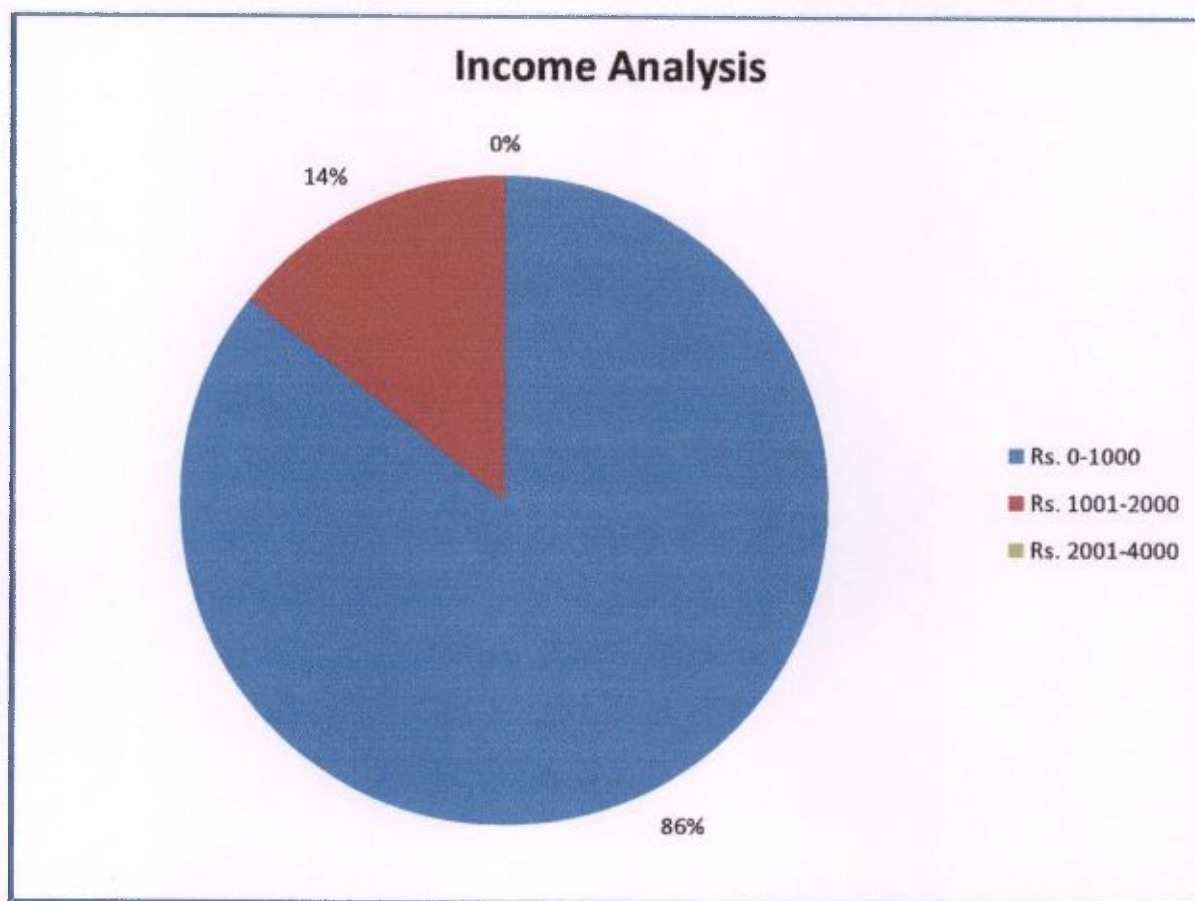
## 7. Marital Status:

Borough	Ward No.	Marital Status		
		Married	Widow	Never Married
VII	56	4	0	1
	57	28	1	9
	58	29	1	6
	59	1184	132	861
	63	56	3	36
	64	53	4	10
	65	6	0	4
	66	6	0	0
	67	6	1	5
	<b>Total</b>	<b>1372</b>	<b>142</b>	<b>932</b>



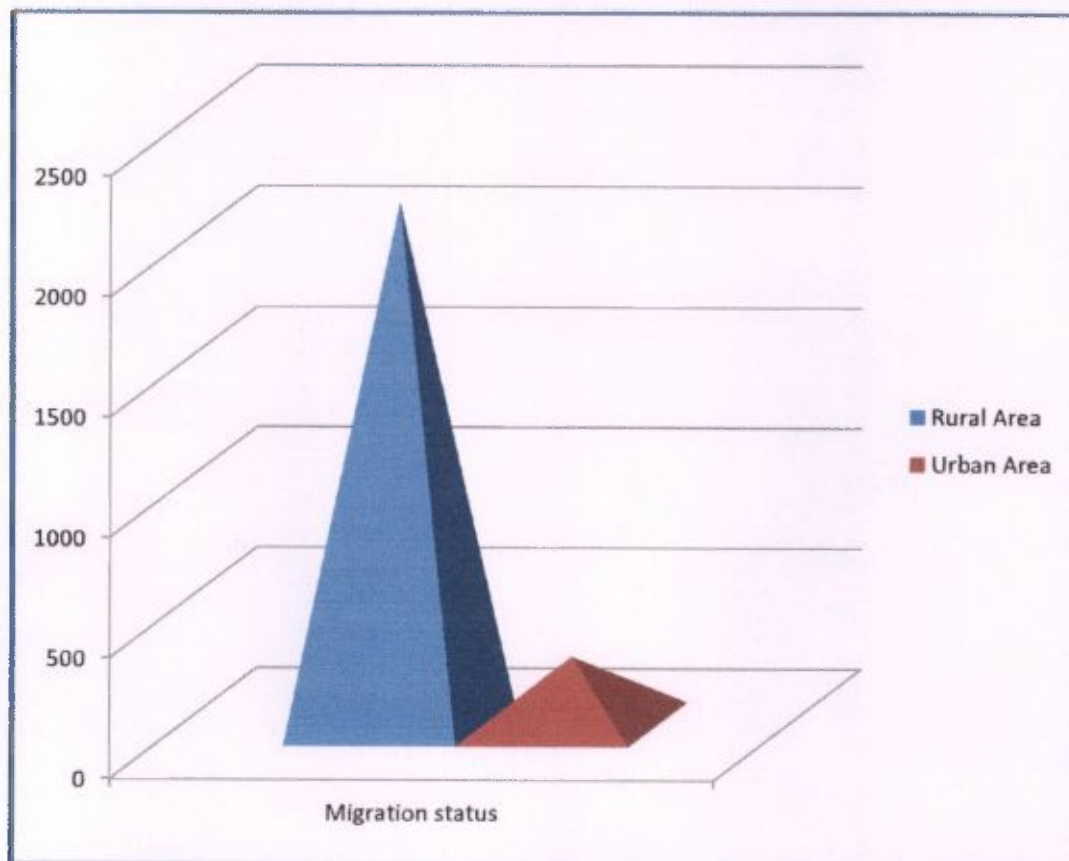
## 8. Income Analysis:

Borough	Ward No.	Income Analysis		
		Rs. 0-1000	Rs. 1001-2000	Rs. 2001-4000
VII	56	5	0	0
	57	27	11	0
	58	23	13	0
	59	1916	261	0
	63	67	28	0
	64	28	39	0
	65	10	0	0
	66	6	0	0
	67	12	0	0
	<b>Total</b>	<b>2094</b>	<b>352</b>	<b>0</b>



## 9. Migration Status

Borough	Ward No.	Migration Status	
		Rural Area	Urban Area
VII	56	0	5
	57	28	10
	58	29	7
	59	1949	228
	63	94	1
	64	47	20
	65	10	0
	66	5	1
	67	4	8
	<b>Total</b>	<b>2166</b>	<b>280</b>

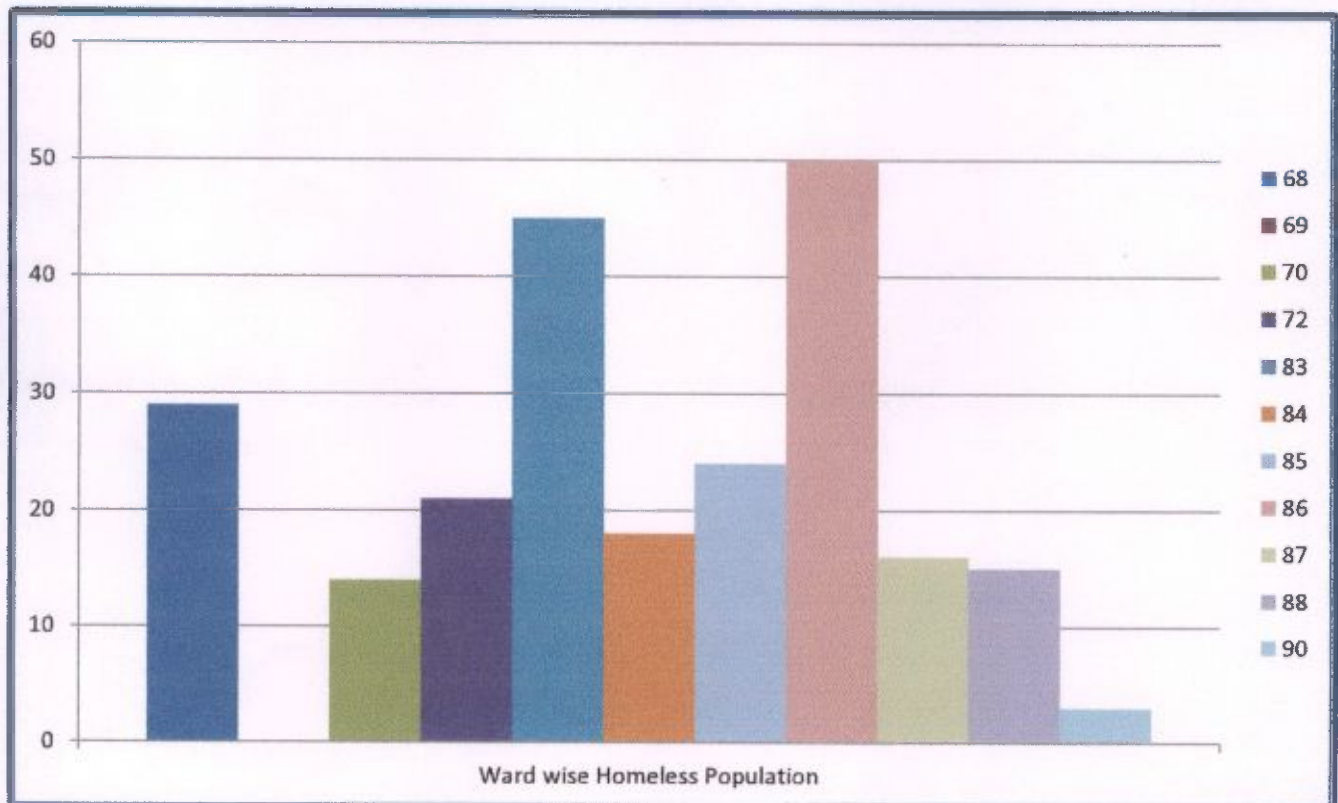




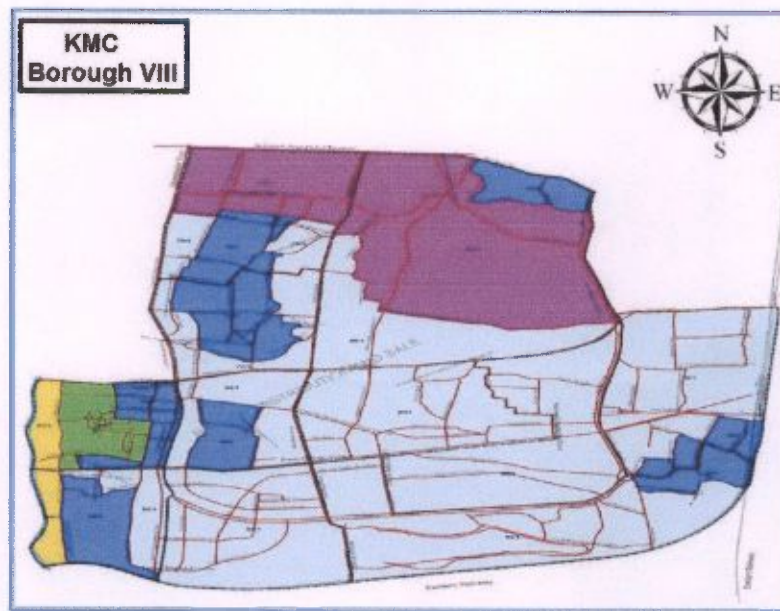
## Detail of Homeless Population Data Borough-VIII

We have started field survey on 14/03/2018 & completed the entire survey job on 20/03/2018. We found following Homeless population data after survey.

Borough	Total number of wards	Ward No.	Homeless People Found during Survey
VIII	11	68	29
		69	0
		70	14
		72	21
		83	45
		84	18
		85	24
		86	50
		87	16
		88	15
		90	3
		<b>Total</b>	<b>235</b>



## Project Area:



Ward No	Boundary	Details
68	North	Bondel Road
	South	Ballygunge Station Road, Fern Road and Kankulia Road
	East	The Eastern Railway and Kankulia Road
	West	Gariahat Road and Ashutosh Chowdhury Avenue
69	North	Acharya Jagadish Chandra Bose Road, Circus Avenue and Beck Bagan Row.
	South	Hazra Road
	East	Syed Amir Ali Avenue and Ashutosh Chowdhury Avenue
	West	Sarat Bose Road
70	North	Acharya Jagadish Chandra Bose Road
	South	Chakrabere Road South and Paddapukur Road
	East	Sarat Bose Road, Paddapukur Road and Chakrabere Road South
	West	Ashutosh Mukherjee Road and Chowringhee Road
72	North	Chakrabere Road South and Paddapukur Road
	South	Hazra Road
	East	Sarat Bose Road
	West	Shyamaprasad Mukherjee Road, Ashutosh Mukherjee Road, Chakrabere Road South and Paddapukur Road
83	North	Hazra Road
	South	Rash Behari Avenue
	East	Shyama Prasad Mukherjee Road
	West	Tolly's Nullah



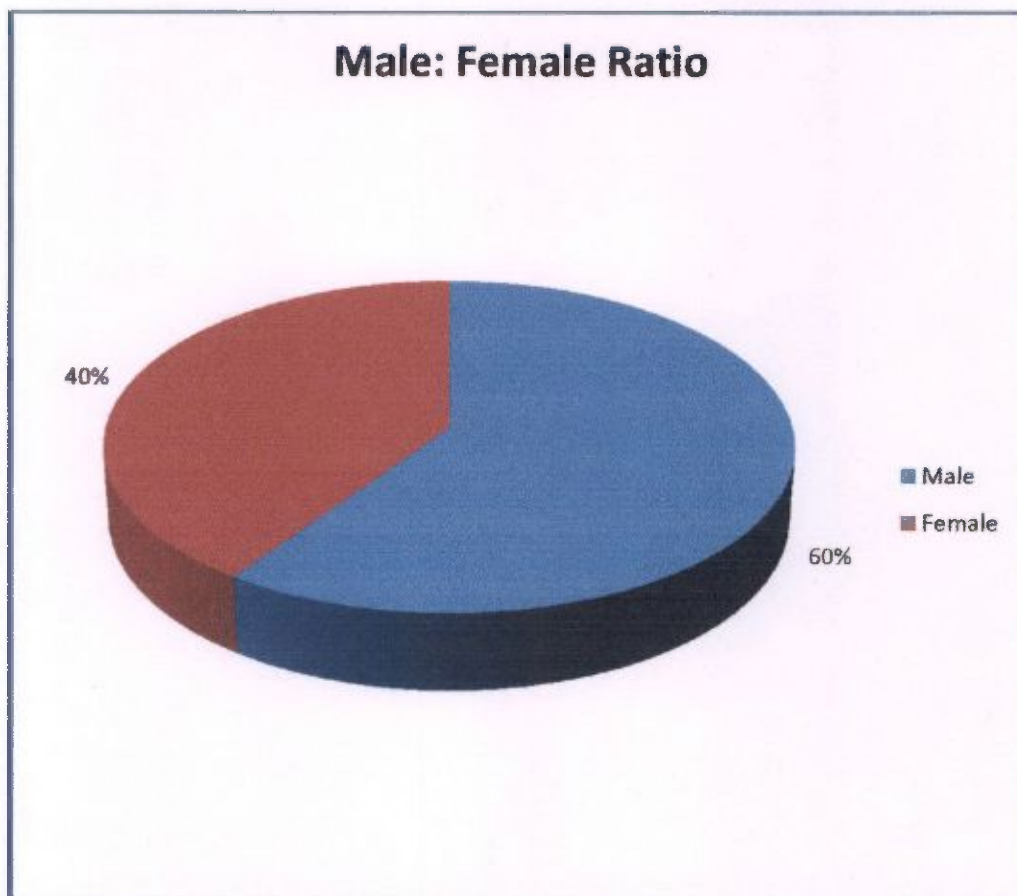
<b>84</b>	North	Hazra Road
	South	Rash Behari Avenue
	East	Sarat Bose Road
	West	Shyama Prasad Mukherjee Road
<b>85</b>	North	Hazra Road and Dover Lane
	South	Rash Behari Avenue
	East	Garcha 1 <sup>st</sup> Lane, Dover Terrace connecting Garcha 1 <sup>st</sup> Lane and Dover Lane and Ramani Chatterjee Road
	West	Sarat Bose Road
<b>86</b>	North	Hazra Road and Rash Behari Avenue
	South	Dover Lane and Dr. Meghnad Saha Sarani
	East	Gariahat Road
	West	Lake view Road, Ramani Chatterjee Road, Dover Terrace connecting Dover Lane and Garcha 1 <sup>st</sup> Lane
<b>87</b>	North	Rash Behari Avenue
	South	The Eastern Railway
	East	Sarat Bose Road and Banoj Road
	West	Shyama Prasad Mukherjee Road
<b>88</b>	North	Rash Behari Avenue
	South	The Eastern Railway
	East	Shyama Prasad Mukherjee Road
	West	Tolly's Nullah
<b>90</b>	North	Rash behari Avenue, Dr. Meghnad Saha Sarani, Kankulia Road, Fern Road and Ballygunge Station Road
	South	The Eastern Railway
	East	The Eastern Railway
	West	Kankulia Road, Baroj Road and Sarat Bose Road



Some more socio-economic findings are evaluated from this homeless people survey data under KMC Borough VIII.

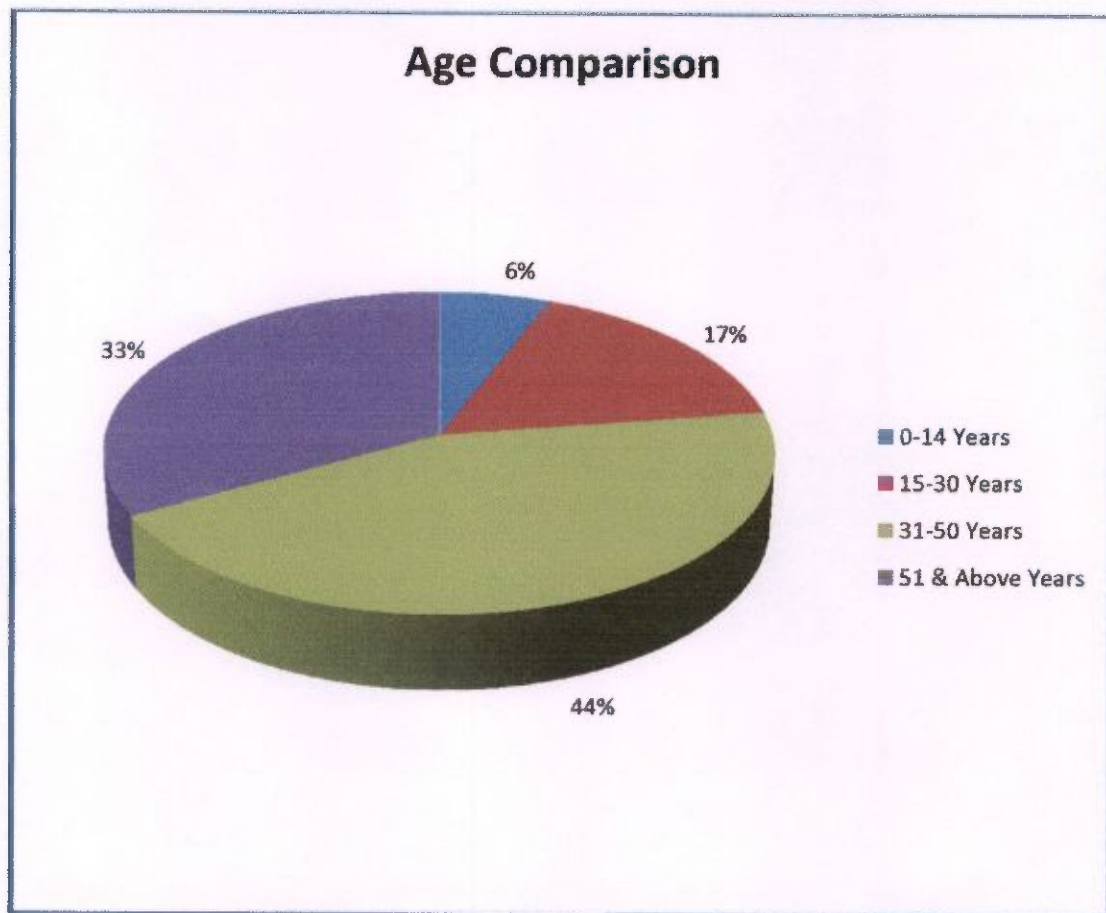
### 1. Sex Ratio:

Borough	Ward No.	Sex Ratio	
		Male	Female
VIII	68	18	11
	69	0	0
	70	10	4
	72	16	5
	83	21	24
	84	14	4
	85	16	8
	86	23	27
	87	14	2
	88	6	9
	90	2	1
	<b>Total</b>	<b>140</b>	<b>95</b>



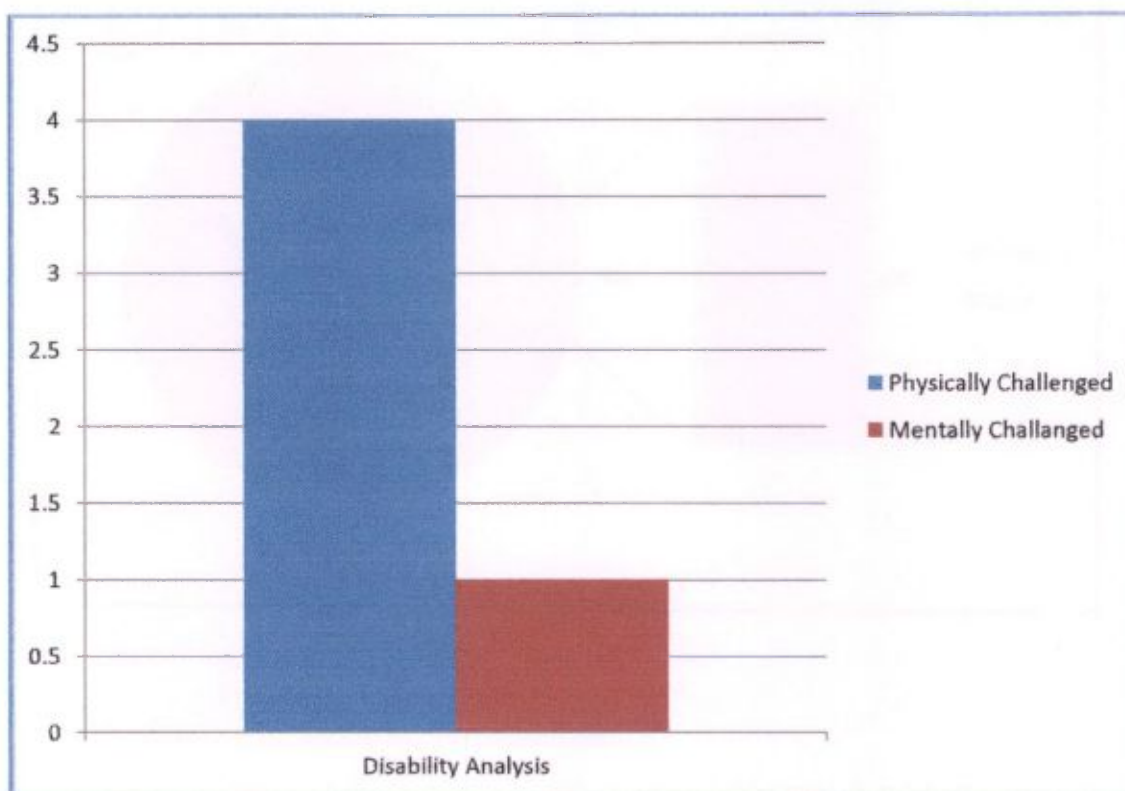
## 2. Age Comparison:

Borough	Ward No.	Age Comparison			
		0-14 Years	15-30 Years	31-50 Years	51 & Above Years
VIII	68	0	0	16	13
	69	0	0	0	0
	70	0	2	8	4
	72	0	4	16	1
	83	1	5	16	23
	84	1	3	7	7
	85	1	2	9	12
	86	9	19	14	8
	87	0	2	11	3
	88	2	2	5	6
	90	0	0	2	1
	<b>Total</b>	<b>14</b>	<b>39</b>	<b>104</b>	<b>78</b>



### 3. Disability Analysis:

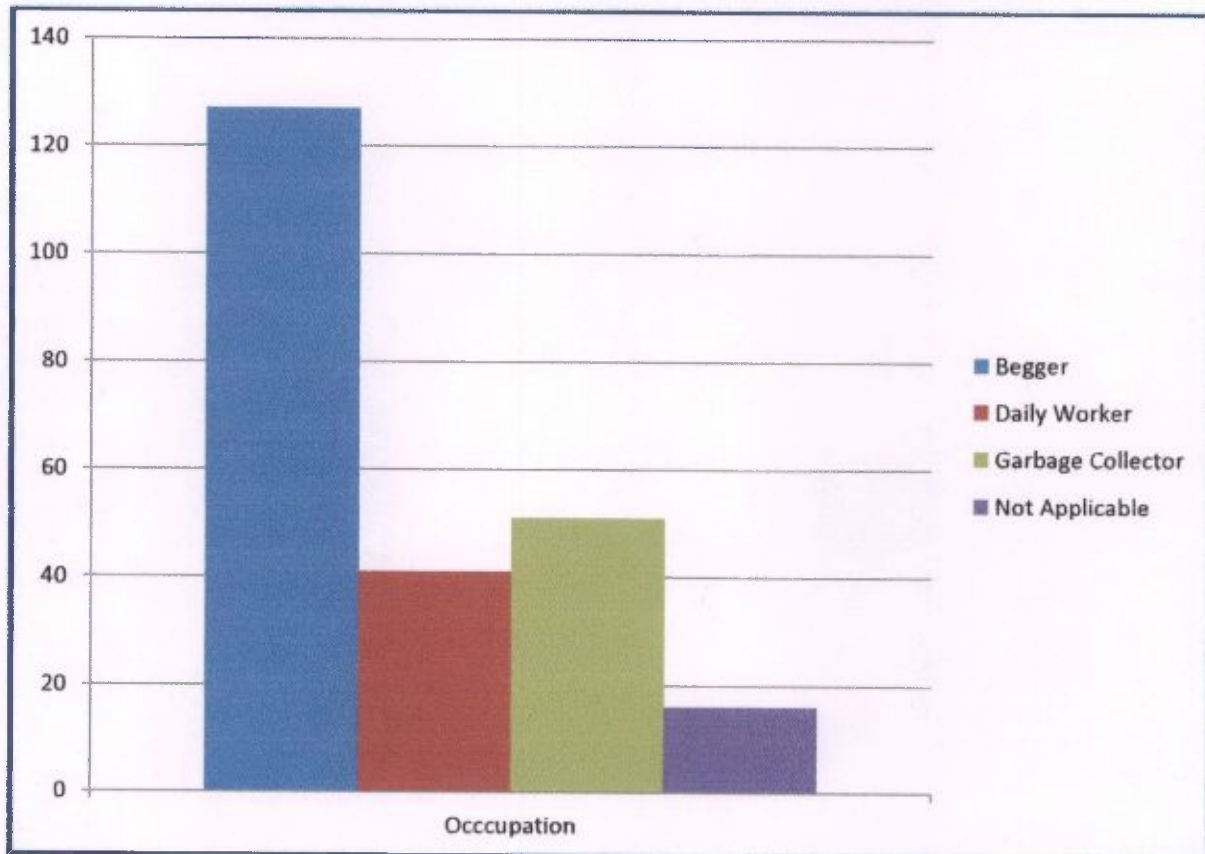
Borough	Ward No.	Disability Analysis	
		Physically Challenged	Mentally Challenged
VIII	68	0	0
	69	0	0
	70	1	0
	72	0	0
	83	2	0
	84	0	0
	85	1	1
	86	0	0
	87	0	0
	88	0	0
	90	0	0
	<b>Total</b>	<b>4</b>	<b>1</b>





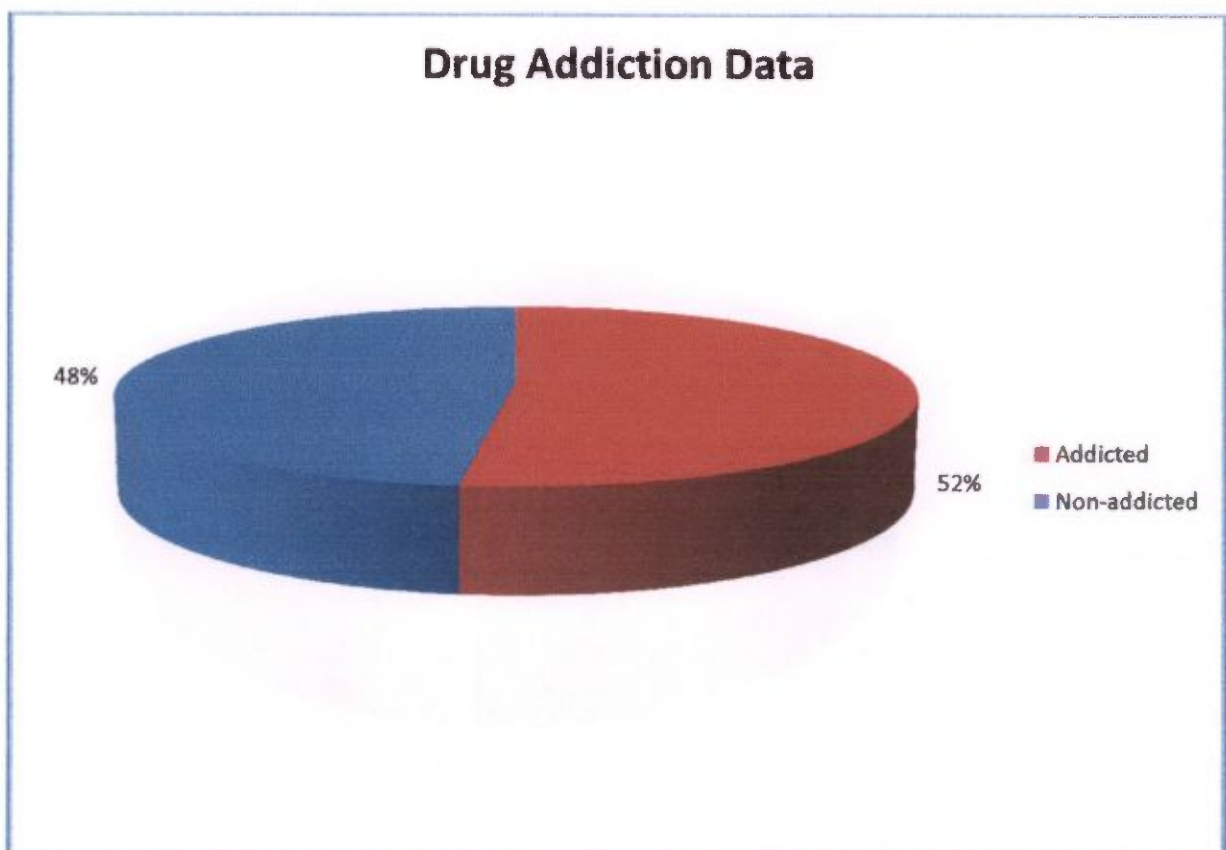
## 5. Occupation Analysis:

Borough	Ward No.	Occupation Analysis			
		Beggar	Daily Worker	Garbage Collector	Not Applicable
VIII	68	18	5	6	0
	69	0	0	0	0
	70	6	4	4	0
	72	13	0	8	0
	83	38	4	3	0
	84	10	4	4	0
	85	13	8	3	0
	86	7	13	18	12
	87	10	3	3	0
	88	9	0	2	4
	90	3	0	0	0
	<b>Total</b>	<b>127</b>	<b>41</b>	<b>51</b>	<b>16</b>



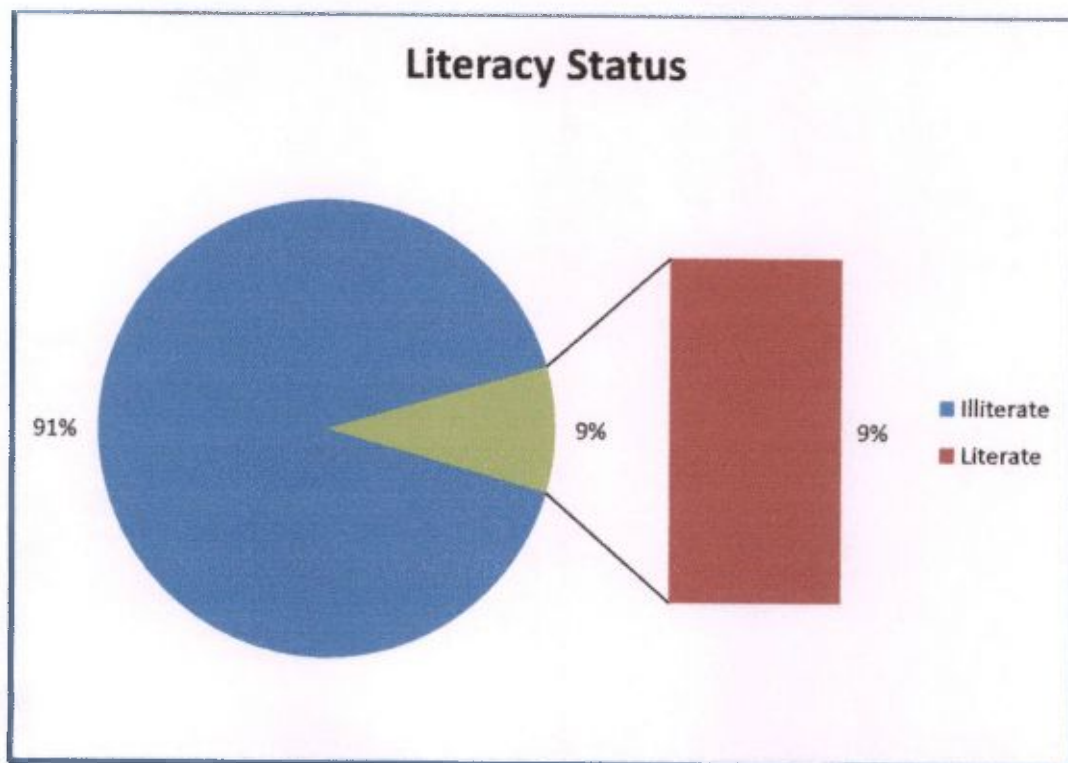
## 6. Drug Addiction Data:

Borough	Ward No.	Drug Addiction Data	
		Addicted	Non-addicted
VIII	68	16	13
	69	0	0
	70	9	5
	72	15	6
	83	17	28
	84	9	9
	85	11	13
	86	23	27
	87	12	4
	88	9	6
	90	1	2
	<b>Total</b>	<b>122</b>	<b>113</b>



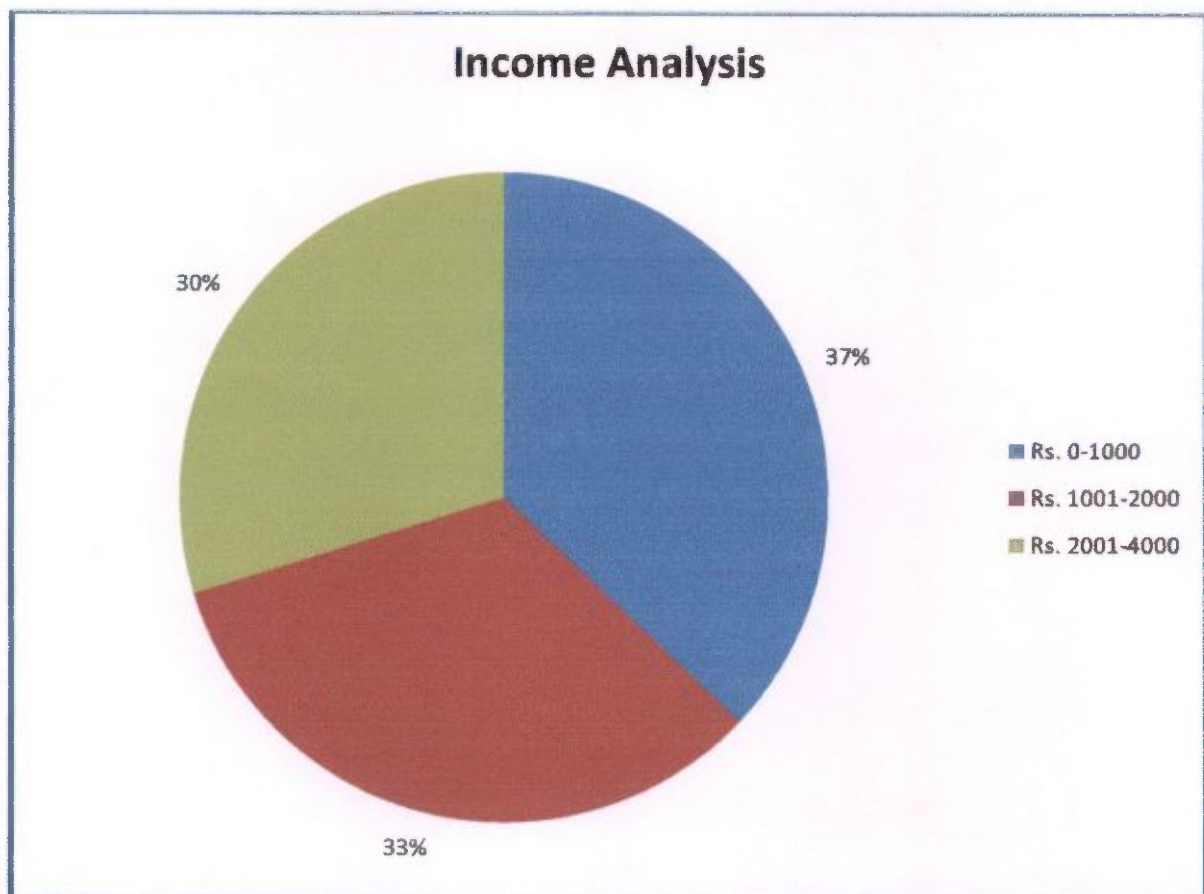
#### 4. Literacy Status:

Borough	Ward No.	Literacy Status	
		Illiterate	Literate
VIII	68	29	0
	69	0	0
	70	14	0
	72	0	21
	83	45	0
	84	18	0
	85	24	0
	86	50	0
	87	16	0
	88	15	0
	90	3	0
	<b>Total</b>	<b>214</b>	<b>21</b>



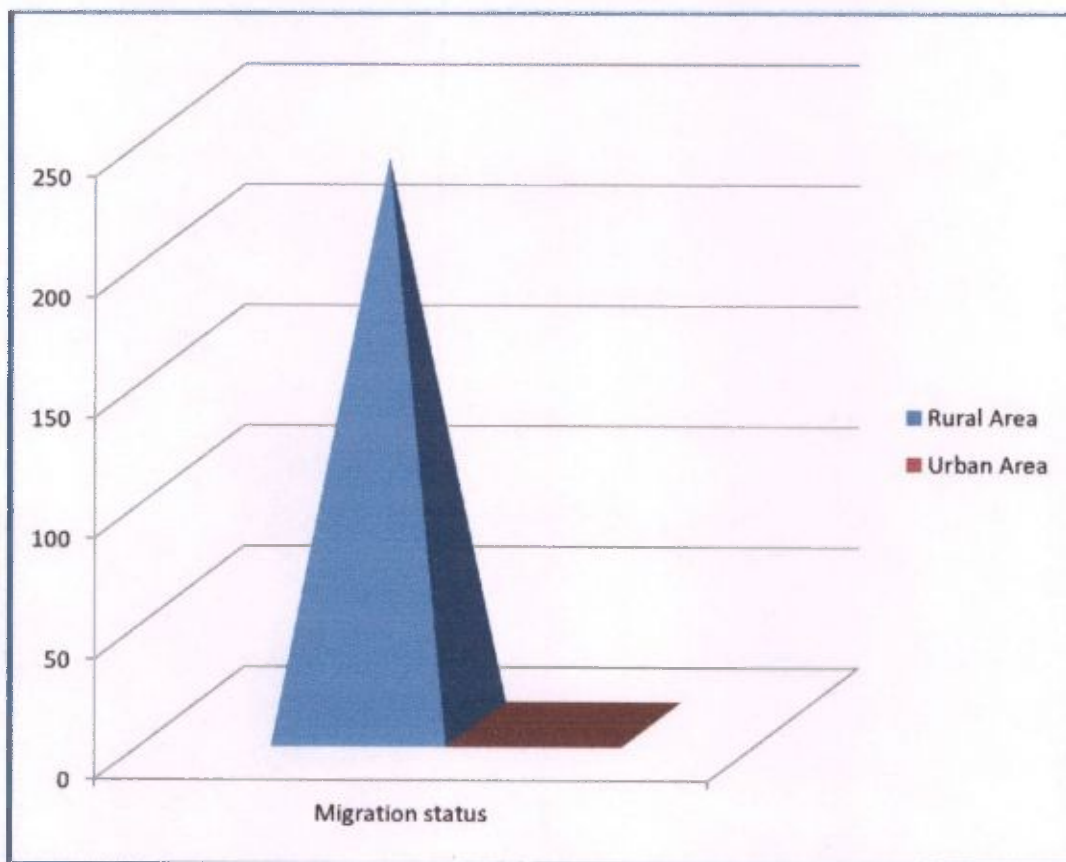


Borough	Ward No.	Income Analysis		
		Rs. 0-1000	Rs. 1001-2000	Rs. 2001-4000
VIII	68	5	16	8
	69	0	0	0
	70	0	10	4
	72	14	2	5
	83	20	18	7
	84	8	4	6
	85	1	13	10
	86	19	9	22
	87	5	5	6
	88	13	0	2
	90	2	1	0
	<b>Total</b>	<b>87</b>	<b>78</b>	<b>70</b>



## 9. Migration Status

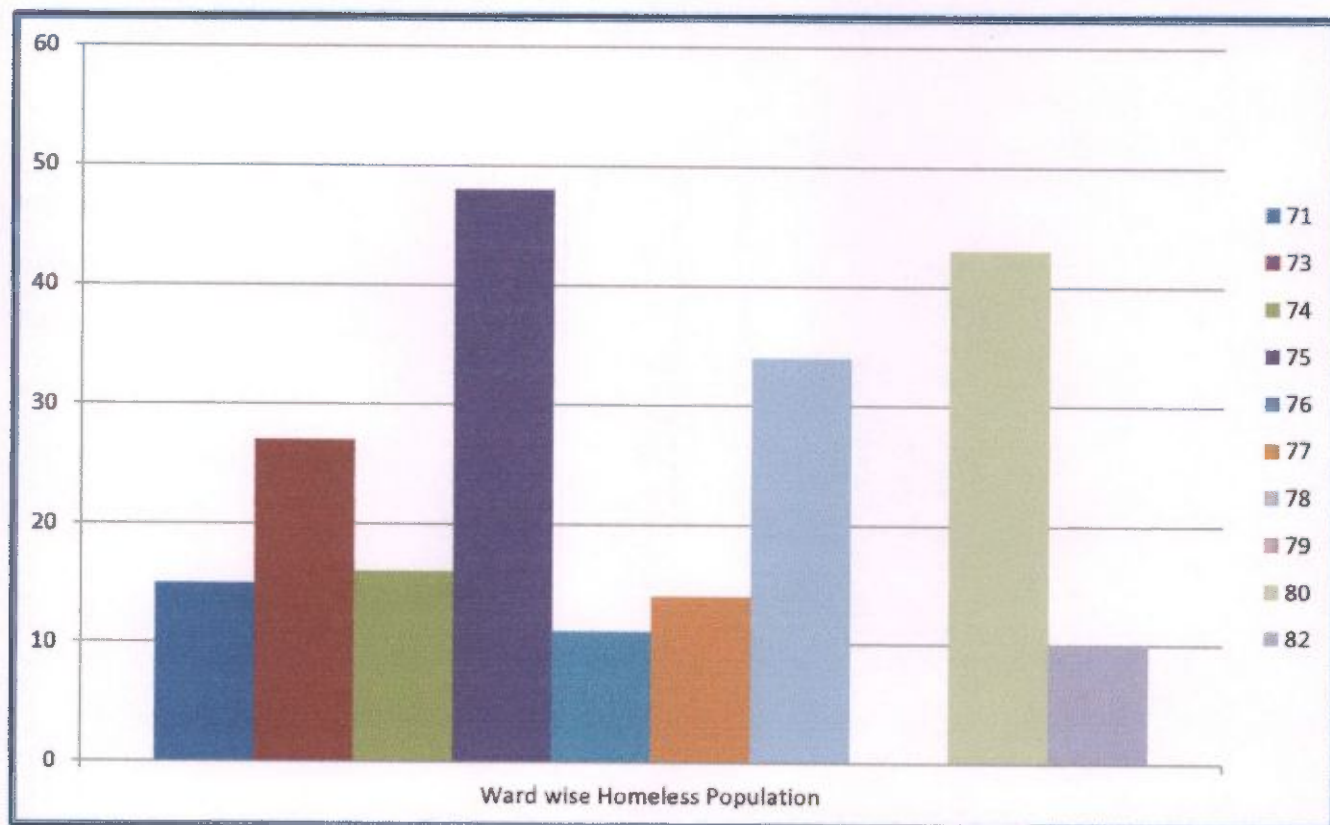
Borough	Ward No.	Migration Status	
		Rural Area	Urban Area
VIII	68	29	0
	69	0	0
	70	14	0
	72	21	0
	83	45	0
	84	18	0
	85	24	0
	86	50	0
	87	16	0
	88	15	0
	90	3	0
	<b>Total</b>	<b>235</b>	<b>0</b>



# Detail of Homeless Population Data Borough-IX

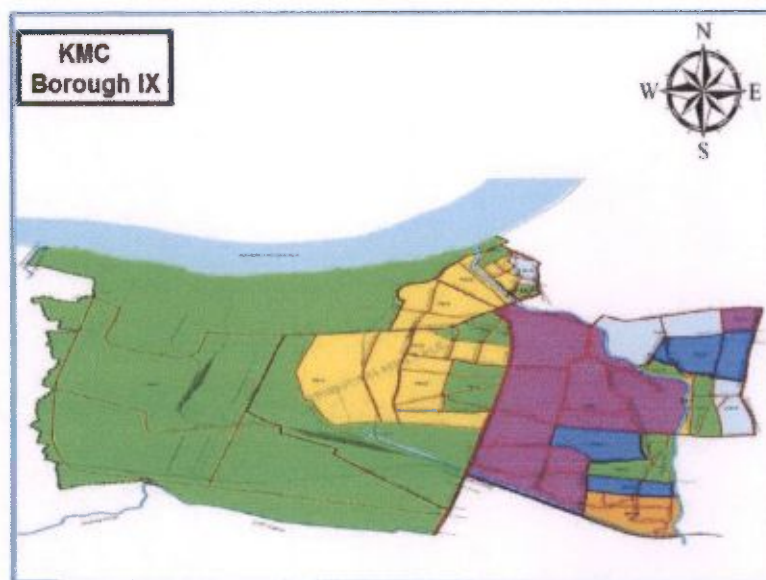
We have started field survey on 17/03/2018 & completed the entire survey job on 22/03/2018. We found following Homeless population data after survey.

Borough	Total number of wards	Ward No.	Homeless People Found during Survey
IX	10	71	15
		73	27
		74	16
		75	48
		76	11
		77	14
		78	34
		79	0
		80	43
		82	10
		<b>Total</b>	<b>218</b>





## Project Area:



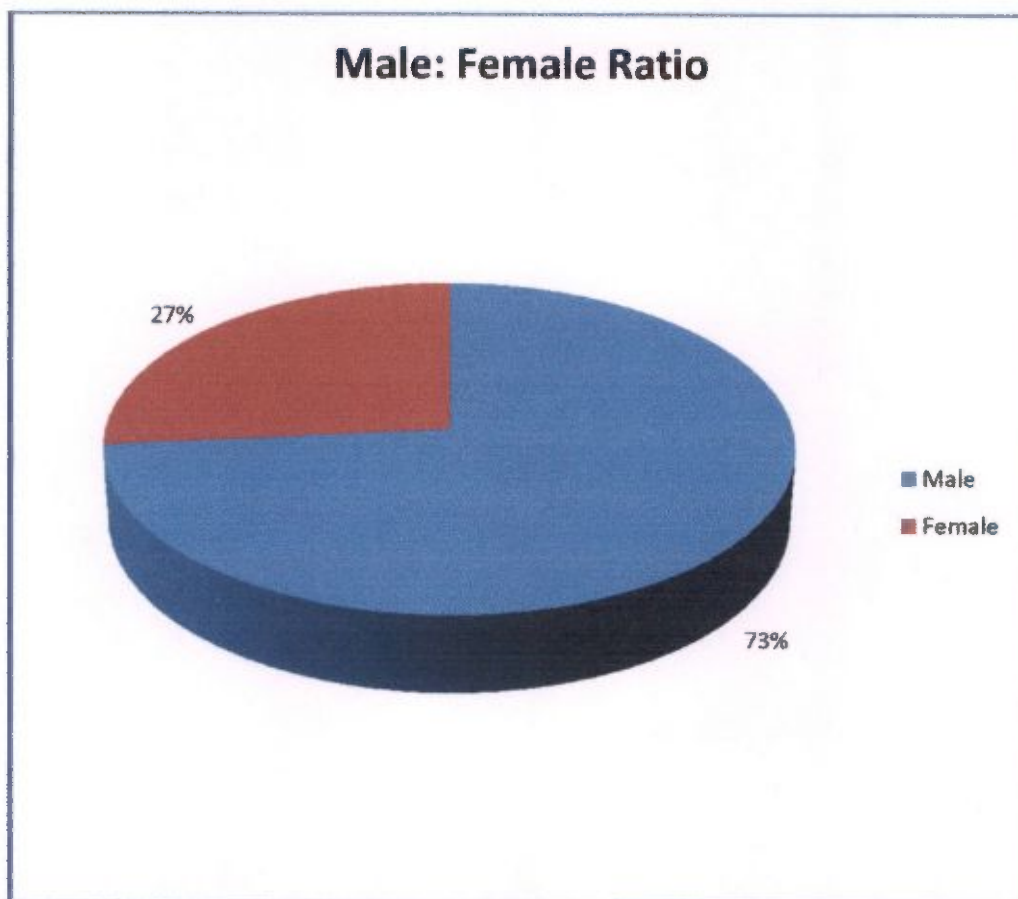
Ward No	Boundary	Details
71	North	Acharya Jagadish Bose Road
	South	Suhasini Ganguly Sarani, Gobinda Bose Lane, Bijoy Bose Road and Tolly's Nullah
	East	Ashutosh Mukherjee Road, Debendralal Khan Road and Chowringhee Road
	West	Tolly's Nullah and the Road connecting Belvedere Road and Acharya Jagadish Bose Road, Madan Pal Lane and Harish Mukherjee Road
73	North	Subhasini Ganguly Sarani, Gobindra Bose Lane and Bijoy Bose Road
	South	Hazra Road and Tolly's Nullah
	East	Shyama Prasad Mukherjee Road, Ashutosh Mukherjee Road, Harish Mukherjee Road and Madan Pal Lane
	West	Tolly's Nullah and Debendra Lal Khan Road
74	North	Tolly's Nullah
	South	Judges Court Road, Chetla Hut Road and the Eastern Railway
	East	Tolly's Nullah, Gopal Nagar Road and Alipore Road
	West	Diamond Harbour Road and Kidderpore Bridge Approach
75	North	Strand Road and a line drawn in continuation of the south side of Strand road to the river Hooghly and Clyde Row
	South	Kabitirtha Sarani
	East	Canal Road, St. George's Gate Road, Kidderpore Bridge Approach and Karl Marx Sarani
	West	Garden Reach Road and the River Hooghly

76	North	Garden Reach Road and Kabirtirtha Sarani
	South	Karl Marx Sarani and Sastitala Road
	East	Karl Marx Sarani
	West	Satya Doctor Road and Sastitala Road
77	North	Karl Marx Sarani
	South	Kavi Mohammed Iqbal Road
	East	Diamond Harbour Road
	West	Bhukailash Road
78	North	Kavi Mohammed Iqbal Road
	South	Braunfeld Row and Hossain Shah Road
	East	Diamond Harbour Road
	West	Bhukailash Road
79	North	Karl Marx Sarani, Hossain Shah Road and Braunfeld row
	South	Goragacha Road
	East	Bhukailash Road and Diamond Harbour Road
	West	Hide Road
80	North	The river Hooghly, Goragacha Road and Garden Reach Municipality
	South	South Suburban Municipality, Garden reach Municipality and Karl Marx Sarani, Satya Doctor Road and Garden Reach Road
	East	Tolly's Nullah, Garden reach, Sastitala Road, Satya Doctor Road, Hide Road, and Diamond Harbour Road
	West	Garden Reach Municipality
82	North	Chetla Hat Road and Judges Court Road
	South	The Eastern Railway
	East	Tolly's Nullah
	West	Alipore Road and Gopalnagar Road

Some more socio-economic findings are evaluated from this homeless people survey data under KMC Borough IX.

### 1. Sex Ratio:

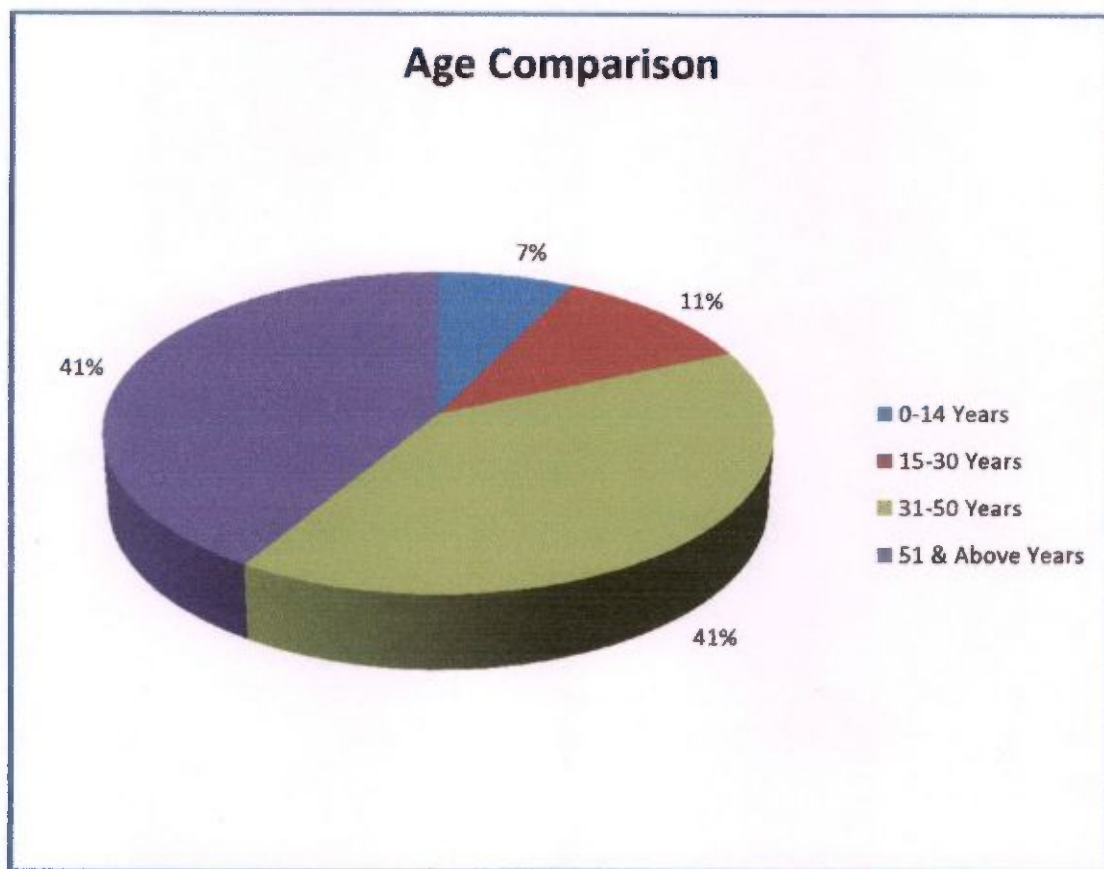
Borough	Ward No.	Sex Ratio	
		Male	Female
IX	71	12	3
	73	22	5
	74	14	2
	75	36	12
	76	6	5
	77	11	3
	78	23	11
	79	0	0
	80	28	15
	82	8	2
	<b>Total</b>	<b>160</b>	<b>58</b>





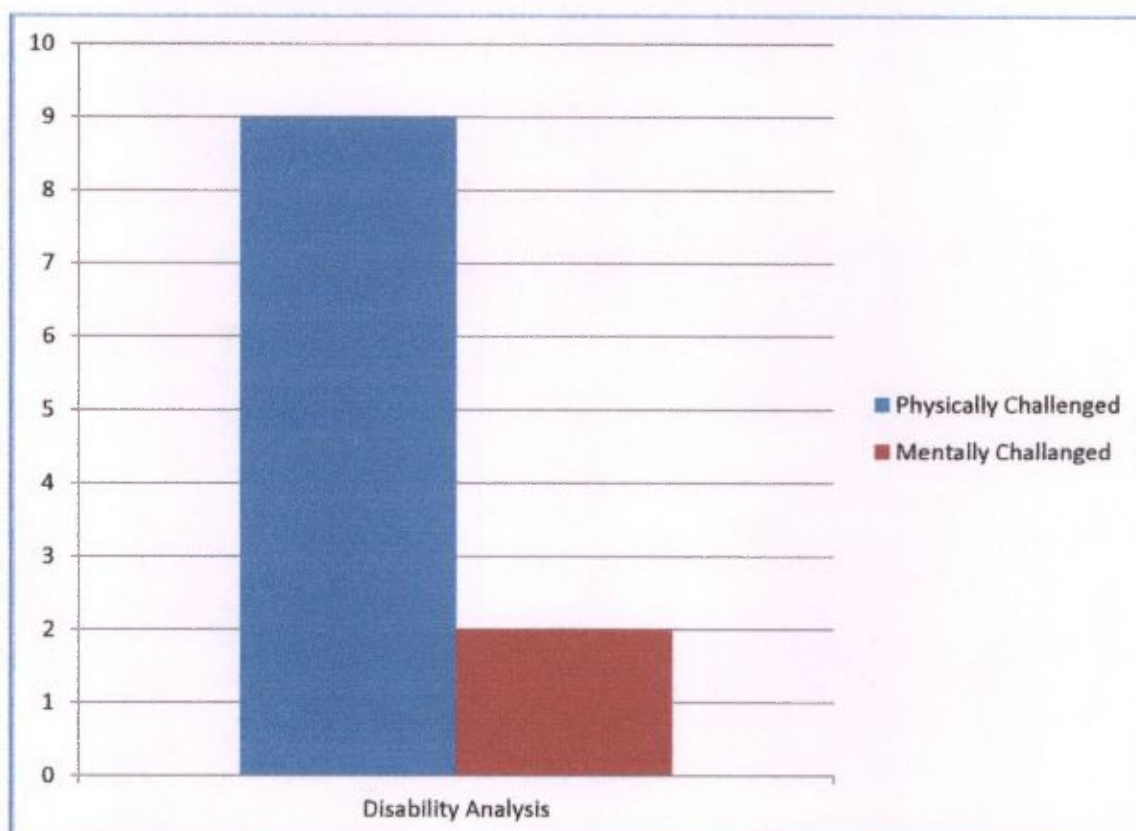
## 2. Age Comparison:

Borough	Ward No.	Age Comparison			
		0-14 Years	15-30 Years	31-50 Years	51 & Above Years
IX	71	0	0	6	9
	73	1	2	15	9
	74	0	1	8	7
	75	2	3	21	22
	76	0	0	2	9
	77	1	3	6	4
	78	7	4	8	15
	79	0	0	0	0
	80	5	11	15	12
	82	0	0	7	3
	Total	16	24	88	90



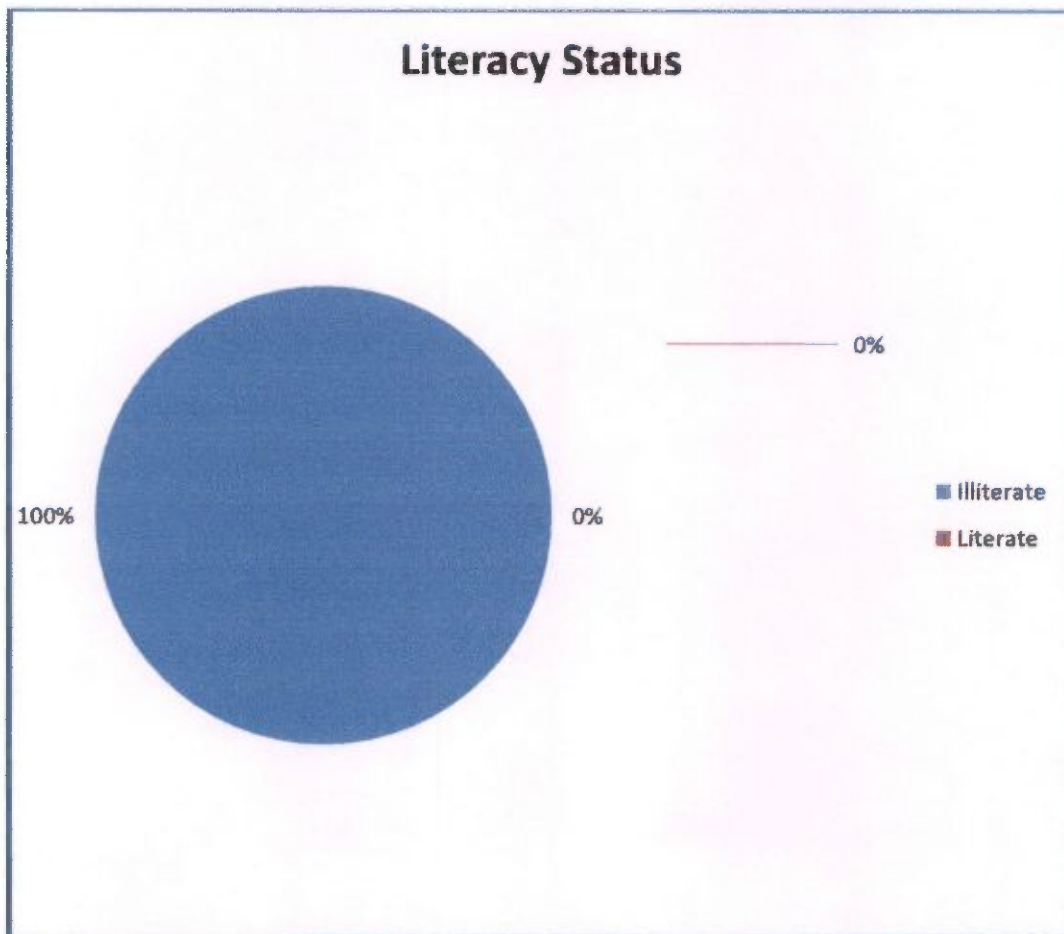
### 3. Disability Analysis:

Borough	Ward No.	Disability Analysis	
		Physically Challenged	Mentally Challenged
IX	71	0	2
	73	0	0
	74	3	0
	75	2	0
	76	2	0
	77	1	0
	78	0	0
	79	0	0
	80	1	0
	82	0	0
	<b>Total</b>	<b>9</b>	<b>2</b>



#### 4. Literacy Status:

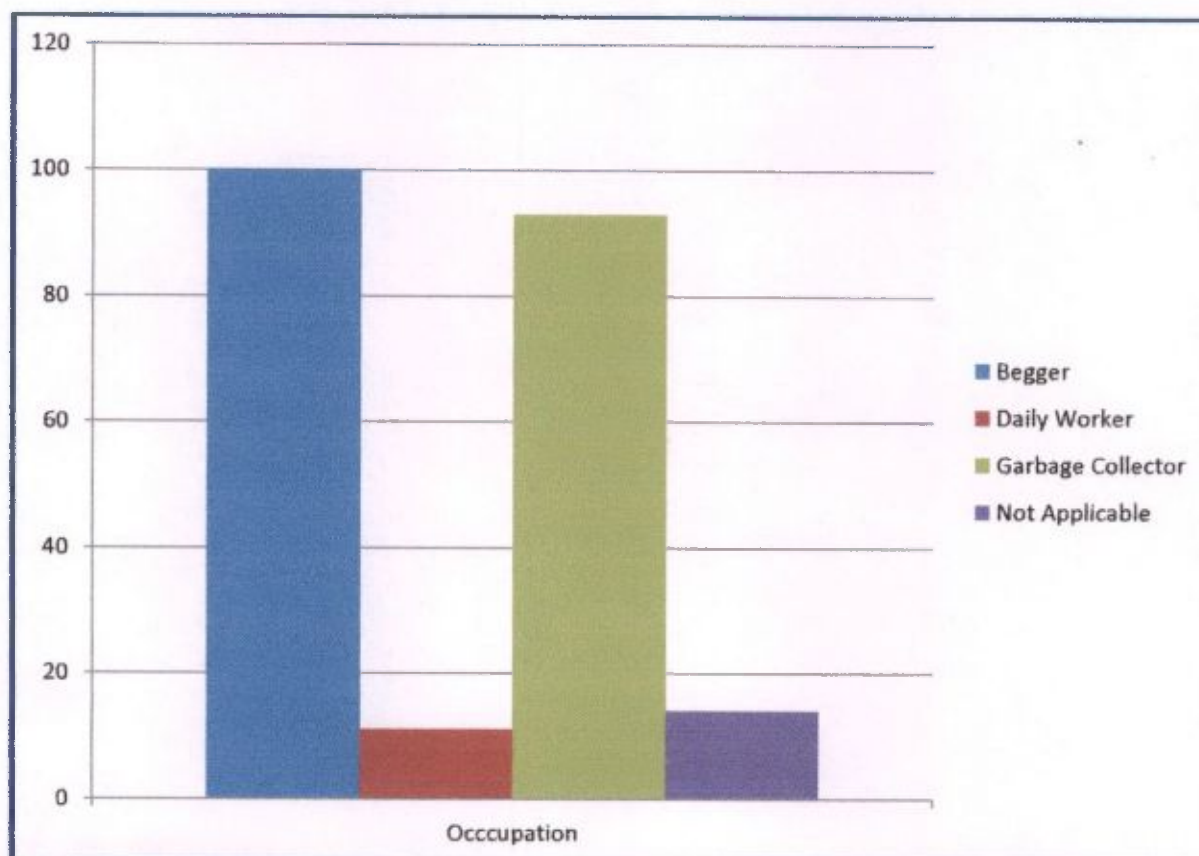
Borough	Ward No.	Literacy Status	
		Illiterate	Literate
IX	71	15	0
	73	27	0
	74	16	0
	75	48	0
	76	11	0
	77	14	0
	78	34	0
	79	0	0
	80	43	0
	82	10	0
	<b>Total</b>	<b>218</b>	<b>0</b>





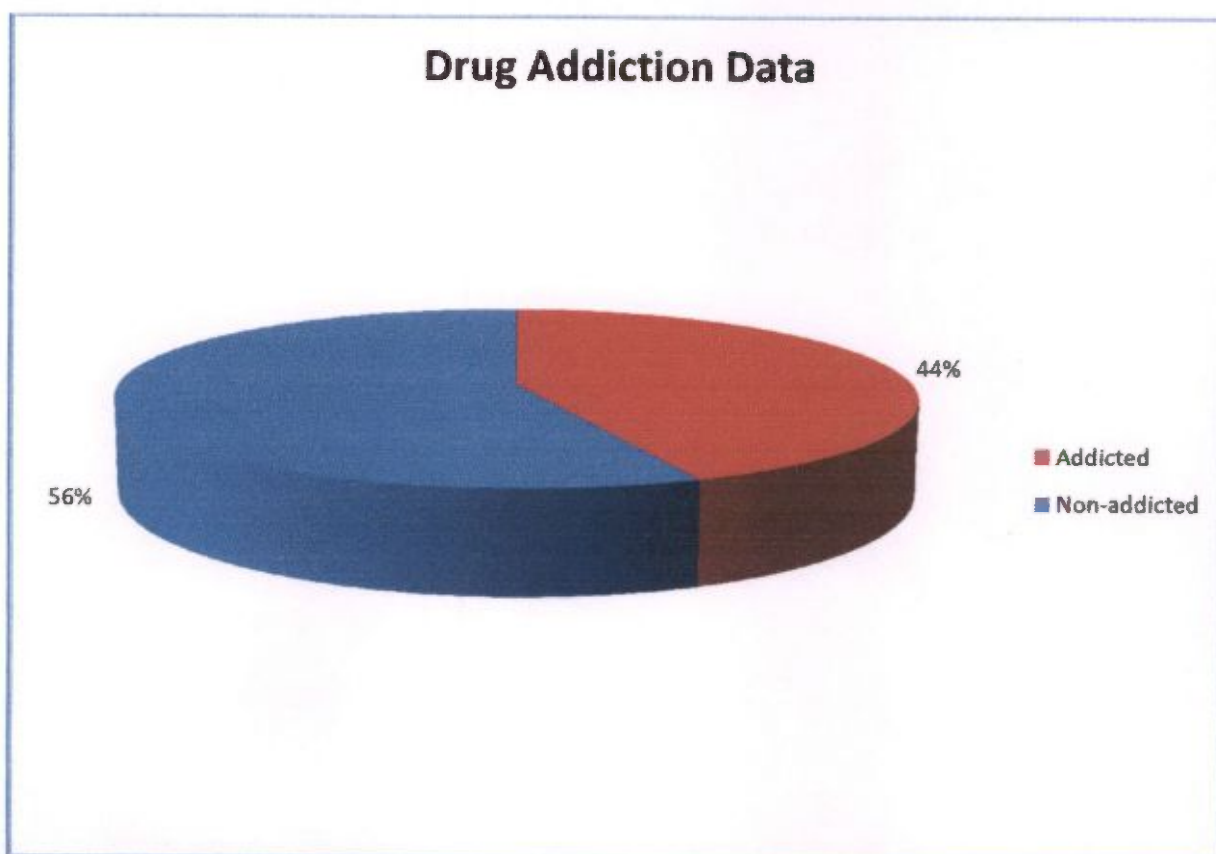
## 5. Occupation Analysis:

Borough	Ward No.	Occupation Analysis			
		Beggar	Daily Worker	Garbage Collector	Not Applicable
IX	71	10	0	5	0
	73	10	6	11	0
	74	9	0	7	0
	75	19	0	27	2
	76	5	0	6	0
	77	6	0	7	1
	78	14	0	13	7
	79	0	0	0	0
	80	22	5	12	4
	82	5	0	5	0
	<b>Total</b>	<b>100</b>	<b>11</b>	<b>93</b>	<b>14</b>



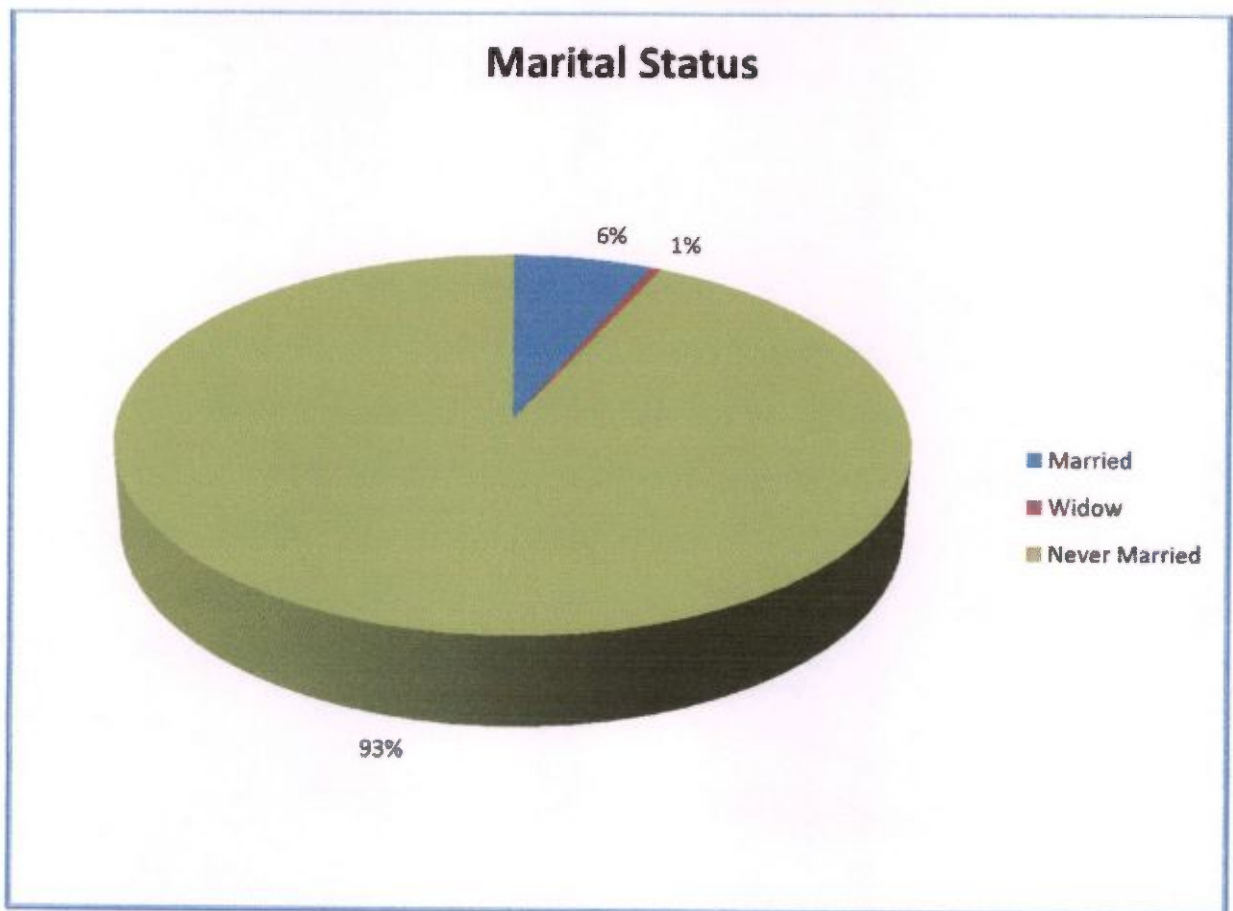
## 6. Drug Addiction Data:

Borough	Ward No.	Drug Addiction Data	
		Addicted	Non-addicted
IX	71	6	9
	73	6	21
	74	8	8
	75	31	17
	76	6	5
	77	5	9
	78	16	18
	79	0	0
	80	12	31
	82	5	5
	<b>Total</b>	<b>95</b>	<b>123</b>



## 7. Marital Status:

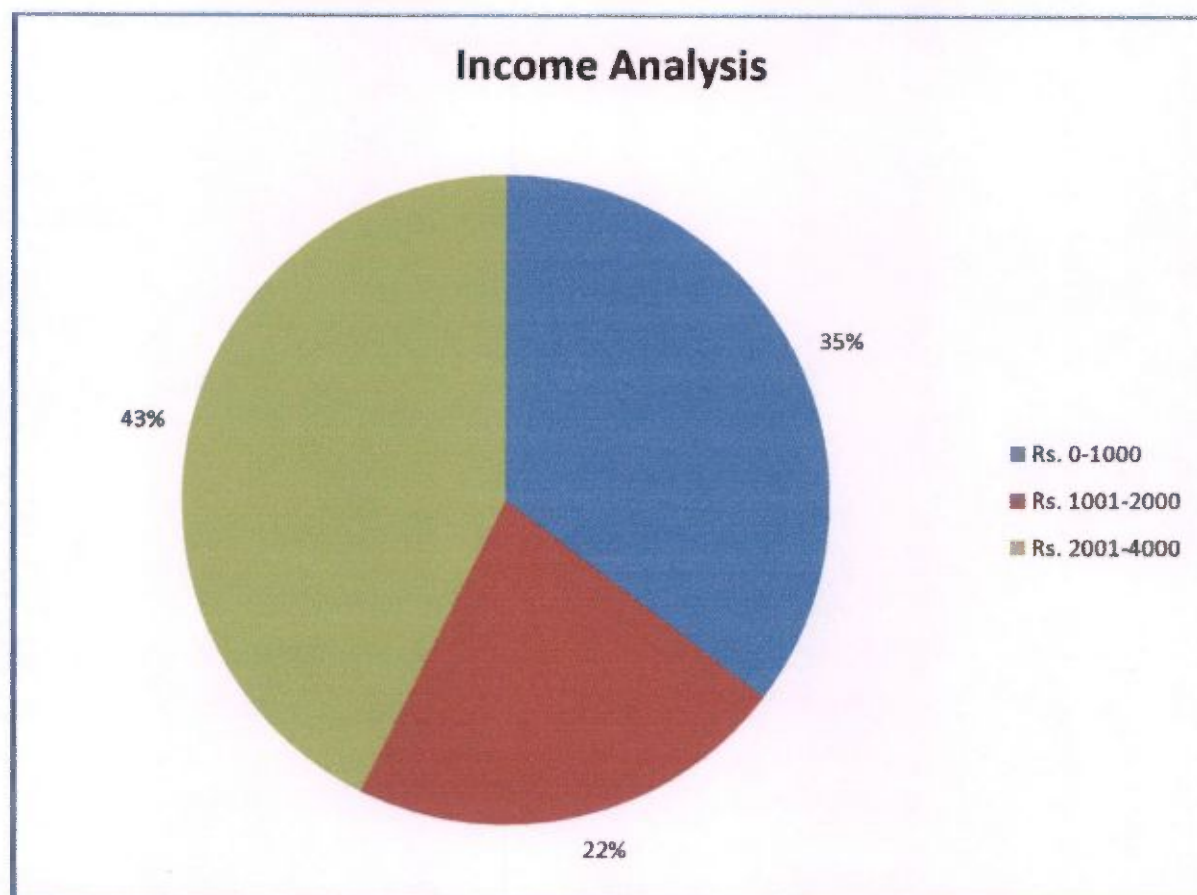
Borough	Ward No.	Marital Status		
		Married	Widow	Never Married
IX	71	0	0	15
	73	0	0	27
	74	0	0	16
	75	3	1	44
	76	0	0	11
	77	0	0	14
	78	3	0	31
	79	0	0	0
	80	8	0	35
	82	0	0	10
	<b>Total</b>	<b>14</b>	<b>1</b>	<b>203</b>





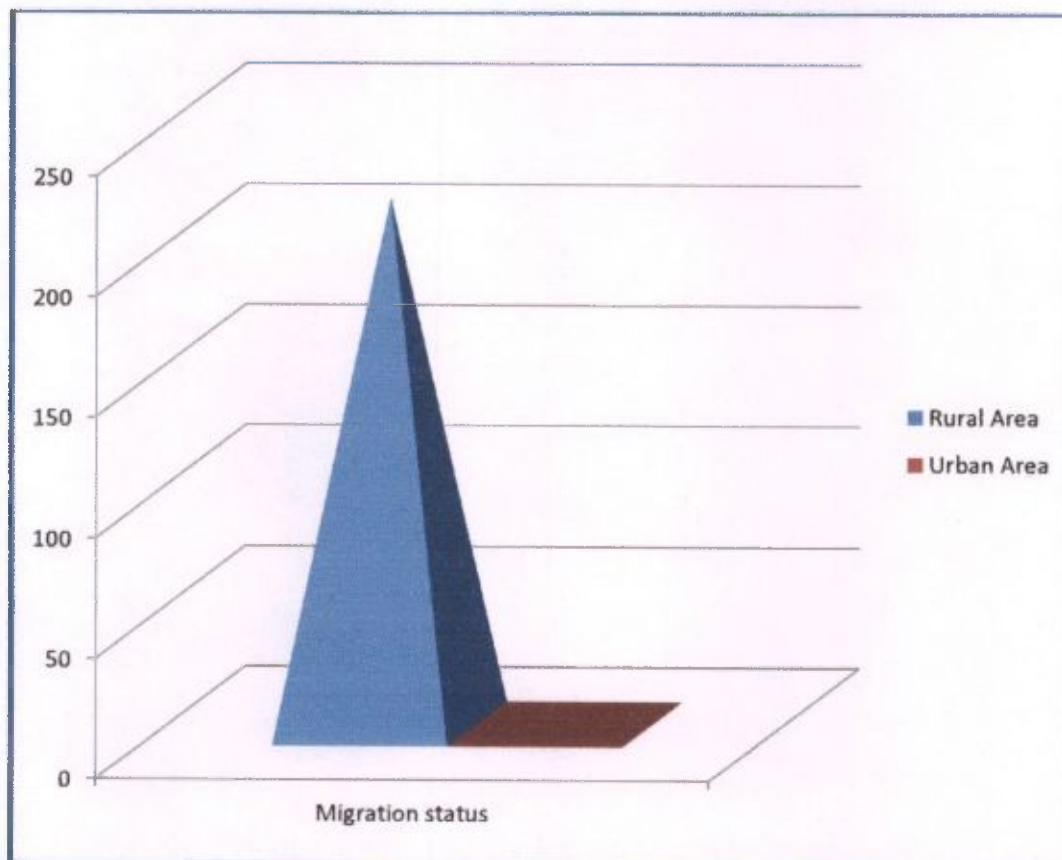
## 8. Income Analysis:

Borough	Ward No.	Income Analysis		
		Rs. 0-1000	Rs. 1001-2000	Rs. 2001-4000
IX	71	9	2	4
	73	6	10	11
	74	8	1	7
	75	5	16	27
	76	4	1	6
	77	5	2	7
	78	10	13	11
	79	0	0	0
	80	25	2	16
	82	5	1	4
	Total	77	48	93



## 9. Migration Status

Borough	Ward No.	Migration Status	
		Rural Area	Urban Area
IX	71	15	0
	73	27	0
	74	16	0
	75	48	0
	76	11	0
	77	14	0
	78	34	0
	79	0	0
	80	43	0
	82	10	0
	<b>Total</b>	<b>218</b>	<b>0</b>



# Resource planning for urban homeless shelter under KMC Zone-III

As assigned by KMC in conducting GIS Based survey for Urban Homeless population, we had conducted a survey under Zone – III of KMC.

The objective of the survey was to provide KMC the count as well as analytical report of such Urban Homeless for providing them shelters and other basic amenities.

The shelters may be constructed in the vicinity areas subject to the availability of land and approval of appropriate authority.

Under Zone – III, we surveyed Boroughs – VII, VIII & IX and identified some vacant areas which may be utilized for construction of Shelters for Urban Homeless.

In Borough VII, we found 3 places, the lists of the land as identified are annexed hereto:-

Borough Name	Area Details	Ward No	Owner	Area in Sq. Ft (Approx.)	Latitude	Longitude
VII	Vacant Land behind Silver Spring Club beside Dhapa Road	57	Not Known	15000	22.55048500	88.39828400
VII	Vacant Land beside Jai Hind Water Pumping Station in Arupota Village	58	KMC	20000	22.54313900	88.40162500
VII	Vacant Land beside Mahendra Roy Lane opposite of Hararat Mdyakub Mosque	59	Not Known	20000	22.54489200	88.37819600

In Borough VIII we have not found any vacant /abandoned land for urban homeless shelter. This borough is very congested in nature.

In Borough IX we have not found any vacant /abandoned land for urban homeless shelter. This borough is very congested in nature.



## Conclusion:

- The survey of Zone III revealed the important statistics that there are 2899 homeless people in total from all the 3 Boroughs.
- We have given the data collected through the survey to KMC in different formats – Excel Sheets, representation through Map, Web application and mobile app called Thikana. Through Excel, the users can check and compare the data easily, whereas, the map will give a graphical representation of the areas where the homeless people are found. Through the web application we created, any user can login from anywhere to check the data and the app will allow users to access the data with just a click from anywhere anytime.
- The data collected through the survey will enable KMC to prepare several developmental plans for construction of Shelters for Urban Homeless using the statistical analysis that we provided.
- In some areas, the female respondents did not allow us to take their photographs; hence their photos are not available.
- In very few cases, in apprehension of being displaced to other places, the respondents were found reluctant in sharing information.
- Karmick Solutions Pvt Ltd successfully completed the entire project work with active support & kind cooperation of KMC officials (SWUPA HQ), KMC Borough Managers, other Administrative Bodies & local people.



# Final Project Report For GIS Based Survey of Urban Homeless Population in the Wards under the Jurisdiction of Kolkata Municipal Corporation (Zone-I)

Prepared by:

**KARMICK**  
SOLUTIONS  
IT. INNOVATION. DIGITAL  
ISO 9001:2015 Certified Company



To  
Chief Manager (SW&UPA)/Zn-I  
Kolkata Municipal Corporation  
5, S.N. Banerjee Road  
Kolkata 700013

**Ref: CM/UHP\_Survey/WO/Zn-I/1/2017-18**

Dear Sir,

With reference to the aforesaid Work Order, it is being conveyed that Karmick Solutions Pvt Ltd has been completed the entire assignment of GIS based Homeless Population Survey within jurisdiction of Zone-I (Br-I, II, III), KMC. We are submitting a "Final Project Report" regarding the above mentioned work for Zone-I.

Thanks & Regards

*Sourav Roy*



Sourav Roy

CEO  
Karmick Solutions Pvt Ltd  
116A Purbalok, Kolkata 700099



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## Executive Summary

### INTRODUCTION

As per the guidelines issued by The Ministry of Housing and Urban Affairs, Government of India, as communicated by SUDA, KMC is implementing "Shelter for Urban Homeless" component by providing shelter with all essential services to the Urban Homeless people in KMC area under NULM.

To assess the actual number of homeless, number of shelters required for Homeless in the KMC area, and for their rehabilitation, it is proposed by KMC to conduct a GIS based survey of the homeless in the wards under it.

Homelessness is a state of utter helplessness. Most people think they are not real people and they are in such a state because of their own deeds. Fundamental rights are denied to them. They for the remaining part of their lives live under make-shift shelters. Sometimes, they are forced to spend nights on railway platforms, pavements, pipes, and so on. No wonder, they are often subjected to extreme violence and continuous threat of exploitation. Due to rapid urbanization, homelessness has grown over the past year in many urban cities across the world.

In order to measure the magnitude of the problem, Karmick Solutions have been entrusted by Kolkata Municipal Corporation to conduct a survey of zone I of KMC which consists of Borough I to Borough III. A custom-made mobile app named 'Thikana' was developed, pre-loaded with a structured questionnaire. The application was used for the survey purpose. The survey was conducted at night hours.

### Significant findings that emerged from our survey are:

#### High Concentration points

A total number of 3477 homeless people were interviewed, out of which maximum were found to be staying alone and few with their respective families. A high percentage of homeless people were found living on the Dum Dum Metro Railway Station, Raja Manindra Road, Bagbazar Tram Depot, Paikpara Bus Stop, Canal West Road, Strand Bank Road, Canal East Road.



#### PROJECT AREA:

The present assignment covers the wards under Zone -I of KMC (Borough I, II, and III). This includes Tala Park, Paikpara, Cossipore, Sinthi, Bagbazar, Shyambazar, Maniktala, Phoolbagan, and Sovabazar. Each of these boroughs are further classified into several administrative wards. B.T. Road, Raja Manindra Road, Strand Bank Road, Gallif Street, Canal East Road, Canal West Road, CIT Road are one of the major roads that pass through maximum number of Wards in these Boroughs. Zone-I is situated in North-East part of Kolkata & maximum area covered by self-owned house & residential apartments. Huge numbers of Govt. & Non-Govt. offices are situated in this area.

#### Objectives of the Survey:

Survey would ensure following objectives, to

- Provide planners a detailed geo location based mapping of concentration areas of homeless populations in the wards under KMC.
- Establish the demographic profile of homeless populations within project AOI (Area of Interest)
- Identify official resources such as land and vacant buildings that can be deployed to provide the required infrastructure for shelters in appropriate location of each city/town.
- Establish the location and type of shelters needed in each city/town by gauging the specific needs of the beneficiaries



## Roles of GIS in Urban Homeless Population Survey

1. Geographical Information System commonly termed, as GIS is a technology to monitor, plan, & analyze geographical data to yield meaningful results. It essentially consists of two types of data namely spatial data & non spatial data. Spatial data consists of an electronic vector map converted from paper maps/scanned images. This process is known as vectorization & can be done through any GIS software. The non-spatial data consists of attributes data regarding a map entities attached to the vectorized objects on the map. This spatial & non spatial data together consists of a GIS system on which analysis can be done by performing queries & other GIS operations such as buffering & thematic generation.
2. One of the major advantages of GIS system is viewing of locations of Homeless Population & Proposed Urban Homeless Shelters in different layers & accordingly shortest route monitoring.
3. GIS mapping supports spatial decision making & strategic planning. It is a rapidly evolving area that continues to expand. Everybody wants information in usable formats & this has led to continual increase in GIS as it is easier to use, more intuitive, more analytic & more embedded within a variety of technologies.
4. Urban Homeless population spatial data can even be used for **territory planning** for future development of Urban Homeless Shelter, meaning that management will know how to deploy funds & manpower so that they don't overlap with each other territories.

## Advantages of the GIS based Survey

The Benefits of the system are as follows:

Functional:

- Allows the user to see the geographic location of the entire homeless population concentration within the Area of Interest (AOI).
- Enable viewing of layers & related information through maps and web based interfaces.
- Provide information on click.
- The users can enquire & generate report as per the attribute data.
- Enhance the process of decision making in a more appropriate and scientific manner.
- Attach any kind of data like photo, documents for the different locations.
- Can use color- coded thematic maps for better understanding.

- Entry & updating of data through web based interfaces for system administrators for the non-spatial attribute.
- Generates customized report as per Zone wise, Ward wise & even Road wise.
- The system would be capable of giving color coded information regarding potentially high populated & low populated zones.
- Gives correct depiction of linear, polygon and point features using GPS data.
- The entire information will upload in a Web based /Mobile application & need not be installed in any kind of desktop software.
- The solutions are deployed at a central server as designated by the client and access rights are given to client to various users to connect and work on it from anywhere using the internet or intranet as per the desire of the organization's desire.

#### **Technical:**

- Avoids duplication, misuse and data error using a centralized database.
- Highly secure with privileges to authentic users
- The authentic users can insert, update, delete maps & attribute data.
- Facility to set map layers
- Facility to click on map and get layer information
- Displays legends
- Identifies attributes attached to geographic features
- Use the clear section tool
- Generates MIS report based on queries

## **Scope of Work**

#### **The steps to be followed during the survey**

- Identifying the areas with concentration of homeless population,
- Profiling the homeless populations in these areas in terms of gender, age, education, occupation, marital status, number of children, history of illness etc. persons with disability should be categorized separately.
- Identifying the aspirations of the homeless for a shelter and also the deterrents preventing the homeless from using the existing shelters, if any



- Broadly identifying the possible buildings and locations where new shelters can be built and duly display on the map by geo tagging them
- The information should be recorded and collated by each team. To ensure faster survey results, data entry should be done in parallel with the survey along with photograph and Geo tagging of each homeless person.

**The following deliverables are expected out of this process at this stage:**

- Map should indicate the locations of all the scattered as well as clusters of homeless people.
- Collated survey results
- Determination of shelter locations, types, number of shelters required in an area, plus available resources in terms of land and building.
- Finalized resource mapping questionnaire for the next stage of resource mapping.

### **Resource Mapping**

The next step is to conduct a resource mapping exercise. The resources that this phase of the survey seeks to identify are

- a) Existing shelters;
- b) Unutilized or underutilized government buildings that can be possibly redeployed as shelters after suitable refurbishing; and
- c) Vacant lands that are suitable potential sites for new shelter buildings.

**At the end of this process, the following deliverable are expected:**

- Field resource mapping survey of all the identified potential buildings and shelter locations
- Determination of the feasibility of the identified buildings and locations for building/ upgrading shelters, along with government agencies
- Collating results and submitting to KMC.
- Discussions on recommendations to be put forth in the report.

### **Karmick's execution Plan**

- A. We had assigned two persons as one team for the task of field survey for each ward of the selected boroughs. Each team was equipped with one Android smartphone and one hand-held GPS device (Trimble Juno SB) for conducting the task of survey.
- B. An android mobile application (Thikana) was developed by our skilled app developers & this application was successfully installed on the mobile devices of each team members.



- C. We had instructed them to perform this Survey between 10:00 PM and 6:00 AM to reach out to the maximum number of homeless people living in each ward.
- D. We gave through training to each team member involved in the task of survey while keeping in mind the fact that our survey questionnaire was already featured in the mobile app installed on their mobile devices. So, the training was on as follows.....
- Imparted them the knowledge on how they should input data collected from each of the respondents (homeless people) into respective data fields of the questionnaire.
  - Made them understand how they have to capture the images of each homeless people with their Android smartphone after successfully completing their interview process for each. (Note: They need to capture three images of the each people in three different camera angles -Frontal, left and right.)
  - Ensured that they know the right method to make use of the given base map for each ward provided to them by Kolkata Municipal Corporation (KMC) to cover each major and minor road of the respective wards in order to reach each and every homeless person living in those wards.
  - To make it sure that during the survey, survey team members assigned for each ward do not accidentally enter into the neighboring ward and therefore do not cause any overlapping of survey data.

Annexure II QUESTIONNAIRE for SURVEY OF HOUSELESS POPULATION															
Latitude										Longitude					
Name of Corporation/ Municipality: Kolkata Municipal Corporation										Ward		Form No.			
Name of Street/Location										Nearest Landmark					
Full Name of Respondent										Father/ Husband's Name in Full					
Present Living Status: (Mention Name of the Street/ Railway Platform/ Bus Shed Stop/ Flyover/ Market Name etc.)										Street/ Footpath Railway Bus Shed Under Flyover Marketplace Other Landmark(Please Specify)		Place of Origin			
Living in State Location										Yes/ No		Living Since (Date or Year)			
Whether BPL Card/ Voter Card/ Aadhaar/ any photo identity (Govt. Provided) Holder										Yes/ No		Whether any type of ration card Holder (Please mention type and number of card)		Yes/ No	
Whether willing to avail of Govt. Arranged shelter										Yes/ No		If No. Please write reason for deterrents from using shelters			
Details of Respondent & Family Member Physically Found															
Full Name	Photo number	Relation with Respondent	Age	Sex	Marital Status	Physically Challenged	Mentally Challenged	Literate	Educational Qualification	Occupation	Monthly income(Rs)	Personal Identification Mark	Place of Occupation	Habits	Reason for Stay at KMC sites
		Self				Yes/ No	Yes/ No	Yes/ No							
						Yes/ No	Yes/ No	Yes/ No	Pre-primary / Primary						
						Yes/ No	Yes/ No	Yes/ No	Eight Std. / Secondary / HS / Graduate / PG						
						Yes/ No	Yes/ No	Yes/ No							
						Yes/ No	Yes/ No	Yes/ No							

Age on 01/01/2018 : Marital Status: N=Never Married/ D=Divorced/ W=Widow/ Widower/ DS=Deserted, Sex: M=Male/F=Female, O= Others

Signature of Enumerator

## Survey Instruments Specification

Karmick Solutions used Handheld GPS along with installed Mobile App for Homeless population survey.



### Features

- 4G cellular data and voice call capability
- Feature packed, fully integrated solution
- 5 megapixel camera
- High-sensitivity GPS receiver
- Long life battery for all-day use

## Karmick's Methodology

Karmick Solutions involved 56 people for the task of field survey, Map preparation, Web & Mobile Application Development & data hosting.

### A. Development of Mobile & Web Application "THIKANA"

At first a web & mobile based database handling system is developed by Karmick for handling the above mentioned spatial and non-spatial data for the entire AOI of KMC.

Development of web and expansion of the internet provided to key capabilities that can greatly help KMC. First, the web allowed visual interaction with data. By setting up a web server, client can produce maps. Since the map and charts are published on the internet, other clients can view the updates, helping to speed up the evaluation process. Second because of the near ubiquitous nature of the internet, the geospatial data can be widely accessible, clients can work on it from almost in any location. Both these features will alter the way GIS specialists will do their work in the very near future. The combination of easy access to data and visual presentation addresses some of the primary difficulties in performing GIS specialists' evaluations.

The application provides user friendly WEB based GUI (Graphic User Interface), which is very intuitive and user friendly such that the most important features are available with a few mouse clicks or a few keystrokes.



The application is completely network compliant and fetches and updates data from server via normal networking protocols. The software would be able to connect to any network database and performs database modifications corresponding to the locking protocols as per the RDBMS concepts. The software connects to an existing user and to existing database simultaneously.

### **Features of the developed application:**

#### **General Features**

- Take Picture of Homeless people with a click
- Helps in layout and printing
- Gives information on click
- Spatial and non-spatial Queries
- Search Facilities
- Generates various MIS Report

The developed application different kinds of information in various layers and retrieve information on clicks. It has search facilities. The users would have the facility to search from the existing database. The search facility would be provided in combination of different fields. It also has the features to include further surveyed data in future. The web system is such that on taking the cursor to the entity it the relevant information and photograph wherever available.

### **Overview of the Web & Mobile Application**

#### **Admin Login page Desktop Application**





## Desktop Application Home page



The screenshot shows the 'Application List' page of a desktop application. It features a table with 12 columns: S.No, Application Name, Number of Users, Status, Type, Name of Institution, National Curriculum, Full Name, Address, Contact Number, Email, and Remarks. The table contains 10 rows of data, including applications like 'English Medium School', 'Hindu College', and 'Jyoti's School'.

S.No	Application Name	Number of Users	Status	Type	Name of Institution	National Curriculum	Full Name	Address	Contact Number	Email	Remarks
1	English Medium School	100	Active	10001	English Medium School	English Medium	Shri. S. S.	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100
2	Hindu College	100	Active	10002	Hindu College	Hindu College	Shri. S. S.	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100
3	Jyoti's School	100	Active	10003	Jyoti's School	Jyoti's School	Shri. S. S.	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100
4	English Medium School	100	Active	10004	English Medium School	English Medium	Shri. S. S.	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100
5	English Medium School	100	Active	10005	English Medium School	English Medium	Shri. S. S.	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100
6	English Medium School	100	Active	10006	English Medium School	English Medium	Shri. S. S.	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100
7	English Medium School	100	Active	10007	English Medium School	English Medium	Shri. S. S.	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100
8	English Medium School	100	Active	10008	English Medium School	English Medium	Shri. S. S.	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100
9	English Medium School	100	Active	10009	English Medium School	English Medium	Shri. S. S.	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100
10	English Medium School	100	Active	10010	English Medium School	English Medium	Shri. S. S.	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100

## Admin Login page Mobile application



The screenshot shows the 'Admin Login' page of a mobile application. It features a blue header with the 'ठिकाना' logo and name. Below the header, there is a white login form with fields for 'User Name' and 'Password'. A 'Forgot Password?' link is located below the password field. A blue 'Login' button is at the bottom of the form. At the very bottom, there is a link that says 'Don't have an account? Create now!'. The mobile status bar at the top shows the time as 15:45.

## B. Field Survey & Final Homeless Data Base Preparation

After the development of Mobile application, our survey teams started the task of the field survey from one corner of the ward map assigned to them and the entire survey task was supervised by our skilled professional. They were given the following mobile devices before the commencement of their task:

- Android-based smartphone pre-installed with 'Thikana' app
- Handheld GPS device for finding the GPS coordinates of homeless people.
  - As per the given questionnaire feature in the 'Thikana' app, survey team members interviewed each of the homeless person/head of the homeless family they found on their survey route in each ward assigned to them by their supervisor. They simultaneously entered the answers in respective data fields in the app itself.
  - After successful completion of the interview of each respondent, one member from the two-person team capture three images of the respondent from three distinct camera angles with his Android mobile device.
  - The survey data including the images collected by each team was then used to create borough wise maps in GDB (Geo database) format. Then we create borough wise GDB geo-tagged with photo of each respondent.
  - Then we uploaded all data to previously developed web-based application using PHP technology. We uploaded the collected survey data along with images over there and ensured only authorized users can access that data.



### **CASE STUDY 1:**

**Name:** Poamila Adhekary (50 years old female)

**Locality:** Our survey team found him opposite footpath of "Bagbazar Tram Depot" on Gallif Street which is under Ward No 7 of Borough I, KMC.

Poamila came to Kolkata in the year 2012 from Bihar. She lives at above mentioned place under a plastic shed. He works as a Beggar in North Kolkata & earns Rs. 500.00 per month. She has no permanent address & used to sleep Road Side/Footpath nearing his present place of Work.



### **CASE STUDY 2:**

**Name:** Ajit Mondal (65 years old male)

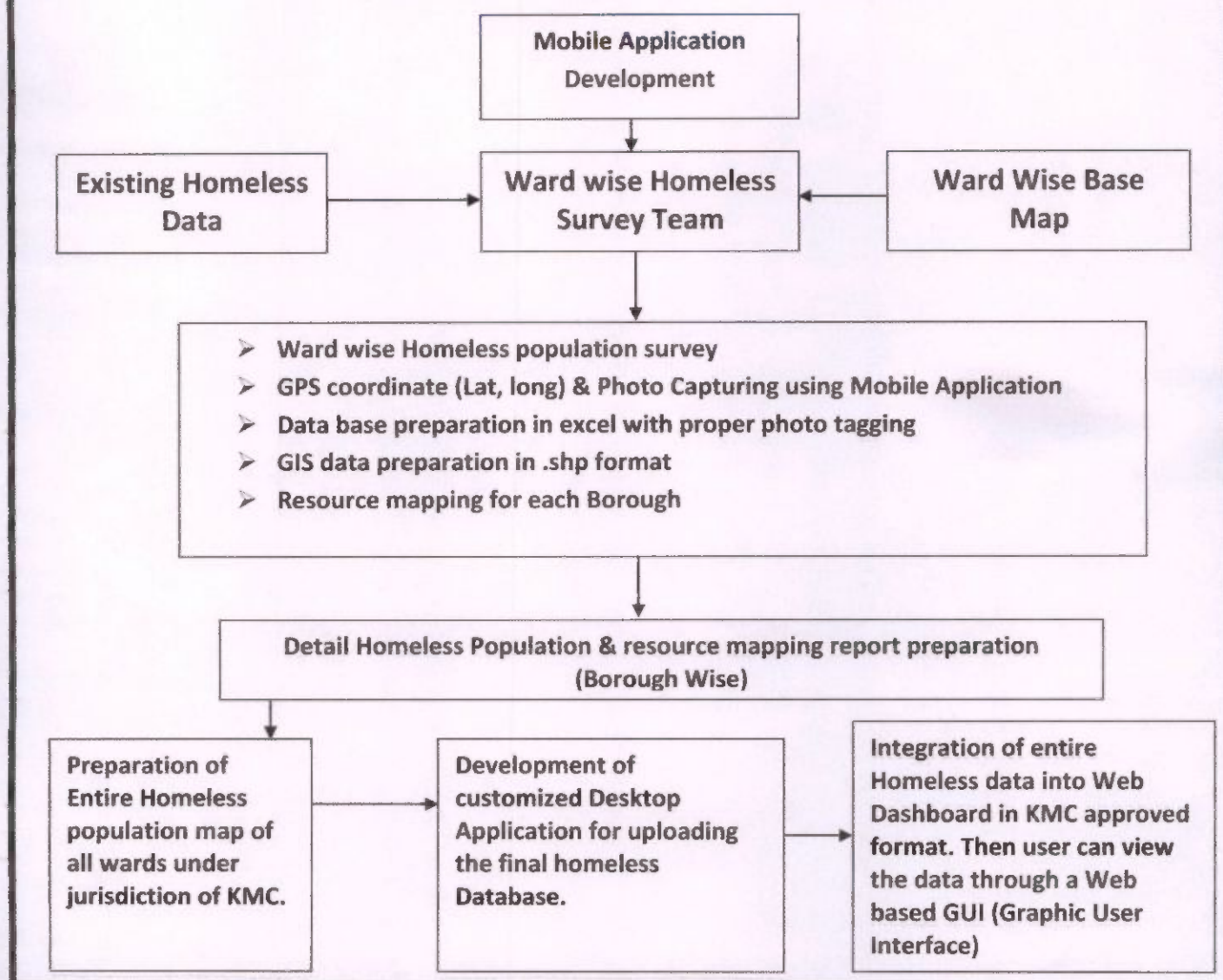
**Locality:** Our survey team found him near "Swastick Wood Products" on Canal East Road, which is under Ward No 14 of Borough III, KMC.

Ajit came to Kolkata in the year 2015 from Purulia. He belongs from farmer family. Then he came to Kolkata for some income. He not knows anything except farming. So, he works as a beggar in Paikpara & earns Rs. 550.00 per month. He has no permanent address & used to sleep Road Side/Footpath. At the time of survey he describes his condition & he eagerly looking for a shelter from Govt.





## PROCESS FLOW DIAGRAM



### Karmick's Project execution timeline

Zone No	Borough No	Total Number of Ward	Survey Start Date	Survey Completion Date	Final Data delivery Date (including GIS)	Homeless population Found
I	Borough I	9	11/3/2018	18/3/2018	20/3/2018	878
	Borough II	9	9/3/2018	19/3/2018	21/3/2018	1026
	Borough III	9	13/3/2018	21/3/2018	22/3/2018	1573
<b>Total</b>		<b>27</b>				<b>3477</b>

## System Implementation & Hosting

Our development was completed & the Web application was to be installed. The software would be installed in the Web server of KMC.

Following would be the Technical Requirements & Specification Required:

**Operation System Platform Required** – Linux Server (Apache 2.4), (PHP 7 to be installed)

**Database** – MySQL 5.6

**Server Specification** – HP Proliant DL 360 G6 or Equivalent -- (2 in quantity, one main server & another is backup)

- Quad Core Intel Xeon E5504 Processor (2GHz, 80 Watts)
- 4 MB (1X4MB) Level 3 Cache
- 8 GB (4X2 GB) Standard; PC3 – 10600E (DDR3-1333) Un buffered
- HP Smart Array P410i zero memory Module
- 460W Hot Plug Power Supply
- Redundant RFK Std
- 1 TB SAS HDD

**Internet Lease Line: 6 mbps for 40-50 Concurrent Users** to implement secured internet, department need to put in a proper infrastructure of Router, virus protection and secured layers of both hard devices and software

**User System Specification** – Any System with Internet Connection and Internet Explorer/Mozilla Firefox/Chrome Browser will be able to use the software.

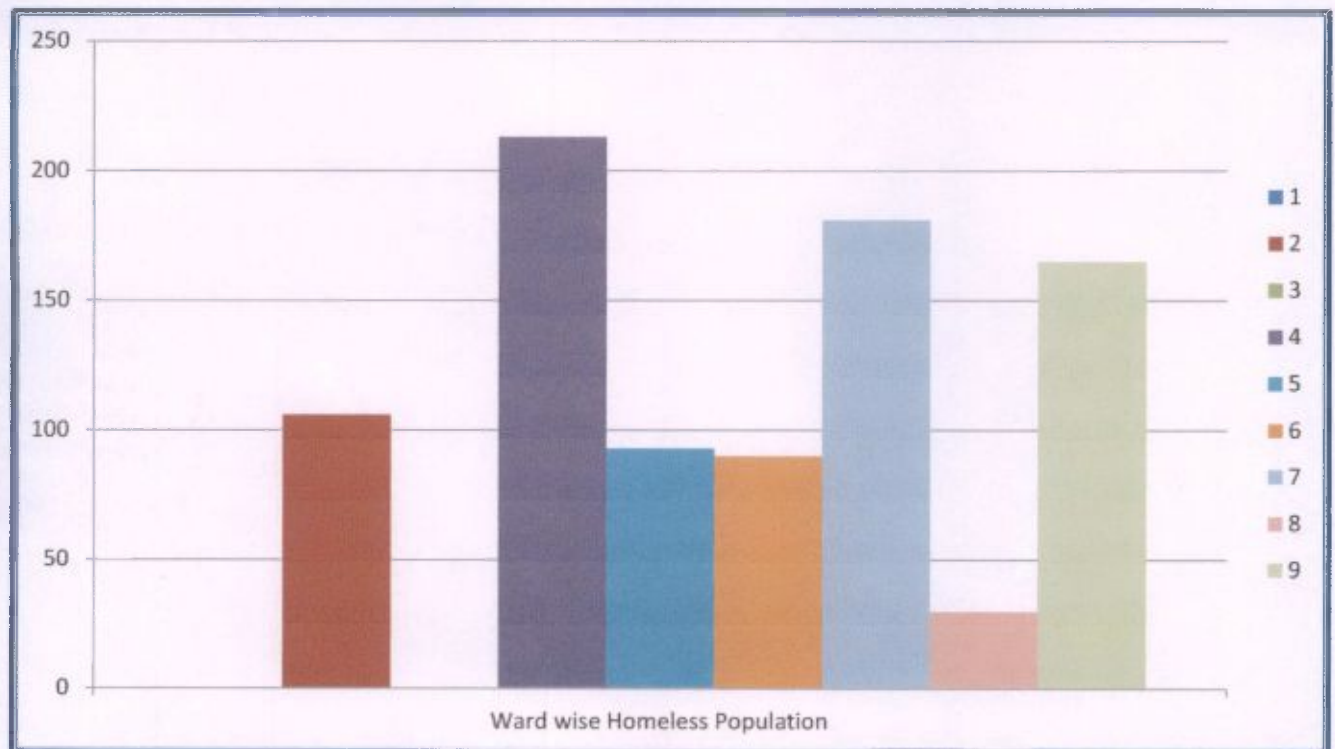
**Borough wise  
Project Output of  
Homeless Population Data  
Zone-I**



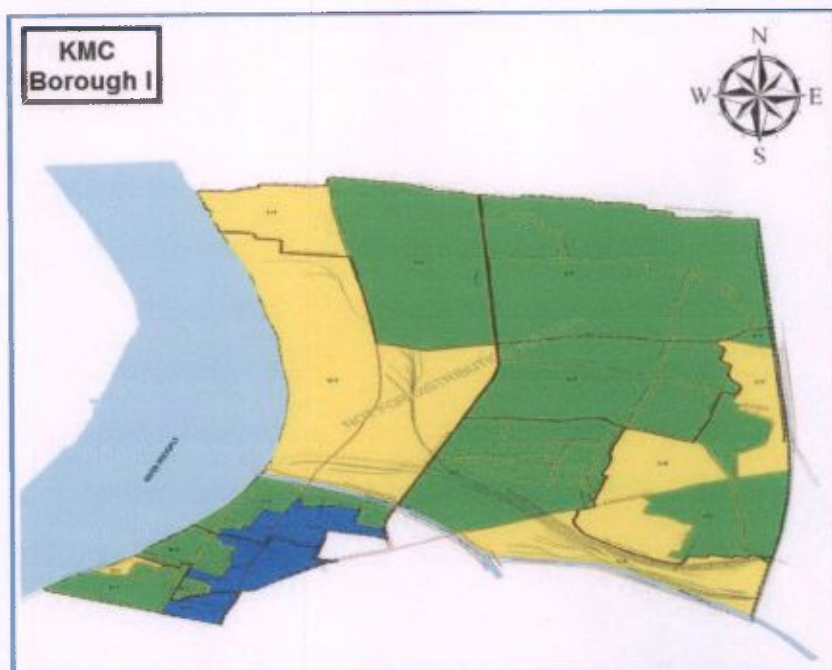
# Detail of Homeless Population Data Borough-I

We have started field survey on 11/03/2018 & completed the entire survey job on 18/03/2018. We found following Homeless population data after survey.

Borough	Total number of wards	Ward No.	Homeless People Found during Survey
<b>I</b>	<b>9</b>	1	0
		2	106
		3	0
		4	213
		5	93
		6	90
		7	181
		8	30
		9	165
		<b>Total</b>	<b>878</b>



## Project Area:



Ward No	Boundary	Details
1	North	Pramanick Ghat Road, Cossipore Road and Kasinath Dutt Road
	South	Khagendra Chatterjee Road and Rustomjee Parsee Road
	East	Barrackpore Trunk Road
	West	Cossipore Road, Rustomjee Parsee Road and the River Hooghly
2	North	Kali Charan Ghosh Road and Ram Krishna Ghose Road
	South	Dum Dum Road
	East	The Eastern Railways
	West	Barrackpore Trunk Road
3	North	Dum Dum Road, Umakanta Sen Lane, Paikpara Raja Manindra Road and Kshudiram Bose Sarani
	South	Jiban Krishna Ghose Road
	East	The Eastern Railways
	West	Anath Nath Deb Lane, Paikpara Row, Beerpara Lane and Indra Biswas Road
4	North	Dum Dum Road
	South	Paikpara Raja Manindra Road and Umakanta Sen Lane
	East	Paikpara Row and Beerpara Lane
	West	Barrackpore Trunk Road
5	North	Paikpara Raja Manindra Road and Jiban Krishna Ghosh Road
	South	Kshudiram Bose Sarani, The New Canal and the Circular Canal
	East	Anath Nath Deb Lane, Indra Biswas Road and the Eastern Railways
	West	Barrackpore Trunk Road and Jiban Krishna Ghosh Road



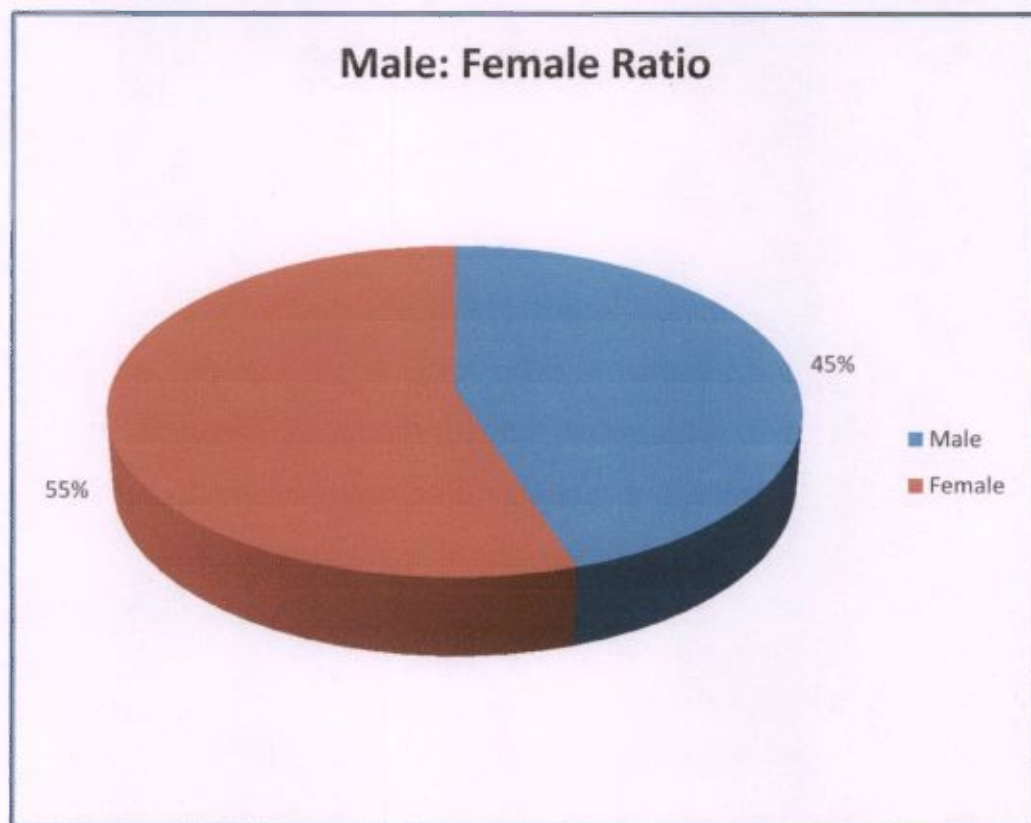
6	North	Rustomjee Parsee Road and Khagendra Chatterjee Road
	South	The Circular Canal
	East	Rustomjee Parsee Road, Cossipore Road and Barrackpore Trunk Road
	West	The River Hooghly
7	North	The Circular Canal
	South	Baghbazar Street, Ma Sarada Moni Sarani, Nivedita Lane, Ramkanta Bose Street and Sarkarbari Lane
	East	Bidhan Sarani, Sachin Mitra Lane and Girish Avenue
	West	The River Hooghly
8	North	Sarkarbari Lane, Nivedita Lane, Ma Sarada Moni Sarani and Ramkanta Bose Street
	South	Bhupendra Bose Avenue, Shambazar Street, Raja Naba Kissen St., Kumartuli Street, Durgacharan Banerjee St, Gopeswar Paul St.
	East	Sachin Mitra Lane
	West	The River Hooghly, Girish Avenue and Rabindra Sarani
9	North	Kumartuli Street, Durga Charan Banerjee Street, Raja Naba Kissen street, Shambazar Street and Gopeswar Paul St.
	South	Sovabazar Street and Shri Aurobindo Sarani
	East	Jatindra Mohan Avenue and Rabindra Sarani
	West	The River Hooghly



Some more socio-economic findings are evaluated from this homeless people survey data under KMC Borough I.

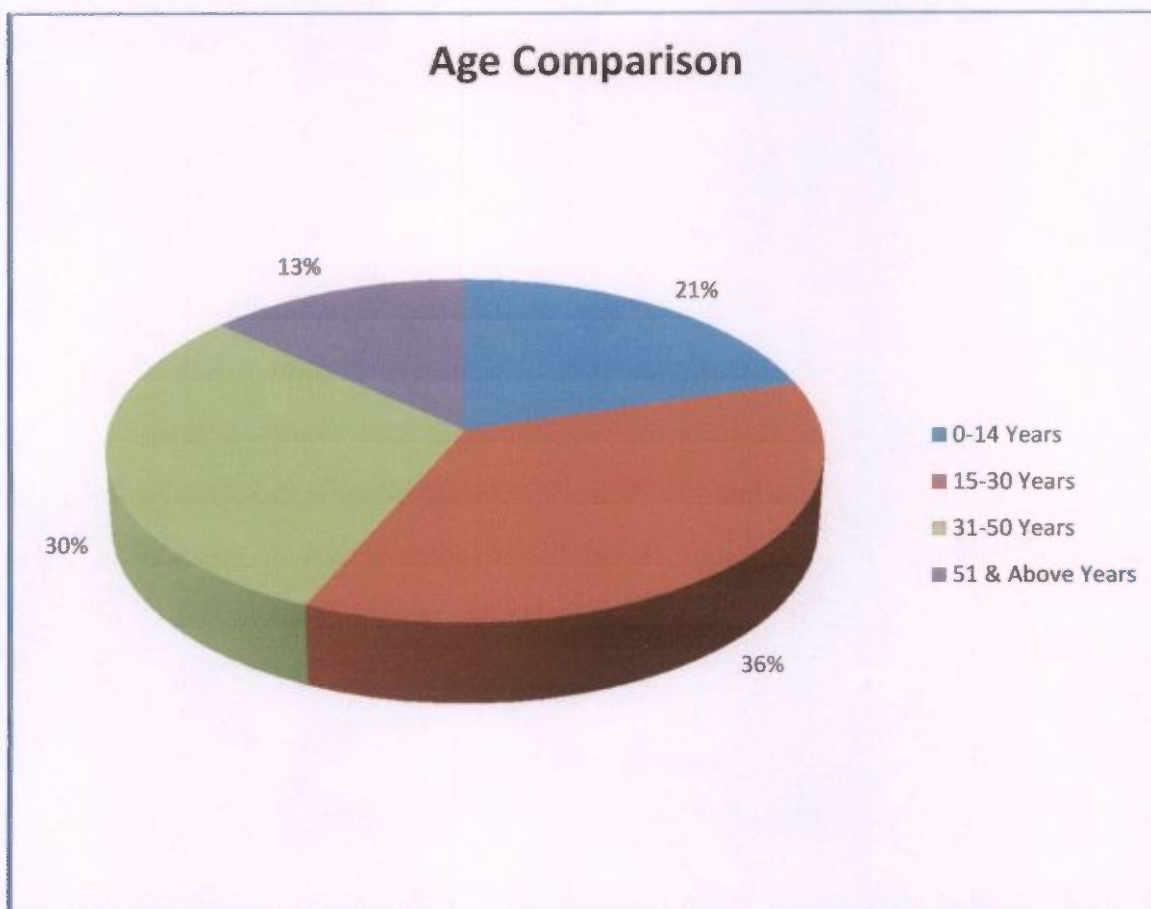
### 1. Sex Ratio:

Borough	Ward No.	Sex Ratio	
		Male	Female
1	1	0	0
	2	48	58
	3	0	0
	4	106	107
	5	44	49
	6	43	47
	7	62	119
	8	14	16
	9	78	87
	<b>Total</b>	<b>395</b>	<b>483</b>



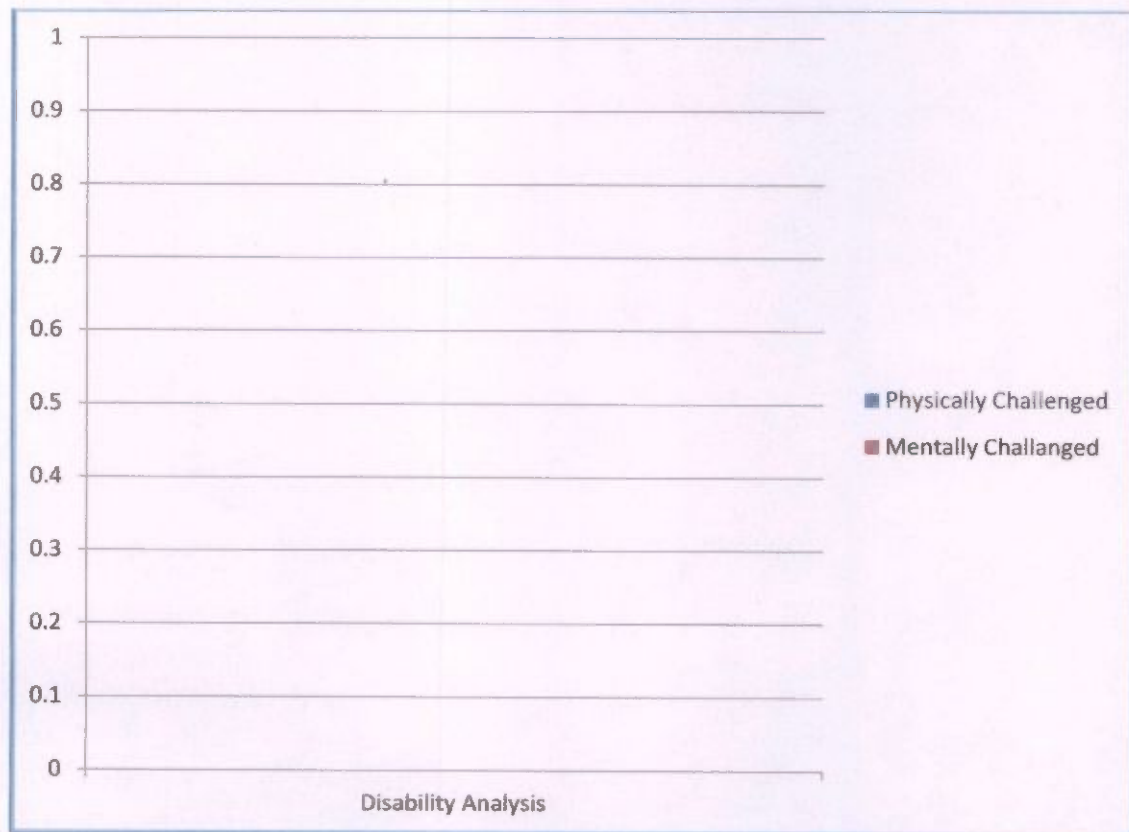
## 2. Age Comparison:

Borough	Ward No.	Age Comparison			
		0-14 Years	15-30 Years	31-50 Years	51 & Above Years
I	1	0	0	0	0
	2	26	30	28	22
	3	0	0	0	0
	4	90	73	41	9
	5	30	37	18	8
	6	25	30	23	12
	7	2	83	66	30
	8	5	11	8	6
	9	1	53	81	30
	Total	179	317	265	117



### 3. Disability Analysis:

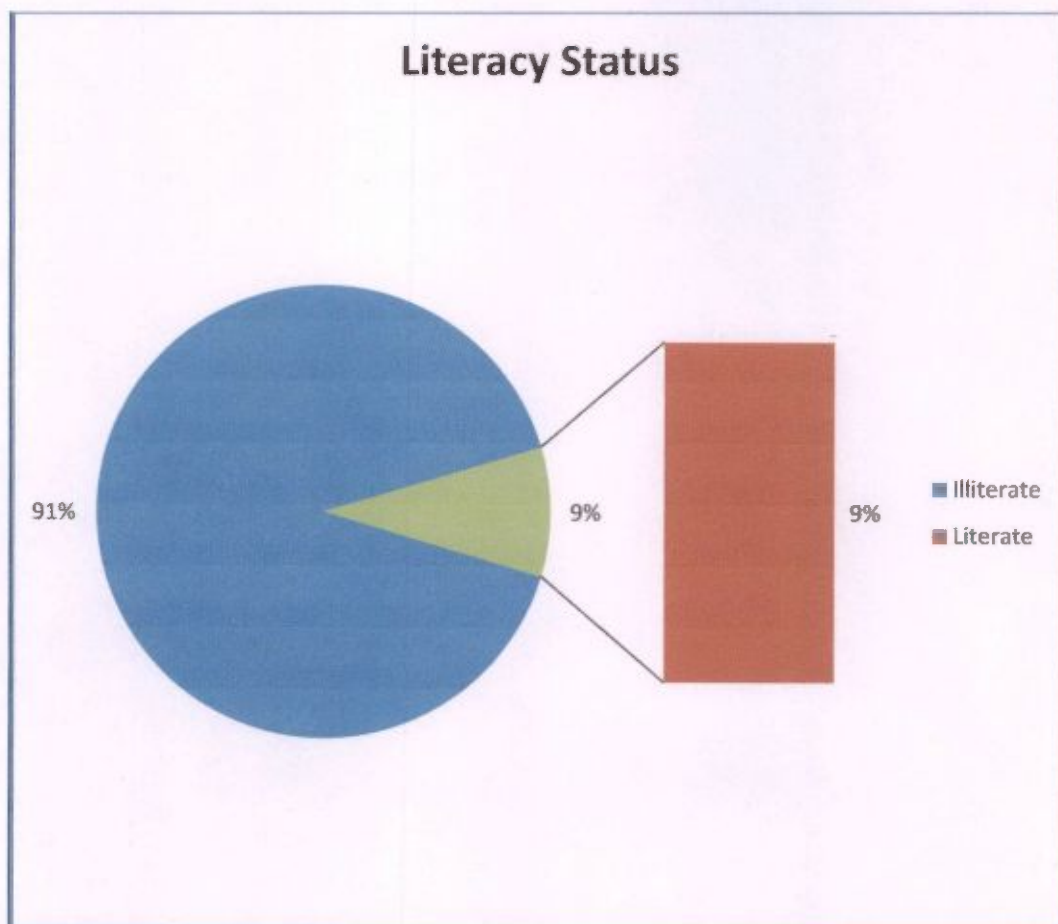
Borough	Ward No.	Disability Analysis	
		Physically Challenged	Mentally Challenged
I	1	0	0
	2	0	0
	3	0	0
	4	0	0
	5	0	0
	6	0	0
	7	0	0
	8	0	0
	9	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>





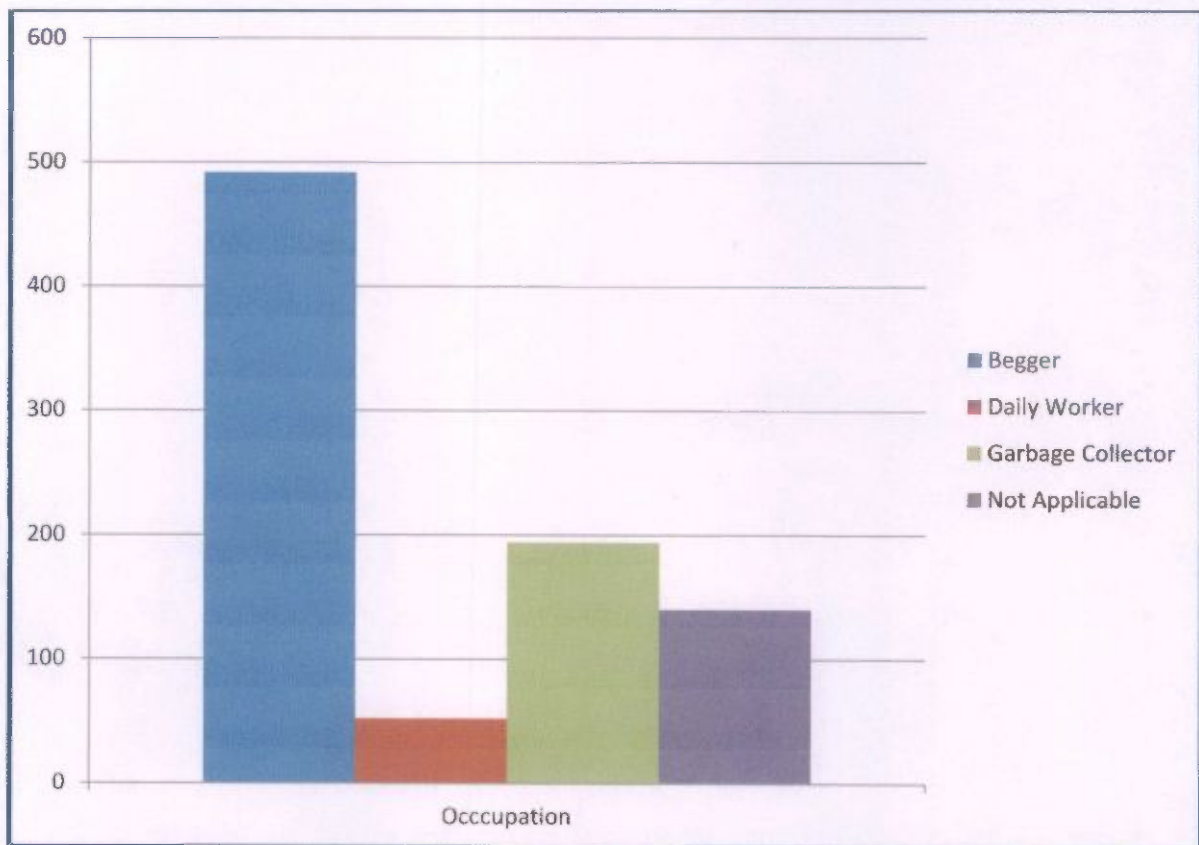
#### 4. Literacy Status:

Borough	Ward No.	Literacy Status	
		Illiterate	Literate
I	1	0	0
	2	85	21
	3	0	0
	4	187	26
	5	92	1
	6	88	2
	7	172	9
	8	28	2
	9	145	20
	<b>Total</b>	<b>797</b>	<b>81</b>



## 5. Occupation Analysis:

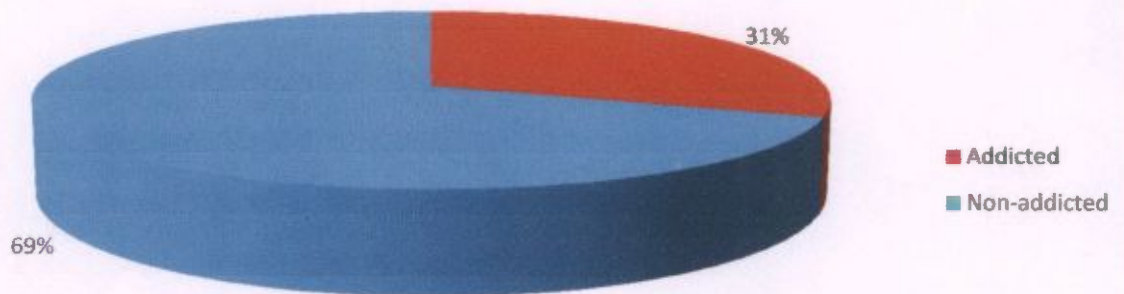
Borough	Ward No.	Occupation Analysis			
		Beggar	Daily Worker	Garbage Collector	Not Applicable
I	1	0	0	0	0
	2	63	0	22	21
	3	0	0	0	0
	4	78	20	46	69
	5	56	0	12	25
	6	47	0	22	21
	7	124	8	48	1
	8	19	0	8	3
	9	105	24	36	0
	<b>Total</b>	<b>492</b>	<b>52</b>	<b>194</b>	<b>140</b>



## 6. Drug Addiction Data:

Borough	Ward No.	Drug Addiction Data	
		Addicted	Non-addicted
I	1	0	0
	2	32	74
	3	0	0
	4	16	197
	5	20	73
	6	27	63
	7	119	62
	8	1	29
	9	53	112
	<b>Total</b>	<b>268</b>	<b>610</b>

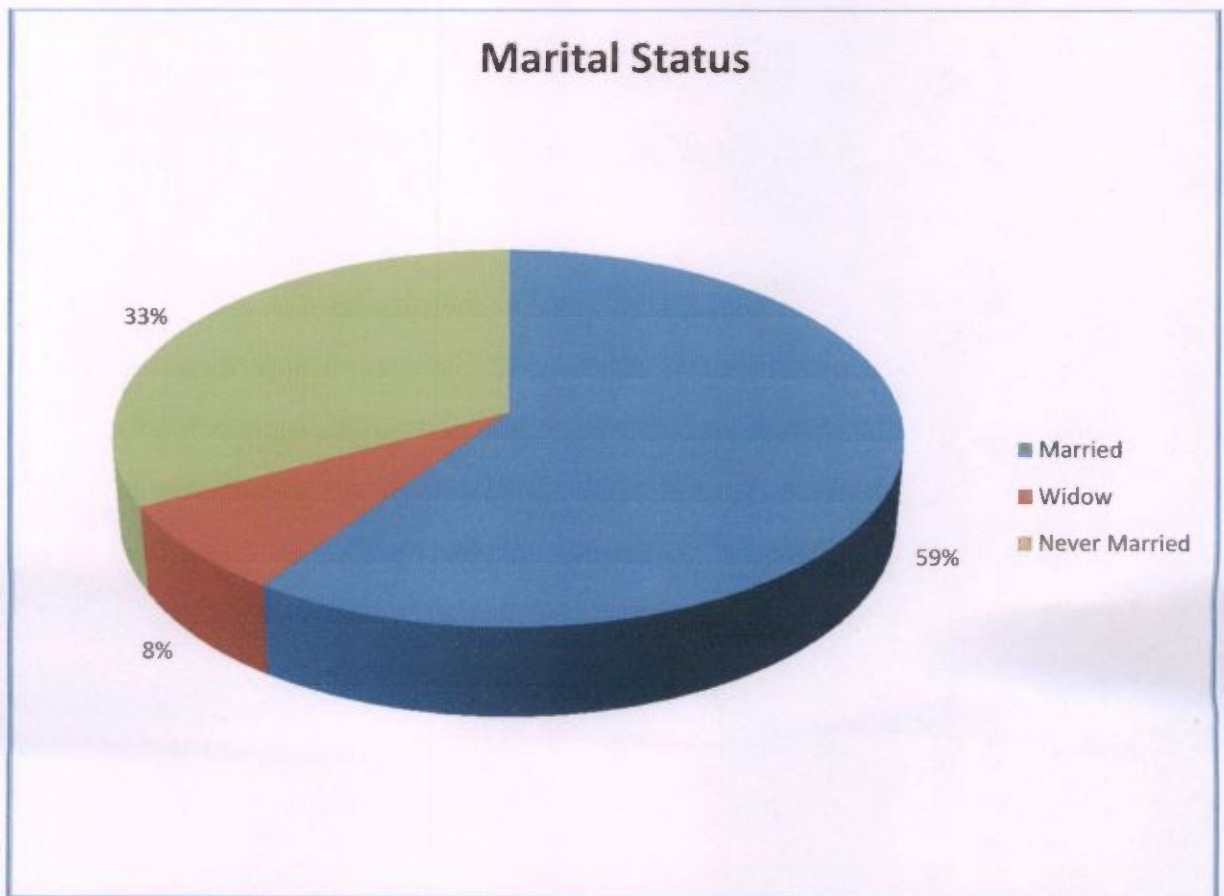
**Drug Addiction Data**





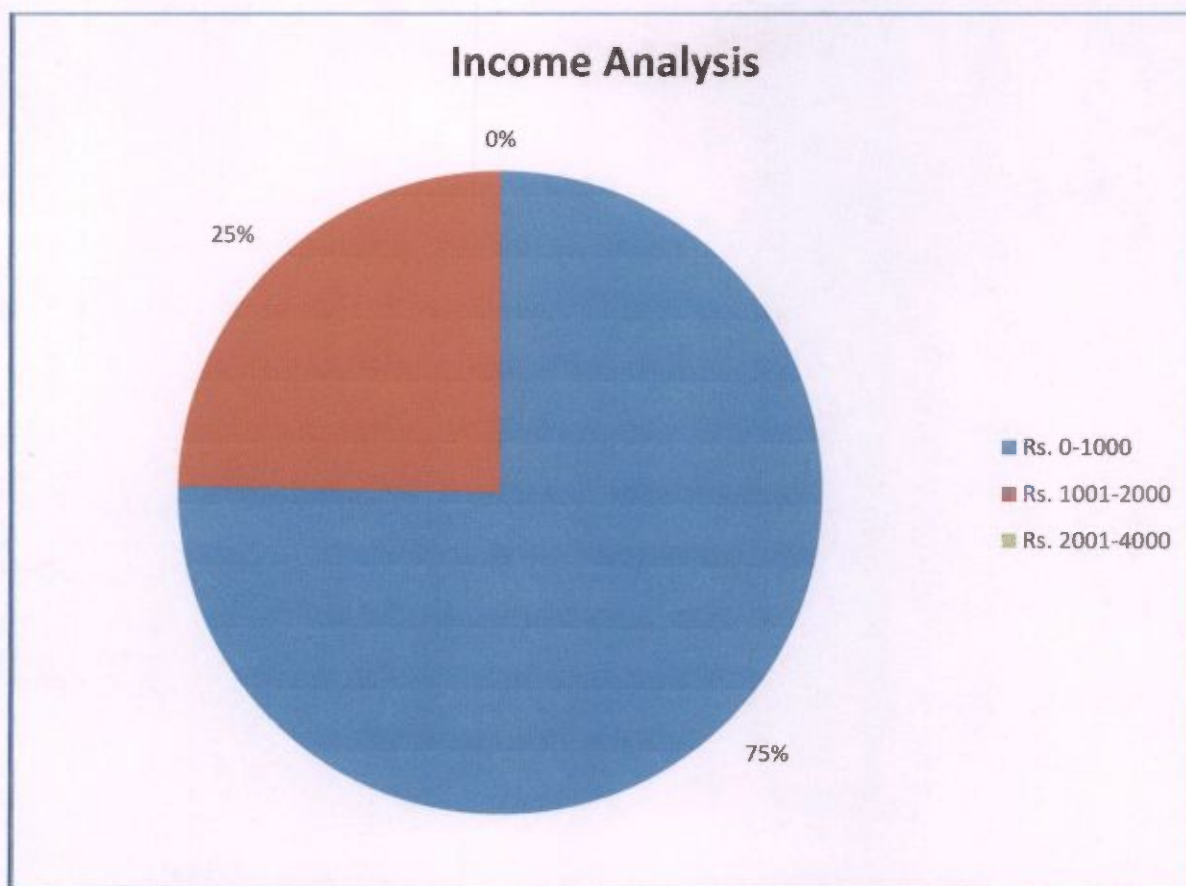
## 7. Marital Status:

Borough	Ward No.	Marital Status		
		Married	Widow	Never Married
I	1	0	0	0
	2	47	7	52
	3	0	0	0
	4	94	8	111
	5	48	2	43
	6	43	6	41
	7	149	19	13
	8	19	2	9
	9	121	23	21
	<b>Total</b>	<b>521</b>	<b>67</b>	<b>290</b>



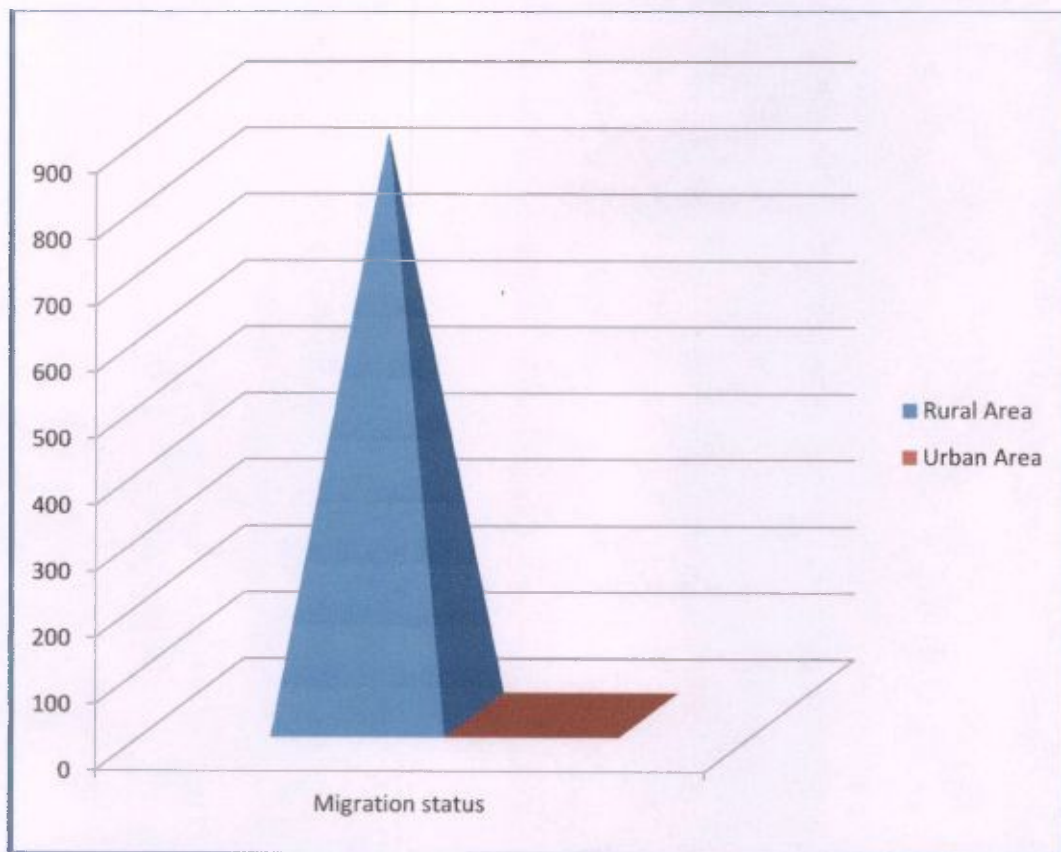
## 8. Income Analysis:

Borough	Ward No.	Income Analysis		
		Rs. 0-1000	Rs. 1001-2000	Rs. 2001-4000
I	1	0	0	0
	2	85	21	0
	3	0	0	0
	4	164	49	0
	5	80	13	0
	6	68	22	0
	7	128	53	0
	8	22	8	0
	9	114	51	0
	<b>Total</b>	<b>661</b>	<b>217</b>	<b>0</b>



## 9. Migration Status

Borough	Ward No.	Migration Status	
		Rural Area	Urban Area
I	1	0	0
	2	106	0
	3	0	0
	4	213	0
	5	93	0
	6	90	0
	7	181	0
	8	30	0
	9	165	0
	<b>Total</b>	<b>878</b>	<b>0</b>

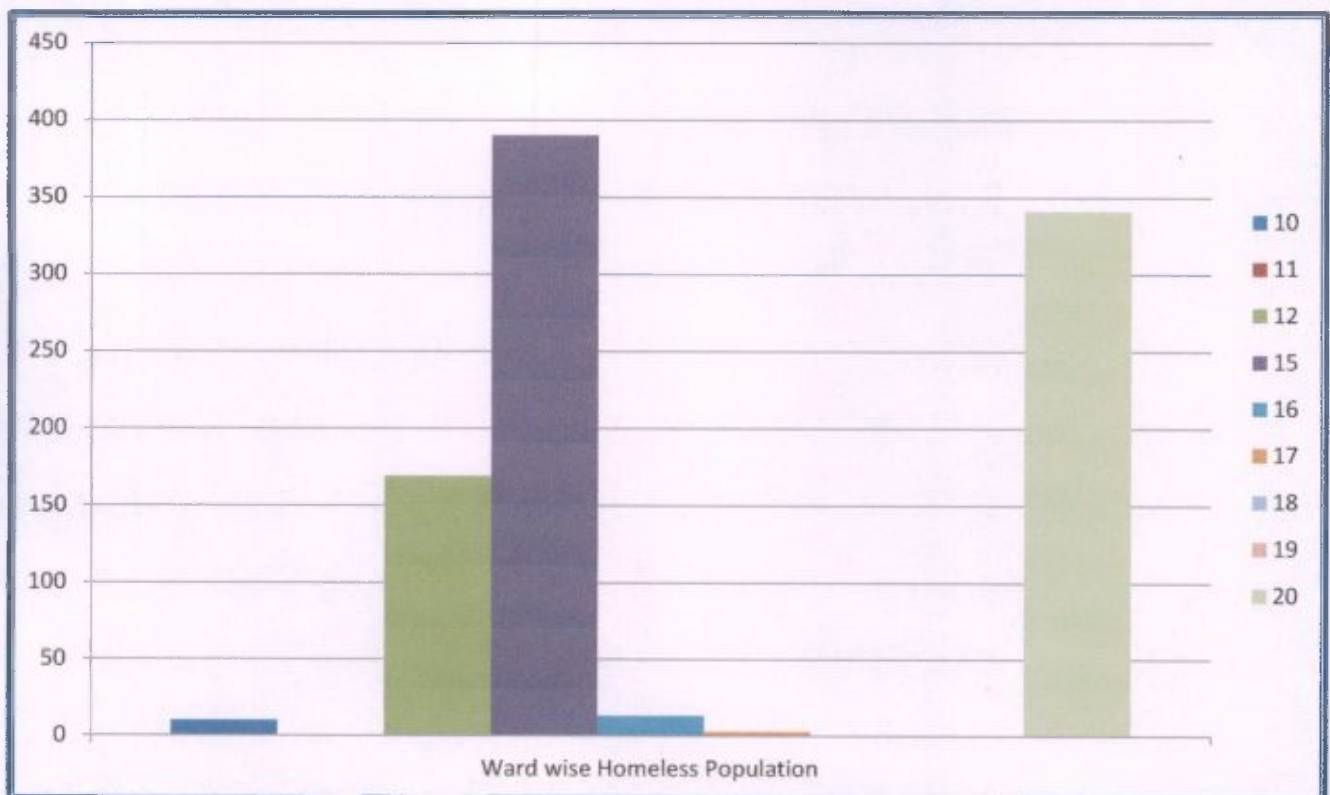




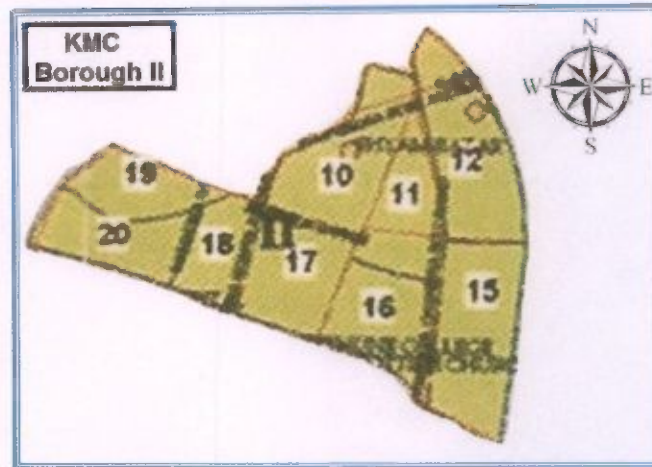
# Detail of Homeless Population Data Borough-II

We have started field survey on 09/03/2018 & completed the entire survey job on 19/03/2018. We found following Homeless population data after survey.

Borough	Total number of wards	Ward No.	Homeless People Found during Survey
II	9	10	10
		11	0
		12	269
		15	390
		16	13
		17	3
		18	0
		19	0
		20	341
		<b>Total</b>	<b>1026</b>



## Project Area:



Ward No	Boundary	Details
10	North	Shambazar Street, Bhupendra Bose Avenue and Baghbazar Street
	South	Ramkanta Bose Street and Shri Aurobindo Sarani
	East	Bidhan Sarani
	West	Jatindra Mohan Avenue and Sachin Mitra Lane
11	North	Junction of Bidhan sarani and Acharya Prafulla Ch. Road
	South	Raja Raj Khrishna Street
	East	Acharya Prafulla Ch. Road
	West	Bidhan Sarani
12	North	The Circular Canal
	South	Shri Aurobindo Sarani
	East	The Circular Canal
	West	Acharya Prafulla Ch. Road and Bidhan Sarani
15	North	Shri Aurobindo Sarani
	South	Vivekananda Road
	East	The Circular Canal
	West	Acharya Prafulla Ch. Road
16	North	Raja Raj Krishna Street
	South	Abhedananda Road
	East	Acharya Prafulla Ch. Road
	West	Bidhan Sarani

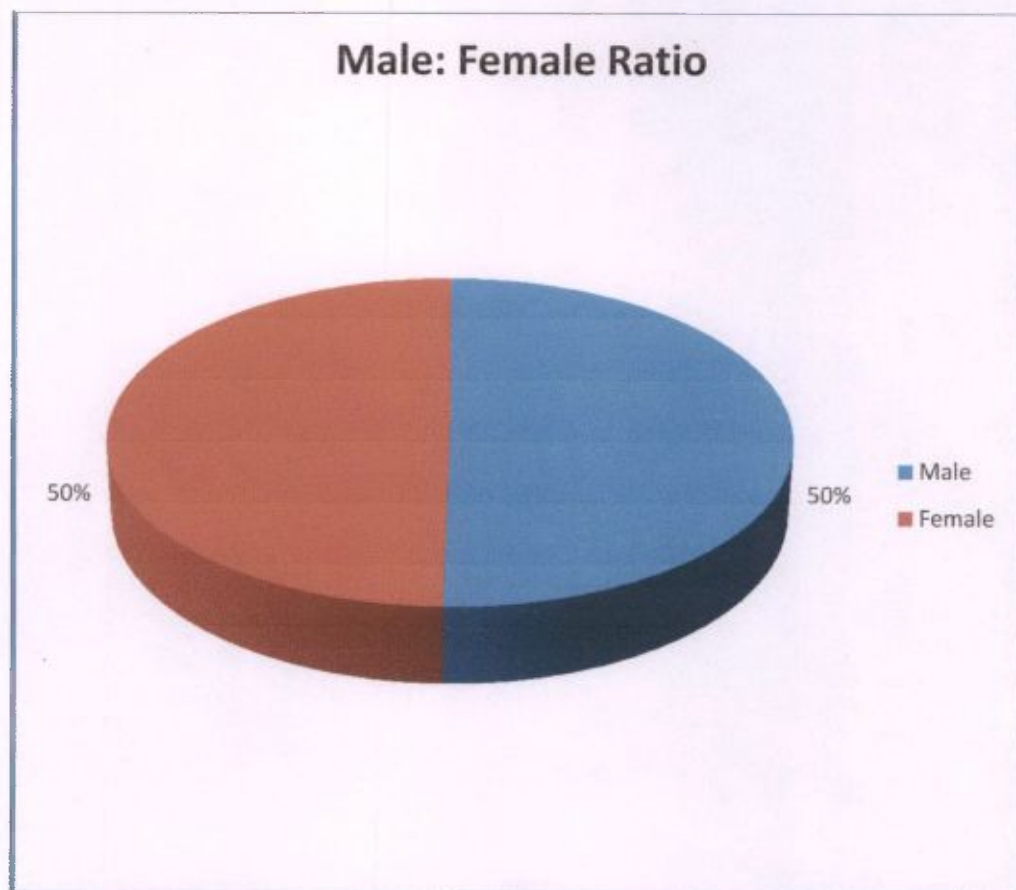
<b>17</b>	North	Shri Aurobindo Sarani
	South	Beadon Street
	East	Bidhan Sarani
	West	Jatindra Mohan Avenue
<b>18</b>	North	Shri Aurobindo Sarani
	South	Beadon Street
	East	Jatindra Mohan Avenue
	West	Rabindra Sarani
<b>19</b>	North	Sovabazar street
	South	B.K. Paul Avenue, Ahiritola Street and its continuation upto the River hooghly
	East	Rabindra Sarani
	West	The River Hooghly
<b>20</b>	North	Butto Kristo Paul Avenue, ahiritola Street and its continuation upto the River Hooghly
	South	Nimtala Ghat Street and Port Trust Road leading to Nimtola Ghat
	East	Rabindra Sarani
	West	The River Hooghly



Some more socio-economic findings are evaluated from this homeless people survey data under KMC Borough II.

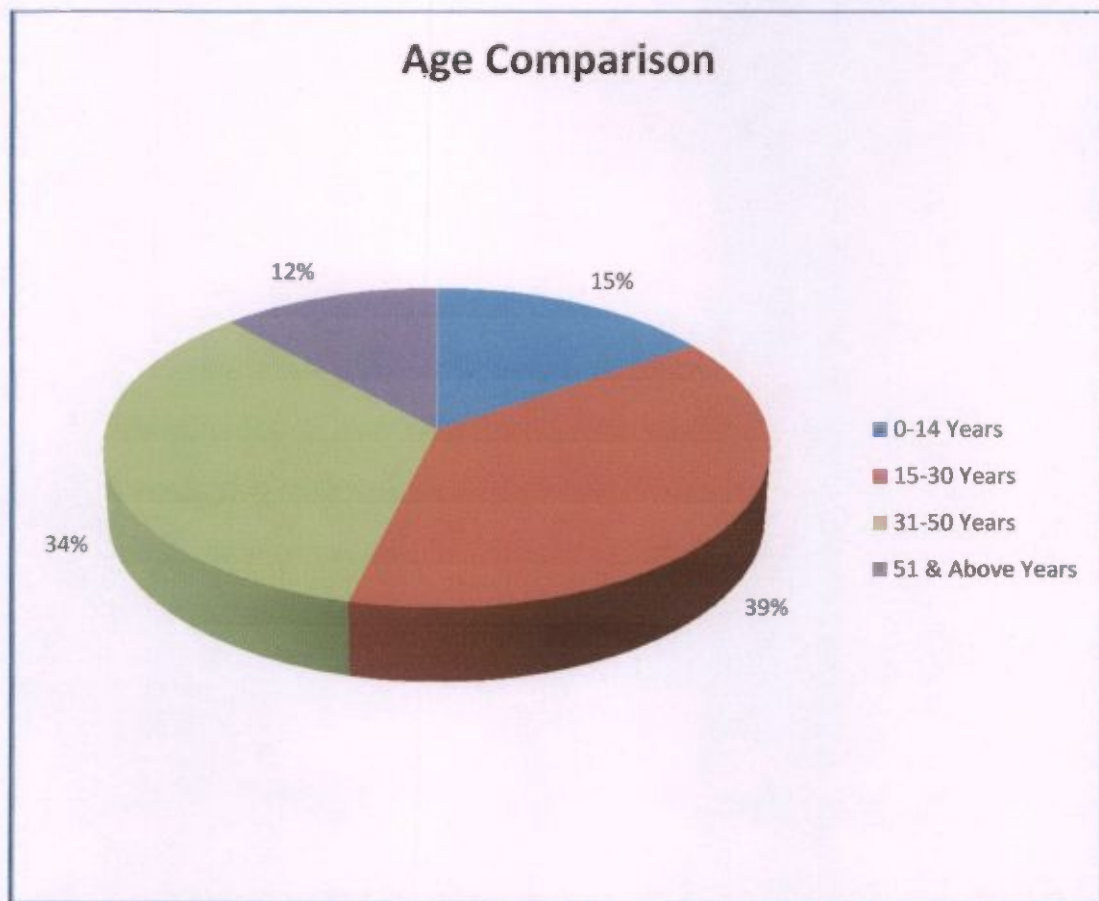
### 1. Sex Ratio:

Borough	Ward No.	Sex Ratio	
		Male	Female
II	10	1	9
	11	0	0
	12	136	133
	15	204	186
	16	3	10
	17	2	1
	18	0	0
	19	0	0
	20	170	171
	<b>Total</b>	<b>516</b>	<b>510</b>



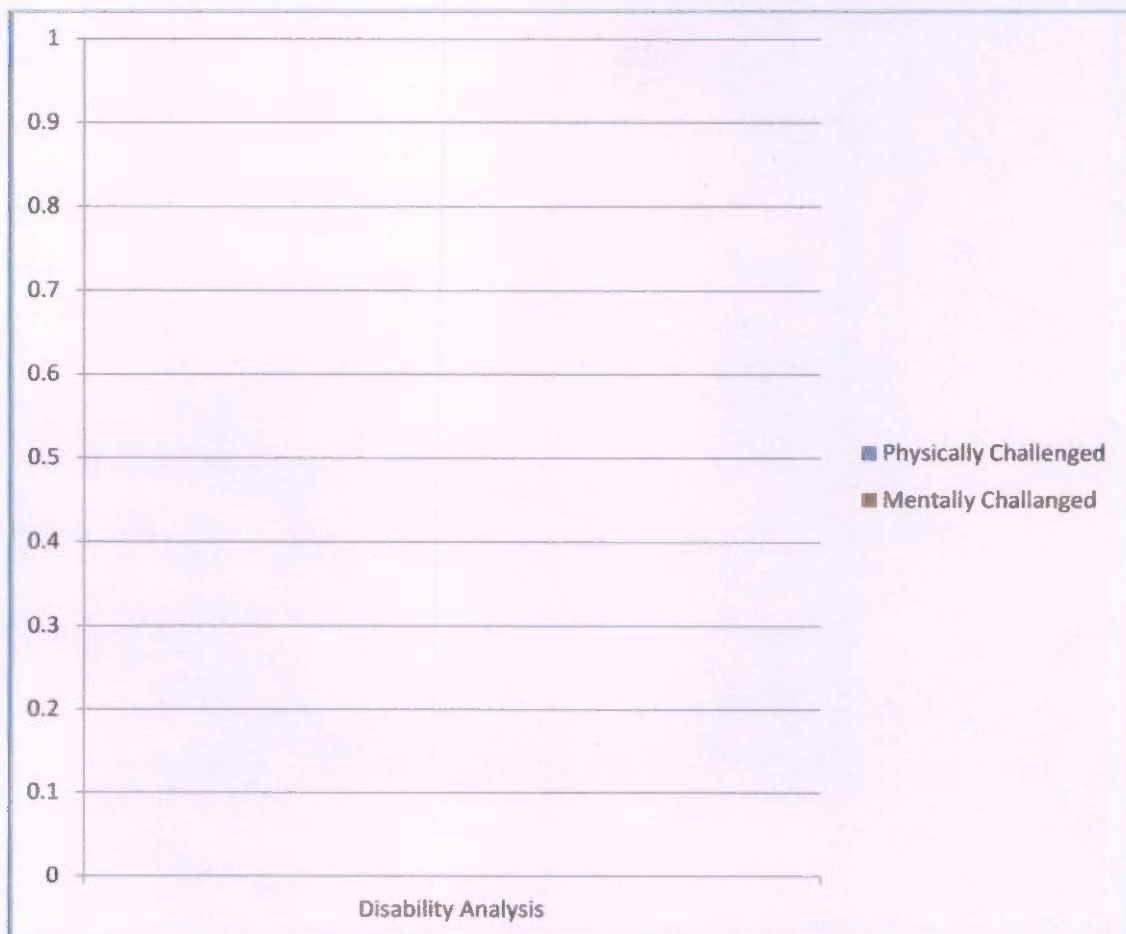
## 2. Age Comparison:

Borough	Ward No.	Age Comparison			
		0-14 Years	15-30 Years	31-50 Years	51 & Above Years
II	10	0	4	5	1
	11	0	0	0	0
	12	86	101	63	19
	15	30	154	162	44
	16	0	8	0	5
	17	0	0	1	2
	18	0	0	0	0
	19	0	0	0	0
	20	42	127	121	51
	<b>Total</b>	<b>158</b>	<b>394</b>	<b>352</b>	<b>122</b>



### 3. Disability Analysis:

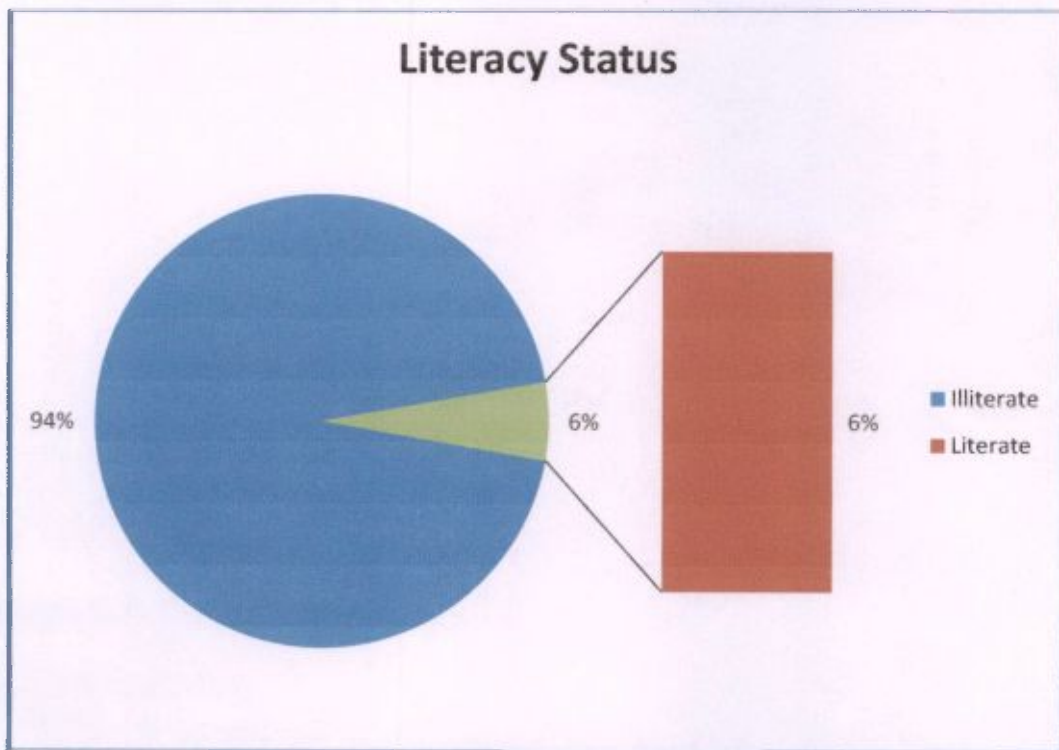
Borough	Ward No.	Disability Analysis	
		Physically Challenged	Mentally Challenged
II	10	0	0
	11	0	0
	12	0	0
	15	0	0
	16	0	0
	17	0	0
	18	0	0
	19	0	0
	20	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>





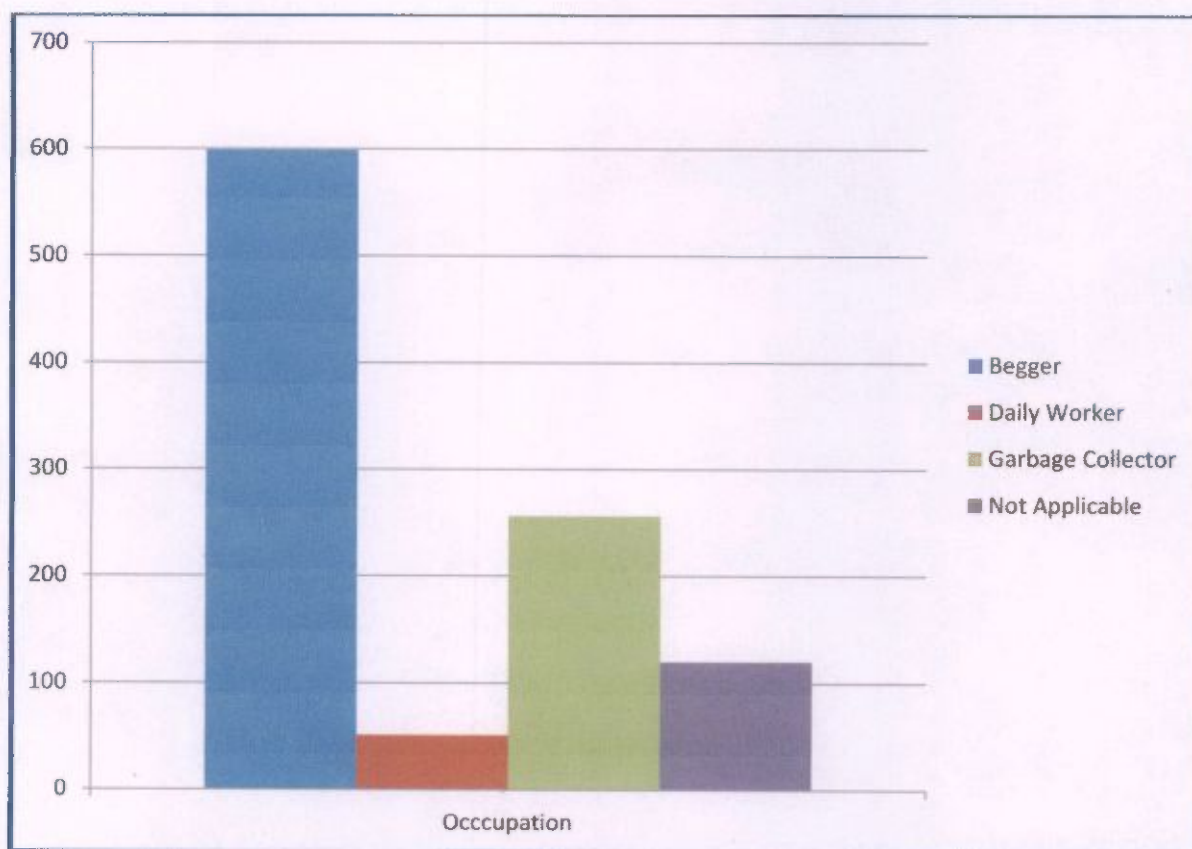
#### 4. Literacy Status:

Borough	Ward No.	Literacy Status	
		Illiterate	Literate
II	10	10	0
	11	0	0
	12	263	6
	15	357	33
	16	13	0
	17	3	0
	18	0	0
	19	0	0
	20	323	18
	<b>Total</b>	<b>969</b>	<b>57</b>



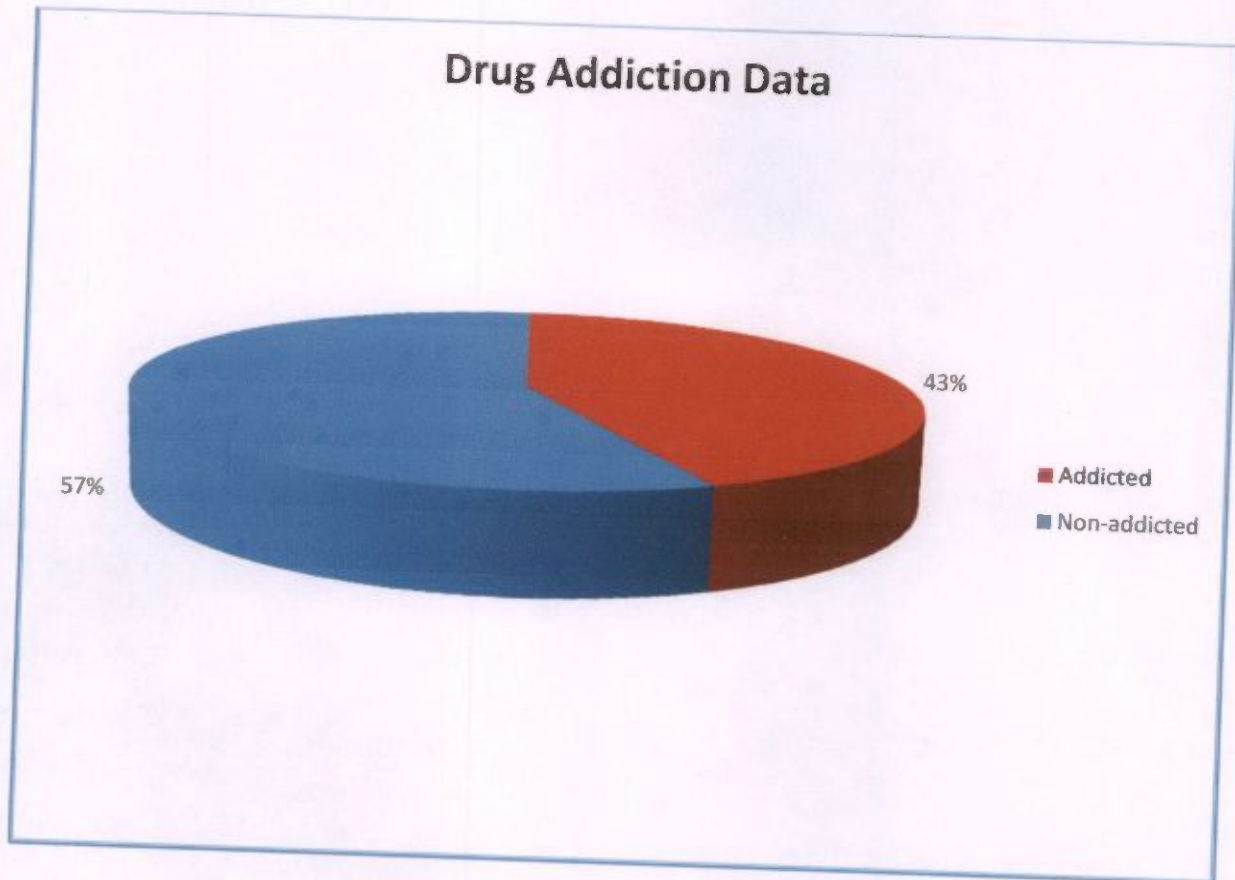
## 5. Occupation Analysis:

Borough	Ward No.	Occupation Analysis			
		Beggar	Daily Worker	Garbage Collector	Not Applicable
II	10	3	0	7	0
	11	0	0	0	0
	12	158	0	51	60
	15	206	26	132	26
	16	5	0	8	0
	17	3	0	0	0
	18	0	0	0	0
	19	0	0	0	0
	20	224	25	58	34
	Total	599	51	256	120



## 6. Drug Addiction Data:

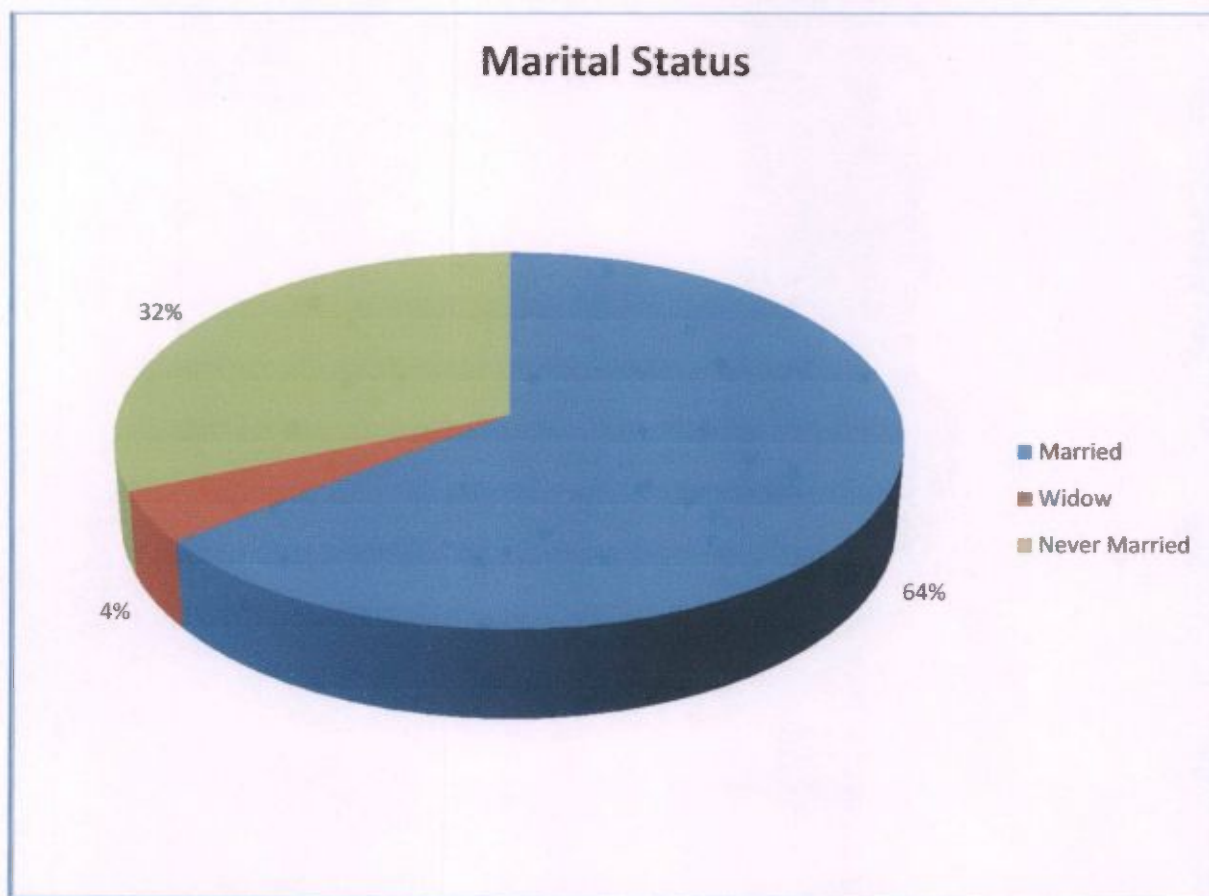
Borough	Ward No.	Drug Addiction Data	
		Addicted	Non-addicted
II	10	1	9
	11	0	0
	12	114	155
	15	180	210
	16	3	10
	17	2	1
	18	0	0
	19	0	0
	20	144	197
	<b>Total</b>	<b>444</b>	<b>582</b>





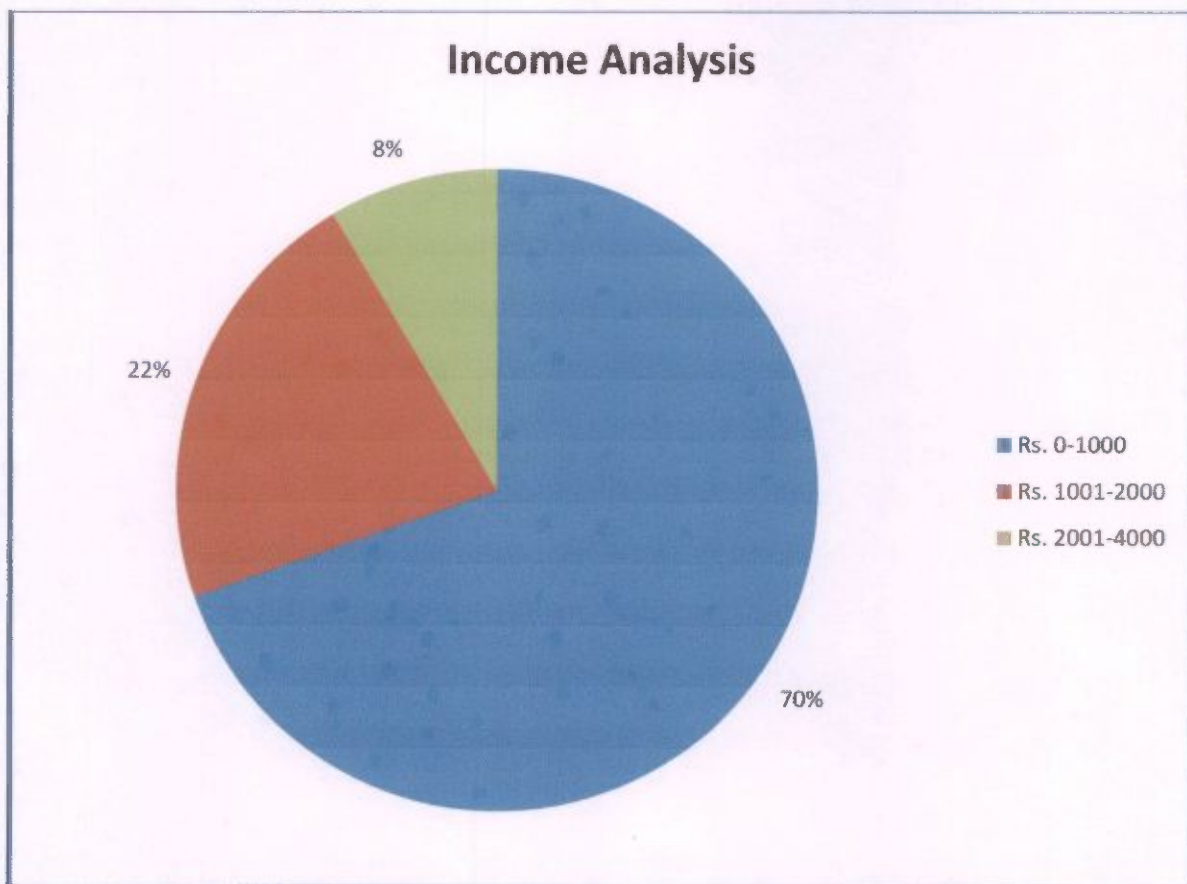
## 7. Marital Status:

Borough	Ward No.	Marital Status		
		Married	Widow	Never Married
II	10	10	0	0
	11	0	0	0
	12	137	6	126
	15	275	31	84
	16	11	1	1
	17	3	0	0
	18	0	0	0
	19	0	0	0
	20	222	7	112
	Total	658	45	323



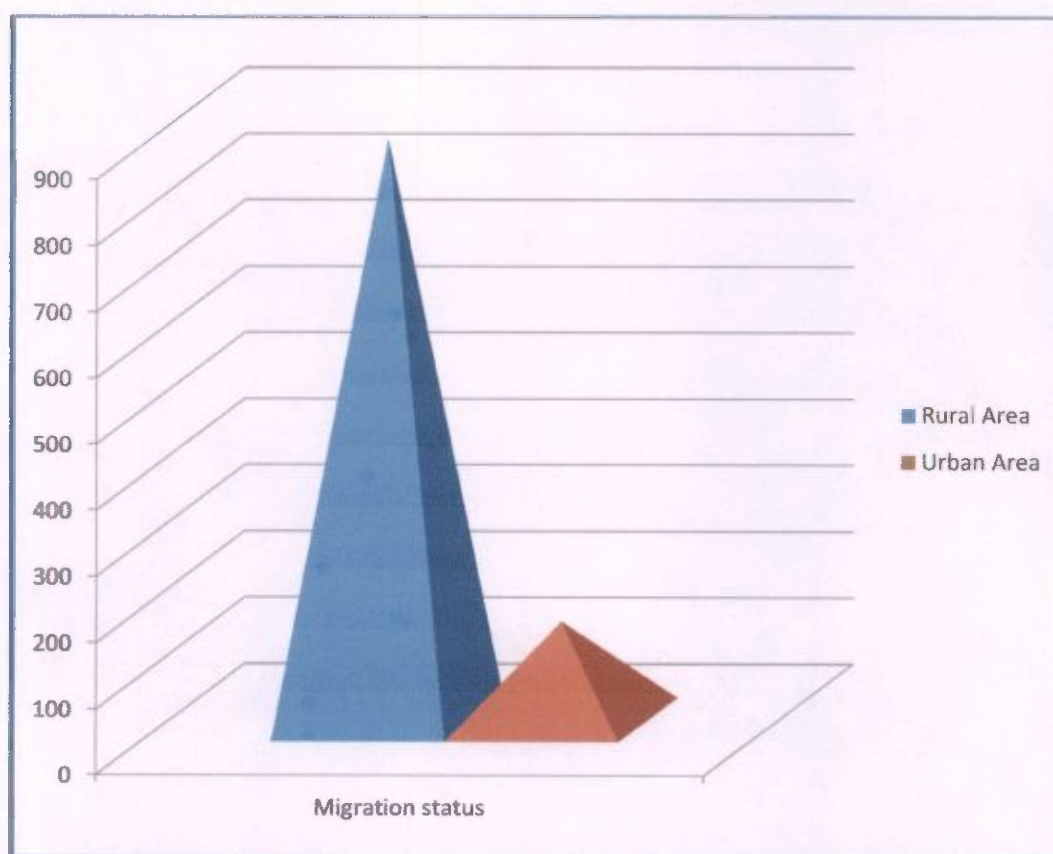
## 8. Income Analysis:

Borough	Ward No.	Income Analysis		
		Rs. 0-1000	Rs. 1001-2000	Rs. 2001-4000
II	10	2	2	6
	11	0	0	0
	12	214	40	15
	15	228	117	45
	16	5	1	7
	17	3	0	0
	18	0	0	0
	19	0	0	0
	20	262	64	15
	<b>Total</b>	<b>714</b>	<b>224</b>	<b>88</b>



## 9. Migration Status

Borough	Ward No.	Migration Status	
		Rural Area	Urban Area
II	10	10	0
	11	0	0
	12	221	48
	15	338	52
	16	11	2
	17	3	0
	18	0	0
	19	0	0
	20	294	47
	<b>Total</b>	<b>877</b>	<b>149</b>

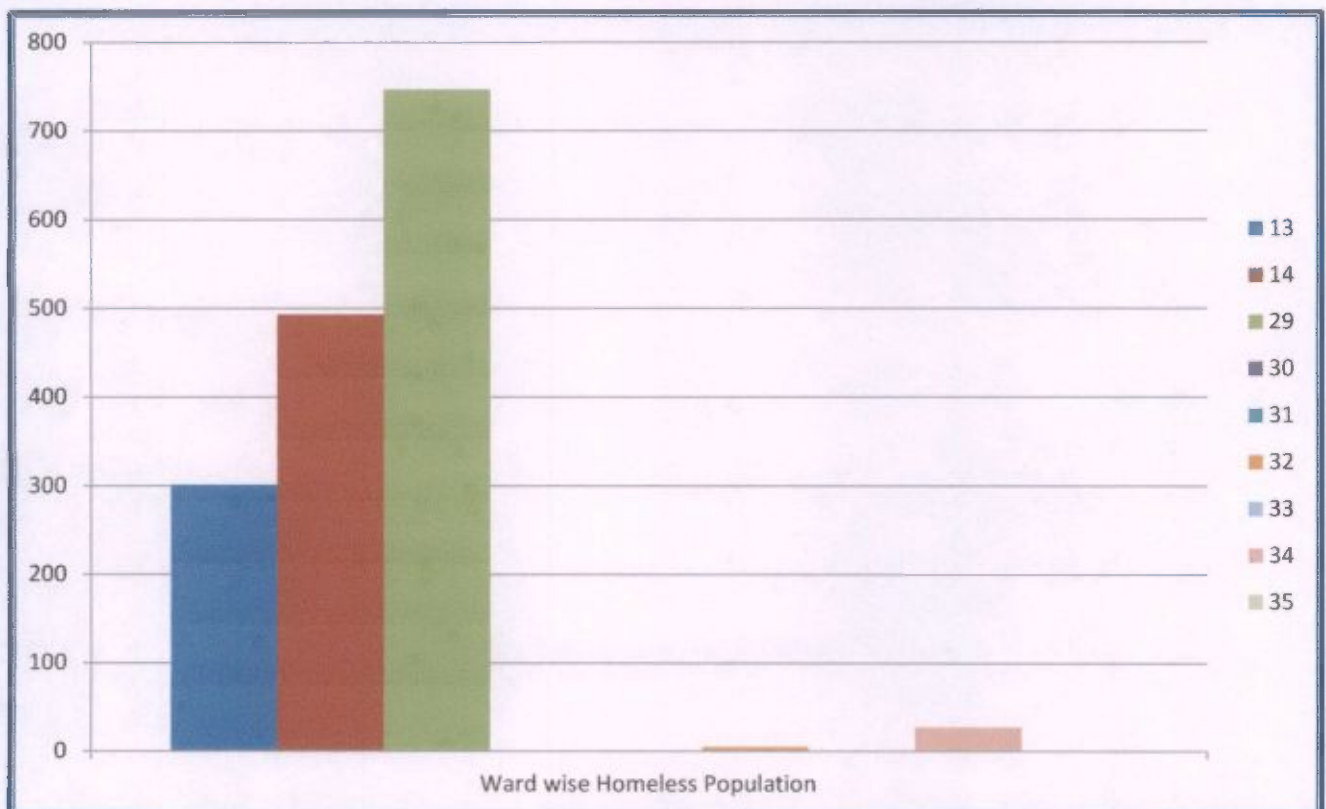




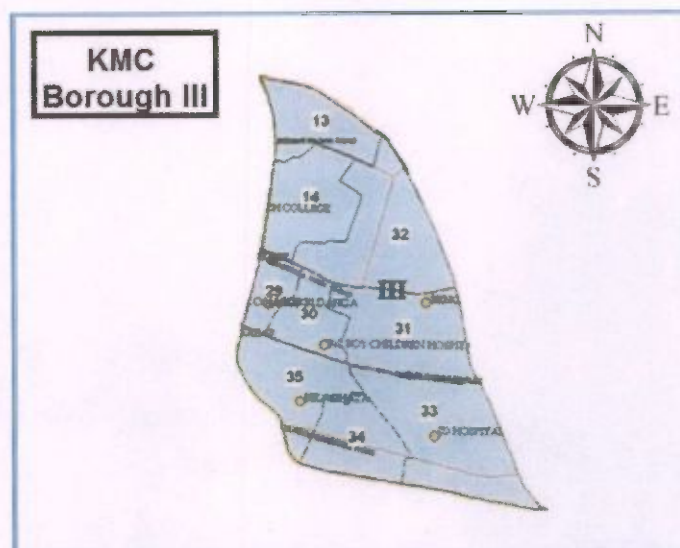
# Detail of Homeless Population Data Borough-III

We have started field survey on 13/03/2018 & completed the entire survey job on 21/03/2018. We found following Homeless population data after survey.

Borough	Total number of wards	Ward No.	Homeless People Found during Survey
III	9	13	301
		14	493
		29	747
		30	0
		31	0
		32	5
		33	0
		34	27
		35	0
		<b>Total</b>	<b>1573</b>



## Project Area:



Ward No	Boundary	Details
13	North	The New Canal
	South	Bidhan Nagar Road and Harish Neogy Road
	East	The Eastern Railways and Harish Neogy Road
	West	The Circular Canal
14	North	Harish Neogy Road, Bidhan Nagar Road and Biplabi Barin Ghosh Sarani
	South	Bagmari Road and Satin Sen Sarani
	East	Rama Kanta Sen Lane, The Eastern Railways and Bagmari Rd.
	West	The Circular Canal and Harish Neogy Road
29	North	Satin Sen Sarani, Matilal Sen Lane and Dhyani Debi Khanna Road
	South	Narikeldanga North Road, Sastitala Road and the Eastern Railways
	East	Sastitala Road, Matilal Sen Lane, Narikeldanga North Road and the Eastern Railways
	West	The Circular Canal
30	North	Satin Sen Sarani, Kankurgachi Road, Sastitala Road and Narikeldanga North Road
	South	Dhyani Debi Khanna Road and Matilal Sen Lane
	East	C.I.T Road and Kankurgachi Road