Practitioner’s Manual

Technology Enabled Participatory Settlement Enumeration
Preface

The Sustainable Development Goals (SDGs) and New Urban Agenda envisage an inclusive, resilient, and sustainable city. This inclusivity cannot be achieved automatically, especially, given the extent of entrenched inequalities that exist in Indian cities. A vast number of urban poor in Indian cities are deprived of many basic services such as, water, sanitation, health, education, and so on. A major reason for such continued and perpetuated deprivation is their invisibility or limited visibility in the eyes of city authorities which are responsible for providing these services to the urban poor. At times, this oversight by city authorities is due to sheer ignorance, sometimes methodically deliberate, and still other times incapability. The urban poor cannot bear any of these. The burden of invisibility is often a huge cost to their families. It means not getting enough income to support the family members; or not getting access to public health services when sick; or not getting opportunities for children and young people in the absence of education and skills; or not being able to access safe drinking water and sanitation services, which trap them in the vicious cycle of poverty. It could be all of the above, as well.

A number of surveys and enumerations by various state authorities, including National Census Survey, often undercount informal settlements in a city and their residents who mostly belong to low-income families. How do the urban poor then find a way to make themselves visible to others including the city authorities? Many urban poor communities across the regions have found answer to this question in self-enumeration. In Participatory Settlement Enumeration (PSE), on the other hand, the residents of informal settlements design and conduct the enumeration, analyse the data generated through these enumerations, and communicate this data to the concerned authorities for participatory planning. Participation and inclusion in PSE thus becomes an empowering experience for the hitherto unaccounted and voiceless urban poor.

PRIA through its initiative called “Engaged Citizens, Responsive City (ECRC)” implemented PSE in collaboration with the Settlement Improvement Committees (SICs) formed under this initiative in three Indian cities – Ajmer, Jhansi, and Muzaffarpur. SICs are the organisations of the urban poor. PRIA adopted a number of innovations in PSE, which further enhanced the confidence of young boys and girls in these informal settlements. PRIA chose to use mobile smart phone based technology for enumeration in these settlements. The young SIC members were trained on how to use smart phone based enumeration.

This manual provides a step-by-step guidance to anyone who likes to facilitate and undertake PSE in informal settlements using mobile smart phone based technology. This can be used by the community, civil society organisations, municipalities, and other utilities. The findings from PSE can be used for planning, monitoring, and assessing any service, which matters to the community. We sincerely hope that the development actors, concerned with improvements of informal settlements and the urban poor residing in these locations, will benefit from this manual.

Dr. Kaustuv Kanti Bandyopadhyay
Director, PRIA
Acknowledgement

Citizens, particularly the urban poor, often lack information that would allow them to better understand their entitlements at the individual, household, and community levels. This is witnessed starkly in the case of sanitation services in Indian cities. As a result, the contribution of citizens in planning is negligible and citizens are unable to understand and monitor local service delivery. Data is also a critical requirement to effectively seek interventions from municipalities, but is usually scantily available at the granular level. In cases where it is available, its access and utilisation requires skills and training that are possessed by only a few.

As a response to this situation, PRIA’s “Engaged Citizens, Responsive City” (ECRC) project administered two surveys in the three cities of Jhansi, Ajmer, and Muzaffarpur. Data for more than 20,000 households has been collected across slums and colonies, which allowed citizens to partake in planning and monitoring of their settlements and cities. The uniqueness of PRIA’s process lies in the nature of citizen’s involvement. PRIA’s Participatory Settlement Enumeration (PSE) allows residents of informal settlements to enumerate themselves, and use results to plan and seek higher quality of service from the stakeholders.

This manual describes the process of conducting a large-scale mobile smart phone based participatory enumeration, and is useful for implementing citizen feedback processes. It can be utilised by civil society groups, municipal officials, and service providing agencies. Such tools allow for a realistic understanding of the status of service delivery, identification of prevalent deficiencies and gaps, as well as an opportunity to take corrective action.

The manual has gone through multiple iterations based on our experiences in the field. The document evolved as we continued to learn. We acknowledge the support of our teams in the cities and are grateful to every individual who participated in the data collection process, as the enumerators, supervisors, and respondents. Nikhil Desai, as the technical consultant, has provided valuable technical support to mobile-based survey and handling of data. His inputs helped shape this manual. We sincerely acknowledge his contribution. The team at Dimagi enabled us to effectively manage our data and provide useful support. Dr. Kaustuv Kanti Bandyopadhyay, Director, PRIA, and Dr. Anshuman Karol, Senior Programme Manager, PRIA provided the overall direction and leadership for which we are sincerely grateful.

Lastly, this report would not have been possible without the guidance provided by Dr. Rajesh Tandon, Founder-President, PRIA. We sincerely acknowledge his contribution.

Sukrit Nagpal
Senior Programme Officer, PRIA
**Acronyms**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>App</td>
<td>Application</td>
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<tr>
<td>CBO</td>
<td>Community Based Organisation</td>
</tr>
<tr>
<td>DUDA</td>
<td>District Urban Development Authority</td>
</tr>
<tr>
<td>ECRC</td>
<td>Engaged Citizens Responsive City</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
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<tr>
<td>MC</td>
<td>Municipal Corporation</td>
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<tr>
<td>PRIA</td>
<td>Society for Participatory Research in Asia</td>
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<tr>
<td>PUA</td>
<td>Participatory Urban Appraisal</td>
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<td>PSE</td>
<td>Participatory Settlement / Slum enumeration</td>
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<tr>
<td>RWA</td>
<td>Resident Welfare Association</td>
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<tr>
<td>SIC</td>
<td>Settlement Improvement Committee</td>
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<tr>
<td>SLB</td>
<td>Service Level Benchmark</td>
</tr>
<tr>
<td>ULB</td>
<td>Urban Local Bodies</td>
</tr>
</tbody>
</table>
# Content

**Preface**  
1
**Acknowledgement**  
2
**Acronym**  
3

**Section 1: Introduction**  
6  
- Background  
6  
- About the Enumeration  
7  
- About the Manual  
8  
- Why Use A Mobile-Based Application?  
8

**Section 2: PSE – Steps and Methods**  
11  
- City-wide identification and mapping of informal settlements  
12  
- Designing the Questionnaire  
13  
- Selecting and Training the Enumeration Team  
15  
- Arranging Required Permissions from City Authorities  
15  
- House Listing  
16  
- Conducting the Enumeration  
19  
  - Guidelines to Download the Commcare Mobile App  
21  
  - Updating the App  
23  
  - Using the Mobile Smart Phone Based Application  
25  
  - Downloading the Enumerated Data  
28  
  - Using the Analysis Tables and Graphs for a Particular Settlement  
30  
  - Monitoring the Enumeration  
33  
- Analysis, Validation and Sharing  
39

**List of Annexures, Figures, and Tables**

**Annex.1: Additional Analysis for Household Toilets**  
41  
**Annex.2: Procuring Handsets and Sim Cards**  
42  
**Annex.3: Alternative Method for Accessing and Downloading Data**  
43

**Figure 1: Steps in organising communities**  
11  
**Figure 2: Steps in PSE**  
12  
**Figure 3: Information Collected through PSE**  
13  
**Figure 4: CommCare Application Flow for PSE on Sanitation Services**  
20

**Table 1: Roles and Responsibilities of Different Team Members**  
14  
**Table 2: Examples of Assigning House Numbers**  
18
SECTION 1

INTRODUCTION

Background

According to the Census, in 1991, 220 million people or about one-quarter of the Indian population lived in the cities. By 2011, this number increased to 377 million or one-third of country’s population. It is estimated that by 2030, more than half of India’s population will be living in cities.

Rapid urbanisation has led to a severe strain on civic services and providers of these services, mainly municipalities. This is most evident in the case of sanitation services. Appalling sanitary conditions are prevalent in Indian cities and pose an extraordinary threat to the health and hygiene of the urban population, particularly the poor who live in informal settlements or slums within these cities. These ‘slum dwellers’, as they are commonly referred to by authorities are seen as people those infringe on cities. This perception often leads to mass eviction of slums in cities.

The approach of ‘development through citizen participation’ is often not appreciated and utilised by municipalities in India. In the absence of any institutional obligation to involve citizens in planning, implementation and monitoring of development programmes, municipalities often adopt a top-down approach, which leads to lack of ownership among people towards their cities and the areas they live in.

Society for Participatory Research in Asia (PRIA) uses citizen centric participatory approaches to planning, implementation and monitoring of public policies and programmes. PRIA is implementing “Engaged Citizens, Responsive City” (ECRC) project supported by the European Union in three Indian cities – Ajmer in Rajasthan, Jhansi and Uttar Pradesh, and Muzaffarpur in Bihar. The project aims to strengthen participation of the urban poor in city-wide planning and monitoring of urban sanitation services. One of the major bottlenecks is lack of authentic data. Municipalities often do not have the necessary capacities to generate updated data for realistic planning.

For citizens, data is a critical requirement to effectively seek interventions from the municipalities, but is usually scantily available at the granular level. Data sources like the Census of India are difficult to utilise for local planning because collection is decennial, and desegregated information at the level of the ward with colony (mostly inhabited by the middle and upper economic class),

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1 Different types of socially derogatory terminologies are used for settlements of urban poor in the government records and policies (e.g. they are termed as Kacchi Basti in Rajasthan, Malin Basti in Bihar and Uttar Pradesh and Jhuggi Jhopari/ Gandi Basti in many other states). PRIA also attempts to minimise utilisation of the word ‘slum’, instead preferring the use of informal settlements.
and slum (mostly inhabited by weaker economic class) is not always provided. These data sources are also complex and not easy to understand by ordinary citizens. Such limitations deter citizen participation, as lack of access to data prevents understanding or monitoring the real situations at local, state and national level. For cities to develop, a critical requirement is that of close coordination between different economic classes (poor and better off), municipality and other State stakeholders. PRIA believes that one of the first steps towards participatory planning and decision-making is to empower communities with critical data.

**About the Enumeration**

The ECRC project makes conscious efforts to strengthen citizen participation in development planning and monitoring of sanitation services in cities. The project uses sanitation services as an entry point to develop organisation, information, and negotiation capacities of the urban poor in informal settlements. Residents in informal settlements are encouraged to form Settlement Improvement Committees (SICs) with leadership from youth and women. This is detailed out in the next section.

PRIA executed two types of surveys in each city. The first type of survey was called *Participatory Settlement Enumeration (PSE)* which followed community based participatory approaches. It strengthened the SICs and helped these local organisations collect data from their own settlements. These enumerations empowered communities with useable data based on which service, infrastructural limitations could be highlighted to the authorities, and solutions to these problems could be deliberated upon.

The PSE was administered to all households in informal settlements. This allowed building settlement and household specific data for informal settlements. In the three cities of Ajmer, Jhansi, and Muzaffarpur, 250 settlements have been enumerated. Apart from a strong focus on sanitation services and infrastructures, these enumerations focussed on access to legal documents which determine one’s realisation of individual entitlements such as birth certificates, voter cards, Aadhaar cards, as well as information on education and occupation.

The second type of survey was called *Participatory City Sanitation Survey*. This survey provided a holistic understanding of prevailing sanitation situation in the city. This survey followed a rigorous and robust sample regime and was administered to 100 households in each ward of the city. These households were systematically sampled and represented a mix of informal settlements (slums) and middle class colonies. Such data became the backbone on which citizen engagement was fostered at the local level (for example, wards in a city). PRIA believed that municipalities alone cannot solve the ever-increasing problems of Indian cities. In such a situation, the processes aimed to go beyond highlighting deficiencies in sanitation services. Through the ECRC project, PRIA has facilitated engagement with multiple stakeholders including Resident Welfare Associations (RWAs) in colonies, market committees, traders’ associations, professional associations, media and academia to explore solutions to problems of urban sanitations services. These common
Participatory Research in Asia

forums allowed for engagement among various stakeholders, especially between city authorities and residents belonging to both colonies and informal settlements. These forums allowed solutions to stem from a coordinated effort between municipalities and residents.

Both the survey initiatives were also in line with the objectives of the Swachh Bharat Mission-Urban (SBM-U) and assess ground realities in three cities. Findings provided critical feedback and played an essential role in monitoring and evaluation of the implementation of public programmes. That apart, the survey has identified relevant aspects through Service Level Benchmarks (SLBs), which were defined as a minimum set of standard performance indicators that are commonly understood and used by all stakeholders across the country. SLBs encouraged municipalities and utilities to collect data to report performances; however, the feedback process did not involve citizens. To a certain extent, these surveys addresses this gap. PRIA has previously partnered with the Water and Sanitation Program of the World Bank, in an initiative called SLB Connect which provided citizens’ feedback to city authorities on the water and sanitation services. Lessons from SLB Connect initiative have found their way into the current surveys as well.

About the Manual

The Manual on Technology Enabled Participatory Settlement Enumeration describes the process of using a mobile smartphone based enumeration to assist communities in collecting as well as utilising their data about their own settlements and people.

Although the section above lists two types of surveys utilised by PRIA under the ECRC project, this manual specifically describes the PSE and its use in the informal settlements of Ajmer, Jhansi and Muzaffarpur. Though the process of surveying remained similar, the other associated processes described here were not implemented in Participatory City Sanitation Survey. Additionally, this note does not describe the actual process of creating surveys on a mobile-based application. A number of online videos and community support groups can be found to understand this process.

This note will be useful to anyone planning and implementing citizen feedback processes. Civil society groups, municipal officials, and service providing agencies who want to initiate participatory enumeration processes with the aim of empowering communities as well as understanding the status of service delivery, prevalent deficiencies and gaps, and taking actions to improve level of services can use it.

Why Use A Mobile-Based Application?

Traditionally, surveys are conducted on paper. Technology enabled PSE process replaces paper with a smart phone. Enumerations are undertaken by community enumerators who visit houses, seek the required information and enter it into the application on their smart phone. PRIA used CommCare, a mobile-based data collection application, designed and supported by Dimagi.
CommCare allows users to code a questionnaire into the application, which is accessed and filled using android based mobile smart phones. The application can be used offline (in areas where internet is not easily available) and is compatible with various languages, including Hindi. There are many advantages to using a smart phone and the CommCare software, some of which are detailed out as follows.

- The process is resource and time efficient, since no transcribing is required.
- Data is immediately synced to a server, which makes remote access possible.
- Data security is maintained and a backup copy is always available on the server.
- Conducting the enumeration on mobile smart phones saves huge quantities of paper, helping with costs as well as efficiency.
- Data collected through the enumeration is accessed in Microsoft Excel using connections between Excel and the server hosted by CommCare. It can be updated at the press of a button after which connected pivots and charts automatically refresh. Data can be accessed anywhere.
- Certain validations, conditions and skip logic can be built into the application, which prevent various types of mistakes and errors. This is an advancement over the use of paper-based enumerations in numerous ways. For example, mobile numbers less than ten digits are not accepted by the application. Enumerators are also unable to skip questions that are considered compulsory. Deeply embedded skip logic presents different sets of questions depending on pre-defined criteria.
- Once a form is submitted, enumerators cannot change the data.
- In case of mistakes or errors being detected at later stages, records can be edited at the back end. Alternatively, enumerators can be granted access to a particular record so that corrections can be made by re-visiting the location.
- All enumerators have unique user names and records are geo-tagged, which ensures proper monitoring as well as the ability to represent information spatially.
- Automatic updates to the latest version of the application ensures that no newer additions to the questionnaire are missed out. Any entries that do not fall within defined parameters are automatically flagged by the system. For example, the time taken to finish an enumeration, along with the actual time in which it was conducted.
- The use of mobiles smart phone allows to capture photos, which enumerators can use to show ground realities as well as corroborate data they have filled.
- Images are also used as part of questions, which help enumerators and respondents achieve clarity. In the application that PRIA used, images included different types of toilets, water sources as well as outlets.
- Questions and options can be updated at any time without effecting the analysis template or data filled earlier.
SECTION 2
PSE: STEPS AND METHODS

Unlike traditional enumerations or surveys, PSE is designed, conducted and managed by the communities living in informal settlements of a city. Traditional enumerations conducted solely by the ‘outsiders’—whether government personnel or agencies appointed by the government—often appropriate data or information from the community and use it for planning at the city, state or national level. PSE, on the other hand, is managed by the ‘insiders’ in the community, sometimes with facilitation from the ‘outsiders’, leading to the ownership of data, its analyses and community-led planning at the local level. However, an effective and empowering PSE would require a lot of preparation and facilitation within the community.

PSE as a community empowerment tool, can be used either as a stand-alone tool (as shown in Figure 2) or in association with other tools (Figure 1). The PSEs in Ajmer, Jhansi, and Muzaffarpur used a combination of tools for organising and empowering communities and charted the following combined steps, as shown in Figure 1 and Figure 2. It prepared the community for assessing sanitation conditions and planning for its improvement in informal settlements. A detailed description of various steps involved in organising the communities of urban poor is provided in the Manual on Organising the Urban Poor (PRIA, 2018). This manual mainly focuses upon the steps involved in technology enabled PSE.

Figure 1: Steps in organising communities

1. Organising communities through Settlement Improvement Committees (SICs)
2. Facilitating Participatory Urban Appraisal (PUA)
3. Orientation of SIC members
4. Formation of city level forum of SICs
City-wide identification and mapping of informal settlements

A process of mapping and listing of all informal settlements was conducted in each city. In this exercise, settlements were physically identified, geo-tagged, and plotted on a map. Basic information regarding legal status of the settlement was collected as well. While this exercise began with gathering secondary data and records on the lists of notified and non-notified slums, PRIA’s team did not restrict this process to settlements that were recognised by governments and State authorities. Information on informal settlements available with city authorities / agencies is often outdated. As a result, people are often found living in unrecorded settlements. This led to a huge variance in the number of ‘slums’ found by PRIA versus the official numbers available in enumerations such as the Census. For example, in Jhansi, District Urban Development Authority (DUDA) records suggest the presence of 57 informal settlements whereas PRIA’s mapping process identified 75 such settlements.

The mapping process provided for a first level interaction with communities living in the settlements. It helped in identification of active citizens and leaders in the community along with other Community-Based Organisations (CBOs) and social institutions operational or active in the settlements. Field teams also interacted with relevant stakeholders in the city such as community leaders, ward councillors, and other elected representatives.
Designing the Questionnaire

After preparing a draft questionnaire, PRIA’s team held multiple interactions with SIC members to ensure all parameters were covered. PRIA was keen to involve communities from the design stage, and based on these exchanges, questions were modified and options added.

The administered questionnaire was divided into the following sections for ease in filling and analysis. While the thrust of the questionnaire was to gauge the status of sanitation facilities in the city, it had also captured basic information about households, which was often important for correlation analysis.

- **Registration form**
  - Ward selection
  - Classification of settlement
  - Basic details including name of respondent, head of household, mobile number and address

- **Basic household information**
  - Type of house
  - Ownership and registration
  - Family income
  - Religion and caste

- **Members’ details**
  - Members of settlement and their sex, age, education, and occupation
  - Access to legal documents such as birth certificate, aadhar card, bank account, voter card, and ration card

- **Toilet, water, SWM and sewerage**
  - Type of toilet facility available and its utilisation
  - Desire to have an individual toilet and space for toilets construction, and application process for the same
  - Waste water outlets
  - Grievance addressal mechanism

*Figure 3: Information Collected through PSE*

The PSE contained five forms. As depicted in Figure 7, the first form was the registration form. This form allowed enumerators to choose from a list of settlements categorised by wards. Considering the similarity in names of settlements, this step made sure the right ward and the right settlement within the jurisdiction of that ward was being chosen. The form was also used to capture basic details of the respondent. The second form focussed on the structure of the house and ownership, and household income, religion and caste. The third form captured information about members living in the household. For each member, age, sex, education, and occupation were captured. This
The fourth form captured information regarding sanitation facilities, namely toilets, drainage, bathroom, sewerage, as well as grievance redressal. A fifth form was used to capture pictures, GPS, and to end the enumeration.

**Selecting and Training the Enumeration Team**

A semi-structured one-day training was organised for 15 community enumerators who were selected from the youth residing in various informal settlements. They were identified during PUA processes and often played a crucial role in SIC formation. All settlements covered for the enumeration in the city were divided within these 15 members. Their presence made communities feel more comfortable.

The training session introduced the participants to the questionnaire, followed by an intensive discussion on the rationale and logical flow of various questions. Once an understanding of the questionnaire had developed, the participants were taken through the customised mobile application designed to capture the enumerations. Following this, the key areas of monitoring and verification of the enumeration were discussed. Additionally, an understanding on smart phone-based enumeration was also developed. This focused on basic aspects like the use of GPS, power management, data connections, etc.

Table 1: Roles and Responsibilities of Different Team Members

<table>
<thead>
<tr>
<th>Team member</th>
<th>Key responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Enumerator and SIC Members</td>
<td>› Identifying households to be enumerated&lt;br› Conducting household level enumerations&lt;br› Responding to all queries raised by the coordinator and administrator for various records</td>
</tr>
<tr>
<td>Enumerator Coordinator</td>
<td>› Supervising the implementation of the enumeration&lt;br› Providing guidance in the implementation and monitoring of enumerations&lt;br› Quality check of enumeration records</td>
</tr>
<tr>
<td>Enumerator Administrator</td>
<td>› Random monitoring and quality checking of enumeration records&lt;br› Providing support and guidance to supervisors and enumerators&lt;br› Troubleshooting of errors and any other issues faced&lt;br› Updating application when required</td>
</tr>
</tbody>
</table>

2 15 animators from the community in each city became the enumeration team. For the purpose of the enumeration, they are referred to as community enumerators.
These trained enumerators and the PRIA team hosted a half-day orientation session for some SIC members who were keen to work along with enumerators to conduct enumerations in their own settlements. Many enumerators and SIC members had never utilised a smart phone before, and an additional step thus was to demystify technology.

The execution of PSE required a planned delegation of responsibilities with checks and balances. The first step was to define the roles and responsibilities of the three-layered team, as elaborated in Table 1.

### Arranging Required Permissions from City Authorities

Before administrating an enumeration of this scale, it was important to take the required permission from the municipality and appraise the institution about the purpose of this enumeration. PRIA team took this step and obtained the required permission. This step also ensures the safety of enumerators against any action. At this stage, requests were also made to the Municipal Commissioners, Mayors and other officials to administer an oath to the enumerators. All enumerators pledged to conduct the enumeration to the best of their abilities and to ensure that the findings generated are used to create better sanitation infrastructure in the city.

### House Listing

One of the first requirements of a large-scale enumeration was house numbering or house listing. This process acted as a stepping-stone to enumeration. PRIA’s teams found that a large number of houses in informal settlements were not provided with addresses by the municipality.
It was essential for the house numbering process to ensure each household bears a systematically assigned number. Additionally, it had to be carried out collaboratively with SIC members. House numbering instilled a sense of ownership in the community and residents since many never had house addresses before. Numbering own houses in a systematic manner also granted a sense of importance as well as fulfilment.

The implementation of a large scale enumeration such as PSE required a clear demarcation and house numbering or house listing process. It was essential for the house numbering process to be a participatory process to ensure each household was systematically assigned an identification number. The SIC members and the community enumerators were trained by the PRIA team about the process of house numbering.

House numbering means that each household bears a systematically assigned number. For buildings that were already given numbers by the municipal corporation, the same numbering was adopted. However, for new buildings that came up after the buildings were numbered by the municipal corporation, they were given sub-numbers/new numbers. For example, if a building is found unnumbered or a new building comes up between buildings numbered 10 and 11, the same should be numbered as 10/1. In case the numbering given by the municipal corporation ends with No. 120, then a new number '121', in continuation of the numbering given by the municipal corporation, may be given.

In cases where no numbering for buildings or houses existed, the team was trained to give numbers to the houses through the following method:
Assigning numbers to buildings

a) If an informal settlement consists of a number of streets, the buildings in various streets should be numbered continuously. Streets should be taken in uniform order from North-West to South-East. The best way of numbering buildings is to continue with one consecutive serial on one side of the street and complete numbering on that side before crossing over to the end of the other side of the street and continuing with the same series, finally stopping opposite the building where the first number was allotted.

b) If a pattern is such that the buildings are scattered or located in clusters or in isolated parts like fields, boundaries, along the side of a railway track or a canal/river/nallah, then to the extent possible, house numbers should be assigned by following the method described (i) above. However, if it is not possible to follow the procedure laid down (i) above, it should be ensured that all the building are numbered and the direction in which the building numbers are assigned should be indicated by arrow marks on the Layout Map wherever the number jumps.

c) If a new building is found after the house numbering has been completed or in the midst of buildings already numbered, it should be given a new number, which may bear a sub-number.

For example, if a building is found unnumbered or a new building comes up between building numbers 10 and 11, the same should be numbered as 10/1.
Assigning number to households

Each house should be numbered. If a building by itself is a single household, then the number of the house will be the same as the building number. But if different parts or constituent units of a building qualify to be treated as separate households, then each household should be given a sub-number within brackets after the building number as 10(1), 10(2), etc., or 11(1), 11(2), 11(3), etc. Examples of assigning house numbers is provided in Table 2:

Table 2: Examples of Assigning House Numbers

<table>
<thead>
<tr>
<th>Building number as assigned by the Municipal Corporation</th>
<th>Number of households</th>
<th>House number</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/1</td>
<td>2</td>
<td>7/1 (1) and 7/1(2)</td>
</tr>
<tr>
<td>7 (1)</td>
<td>2</td>
<td>7(1) (1) and 7(1)(2)</td>
</tr>
<tr>
<td>7 (A)</td>
<td>2</td>
<td>7(A) (1) and 7(A)(2)</td>
</tr>
<tr>
<td>7/A</td>
<td>2</td>
<td>7/A (1) and 7/A(2)</td>
</tr>
</tbody>
</table>

Conducting the Enumeration

Before conducting the enumeration, the enumerator in charge of the settlement conducts a count of the number of houses, and divides these within the enumeration team. A step-by-step guide to conduct enumerations is presented in the following pages.

Pre Enumeration Checklist

All enumerators were instructed to follow this pre enumeration checklist to ensure high quality data collection and to reduce errors.

Enumeration should always be conducted in order of the forms, i.e. 1, 2, 3, 4, 5. Not doing the enumeration in this order can lead to incomplete enumerations, for which enumerators will need to collect data again.

The Practice IDs (For example, aj.practice, jh.practice, mu.practice) are strictly for practice and training only. In case SIC members are being trained, please ensure it is done using Practice IDs only. Also, it is the responsibility of enumerators to ensure that enumerations are conducted using Personal IDs and not Practice IDs.

Every enumerator should carry a register. Any enumeration that is left incomplete should be noted here so that the information can be passed on to the Enumeration Coordinator. Every enumerator must also carry a hard copy of the questionnaire so that it can be shown to any respondent / authority as and when requested. If a demonstration on mobile is required, please log into Practice Ids.

All enumerators must carry a copy of the permission letter provided by the local municipality. Ensure the application is up to date before conducting enumerations.

Please ensure the right ward and settlement is selected. Settlements are listed under wards as per lists provided by teams. If changes are required, please request a day prior to conducting enumeration.
Figure 4: CommCare Application Flow for PSE on Sanitation Services
Guidelines to Download the Commcare Mobile App

In your android based mobile or tablet, find the Google “Play Store” icon and click on it.

Enter “CommCare” in the area highlighted in red colour.

Click the first option marked in red colour, and then click on Install. Follow the instructions on the screen and wait for the application to install.
Open the application from the app drawer. You will see a screen with the message ‘enter code’. The code will be provided to you separately and is dependent on the application version.

Once you have entered the code, please click on accept. After that, click on ‘Start Install’ to begin installing the application.

Let the app install completely. *Ensure that the box “Keep trying if connection is interrupted” is checked. This prevents any internet related issues from averting the installation.*
**Updating the App**

If your supervisor informs you that a new version of the app has been launched, then go back to the main screen. Click on the “Settings” button either on the bottom left corner or the top right corner of the mobile. In the list, select the first option “Update App”.

Commcare will now start to download the new updates to the app from the server.

Click on the green tab to install the lasts updates to the app. After this step, you will be logged out of Commcare. You will then need to enter your password to log in again.
To verify if the latest update of the app is being used, go to the main screen. Click on the “Settings” button either on the bottom left corner or the top right corner of the mobile. Then click on ‘About CommCare’.

You will see the App version number mentioned in the details. For example, in this case, it is “App v89”, meaning version number 89 is being used. Verify if this is the latest version of the app launched with the supervisor.
**Using the Mobile Smart Phone Based Application**

Begin by logging into the application.
Enter the Username and Password specified to you.
Note that the Username and Password can have letters as well as numbers. They are also case sensitive.

After logging in, you will see the main screen.
Click on “Start” to begin filling information for any new respondent.
Click on “Saved” to view information filled previously for any respondent.
Click on “Incomplete” to view incomplete information filled for any previous respondent.
Click on “Sync with Server” to send any forms which have not been automatically synced with the server. If some forms have not been synced, the number will be mentioned in the icon.

When registering a new respondent, if an error message stating “could not find an lookup table” appears, then click on “Sync with Server” to resolve the issue.
Click on “Log out of CommCare” to log out at the end of the day after completing the enumerations.

Click on ‘Start’ to begin the enumeration. After clicking on ‘Start’, you will come across the two “modules” in the enumeration.
For any new respondent, please click on the first module “परिवार पंजीकरण” to register the details of the respondent.
On clicking the module “परिवार पंजीकरण”, the following form “1 – पंजीकरण फॉर्म” will appear. Click on this form to register the new respondent.

Inside the form, you will need to answer different types of questions. To move from one page to the next, swipe from right to left. (or use the arrow buttons) If you need to change the answer to a previous question or simply refer to a question answered earlier, swipe from left to right.

When the last question of the form is answered, the bar on the top of the screen will turn from blue to green. Click on the green “Finish” button to complete the form and save it.
Once registered, you will be redirected to the screen listing the modules.

Click on the second module “सवे की अन्य जानकारी” to fill in other details for the respondent.

You will be directed to a list of all respondents registered on your device.

The respondent registered most recently will appear at the top.

The three fields visible are “जवाबकर्ता का नाम”, “वार्ड क्र” and “शहर का नाम”.

Click on the relevant name and proceed ahead.

On clicking a name from the respondent list, you will be shown more details of the respondent filled. Make sure you are selecting the right respondent.

The additional details include address details like “मकान का नंबर” and “बस्ती का कोड”.

Click on the “Continue” tab at the top to proceed.
You will be able to see a list of forms to be filled. Fill the forms in the numeric order. Hence, start with the form “2 - परिवार की मूल जानकारी” and then proceed to form 3, 4 and 5. After you fill a form and save it, that form will not appear on the screen any more for this respondent.

The last form to be filled should be “5 – सर्व समाप्त”. After filling this form, you will be directed to the list of modules where you can register a new respondent.

### Downloading the Enumerated Data

For each city, a separate excel file is created. This file served as the analysis template. The steps listed below explain how to download data from the CommCare server.

1. The Excel file for the city is available in the OneDrive folder of respective city. Using cloud-based storage allows data files to remain synced and can be accessed easily. Enumeration administrator can access it either through his/her computer’s browser or by syncing the OneDrive folder to computer. It is available in Common tools and files for survey → HH Census Survey → City Name.

2. This file is the analysis template. Save it as a copy with the name of the slum or settlement with which you are currently working. Do add a date to keep track. For example, LoharBasti_10th June. It is advisable to create a separate folder in OneDrive for each
settlement that is enumerated. The local copy you have created (along with other relevant documents) can be placed here for easy access and sharing.

3. Navigate to the first sheet titled Form 1. Go to the “Data” tab on the top of the page. Click on “Refresh all” as marked below. This will update the file with the latest enumeration data from the CommCare website. Keep in mind that this process can take a few minutes. Excel often displays a ‘not responding’ message while this is happening, but it is nothing
to worry about, and your system will begin to function normally once the data has been downloaded.

4. Next, go to the “Index” sheet and click on the tab “Filter for Ajmer (or other city name) data” at the bottom of the page. This will filter all the data in the data sheets for respective city.

Using the Analysis Tables and Graphs for a Particular Settlement

1. In the "Data" tab, click on "Connections"
2. Select the first row "Connection" and then using the shift button on your keyboard; select all the connections that are displayed. After that, click on remove.

3. This process delinks the file from the Commcare server. Doing this ensures that data is not refreshed automatically. By breaking connections, you are removing any link between this file and CommCare. Keep in mind, you are doing this for the local copy you created earlier, and not for the analysis template itself.

4. This process delinks the file from the Commcare server. Doing this ensures that data is not refreshed automatically. By breaking connections, you are removing any link between this file and CommCare. Keep in mind, you are doing this for the local copy you created earlier, and not for the analysis template itself.
5. Now, if you try to click on "Refresh All", it will only update the pivot tables and charts but not fetch data from CommCare.

6. The local copy has data for all the settlements enumerated until now, across all cities. As of now, a filter has been at the back end, which restricts data download to dates after 1st January 2017. This has helped in reducing the size of the file. The first step thus is to remove all data that does not pertain to the slum in question. The easiest way to do this is to filter sheets using the Column titled ‘Name_of_slum_colony’. A corresponding column is “Name_of_slum_colony_mohalla_society”. This column displays a unique code for each slum. In rare cases, some enumerations may display the code, but not the name. Ensure that all entries have the settlement name in place else manually copy the slum name and paste it where required.
7. Select the settlement name apart from the one you want to retain and delete all the entries using Excel’s delete rows function. Do not delete the first row since it is connected to the pivots, tables and charts. This step needs to be repeated for all sheets. Once you are done, remove the data filters.

**Monitoring the Enumeration**

Monitoring of the enumeration is an essential part of ensuring the quality of data. One of the advantages of a mobile smart phone based application lies in the fact that a large number of monitoring aspects can be built in to the application itself. The first point to note is that the enumeration was created with built in skip logic. Many questions were also based on answers to the previous questions and the selection of certain variables. Additionally, to avoid common mistakes, the application was built to reject and warn against certain errors. Some of these are detailed out below.

1. Only ten digit mobile numbers are accepted.
2. If either less than or greater than ten digits is entered, an error message is raised and one cannot proceed with the enumeration.

1. In the question where the name of the respondent has to be entered, only text characters (A-Z, a-z and space) can be entered.
2. If any numbers are entered, an error message is raised and one cannot proceed with the enumeration.
1. In the question where the age of the respondent is asked, only an age between 0 and 125 years is accepted.
2. If an age like 130 is entered, an error message is raised and one cannot proceed with the enumeration.

1. In the question where the number of years and months of stay is asked, it should be ensured that the number of months entered is less than or equal to 12.
2. If the answer is entered as 14 months, an error message is raised and one cannot proceed with the enumeration.

1. When the number of family members is entered along with the breakup of male-female members, ensure that the male and female members add up to the total members.
2. If there is a mismatch, then an error message is raised and one cannot proceed with the enumeration.

Once a settlement is enumerated, an Enumeration Coordinator checks the data for consistency. The Enumeration Administrator conducts a random evaluation as well. The roles and
Participatory Research in Asia

Responsibilities of Community Enumerators, Enumerator Coordinator, and Enumeration Administrator have already been discussed in Table 1.

Some of the aspects checked by the Coordinator and Administrator are mentioned below. Considering the uniqueness of each settlement, an exhaustive list cannot be created.

<table>
<thead>
<tr>
<th>Form 1</th>
<th>Check for total number of members in household (using the definition of household as provided in National Census).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Check for spellings of family members</td>
</tr>
<tr>
<td></td>
<td>Ensure that age is written in complete years. In case of children less than 1 years of age, enumerators are to write 0.</td>
</tr>
<tr>
<td></td>
<td>Check to see if the age of members matches with education and occupation profile. Use appropriate filters to check this.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Form 2</th>
<th>Check type of house</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Depending on notification status of slum, check responses received for land ownership (patta). Ensure that responses are in line with others received in the settlement.</td>
</tr>
<tr>
<td></td>
<td>Check religion and caste</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Form 3</th>
<th>Check for type of toilet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Check to see if outlets of Bathroom, Kitchen, and Toilet match. If not, probe to understand why. Also check if certain responses stand out from those that are general to that slum.</td>
</tr>
<tr>
<td></td>
<td>Check for facility of garbage collection and if it matches with facilities available in the settlement</td>
</tr>
<tr>
<td></td>
<td>Check similarly for drinking water sources</td>
</tr>
<tr>
<td></td>
<td>Check if source of drinking water matches other water sources. If not, probe to understand why</td>
</tr>
</tbody>
</table>

| Form 4                          | Check if mobile numbers have been entered.                                                                                     |

| Form check                      | This is elaborated above. Make sure there are no incomplete records and ensure that enumerations are completed in adequate time (neither too fast nor too slow). |
Points to note while checking data

1. It is important to check if there are an equal number of entries across all data sheets, except the “Member level details” sheet. (The “Member level details” has more entries because the information has been collected for all members of the Households.) This can be checked in the “Form check” sheet. In the column Z named “No of forms filled”, if the count is showing as 3, and if in column AA, named “Whether complete”, the status is showing as “Yes”, then the enumeration is complete for that respondent.

If not, try to understand why. One possible reason could be that some enumeration participants opted out of the enumeration. It is also possible that enumerators left some enumerations incomplete, in which case they can be instructed to go back to the households and complete the enumerations. Other reasons include errors in settlement naming, which will require probing. Always check the enumeration tracker to double check that the number of households interviewed match with the entries listed. Once you are done, go to each individual analysis sheet titled as 1 – Analysis, 2 – Analysis, 3 – Analysis, and 4 – Analysis; click on any pivot table and then under analyse, click on ‘refresh all’. You will see updated charts under the sheet titled ‘charts’.

2. It is also important to ensure that enumerations are genuine. Two easy ways have been identified. One is to check the time of the enumeration, and the other is to check duration. Any anomalies must be discussed with enumerators and verified.

3. Columns Z, AA and AB are the columns, which will signal if any protocol has been violated.
   - Column Z gives the beginning time of the enumeration. If the enumeration began before 7 AM or after 8 PM, then the colour red would show up, else it will be green.
- Column AA gives the ending time of the enumeration. If the enumeration ended before 7 AM or after 8 PM, then the colour red would show up, else it will be green.
- Column AB gives the completion time of the enumeration. If the enumeration took less than 5 minutes or more than 15 minutes, then the colour red would show up, else it will be green.

Making Changes to Data

Any errors or discrepancies are first verified with the enumeration team. Owing to the unique nature of informal settlements, this step is pivotal. If the enumerator and coordinator feel that an error has crept in, it is rectified. This rectification can take place either in excel, or through the back end. Here too, depending on the nature of the error, the coordinator can decide if it easier to rectify the error at the back end, or grant access to the enumerator, in which case a section of the enumeration can be re-administered. PRIA applied a mix of these techniques but as the number of errors were usually low, it was quicker to make changes in a local excel file. Because our charts were dynamic, any changes were reflected automatically. Given below are a set of instructions to follow while making changes.
1. All corrections will be made to the local level file itself.
2. Once data has been verified, please refer to the code sheet and make changes in the file. You may replace the original entry but do highlight it so that it is easier to place at a later stage.
3. When you are sure about the authenticity of data, you can replace all the formulas in forms 1 – 5 with values. This helps reduce the size of the file significantly. The easiest way to do this is to select entries in the form using the select all shortcut: Ctrl + A. Copy all entries using Ctrl + C. Finally, paste using Ctrl + Alt + V, and then select values. You can also do this using the paste button in the toolbar, and selecting values. Replicate this for all forms.

Working with Charts

Once the data is finalised by PRIA’s team, it is time to visually depict the generated results. All charts are automatically updated based on the data; nonetheless, it is important to know how to work with charts. Here are a list of steps to take into account.

In many charts, you will find that certain columns are irrelevant since they have ‘0’ entries listed under them. To switch these off, click on the chart, and then on the filter setting and untick. Refer image below. In this case, since there are no entries under ‘अन्य’, it can be switched off.
Analysis, Validation and Sharing

The entire enumeration process came to a full circle through the analysis, validation and sharing of the data generated. The analysis consisted of the tabulation of settlement-wise breakdown of the demographics of all respondents and their households. Basic household information, inclusive of cross-tabulation between the type of houses with ration cards and income, as well as ownership and registration of houses were analysed. A few cases included the cross-tabulation of member level details such as gender, age, education and occupation with access to legal documents. The analysis also exhibited the state of access to sanitation facilities, such as toilets, and the kind of structural set up dominant in the settlements.

Keeping in mind the dynamic nature of informal settlements, these analyses were then validated at multiple rounds of group meetings with the community members. Dated information was changed and modified as per changes on the ground. This process kept the community engaged and participative in ensuring that the data reflected the current status of their settlements. Once validated, the data was shared with the other stakeholders, including elected councillors and municipal officials. The community and other stakeholders discussed the results of the enumeration for potential solutions and positive changes.

Enumeration results become the backbone on which SICs approach municipalities for service provisioning and infrastructural improvement. Once the data is available, SICs discuss the findings and decide what areas to prioritise. Using this data, SICs have been able to request for toilets (both community and individual), construction of drainage and sewerage, as well as Aadhaar and Voter ID.
PRIA team share a copy of each settlement’s data with the municipality and ward councillor. These findings represent the settlement as a whole and showcase service deficiencies, which councillors are able to use to pitch for improvements. In addition, individual settlement reports are consolidated and analysed for a city-wide picture.
ANNEX.1
ADDITIONAL ANALYSIS FOR HOUSEHOLD TOILETS

An additional aspect we embarked upon was where data was presented in the form of a database for those who did not have access to toilets at home. The database looks at the following: Name, Head of Household, Mobile Number, House Number, Address / Landmark, Availability of Aadhar and Bank account (at the beneficiary level); as well as Space for construction of toilet, Application for toilet, Date of application, and current status. This information is available from columns BG to BQ in the “Form 4” sheet. A template of formulas used is provided here. Note that these may differ due to sheet names and other factors.

<table>
<thead>
<tr>
<th>Field</th>
<th>Sheet</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Sheet1</td>
<td>=VLOOKUP($L2,'1-पंजीकरण फॉर्म'!$C$2:$T$200,17,0)</td>
</tr>
<tr>
<td>Head of HH</td>
<td>Sheet1</td>
<td>=VLOOKUP($L2,'1-पंजीकरण फॉर्म'!$C$2:$T$200,18,0)</td>
</tr>
<tr>
<td>House Number</td>
<td>Sheet1</td>
<td>=VLOOKUP($L2,'1-पंजीकरण फॉर्म'!$C$2:$T$200,15,0)</td>
</tr>
<tr>
<td>Address / Landmark</td>
<td>Sheet1</td>
<td>=VLOOKUP($L2,'1-पंजीकरण फॉर्म'!$C$2:$T$200,16,0)</td>
</tr>
<tr>
<td>Mobile number</td>
<td>Sheet5</td>
<td>=VLOOKUP($L2,'5-सर्व समाप्त'!$C$2:$K$72,9,0)</td>
</tr>
</tbody>
</table>

To procure Aadhar and Bank account details, use the following:
1. In the sheet titled ‘सदस्य सर्व की जानकारी’, create two columns: Aadhar check & Bank account check. Under each, paste the respective formulae.
   - Formula for Aadhar: =IF(F2<18,0,IF(K2=2,1,0))
   - Formula for Bank Account: =IF(F2<18,0,IF(L2=2,1,0))
2. These formulas will return a value of either 0 or 1. A value of 0 means the concerned individual either does not have this document, or is less than the age of 18. A value of one means the individual is above the age of 18 and has this facility.
3. In the same sheet, create a pivot table starting from Unique ID, and selecting till the columns you have made right now. Create a pivot table on a new sheet and title that sheet as 'Sheet1'
4. Make sure the pivot is in A3. In the row section, select Unique ID, and in values, select sum of Aadhar check, which is the column you created. The default value may be count. Go to value field settings and change this to Sum.
5. Copy the pivot table you have created to G3, and replace Aadhaar check with bank account check in the values field. Here too, ensure that sum is selected.
6. In the analysis for toilets sheet, input the following formula.
   - Aadhaar: =IF(VLOOKUP(L2,Sheet1!$A$3:$B$2819,2,0)>0,"Yes","No")
   - Bank Account: =IF(VLOOKUP(L2,Sheet1!$G$3:$H$2819,2,0)>0,"Yes","No")
7. Ensure your rows are matching and you should be done!
ANNEX.2

PROCURING HANDSETS AND SIM CARDS

PRIA procured 15 smartphones for each of its three cities, ensuring the following minimum standards:

(I) Smartphone operating at least Android V.6.0 (Marshmallow)
(II) Five-inch touch screen
(III) Battery size of 2800 mha and above
(IV) Multilingual support – especially Hindi
(V) 8 MP primary camera with autofocus and flash
(VI) Equipped with Global Positioning System (GPS) technology
(VII) Ram of 2Gb or above

Enumerators were requested to procure their own SIM cards and a monthly amount was provided for data recharges.
ANNEX.3

ALTERNATIVE METHOD FOR ACCESSING AND DOWNLOADING DATA

The section that follows is the older method of data export and has been added here in case it is required.

While this method of downloading website from the website works fine, PRIA decided to switch to a more automated method that did not require field teams visiting the website and manually exporting data. It was felt that being able to pull information in an excel sheet would be less time consuming, more secure and less prone to errors.

Accessing enumeration data

1. You will receive an invitation in your mailbox from CommCare to access data. Please click on the link marked below to proceed ahead.

2. You will be directed to the Commcare home page. In case you do not have a Commcare account, please sign up for a new account by clicking on the link marked below.
3. Create your Commcare account by filling in details like full name, email id and password.

4. Once you create a new account and sign in, you will need to accept the invitation by clicking on the link marked below.

5. You will be directed to the below page which is the main dashboard of your project.
Participatory Research in Asia

Downloading enumeration data

1. On the main project page, please click on the “Data” tab at the top.
2. In the drop down, please click on the “Export Forms” tab, as marked below.

3. You will then be redirected to the below page which has all the forms of the app listed.
4. Please click on the “Export” tab next to the form “HH listing > 5 - सर्व समाज” (or the form you require) to proceed ahead.
5. The page for downloading the data corresponding to Form 5 will open up.
6. Three kinds of filters need to be set in order to download the data correctly.
7. The first filter is the “User Types of Group” filter. Please select “Group” from the drop down as marked below.
8. The second filter is the “Group” filter. Please select your respective group from the drop down.
9. Hence, if you are from the Jhansi team, please select “Jhansi enumerators” from the drop down as marked below.
10. The third filter is the date filter. Please set the date range for which you want to download data.

11. Hence, if you want to download data for enumerations synced between 3rd and 6th Aug, please set the dates as marked below.

12. As seen below, the filters are set for downloading data for the “Jhansi enumerators” group for data collected between 3rd and 6th August 2016.

13. Please click on the “Prepare Export” tab as marked below.

14. Commcare will now prepare the data to be downloaded.

15. Please click on the “Download” tab as marked below to download the data.
About PRIA

Established in 1982, PRIA (Participatory Research in Asia) is a global centre for participatory research and training based in New Delhi. Currently, PRIA has field offices in several states of India and partnerships with 3000 NGOs across the global North and South to deliver its programmes on the ground. Over 35 years, PRIA has promoted ‘participation as empowerment’, capacity building of community organisations, and people’s participation in governance. Initiatives are undertaken in the overall perspective of ‘making democracy work for all’ – in the political system; democratic culture in families, communities, and society; and participatory democracy with active citizenship. PRIA’s programmes on the ground focus on promotion of participation of the poor, especially women and youth, to claim rights and basic services.

Through building knowledge, raising voice and making democracy work for all, PRIA realises its vision – of a world based on values of equity, justice, freedom, peace and solidarity.

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