



Making the invisible visible

Generating data on 'slums' at local, city and global scales

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SDI is a network of community-based organisations of the urban poor in 33 countries and hundreds of cities and towns across Africa, Asia and Latin America. In each country where SDI has a presence, affiliate organisations come together at the community, city and national level to form federations of the urban poor.

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The largest and most detailed set of data about what are termed ‘slums’ or ‘informal settlements’ has been built from enumerations undertaken by the residents of these settlements and their federations. These include settlement profiles, house-by-house surveys and mapping. This paper describes the challenges of keeping the process owned by communities while also ensuring the outputs are useful to others, including local governments. These enumerations serve as instruments for advocacy and dialogue with city authorities and development partners around slum upgrading and planning. This paper describes the social and technical complexities in achieving a single, globally accessible platform for ‘slum’ data.

Contents

Acronyms	4	4 Preparing for standardisation	14
1 Introduction	5	5 The standardised process of data collection	17
2 Shack/Slum Dwellers International and data collection	7	6 Verification	19
2.1 The census of the pavement dwellers	8	7 Conclusion	21
2.2 Invisibility across cities, countries and continents	9	References	22
3 Evolution of data collection and the argument for standardisation	10		

Acronyms

GIS	Geographic information system
GPS	Global positioning systems technology
MDG	Millennium Development Goals
NSDF	National Slum Dwellers Federation
SDI	Shack/Slum Dweller International
SFI	Santa Fe Institute
SPARC	Society for the Promotion of Area Resource Centres

1

Introduction

Shack/Slum Dwellers International (SDI) is a transnational network of community-based organisations and federations of the urban poor in 33 countries in Africa, Asia and Latin America and local NGOs affiliated to them. It was launched in 1996 and formally registered in 1999. It had its genesis in India and South Africa, as ‘a global platform [that] could help [...] local initiatives develop alternatives to evictions while also impacting on the global agenda for urban development’ (SDI 2015a). In the course of the past two decades, SDI has focused on the local needs of shack/slum dwellers, supporting the voices of the urban poor through developing mobilisation, advocacy and problem-solving strategies that counter exclusion from development.

Daily savings in predominantly women-led groups form the heart of community self-organisation and trust building in slum/informal settlement communities. This is supported through community-to-community learning exchanges and by enumerations (censuses/surveys/profiles and mapping) of informal settlements undertaken by their residents with support from their federations and from SDI. SDI has used its global reach to build a platform for slum dwellers to engage directly with governments and international organisations to try new strategies, change policies and build understanding about the challenges of urban development.

Communities of the urban poor across Africa, Asia and Latin America affiliated to SDI have begun a network-

wide campaign to standardise and aggregate the data they collect at household and settlement levels. Data about these communities’ everyday lives and living conditions serve as a means to communicate the scale and extent of informality and deprivation in the spaces these communities occupy in the city. In the past three decades data collection has also helped build a positive shared identity among slum/informal settlement dwellers and fostered the development of political legitimacy with city officials.

In an effort to increase the scale of these processes and improve their ability to gain official acceptance and leverage resources, SDI federations are standardising collection formats and digitally systematising the data-collection process and management. This involves the development of a centrally managed settlement profile and survey tool for use across SDI’s global network.

This paper outlines a development of these processes of data collection, the characteristics of the data collected and the methodology employed. It considers the tensions inherent in systemising a community-driven data-collection process, and the difficulties involved in balancing multiple and sometimes contradictory aspects of the process. Standardisation of the settlement profile opens up new spaces for dialogue for SDI federations with local governments, central governments and international agencies wanting to support urban poverty reduction in informal settlements. At the city

scale, standardised profiling helps federations to understand the problems at the scale of the city and to compare conditions across cities and national borders in order to interact more effectively with city authorities in a citywide dialogue. Along with the gains offered by standardised profiling, this paper discusses the challenges of standardising and universalising a process that historically has focused on the particular and local contexts of individual settlements and their relationships with their local authorities.

This paper begins with an insight from one of the national leaders of an SDI affiliate in India and then elaborates on the general processes of data collection developed by SDI, the motivation to begin the standardisation process and the social and technical complexities that the network has had to address in achieving a single, globally accessible data platform for its profile data (see Box 1).

BOX 1. SHEKAR FROM INDIA

I was born in a Bombay¹ slum, in a neighbourhood made up of migrant workers. My father and Jockin were the first generation leaders for the National Slum Dwellers Federation (NSDF). I was six years old when an eviction started that changed the way NSDF came to organise communities.

Bhabha Atomic Research Centre owned the land where we lived. The government recognised the strategic importance of the land, and started planning a large resettlement/eviction process. Jockin was organising protests, but initially we were failing on all fronts. We did not have any information about the settlement, even though we were engaging trade unions, government agencies, and so on.² We lost the court case, and the government commanded us to move once again.

In the resettlement, we saw that some got houses and others did not. This is because neither the state nor the community had information about the settlement. Ten-by-fifteen-foot land plots were allocated to each household. This new place had no social and economic infrastructure, and the monsoon rains had just started.

We realised that there was no need for another community to go through what we went through. We started thinking about ways to assist communities in similar situations, and how we can best support them. We started counting all the slums in Bombay. This happened over weekends, and there were no resources to support the process. When we

compared the numbers the state put forward, and that what we collected, we saw a large discrepancy: the state was always undercounting and minimising the urban crisis. For instance, we counted 400 structures in a settlement, but the state would say there are only 100 structures. We divided the city by land ownership (private, state owned, parastatal, etc) and identified the slums on those pockets of land.

When we went to talk to the leaders, everyone gave different counts of the shacks. As NSDF we verified this by doing a brief walk to get our own idea of how many shacks there were. First we needed to have the information before we started talking to the government. We started organising communities around the data, and so started creating federations. Since 1989 we have been collecting data and referencing it on spatial maps. In 2000 a large demolition started on the railways. We won the court case because of the maps we produced.³ We presented family identity cards for each household and a complete database for each settlement. The court ruling was that the government was acting illegally as it was not providing an alternative.

For us, we learnt that information and savings have real power in engaging with government. Now we don't go to government shouting and screaming, but approach them with hard data to show that 800 people share one toilet.

Source: Exchange report

¹ Bombay is the former name of Mumbai, the capital city of the Indian state of Maharashtra.

² See also Arputham (2012: 27–30) for details of how data were collected from this informal settlement about businesses, electricity and telephone poles to bolster the residents' case against eviction.

³ See also Patel *et al.* (2002: 159–172).

2

Shack/Slum Dwellers International and data collection

Communities and federations of the urban poor who are members of SDI have been collecting data and producing knowledge about their everyday lives for three decades. This work preceded the development of the transnational network as it emerged from the first SDI affiliate in India – the Indian Alliance (made up of the National Slum Dwellers Federation; Mahila Milan, a federation of women slum and pavement-dweller savings groups; and the local NGO SPARC or the *Society for the Promotion of Area Resource Centres*). Their work included supporting women pavement dwellers to undertake a census of pavement dwellers in Mumbai in the 1980s.⁴

SDI affiliates use data collection to produce social and political capital for themselves, both linking their communities together and building relations with their local authorities and other government agencies. The data they produce has become the basis of a powerful social and political argument that has seen the leveraging of substantive improvements in the lives of millions of slum dwellers across the global South. Collected by means of self-surveys and community-led mapping, it captures their everyday lives and living conditions and communicates the scale and extent of informality and deprivation in the spaces they occupy

in the city. It has become, along with daily savings and peer-learning exchanges, part of the basis around which slum/informal settlement dwellers mobilise and organise to effect real change in their settlements and everyday social lives.

There are three SDI federation data-collection activities: settlement profiles, house-by-house surveys (censuses) and mapping. All three are led and managed by the communities themselves. The value of the data they collect is well recognised and understood both within the network and beyond. Its value is reflected in the numerous working partnerships and agreements SDI federations across the global South have formed with local governments, international bilateral agencies and planning schools and in SDI's partnerships with and membership of international development bodies such as the Cities Alliance and the *United Cities and Local Governments of Africa* (UCLGA).⁵

In collecting information and data about their everyday lives, these marginalised and often invisible citizens have found a means to change political relations and increase their participation in their own development. SDI argues that community development should be based on such priorities as identified by communities during the course of their own data-collection activities. This is the only

⁴ For more information see: www.sparcindia.org/index.php

⁵ For a list of SDI's development partners see: www.sdi.net.org/partners

way to ensure ownership of development initiatives and real participation of communities rather than just 'tick the box' participation.

There are multiple benefits from community-led data collection. The three levels of data (settlement profiles, household level enumeration/census and maps collected and collated by slum dwellers) serve as tools to mobilise communities. They also serve as instruments for advocacy and for opening dialogue with city authorities and national and international development partners around slum upgrading and planning. Writing about settlement profiling and enumeration, SDI president Jockin Arputham argues that the self-census and enumeration practices of the network are '...self-development. [You] cannot do development in [these] slums without an enumeration done by their inhabitants. Before going for any physical development you need their enumeration and their settlement profile' (Arputham 2012: 30).

The self-enumeration practices of SDI were born out of an effort to prevent the eviction of Janata colony, a well-established community with a legal identity in Mumbai in 1973. In doing the enumeration of Janata colony, the slum dwellers counted the businesses and the infrastructure – including the electricity and telephone poles. Since telephone poles were official legal infrastructure with 'an official address – a district, an area' (Arputham 2012: 27) their presence meant that the slum settlement to which these poles belonged had a legal address. By showing the number of telephone and electricity poles that had addresses the slum dwellers could prove that they had addresses too, as in 1970s Mumbai 'you could not have a telephone without telephone poles' (ibid). What is both curious and tragic

at the same time is that in Janata colony, the telephone and electricity poles had physical locations noted within the municipality, but the residents around them did not have addresses. By tying their status to that of these infrastructural objects, the resident slum dwellers had begun to make a claim for the documentation of their presence in the city.

2.1 The census of the pavement dwellers

In 1985, the census of the pavement dwellers – *We, the Invisible* – was published (SPARC 1988). This was the first census of pavement-dwelling families in Mumbai. It sought to capture and make visible the histories, lives and productive contributions of these otherwise 'virtually invisible' people (SPARC 1988: 4). These data-collection efforts of pavement dwellers sought to create a constituency for invisible people with no official address. They sought to create new categories of identity in the city through which pavement dwellers could gain recognition in official structures.

An important aspect that underscored these early enumerations was the fact that they were conducted out of necessity using frugal means and with limited resources both in terms of financial and human capital. They demonstrated that if conducted in a clearly defined and bounded area they could deliver comprehensive results in a short time. Expressed in *We, the Invisible* was also the hope that these enumerations would put pay 'to the myths and misconceptions about pavement dwellers in general and the difficulties of enumerating them in particular' (SPARC 1988: 10).

Figure 1: Extract from the preface to the second edition of *We, the Invisible* (SPARC 1988).

Preface to the Second Edition :

For those of us who were part of it, "We, the Invisible" was the culmination of a magical and unique endeavour. An infant SPARC, then comprising only seven people, set out to census thousands of pavement families in one part of South Bombay, with the conviction that the information thus generated would somehow stave off the demolition of their homes. At that time, people were anxious to represent to the authorities, the policy-makers, and other citizens of Bombay; to tell them who they were, why they were here, and what they contributed to the city. It was the only way of combating the myths and prejudices surrounding pavement dwellers.

We now know "We the Invisible", and the all Bombay census conducted by Nirmala Niketan (College of Social Work) succeeded in doing this. Myths and prejudices have been substituted with facts and figures. Mass demolitions did not take place - but we will never know how much "We, the Invisible" - or any of the myriad other efforts of that time contributed to this outcome, and continues to do so. Otherwise, this second edition would not have been necessary. Letters and requests for the document have kept pouring in long after the first 1000 copies were exhausted.

Official censuses and surveys at the time demonstrated 'that the obsessive concern with slums [...] led to the neglect of pavement dwelling as presenting an equal – if not greater – challenge to urban planning and development' of Indian cities (SPARC 1988: 6). For example the 1976 census of Mumbai slums by the government of Maharashtra excluded pavement dwellers in its count. The public policy on pavement dwellers was that they were illegal encroachers on public land. *We, the Invisible* describes the regular demolition of pavement hutments by authorities and their rebuilding by residents as 'a minor war of attrition [...] with occasional skirmishes (ibid).

Between 1981 and 1985, this 'minor war', took centre stage in a major legal battle between the state and civil society organisations (CSOs) representing pavement dwellers. The court ruled that eviction of pavement dwellers was legal with prior notice and under humane conditions, with no requirement on the part of the state to offer alternative accommodation or location (SPARC 1988: 8). Following this judgement a mass eviction was expected by the pavement dwellers and SPARC; yet SPARC soon realised that there were no accurate numbers available on pavement dwellers.

SPARC decided to conduct a rigorous enumeration that would a) cover a significantly large number of pavement dwellers in a defined geographic area, and b) feed the information back to the residents to strengthen their capacity for mobilisation and organisation. The latter aim built on the legacy of the Janata enumeration, which was to establish a tool for agency for marginalised communities. A total social survey such as the enumeration (which includes a complete demographic profile of all individuals and households) can provide a 'clear quantified understanding of the dimensions' of the external conditions and problems faced by these communities (SPARC 1988: 9). But it also creates the awareness first and foremost in the community themselves that their situation is not unique and is shared with many thousands across the city.

2.2 Invisibility across cities, countries and continents

Twenty years later, families in informal settlements in Nairobi would face similar pressures to the ones in Mumbai and they would come to understand the value of enumeration and mapping. With the coming of independence to Kenya in 1963 and the easing of colonial controls on migration to urban areas, the formerly segregated capital Nairobi saw 'class rather than race' (SDI 2008: 10) perpetuate the colonial

arrangements of 'residential areas, planning and service standards'. Rapid rural-urban migration put pressure on available land, especially the areas formerly designated for natives and this brought an increase in 'squatter and informal settlements' (ibid). With less and less land to occupy and no official recognition or response to their existence in the city, the poor took to the occupation of 'riparian reserves, swamps, steep slopes, refilled quarries and garbage dumps...services reserves like railway safety zones, land under high voltage power lines and on road reserves' (SDI 2008: 11). These settlements were in plain sight with increasing levels of poverty and deprivation, yet they remained unrecognised and unacknowledged by government on the maps of the city and planning policies.

During the 1980s and 1990s the urban poor of Nairobi would come to face a worse adversary than planners and mappers. Land grabbers, beneficiaries of the corrupt patronage system by which 'land was used to purchase political favours' (SDI 2008:11) moved in to claim their gains. Not finding 'their lands' 'unoccupied' they moved to violent demolitions of informal settlements and evictions of their residents, aided by the official administration.

The annals of SDI federations evidence the ways in which the collective power of grassroots data collection can catalyse new and less adverse forms of political relations. The April 2012 edition of the journal *Environment & Urbanization* included several papers on data collection and mapping activities by SDI affiliates. These also highlighted their contributions to development in informal settlements and their impacts on the policies that deal with such neighbourhoods from cities across the South. It highlighted the flexibility of the tool to be adapted to varying contexts and yet serve the same ends (Patel *et al.* 2012). For example, Farouk and Owusu (2012) describe how the Ghana Federation of the Urban Poor (GHAFUP) and their support NGO People's Dialogue on Human Settlements successfully countered evictions in Old Fadama, Accra's largest and oldest slum on three occasions by means of community-led enumerations. In Zimbabwe, the profiling, mapping and enumeration of Magada settlement in Epworth led to local government's first agreement to support in-situ upgrading with the consequent development of such a protocol within the municipality of Epworth (Chitekwe-Biti *et al.* 2012: 131–148).

These examples demonstrate how data collection has been used to help to build a new relationship with the authorities, legitimating the presence of the informal settlement dwellers and enabling them to secure upgrading.

3

Evolution of data collection and the argument for standardisation

SDI's network of federations and support NGOs shared these practices of data collection and their potential gains through many exchanges and related interactions. Emphasising the importance of working in a distinct defined geographic area, the focus on highlighting and addressing local and particular conditions of individual communities remains at the centre of any data-collection process. Initially, surveys that engaged all households in a settlement were undertaken but settlement profiles became increasingly common as these were quicker and could cover all settlements in a city, as described below. This engagement with data collection in all informal settlements also helped strengthen the network or federation.

The first step of any enumeration is the settlement profile, the collective snapshot of a settlement's baseline information. It locates slum/informal settlement dwellers and their settlements and includes the mapping of the settlement boundary. Each profile includes the history of the settlement, its security of tenure status, an estimate of its population and access to basic infrastructure such as water and sanitation. It includes the social, political

and environmental conditions, including the scale and nature of informality and assets. It is considered to be a first step in generating an understanding of the settlement for the community themselves and for the city/local government authority. Thus, profiling of a settlement is orientated both inwards towards the settlement residents and outwards to potential allies in its development.

The completion of the survey questionnaire used in profiling has been known to last several hours as community members actively debate the information gathered. The short-hand for this community meeting is 'focus group discussion' (FGD). However, it may more accurately be described as a mass community meeting⁶. All settlement stakeholders from settlement and community leaders, regular residents, community based organisations and interest groups like women's groups and youth groups, as well as, local government officials are invited to attend these meetings. This is to ensure that as representative as possible cross-section of interest groups are present for the profile. Upon completion of the focus group discussion, it requires

⁶For a description of the methodology of the settlement profile process see SDI 2015b: 10-12

the federation to return all data collected during the profile to the community at a follow-up meeting. The data returned includes a digitised copy of the survey questionnaire, a copy of the boundary and services map produced, as well as a basic first report on the distribution of basic services and the development needs of the settlement as prioritised by the community. During this follow-up meeting the community has the opportunity to verify the data, reflect on it and begin the process of collective development planning based on their information.

While the data seems to occupy centre stage during these meetings, it is rather the activity of collective deliberation that is cause for the most excitement. **A sense of belonging** to place and space has powerful bearing in the taking of **ownership** for its development. With a now-concrete understanding of the location and extent of land and access to basic services, the community as a collective may engage in informed planning for their settlement. There is a sense that the profile 'protects settlements from encroachment as communities identify with their borders, enhance advocacy for change and lastly [begin to] inform community planning strategies for housing and infrastructural development' (Mbaka 2013). The settlement profile becomes an important first step towards engaging city officials and policymakers in participatory self-development for upgrading, improving living conditions and recognition.

The settlement profile and mapping make objective and subjective assertions at the same time. Objectively the settlement becomes a distinct and quantified entity with a defined constituency for which clear aims may be advocated.

For the subjectivities of the community members, the profile accords a sense of security in a shared identity. With an enhanced sense of belonging among residents it increases the shared responsibility for the resources available and desired. The data-collection activities form the basis of organising communities around communal challenges that require structured collective action. The establishment of savings groups, in which members save small amounts on a daily or weekly basis, often coincide with or flow out of settlement profiling activities and form the first level of concrete organisation.

As SDI worked with data collection, it came to realise the potential of greater aggregations of information. Publications like the *Nairobi slum inventory* and *Profiles of the informal settlements within the Ekurhuleni*

Metropolitan Area aggregated profiles and provided a report at the city scale.⁷ The Community Land Information Programme (CLIP) in 2008 in Namibia made the first step to aggregating profile data at the national level. A total of 235 settlements were profiled nationally. The commonalities in informality across the settlements were apparent, yet there was no concrete demonstrable comparative basis available across cities and countries. While the body of knowledge and data collected by slum dwellers these past 30 years offers a substantial contribution to the total data available on informal settlements in the global South, this data has never been aggregated to make a single comprehensive database of the lives of the urban poor. The questions of the settlement profile were not standardised, yet they addressed and involved many commonalities around the nature and conditions of slum/informal settlements across cities. The process of settlement profiling also remained very consistent.

The need for a single unified questionnaire and a single database came to be widely recognised across SDI. For the national leaders the objective of data aggregation was an important evolution of the work SDI federations had been performing for many years. It reflected the need to scale up their efforts in building a unified voice of the urban poor at the national and global level.

The president of SDI, Jockin Arputham, communicated the need for a single and standardised profiling tool to the federations as follows:

We need one SDI questionnaire, so we can use the information globally. We want to understand what the magnitude of our power is. We want to make different cases to different audiences. We want to collaborate with all the actors speaking about land, housing, infrastructure, all the people speaking about the urban poor. But we want to have a voice at these forums.

Jockin Arputham, Enumerations Meeting Nairobi, 13 April 2013

Arputham highlighted a number of reasons for the federations' need to scale up and standardise SDI's settlement profile. SDI federations always and will continue to make their arguments in relation to land and access to basic services. This is the basis of their unique social and political argument: an argument that

⁷ *Nairobi slum inventory* totals 75 settlements (SDI 2008) while *Profiles of the informal settlements within the Ekurhuleni Metropolitan Area* total 143 settlements (CORC and SA Alliance 2009).

is not just about rights, but about justice. For slum dwellers first and foremost it remains important to understand that:

- The federation/communities when organised have the power to direct resource flows to their settlements.
- Data is the first step in building a positive identity for slum dwellers and organisation around this identity.
- Data is the basis of advocacy and opening dialogue, an asset for negotiation for slum upgrading (local/global).
- The process of data collection presents an opportunity for collaboration (not 'participation') for communities in the implementation of their own prioritised development.

When Arputham spoke about the need to 'understand the magnitude of the federations' power' he had a dual intent. First, he refers to the strength of the federations' position when they speak to governments. Second, he refers to an internal reflection on what forms the basis of the power of federations – savings, data collection and exchanges. Making different cases to different audiences demonstrate the use of the tangible evidence drawn from the data. They also show the use of the data-collection process as a point of departure with which to engage relevant actors around those issues pertinent to slum dwellers. In addition, the data help to establish partnerships with the government at local, national and international levels and in so doing support the voices of the urban poor. Finally, the data is not just political, it is social. The arguments of slum dwellers are not just about rights, they are about justice.

It was agreed that the beginning of this process would be a standardised informal settlement profile. Profiles in any city permit the aggregation of data and the comparison of conditions across informal settlements in the SDI network. For SDI federations, such knowledge insights were just one of the benefits they anticipated from this aggregation process.

In addition to the aggregation of SDI settlement profile data, the ambition was also to make this data more accessible through a public domain to new audiences beyond the federations and their support NGOs. Like other large data banks, SDI profile and enumeration data remained in federation leaders' 'little black books', PDFs, glossy reports and spreadsheets and these were often not readily accessible to those beyond the network. SDI sought to present grassroots local

organisations as the experts and global leaders on slum data; and it recognised that it had to present data on the internet. It hoped that by offering opportunities to access the disaggregated data, it could achieve greater recognition of the work of the federations.

This coincided with a time when there was a more general recognition within the global development agenda that there had been too little emphasis on local implementation with the Millennium Development Goals (MDG) process. This trend would continue in the lead-up to the discussions for the new development agenda beyond 2015. Satterthwaite and Mitlin draw attention to the fact that besides omitting grassroots civil society leaders, of the 26 people making up the high-level panel to advise the UN-Secretary General on the post-2015 development agenda, only one was from local government (Satterthwaite and Mitlin 2013: 13). They argued that there is a 'vast distance from local realities' between those who discuss the future of some of the most deprived populations and those who live it every day or are tasked with improving these conditions. SDI chair Sheela Patel echoes this sentiment arguing that 'the reality of the local context is becoming less and less visible in an increasingly globalised development agenda' (Patel 2014). There was also recognition that data collection especially at the local level would be an important part of the effort to remedy past and potential future failings.

For informal/slum communities, marginalised and disadvantaged by spatial, economic, social and political exclusion, the political voice built by means of community-led collection and documentation activities creates space to:

- Identify developmental priorities
- Organise leadership down to street and household level, and
- Stay evictions and cohere around community-level planning and settlement upgrading.

Such data collection forms a part of the critical base from which urban planning can achieve deeper community participation and drive city development plans to include the urban poor. Sharing data collected with government and other development institutions (ie World Bank, UN-Habitat), creates relationships and makes the poor integral players in the decisions that affect their lives. Where local governments themselves lack the human resources and capacity to collect and

generate this kind of data (eg Stellenbosch Municipality in South Africa), their interaction with SDI communities has given them access to valuable databases. This has often re-informed their information and documentation management around informal settlements and their residents. Keeping ownership of the data with the federations/communities (thus ensuring that it remains an asset for negotiation for communities) offers a means to maintain a 'local' voice in global dialogues.

Owning the data increasingly means that communities have to keep up to date with the communications technologies available to governments and other partners. Reporting and having the data available in formats that governments are able to use and find acceptable has become key in cementing the value of community data. Formats range from geographic information system (GIS) reference maps to actual databases.

4

Preparing for standardisation

The project to realise the ambition of a standardised universal settlement profile tool for the SDI network was funded by a grant from the Bill and Melinda Gates Foundation⁸. The project was a joint grant held by SDI and Santa Fe Institute (SFI), seeking to, among other, aggregate and analyse around 7,000 federation profiles collected across the network, standardise the settlement profile tool and build a globally accessible database to house existing and future settlement profiles.

To create one standardised settlement profile for SDI federations would be about more than agreeing on the questions and column headings of the survey questionnaire. It would become a process of iterative and continuous co-design and negotiation. The challenge was to marry the federation process with contemporary support technologies that would neither replace nor undermine the community-led aspect of the process or its ownership.

A total of 15 countries contributed settlement profiles to a first round of data assessment. The data came in the form of summary tables, narrative report documents in PDF format and other quantitative tables. These needed to be captured in numerical form such that the data could be analysed more easily. The challenge was to consider ways in which this data could be collected more speedily and accurately, verified and ultimately reported in a format with multiple applications. The standardisation of the profiling form

and associated reporting formats would enable the aggregation of profiles to and beyond the city scale. As noted in Section 3, it was anticipated that this would both increase the profile of grassroots development organisations and strengthen recognition of their capabilities. In the longer term it was believed that this would lead to more favourable policies, programmes and government practices.

Historically, federations collected the data using paper surveys and returned the surveys to their NGO support staff relying on these to digitise, analyse and report using spreadsheets, narrative reports and GIS. Depending on the capacity available within the NGO – support staff are often engaged in multiple tasks – this process could take weeks or months. The reports could range from anything to a couple of pages to hundreds. Reports also had to be continuously adapted for the intended audience or one generic reporting template was used to communicate with a range of actors, ie donors, academics and government, bringing new challenges in how the data was viewed or accepted.

The lag time between collection and reporting through this process inadvertently often 'diluted' community ownership of the data, bringing about the very thing that at the genesis of the data-collection process the federation leaders wanted to prevent. One could argue that it was an explicit reason why the federations hesitated for so long to incorporate digital technologies in their data collection. Data was meant **to be with the**

⁸Bill and Melinda Gates Foundation OPP1076325: Slum Profile Database Project. Grant period November 2012 to June 2015.

federations and available in forms of 'literacy' available to them, but at the same time intelligible to and usable by their development partners.

Returning collected data in an accessible form to communities means the federations/communities maintaining ownership of the data. It offers a means to maintain the 'local' in global dialogues. For SDI, this meant supporting a language/communication strategy that narrates and quantifies all this and remains intelligible to slum dwellers.

The data collected for *We, the Invisible* was available within 24 hours and its impact and appeal was its essential simplicity and directness. For the technical team charged with supporting the federations in the design of their data platform and visualisation tools it would become a guiding inspiration and ambition to replicate this standard as well as maintain even in the technologies and their applications the drive to dispel 'myths and prejudices' about slum dwellers with 'facts and figures' and maintain their power to tell 'who they are, why they were there [and] what they contributed to the city'. To paraphrase James Corner's description of the 'agency of mapping': '[SDI federations] neither reproduce, nor impose on existing maps/data, rather they uncover realities previously unseen or unimagined, even across seemingly exhausted ground [...] remaking territory over and over again' (Corner 1999: 213) It would be this remaking of territory that would characterise the federations' journey into the digital age.

While there was a definite need to develop technical capacity around digital and online software technologies, what SDI federations had available was more than two decades of settlement profiling and mapping experience and data. Both the quantity and quality (of the data) was unique, and made for a sound foundation on which to build.

'Responsive and adaptable' would trump 'relevant and appropriate' in the choices for both technologies and development partners. Collaborators and fellow tool-builders with the same qualities and lots of patience were required as SDI technical support staff and federations figured out together what it means to allow 'the federation way' to guide the development of tools and not have the tools/technology determine or dictate 'the federation way'

Along with enhancing the technical standard of the SDI federations' community-led and managed data practices with state-of-the-art technological applications, the objective is to produce a demand for grassroots data at scale through the presentation of what communities have collected and verified. There are commonalities in informality and the conditions of poverty and deprivation. And although these were apparent to informal settlement dwellers and international policymakers,

informal settlement residents federated to SDI had not attempted to use their data to show such commonalities.

The standardisation of the profiling form and adapted format involved some difficult decisions. These can be illustrated through an analysis of the problems and response to categorisation. The profiling form required consistent differentiation between formal and informal, recognised and not recognised settlements. Across the countries in the network informal settlements may be termed as 'slum', 'unplanned', 'high density', 'shack' or 'squatter' settlements with varying levels of legal and extra-legal protection depending on physical location and the prevailing political and social contexts. Further concerns around categorisation included how to classify those slum settlements that had land tenure but no services and those that had neither. Government definitions (or rather recognition) of informal or unplanned settlements remain at odds with the community's lived experience of slums.

The process of reconciling the needs/priorities of the federations and the technical issues was not quick. Rather it was long and iterative as suggestions were tested in a dialogue between the federations and technical staff. It took almost a year to resolve all the questions. And this was only finalised in May 2014. In some surveys, the quality of the data was discouraging and pointed to a lack of federation participation and ownership in the data-collection and verification processes. There were numerous exchanges and often difficult arguments between the team coordinating this work and local affiliates. Further tensions emerged between maintaining the *raison d'être* of the SDI slum database and developing and partnering with contemporary technologies required to support the collection of 'good-quality' data that is more readily accessible to both federations and their development partners. The analysis of the 7,000 historic profiles collected by June 2013 identified a number of challenges to an easy standardisation:

- Affiliates were collecting different kinds of data as these were based on local priorities but this presented challenges for developing a common profile format.
- Definitions were inconsistent and imprecise across profiles from different cities, again because the profiles were developed by local processes.
- Not all profiles had sufficient information for analysis, and some were incomplete.
- Data was collected at various times, some profiles were undated.
- There were possible duplicates – and for some cities, data collected on two or three occasions and for different purposes (for instance to fight eviction).

- The older data often lacked location information and geospatial referencing.
- The land area units and distances were imprecise or absent in many early surveys.
- Spatial definition was inconsistent and included neighbourhood identities, government delineations and historical boundaries.

Despite the above challenges, ultimately 6,198 historical settlement profiles were rendered and confidently acknowledged by federations and scientists and brought together within the new SDI informal settlement profile platform, known as the 'Ona platform' which uses technology developed by Enketo and Ona Data for collecting data.⁹

Slum dweller federations actively generate working definitions of informal settlements/slums relevant to their own local context. This not only helps the federation in the field to identify pockets of slums among otherwise formal neighbourhoods but to list and then map them. It also helps to contextualise the politically sensitive concept of slums and informal settlements. Target 11 of Goal 7 of the MDGs aimed to address the improving of slum conditions. Sensitivity to the terms 'slums' and 'informal settlements' by governments may be reflected in the official concepts such as 'unplanned areas' (Zambia) or 'high-density areas' (Zimbabwe). In conceptualising/naming them as such, some settlements may thus remain uncoun- ted. Localising such a definition has an important impact on how the challenge of settlement upgrading is approached locally.¹⁰

For example, based on field experience, in the course of the citywide profile of the Greater Accra Metropolitan Area the federation in Ghana learnt to focus the mapping of services on those outlined in the standardised profile (water, sanitation, garbage disposal sites, street lights). It included under 'other' only such services which support slum upgrading and have relevance for the federation's work and process in engaging with government to address upgrading/ security of tenure concerns in their local context. The goal of the profile has always been to strike at the heart of issues faced by slum dwellers in their everyday lives: insecurity of tenure, one toilet seat for every 300 people, one water tap for every 5,000 residents and to show that even the cost of potable water in informal settlements can be 4 to 5 times more than what middle

class people pay in the same city. These issues and how to address them in a sustainable manner are the foundations around which slum dwellers are and may be mobilised and organised into collectives driven and sustained by both a social and political agenda.

Often, the government supply of basic services lags behind demand. Coupled with rapid urbanisation, even existing infrastructure buckles under the demand exerted upon it, resulting in areas with 'poorly maintained drainage systems, high occupation density and congestion', often rendering previously formal and recognised settlements into slums according to UN-Habitat's 'slum' definition (UN-Habitat 2003). The federations use a combination of the government's list of 'recognised' slums and include the UN-Habitat's definition along with their own lived experience in order to compile their list for slums and then order them according to three categories: informal (illegal and unprotected), formal (legal and protected) and resettled. 'Resettled' refers to settlements where government has already been involved and for which to some extent a responsibility exists with government to support and maintain the infrastructure.

In addition to the collection of data with consistent categories is the uploading of new profiles to the Ona platform. The platform allows for offline data capturing, which means the federations now have access to a tool that can work with minimal and even poor internet-connectivity, capturing the data while offline and then uploading it onto the central database once internet connectivity is available again. This is a valuable aspect of making contemporary technologies more accessible in spaces with limited access to the internet.

The historic profiling data was input into tables structured around eight areas of interest. These related predominantly to physical infrastructure, population and access to communal basic services. Information on the social and land tenure context was often not sufficiently precise to be included. Drawing on this process, a standardised informal settlement profile survey tool was developed with close to 250 quantitative and qualitative questions. The federations have increasingly engaged with geographic reference mapping over the years and two support tools for mapping the boundary and basic services data were developed alongside the main profile form. Referencing data spatially also provides a recognised means of verifying the data collected in the master profile.

⁹ Ona Data is a social enterprise based in Nairobi and New York and is helping communities build tools that allow organisations to drive change through data. Enketo is an open-source data technology that supports the offline capturing of data.

¹⁰ See for example: NGO Forum for Urban Water and Sanitation (undated).

5

The standardised process of data collection

A standardised SDI informal settlement profile was finalised with the following tools:

- 1) Informal settlement profile
- 2) Informal settlement boundaries map
- 3) Informal settlement services map

The minimum requirement for a settlement profile is completion and verification of 1) and 2). For a profile to support an informal settlement upgrading project, all three elements need to be completed and verified.

The guiding premise in the development of this protocol's accompanying technologies was: how does this proposed protocol of tools support community mobilisation and create a voice for the urban poor? It was acknowledged that the use of these tools is part of a community mobilisation process and builds collective processes that go hand in hand with other SDI processes, e.g. savings groups and advocacy work. This process suggests active local work by federation members and leaders and scales up the work of the

federation beyond residential settlements to the citywide scale. Further, it provides an accessible means to monitor and evaluate the work of the federations by the federations themselves calling for the turnover time from data collection to reporting to be shortened and for the federations to be part of the entire collection-to-reporting cycle.

The building of these tools has required the inputs of affiliated federations as well as software developers. The project has further required the building of a knowledge platform disaggregated into two components.

- An online database with collection, analyses and reporting tools that draws from and is used by informal settlements dwellers.
- A web portal providing globally accessible infographics to report the data at the city and settlement levels. This is included to be useful to affiliated federations wishing to engage their local governments in slum upgrading.

Field testing of the standardised profile form started in seven countries in Africa in July 2013 (Kenya, Uganda, Ghana, South Africa, Namibia, Malawi and Zimbabwe). The aim was to test the performance of the new tool through the collection of a target 800 new profiles in the standardised format. Between November 2013 and March 2014 a full assessment of data collected in the first version of the standardised form was conducted. This included a line-by-line review of all the data received. It also included discussion with both technical staff at the affiliate level and federation leaders about the data-collection process itself. This was also discussed at a meeting of the East Africa federations in Mombasa, Kenya in November 2013.

In response to the challenges reported, further settlement profiling learning took place in Ghana (December 2013), Tanzania (March 2014), Zambia (March 2014) and Sierra Leone (for the West African countries Togo, Burkina Faso, Ghana, Nigeria and Liberia in June 2014). The new tools brought new challenges especially for those federations who were new to GIS mapping.

Following research done by SFI with regards to a suitable partner for a database system that would serve the SDI process, Ona Data was selected to be the data platform partner in March 2014. The Ona platform supports a single database infrastructure and capturing repository for the settlement profiles from where settlement data may be viewed, managed, analysed and visualised. This realises SDI's aim for its affiliates and federations to contribute to the single largest repository of slum data collected and managed by communities themselves and available as the first port of call for researchers, policymakers, development practitioners, governments and local authorities operating in the field of urban poverty analysis and reduction. The establishment of a standardised dataset covering slum settlement profiles across Africa, Asia and Latin America allows for community-led data gathering and management as best practice when dealing with slums while following a bottom-up approach to development initiatives.

The first prototype visualisation of the data was returned to the federations in Ghana in December 2013 and then to federations in Tanzania and Zambia in March 2014. Feedback from these interactions led to adjustments that enhanced the robustness of the profile tool, and ensured that the visualisations dashboard was accessible to the federations.

The visualisations dashboard¹¹ has been designed to display data from seven key reporting modules identified by the federations. This is the first data they interact with at the community level and communicate to the city. These are:

- Basic information: a summary of the history, demographic and structure details of the settlement.
- Water: the level of access to water in communal facilities, given as this remains the means by which the majority of informal settlements access water.
- Sanitation: the total number of toilet seats available in communal facilities and the ratios of these to the population.¹²
- Health services: availability of primary and secondary health services in settlements, and otherwise the average distances from the settlement to access health services.
- Infrastructure: such as access to electricity, roads and transport.
- Commercial establishments: for general daily needs such as informal markets and general shops.
- Organisational capacity: to determine/show the levels of self-organising at the settlement level in terms of savings and women's groups (SDI federation processes are primarily led by women and organised within and around the savings groups' network).

Making the invisible visible has been the guiding premise of SDI federation data-collection processes since its inception. Social media and data visualisation dominate contemporary dissemination of information. The knowyourcity.info website enables SDI affiliates to have their own public visualisation platform; this website also means that the reporting mechanism for the standardised settlement-profile data is owned controlled by the federations. These processes enable each federation to decide if they want their data reported on the website. The website has an access control mechanism after the first-level city-level report. Public users can view the aggregated city-level data in seven predefined modules and can compare predetermined settlements. Access to individual settlement data is controlled by means of login details available to the federations. It has not yet been decided how external agencies access the disaggregated data.

¹¹ See: knowyourcity.info

¹² According to Jockin, the goal of the settlement profile is to understand the communal-level rather than household-level situation. As Shekar's story shows (Box 1) it is important to realise that in slums many people share one toilet. What makes SDI's data arguments at their core social and political is their emphasis on the rate (ratios) at which slum dwellers in their everyday lives have to access basic amenities such as water and sanitation, often at the communal level. The cost of access is not only monetary (as slum dwellers often have to pay-per-use for toilet facilities or pay more than middle-class citizens for water) but also social, with impacts on convenience and dignity.

6

Verification

Following the SFI report on the data quality and verifiability of SDI data, consensus was reached to count only those profiles that were definitely for a unique settlement and that were collected since and including 2009. A total of 6,198 profiles were returned to SDI federations for verification and captured in a central dataset. The extracted data was re-organised in a computer-readable format. This forms the basis of SDI's historical dataset on profiles. As profiles are being updated into the new standardised format, these historic records serve as a baseline and can be referenced and used to support a longitudinal record of the development or disappearance of slum settlements. Settlements may 'disappear' either as a consequence of engaged interaction with government leading to resettlement or upgrading or due to eviction.

The settlement profile is linked to two geographic profiles. The first captures the boundary of the settlement and calculates the land area it occupies, while the second maps and references all the community service points, such as communal water taps, toilets and other assets like community centres and day-care centres. For mapping the boundary, community members trained in using global positioning systems (GPS) technology and knowledgeable about the limits of the settlements walk around the boundary and capture the GIS coordinates. This data is then extracted from the GPS device and captured using the informal settlement boundary mapping tool within the Ona platform. The boundary data is then verified on a satellite base map with the help of its identifying landmarks and indicated by the community. This map is then also printed and returned to the community for final verification.

The second tool maps the coordinates of a single service site, and includes the possibility to capture a photo for future identification; the data collected mirrors the data questions related to the service type from the main profile. For example for water taps, it records whether the service is in working order or not and whether the water is safe for drinking. While the federations are increasingly experimenting with capturing this data on smartphones and tablets via applications like ODK Collect, which allows for offline capture of data and recording of GPS coordinates, the data is also recorded in a table on paper, which helps with the verification of the data. Where the mapping exercises have preceded the focus group discussion, the collected data is verified against community knowledge during the focus group discussion.

A range of verification methodologies and practices are emerging as the federations use the standardised profiling process. What is already evident is that the quality of the data produced has become increasingly important as the engagement with government around data increases (see Dobson *et al.* 2014). Table 1 below states that community-led data is more likely to be reliable than data collected by external groups and summarises other advantages.

Table 1. Comparative advantages of community-generated data

DATA COLLECTED BY COMMUNITIES	DATA COLLECTED BY OTHERS
The data remains 'alive' in the community	The data is analysed in complex ways and is rarely returned to the community
The data contributes to a realignment of power between the community and the authorities	The data reinforces the power of those outside of the community and the gap between their knowledge and that of the community
The process of data gathering organises communities in a way that facilitates productive engagement with other urban development stakeholders (especially government)	Has no impact on community organisation
Generates a dialogue on planning at the community level	Generates a dialogue in professional/academic circles
Is often more comprehensive owing to improved access to those in informal settlements and is a product of dialogue which reduces misinformation	Often relies on samples and is prone to misinformation from communities (whether because of community strategy or suspicion)

Source: Dobson *et al.* (2014)

7

Conclusion

The data collected by SDI federations at the settlement level is put to work to affect substantive change at the level of their settlements and everyday lives. It works towards more equitable resource flows from the public and private sector to urban poor communities. In recognising the need for scaling up the data-collection process of SDI federations to support a more inclusive voice for the world's urban poor, a single caveat has been recognised as important: the process, not the technology, should drive the development of tools and new techniques.

This project has aimed to ensure that data collected by slum dwellers is suitable for poverty analysis, urban planning, and can maintain its usefulness for grassroots mobilising, negotiating and community organising.

The profile tools continue to generate a general picture of the conditions of informal settlements and informality and residents' access to security of tenure (land) and basic services. The data, combined with the power of savings and organised savings networks, open and sustain a dialogue with local governments to partner in slum upgrading.

The standardised profile form has now been tried and tested in almost all SDI's federations with great success. In total the federations have in the past two years produced more than 2,000 standardised profiles. GIS maps of the boundary and services maps of these settlements support these profiles. It is important to underscore that the 'physical tools' – survey and mapping forms – remain closely connected to and driven by the processes of organising communities and developing and sustaining dialogue within and beyond the community for the improvement of the lives and everyday living conditions of slum dwellers. The new standardised formats are generating great excitement with regards to maintaining the richness of the data they collect, and also the speed at which we can work, without compromising on the rigour and quality of the data or its place in producing usable data on and for slum dwellers.

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The largest and most detailed set of data about what are termed 'slums' or 'informal settlements' has been built from enumerations undertaken by the residents of these settlements and their federations. These include settlement profiles, house-by-house surveys and mapping. This paper describes the challenges of keeping the process owned by communities while also ensuring the outputs are useful to others, including local governments. These enumerations serve as instruments for advocacy and dialogue with city authorities and development partners around slum upgrading and planning. This paper describes the social and technical complexities in achieving a single, globally accessible platform for 'slum' data.

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