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Critically analysing the potential of Slum Dwellers International (SDI)-inspired savings-based mobilisation and community-led enumeration in Addis Ababa from a data justice perspective

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Abstract

In recent decades, urban social movements, such as Slum Dwellers International (SDI), have challenged asymmetric power relations in the production of knowledge and the urban exclusion of informal settlements. SDI-affiliated federations have promoted women-led savings groups and used community-led enumeration (settlement profiling, household survey and vacant land survey) and other participatory social mobilisation tools to challenge exclusion. However, SDI's data initiative has not yet been subjected to critical analysis through the emerging data justice framework in development studies. Additionally, women led-social mobilisation of informal settlement residents has been lacking in urban Ethiopia. Based on action-oriented research, this paper critically assesses the potential of SDI-inspired savings group-based mobilisation, settlement profile and mapping complemented by participatory photography in enhancing the role of slum dwellers in urban development planning and Covid-19 responses in Addis Ababa, Ethiopia. Accordingly, the action-oriented research organised 25 women slum residents in District One of Gulele Sub-city into savings groups. With the support of local research partners and strictly adhering to Covid-19 social distancing rules, a settlement profile and a participatory map were developed and validated by local stakeholders, including the representatives of the research participants. After analysing the research process using the data justice for development framework, the paper concludes that the intervention effectively identified settlement development needs and built collective capacity and partnerships with authorities and other development agents. However, the research intervention was limited in fully involving the larger community and utilising the findings to influence decision-making. The paper contends that strong social mobilisation should complement data initiatives in informal settlements to enhance residents' role in generating information about themselves and using it to influence structural change. This research has shown the possibility and potential benefit of SDI-inspired mobilisation in Addis Ababa. However, further integration with transnational urban movements and technical support are needed to capitalise on the study's achievements.

Keywords

Settlement profile, participatory mapping, photovoice, data justice, data initiatives, participatory research, informal settlements, savings groups

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Image source

Photo by benedek from Canva Pro.

Table of Contents

1 Introduction	5
2 Literature review	7
2.1. Introduction	7
2.2 Slum Dwellers International and community-led enumeration	7
2.3. Participatory photography.....	9
2.4. The Data Justice for Development framework.....	10
2.5. Conclusion	12
3 Social mobilisation through savings groups and the participatory research process and findings.....	13
3.1 Introduction	13
3.2 The context of the research site	13
3.3 Methodological approach.....	15
3.4 Initiating the action-oriented research	16
3.5 Establishing savings groups.....	18
3.6 Settlement profile	19
3.6 Participatory mapping.....	23
3.7 Photovoice	26
3.8 Partnership-building workshop	36
4 Analysis.....	37
5 Conclusions.....	43
References	47

1 Introduction

Understanding data systems from a justice perspective is crucial in urban areas. This is particularly important in the Global South, where the state collects social and spatial data to consolidate its rule and promote a high-modernist city vision (Scott, 1998) while leaving most informal settlements semi-visible (Appadurai, 2002).¹ In most parts of the Global South, informal urban settlements tend to be invisible on state officials' the cognitive map during the allocation of resources (Dovey & King, 2011). However, the increasing demand for urban land for development enhances the visibility of informal settlements, especially those located on prime land, increasing their occupants' vulnerability to eviction. Such semi-visibility of informal settlements in official records has exposed slum residents to eviction and exclusion in services and infrastructural provision (Patel et al, 2012).

Since the last quarter of the 20th century, various social movements have challenged informal settlement residents' exclusion from generating knowledge about slums and the consequences of this for decision making (Appadurai, 2002). One of the most prominent urban social movements is Slum Dwellers International (SDI), a network of slum dwellers' federations and their support NGOs in 33 countries. SDI mobilises slum dwellers through savings groups and federations (D'cruz & Mudimu, 2013). SDI federations, supported by NGOs, academics and transnational networks, have used community-generated social and spatial data in their struggle for recognition of their settlements and active involvement in urban development planning (Appadurai, 2002; Patel et al, 2012; Mitlin, 2013, 2015). The United Nations Sustainable Development Goals and the New Urban Agenda have recognised such initiatives in enhancing inclusive and sustainable settlement planning and management (United Nations, 2017). However, SDI's data initiatives have not yet been subjected to critical analysis from the emerging data justice perspective in development studies (Heeks, 2017; Heeks & Renken, 2018). In using the data justice perspective to critically analyse SDI-inspired data initiatives, this paper has tested the analytical capability of the emerging data justice framework.

For various historical and political reasons, the social mobilisation of informal settlement residents has been lacking in urban Ethiopia, perpetuating the exclusion of slum dwellers from urban development planning (Weldeghebrael, 2019). While there have been some NGO and researcher-led social mobilisation and participatory mapping experiments, these were unable to be sustained and scaled (for example, Lemma et al, 2006; Elias, 2008).

This paper is based on action-oriented research that critically explores the potential of introducing SDI savings-based mobilisation and settlement profiling and mapping to

¹ Based on UN-Habitat's (2003, p 12) definition, 'informal settlements' are understood in this research as settlements with one or more of the following: poor access to basic services, poor structure of housing, overcrowding and insecurity of tenure.

enhance the role of slum residents in urban development planning in Addis Ababa, Ethiopia. Among SDI's multiple social mobilisation tools, women-led savings groups and settlement profiling were selected for the research, in consideration of their organising potential and as a starting point to reflect on development needs (Muller & Mbanga, 2012). The research also employed participatory photography, specifically photovoice exercises (Wang & Burris, 1997), to enhance the role of the research participants in the co-production of knowledge about their settlement and to complement the findings with a visual representation of their development needs.

Despite the challenges posed by the Covid-19 pandemic for participatory research, it was possible to undertake the research intervention while maintaining the necessary social distancing and identifying the challenges posed by the pandemic. A total of 25 low-income women, who live in a slum area in the north of Addis Ababa, were mobilised through a savings scheme. With the help of research facilitators, the organised women developed a settlement profile and a participatory map. A photovoice exercise also supplemented the research process. The women took pictures of the problem areas and assets of their settlement using smartphones and discussed what the pictures represented. A geographic information systems (GIS) professional integrated the photovoice pictures with the participatory maps, using the geolocation references of each image. The participatory research findings were presented to the district administration, NGO representatives and community leaders for validation and partnership building. The lead author analysed the whole process using a data justice for development (DJfD) framework (Heeks, 2017; Heeks & Renken, 2018) to assess the participants' role in the research process and the impact of the intervention.

Based on the analysis, the paper advances conceptual, methodological and practical contributions. Conceptually, it argues that strong social mobilisation should supplement data initiatives in informal settlements to enhance the role of residents in the research process and influence decisions that affect their lives. Analysing the process using the DJfD framework revealed that the organised women had achieved recognition as a development partner within the community and that there was now an interest in expanding their mobilisation to the wider community. The intervention was also instrumental in visually representing the settlements' development needs and starting a conversation on how to address them. However, the participatory research process has some limitations in terms of involving the community at every stage of the information value chain. More fundamentally, a small-scale, one-off research project cannot secure the structural change required to produce new and better development options on the scale required. These limitations could be addressed incrementally by strengthening and scaling the savings-based mobilisation through a long-term collaboration with professionals and academics to extend and deepen the mobilisation. In this regard, the SDI-affiliated federations' experience is crucial in building city, national and transnational

solidarities, co-production of knowledge and scaling participation (Appadurai, 2002; Horn et al, 2018; Mitlin et al, 2019). Experiences from SDI-affiliated federations have shown an increased level of informal settlement residents' participation in different stages of knowledge production about their settlement and in using the information to negotiate decisions affecting their livelihoods (Appadurai, 2002; Patel et al, 2012; Beukes, 2015).

Methodologically, the action-oriented research has shown that integrating participatory photography (photovoice) with settlement profile and participatory mapping techniques empowers disadvantaged groups to identify key challenges in their settlements and start a conversation with development partners. With the rapid expansion of smart phones in Africa, using participatory photography allows research participants with little or no formal education to enhance their participation in different stages of data processing from data capture to analysis to interpretation. Moreover, the practical implications of the action-oriented research are showing the viability of facilitating grassroots social mobilisation and participatory research in a context dominated by top-down authoritarian mobilisation, even during a pandemic, by taking the necessary precautions.

The paper is organised into five sections. The following section briefly reviews the literature on DjfD, SDI and participatory photography (focusing on the photovoice exercise) to situate the research in the broad theoretical debate. The third section presents the research process and its key findings. The fourth section analyses the research processes using the DjfD framework. The final section presents conclusions.

2 Literature review

2.1. Introduction

This section briefly discusses the DjfD framework. The framework (Heeks, 2017; Heeks & Renken, 2018) was selected to assess its potential to capture the intertwined nature of data systems and social justice in analysing a community-led enumeration experiment.² The section will also present a review of the literature to highlight the potential of SDI's social mobilisation and participatory data collection tools supplemented by a photovoice exercise in challenging the exclusion of informal settlements.

2.2 Slum Dwellers International and community-led enumeration

SDI adopts various social mobilisation strategies to address the asymmetric power relations between state officials and informal settlement residents (Appadurai, 2012; Mitlin, 2013, 2014, 2015). Women-led savings groups, usually composed of 15 to 50 members, are the bedrock of SDI community mobilisation (D'cruz & Mudimu, 2013). SDI starts its presence in a new city by organising the most vulnerable groups, especially women, into savings groups (D'cruz & Mitlin, 2007). Individual savings groups federate

² An explanation of 'enumeration' is presented in the next section.

without losing their autonomy at the city and national level into federations to negotiate with the authorities (Appadurai, 2002; D’cruz & Mitlin, 2007). By mobilising the most vulnerable, the SDI strategy aims to enhance their social capital and enable them to act collectively for their common purpose (Appadurai, 2002; D’cruz & Mudimu, 2013). In addition, SDI strategises to enhance the negotiation capacity of informal settlement dwellers, using multiple social mobilisation and learning tools. These mobilisation tools are enumeration, community project financing institutions (Urban Poor Funds), an NGO to support federations with technical expertise, precedent-setting practices, community-to-community learning exchanges and transnational alliances (Appadurai, 2002; Mitlin, 2015; Weru et al, 2018).

Community-led enumeration, one of SDI’s social mobilisation methodologies, aims to “enable poor urban communities to mobilise knowledge about themselves in a manner that can resist eviction, exploitation and surveillance in favour of advancing their rights, resources and claims” (Appadurai, 2012, p 639). Community-led enumeration involves developing settlement profiles, information on households, and vacant land surveys supported by mapping (Patel et al, 2012). Settlement profiles are the first information, collected as a starting point to build a collective sense of community and ignite the conversation on developing the settlement (Appadurai, 2012; Patel et al, 2012).

Settlement profile compiles basic settlement information about the history and demography, water and sanitation, services and infrastructures and organisational capacity of a given settlement (Arputham, 2012; Patel et al, 2012). Settlement profiles are supplemented by mapping exercises, especially using global positioning systems (GPS) to mark structures, essential landmarks, services and settlement boundaries (Patel et al, 2012). The collected data will be analysed and presented to the community members, and further information will be solicited (Arputham, 2012). The process is crucial for identifying gatekeepers and potential leaders of the settlement and creating awareness of a community’s assets and the challenges it faces for further action (Arputham, 2012; Patel et al, 2012). In addition, SDI-affiliated federations will conduct a community-led household survey and a land survey if there is a slum upgrading intervention or a threat of eviction or relocation (Patel et al, 2012).

SDI’s social mobilisation strategies are instrumental in expanding data justice for informal settlement residents. For instance, in India, SDI’s social mobilisation of pavement dwellers and its community-led enumeration allowed 60,000 people living along a railway line to resist eviction and properly resettle (Patel, 2002). Similarly, the Namibian government adopted community-led enumeration to fill the information gap about informal settlements. As a result, the Shack Dwellers Federation of Namibia, an SDI affiliate network of savings groups, was delegated to undertake nationwide community-led enumeration (Muller & Mbanga, 2012). The mainstreaming of SDI’s community-led

enumeration in Namibia shows how its data initiative and social mobilisation influenced the way the Namibian government collects informal settlements data.

Beyond expanding data justice for informal settlement dwellers, SDI-affiliated federations have used established data infrastructure and mobilisation to respond to public health emergencies, such as Covid-19. Various SDI federations' established data infrastructures, developed through community-led enumeration and other SDI mobilisation tools, have a significant potential to establish a partnership between informal settlement residents and state and non-state actors, in order to identify, monitor and respond to the Covid-19 pandemic (Gupte & Mitlin, 2020; Wilkinson and contributors, 2020). For example, the Kenyan SDI federation, Muungano wa Wanavijiji, has published periodic village-level reports on the Covid-19 situation, prevention and response activities of informal settlements, and mapped potential community isolation centres.

Thus, this action-oriented research tested the potential of women-led savings groups in the Addis Ababa context, considering their mobilisation and organising power (Appadurai, 2002). Producing a settlement profile was also selected for investigation, considering its role in kick-starting the conversation about priority development challenges and the strategies to address them (Muller & Mbanga, 2012). At this juncture, it is crucial to critically examine the data justice implications of mobilising informal settlement women through savings groups and facilitating community-led settlement profile preparation and mapping in Addis Ababa. Participatory photography will also supplement the research.

2.3. Participatory photography

Since the end of the 20th century, there has been a growing trend towards using more visual and participatory methodologies to empower research participants to represent and interpret their lived experiences on their terms (Lombard, 2013). Using photographs taken by research participants to elicit, analyse and communicate in-depth information is an innovative participatory visual method (Mathison, 2009). Photovoice, one of the innovative participatory photography tools, uses images to influence policies and decisions, primarily in public health interventions (Catalani & Minkler, 2010). The VOICE in photovoice stands for "voicing our individual and collective experience" (Wang & Burris, 1997, p 381).

Wang and Burris (1997, p 369) identified three primary goals of photovoice: "(1) enabling people to record and reflect on community's strengths and concerns, (2) to promote critical dialogue and knowledge about important issues through large and small group discussion of photographs, and (3) to reach policymakers." Photovoice involves handing over the camera to marginalised groups to take a picture they think is important to them after receiving training on ethical concerns and technical issues. Then the research participants, ie marginalised groups, will select a few pictures and discuss each image with other community members and facilitators. Finally, the discussion will synthesise the

photographs and stories, and the research participants will present key recommendations to community leaders or policy makers (Wang, 1999).

Photovoice is instrumental in undertaking needs assessment studies (Wang & Burris, 1997). This is because the exercise allows a view of the world through the collective perspective of marginalised communities using the powerful tool of images. Additionally, with minimal training, people without formal education can capture photographs of their needs and assets and communicate their challenges and priorities to policy makers. The photovoice exercise is thus vital in building relationships between communities and development partners to address the challenges identified (Wang & Burris, 1997).

This research therefore supplemented the settlement profile and mapping exercise with a photovoice exercise. The use of photovoice here had three objectives. First, it aimed to put the research participants (organised women) at the centre of knowledge production about their settlement (Wang & Burris, 1997). Second, it used the photovoice findings to strengthen these women's mobilisation and build relationships with other actors to address the community's challenges (Wang, 1999). Third, it ensured that the images showing the problems and assets of the settlement would be integrated into the map using the pictures' geo-references.

2.4. The Data Justice for Development framework

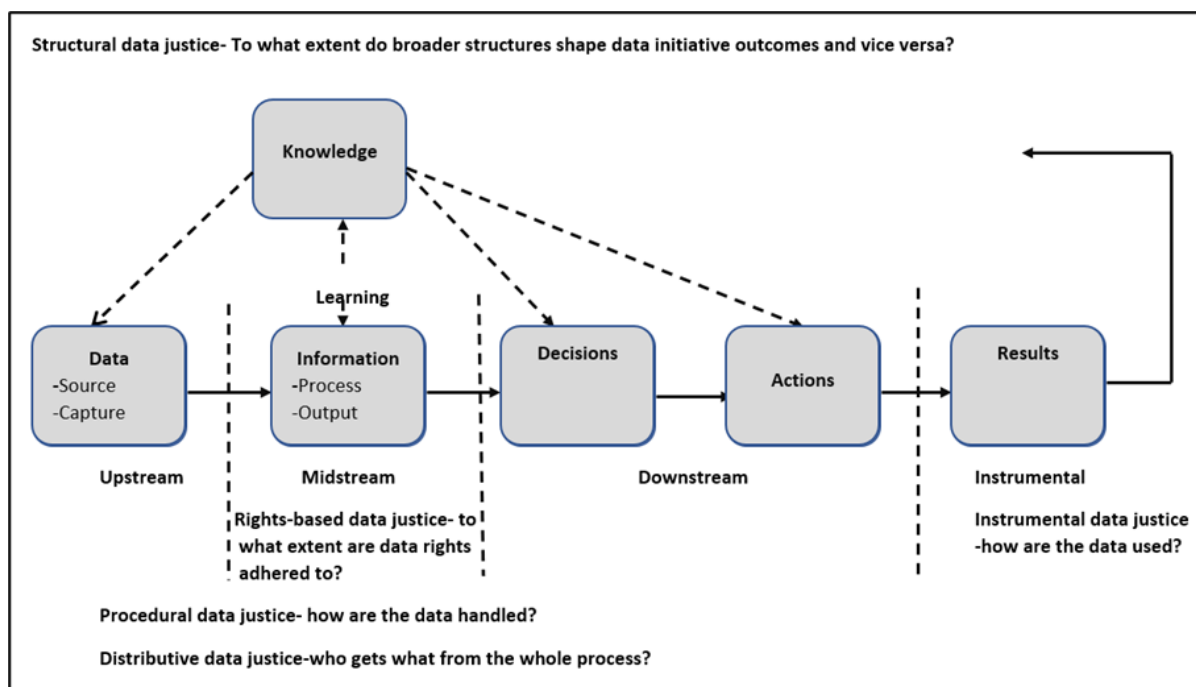
Although data are usually presented as objective and apolitical facts, they are the outcome of ideas, techniques, people, systems and the contexts that produce them (Kitchin, 2014). Kitchin and Lauriault (2014) argue that the process of conceiving data, their measurement and analysis, and their use determines their nature. Data in themselves are a "force realised through its production, uptake and deployments" (Ruppert et al, 2019, p 4). Thus, it is essential to "interrogate all forms of potentially depoliticised data science and track the ways in which data are generated, curated, and how they permeate and exert power on all manner of forms of life" (Iliadis & Russo, 2016, p 2).

The prevailing power asymmetry in data production and the broader social organisation makes the assemblage of data production, processing and utilisation prone to injustices (Johnson, 2014). Further, the extensive use of data to inform policy decisions and shape personal lives raises the question of justice: how can we ensure "fairness" in the generation, distribution, control and utilisation of data (Johnson, 2018, p 2). The constant re-utilisation and re-production of data makes achieving fairness more challenging. Nevertheless, viewing data assemblage from a justice perspective, ie data justice, is essential for assessing the ethical issues involved in data collection, analysis and utilisation (Taylor, 2017).

Data justice refers to the "fundamental ethical judgment of social arrangements for distributing information and its effects on self-determination and human development"

(adapted from Johnson, 2018, p 1). Data justice is a subset of the broader ‘political justice’, which considers the role data play in shaping policies, behaviours and resource allocation (Johnson, 2018). With the extensive use of data in informing decisions and shaping various aspects of people’s personal lives, an emerging body of literature has scrutinised the fairness in generating, handling and utilising big data (for example, Taylor, 2017; Johnson, 2018, Dencik et al, 2019).³ Similarly, Heeks and Renken (2018) developed the DjfD framework, which can inform the analysis of small data that are “tailored to answer specific research questions” (Kitchin, 2014, p 29). The framework is suitable for analysing small data systems from various dimensional justice perspectives at each level of the information value chain (see Figure 1), ie from its capture until its utilisation in shaping decisions.

Figure 1: The information value chain



Source: Slightly adapted from Heeks and Shekhar (2019, p 996).

The DjfD framework assesses overall data production and utilisation from instrumental, procedural, rights-based, structural and distributional justice perspectives (Heeks, 2017; Heeks & Renken, 2018; Heeks & Shekhar, 2019). Instrumental data justice refers to fairness in the actual or potential outcome of the information collected (Johnson, 2018). Procedural data justice refers to the fair handling of the data throughout the information value chain (Heeks & Renken, 2018). The higher the target community’s control in the

³ Data which are high in *volume*, *velocity* – being produced in or near real time – and *variety* in terms of being unstructured and structured and temporally and spatially specified (Kitchin, 2014, p 68).

data capture, analysis and use of the results for local development, the higher the level of exercise of procedural data justice (Heeks & Shekhar, 2019). Rights-based data justice refers to “adherence to basic data rights such as representation, privacy, access and ownership” (Heeks & Shekhar, 2019, p 995). Distributive data justice is an overarching dimension of data justice, which can be applied to each of the other data justice components to assess the (in)equality in data-related outcomes (Heeks & Shekar, 2019). Finally, structural data justice can be assessed by understanding the structural “power over” the functioning of a given data initiative and the “power to” of the data initiative in reshaping existing power relations, institutions and dominant knowledge systems (Heeks & Renken, 2018, p 97).

Considering entrenched structural inequalities, fully achieving fairness in all dimensions of the DjfD framework in the context of Global South informal settlements may be a distant goal. However, the framework provides a tool to analyse a given data initiative. Accordingly, this study used the DjfD framework to analyse the action-oriented research. Nevertheless, the data justice framework’s exclusive focus on the information value chain limits its analytical value. The framework does little to clarify the role of external actors and professionals in expanding data justice for the urban poor. Moreover, it is not very good at highlighting the need for data initiatives to be part of a broader social mobilisation to catalyse social transformation (Wheeler, cited in Berdou, 2011).

2.5. Conclusion

The DjfD (Heeks, 2017; Heeks & Renken, 2018) provides a framework of analysis to evaluate a given data initiative from a broader social justice perspective. However, it has three limitations. First, the framework tends to be over-ambitious, albeit noble in its goal, given the prevailing structural inequalities faced by residents of informal settlements in the Global South. Nevertheless, the framework can help identify progress achieved by a given data initiative and constructively identify gaps for future improvement.

Second, the framework focuses exclusively on data initiatives, giving less attention to the broader structural marginalisation of informal settlement residents. Nevertheless, the experience of SDI-affiliated federations shows that it is the combination of multiple social mobilisation strategies with community-led enumeration that has allowed their members to enhance their collective negotiation capacity with authorities and influence institutional changes (Appadurai, 2012; Muller & Mbanga, 2012; Patel et al, 2012; Mitlin, 2014, 2015).

Third, the framework exclusively focuses on the target communities’ or individuals’ data rights and views external agents’ support for data initiatives in informal settlements with scepticism (see, for example, Heeks & Shekhar, 2019). However, SDI’s experience shows that the co-production of evidence-based participatory research by informal settlement dwellers’ federations in collaboration with professionals and academics is vital in advancing the interests of the slum dwellers (D’cruz & Mitlin, 2007; Horn et al, 2020).

Nevertheless, such collaboration needs to be guided by a negotiated strategy of using knowledge for social transformation, by constant critical reflection on power relations and by the transparent accountability of professionals and academics to the community (Mitlin et al, 2019).

Overall, the SDI community-led enumeration, supported by other social mobilisations, has proved instrumental in expanding data justice for informal settlement residents, enhancing their role in urban development planning, and responding to Covid-19. This research project aimed to test the potential of SDI women-led savings mobilisation and settlement profile and mapping, supplemented by photovoice, in expanding slum dwellers' data justice and role in urban development in Addis Ababa. The lead author analysed the process using the DjfD framework.

3 Social mobilisation through savings groups and the participatory research process and findings

3.1 Introduction

The action-oriented research chose a slum settlement located in the north of Addis Ababa, in consideration of its minority ethnic group composition, its established community network with the local research partner and the settlement's poor housing and environmental conditions. With the guidance and close supervision of the principal investigator and briefing from the representative of the SDI-affiliated federation in Kenya, the local partner placed 25 women into five savings groups and facilitated settlement profile, participatory mapping and a photovoice exercise. The findings of these actions were presented and validated by key stakeholders, including district administration representatives. This section discusses the organisation of the 25 women into saving groups and the participatory research process and findings.

3.2 The context of the research site

Addis Ababa has three main types of informal settlement: inner-city slums, peripheral squatter settlements and street/pavement shacks. Inner-city slums are organically developed settlements without planning oversight, mainly created before the 1975 nationalisation of urban land and rented housing. About 70% of inner-city houses were nationalised in 1975 by the military regime (1974–91) and rented primarily to low-income residents at low prices. As a result, most inner-city houses are dilapidated, congested and have poor access to essential services and facilities (UN-Habitat, 2007; Elias, 2008). In addition, their central location has exposed them to redevelopment-induced displacement to the periphery. The second category of informal settlement is squatter settlements developed on vacant public land or plots purchased informally from peri-urban farmers or land speculators. The residents of these settlements are usually threatened with eviction during the city government's sporadic campaigns against

informality. However, settlements that survive demolition campaigns will be consolidated and able to access various services and tenure in the long run (Yirgalem, 2009). The third informal settlements are the pavement shacks built on major transport corridors, in parks, squares and vacant public land (Elias, 2008). Pavement shack dwellers are exposed to constant threats of eviction from authorities and are vulnerable to various health risks as a result of their poor living conditions.

In urban Ethiopia, the city government are expanding informal settlements' "legibility", the statecraft of enhancing visibility for governance purposes (Scott, 1998), through development-induced displacement and the legalisation of established informal settlements (Weldeghebrael, 2022). However, the government defines eligibility criteria by identifying households entitled to compensation during development-induced displacement and the legalisation of informal houses. It does so based on public records of households (such as property tax receipts, bills and other official documents) and the existence of the structure in the government's aerial maps made before April 2005 (AACALDDB, 2014).⁴ Tenants and families within an extended family are not entitled to compensation or regularisation (Weldeghebrael, 2019). Such guidelines have allowed the government to evict many households from houses they had lived in for many years without compensation or replacement housing.

Due to the Ethiopian government's repressive policies and top-down urban development planning culture, it has been a challenge for informal settlement residents to mobilise themselves to defend their data justice and right to the city (Weldeghebrael, 2019). The recently revoked Charities and Societies proclamation prohibited civil society organisations, which generate more than 10% of their annual funding from non-domestic sources, from mobilising communities for rights-based development intervention. Before the enactment of the proclamation in 2009, some NGOs initiated slum upgrading and community mobilisation interventions. However, most of these initiatives failed to be sustained or scaled up once the NGOs terminated their interventions (Elias, 2008). Further, those innovative slum identification and mapping interventions (for example, Lemma et al, 2006) that took place were not supported with social mobilisation or scaled up to other areas. The absence of well organised social mobilisation in Addis Ababa allowed the government to displace inner-city slum dwellers to peripheries and to demolish peripheral informal settlements without providing alternative housing (Weldeghebrael, 2019).

A well organised social mobilisation of slum dwellers can challenge the city government's top-down urban planning culture and anti-informal settlement policy, as the experiences of various SDI federations show (Appadurai, 2002; Lines & Makau, 2018). Accordingly, this

⁴ During and immediately after the May 2005 election there was massive encroachment on land in Addis Ababa.

research aims to assess the possibility of establishing SDI-type social mobilisation in urban Ethiopia.

3.3 Methodological approach

The research adopted the SDI-inspired co-production of knowledge and social mobilisation as a methodological approach. SDI aims to ensure “the right to knowledge creation and its ownership” and “the right to research, to explore, to classify, to analyse, to verify and to extract learning and knowledge from that process” by the subjects of the research (SPARC, 2014, p 7). Furthermore, knowledge production is viewed by SDI as an instrument for mobilising informal settlement residents to take political action to challenge their marginalisation (Appadurai, 2012; Patel et al, 2012; Mitlin et al, 2019). In this effort, SDI affiliates collaborate with academics and other professionals to help them generate academically validated knowledge, which government officials value (D’cruz & Mitlin, 2007; Mitlin et al, 2019).

Since this research began before the Covid-19 pandemic in February 2020, the lead author and his collaborators readjusted the research design to the changing circumstances. Under normal circumstances, established SDI-affiliated federations introduce SDI savings-based mobilisation in a new context through community-to-community learning exchanges (Mitlin, 2015). Similarly, for this research, the plan was to invite community mobilisers from the Muungano wa Wanavijiji SDI-affiliated federation in Kenya to introduce savings-based mobilisation and to train community members on settlement profile and mapping. However, as a result of the pandemic and consequent travel restrictions, neither the federation representatives nor the principal investigator could travel to Addis Ababa. Thus, the principal investigator (lead author) subcontracted the fieldwork to a local research partner, Creative Professional Consult (CPC), an Addis Ababa-based consultancy firm engaged in social development support services. CPC has experience in facilitating research projects, capacity development activities and other aid/development interventions. CPC involved a public health professional, qualitative and visual methodology expert, financial advisor and community mobilisers in facilitating various research and training activities. Before the intervention, Muungano alliance representatives provided a virtual briefing to the CPC representative and the principal investigator on mobilising women-led savings groups, settlement profiling and mapping.

Based on the briefing and the literature on SDI methodology, the principal investigator and the local research partner adapted the SDI savings mobilisation and settlement profiling to the changing pandemic restrictions and local context. First, given the Covid-19 social distancing rules and risks, and the low levels of trust within the community, the saving groups were made smaller. Second, the settlement profile and mapping exercise was restricted to 25 women and verified by invited influential community members,

officials and NGO representatives. As a result of pandemic risks and a shortage of time,⁵ it was impossible to undertake a settlement profile by organising mass meetings and training grassroots facilitators as per the SDI method (SDI, 2015). Instead, the research draws on Stein et al's (2018) Participatory Asset Appraisal (PAA) focus group-based participatory research and mapping approach in generating basic settlement profile information. Third, the research adopted photovoice exercises using smartphones instead of the GPS-based spatial data collection used in the SDI methodology (SDI, 2015). The photovoice exercise using smartphones was useful to the research participants and valuable for collecting spatial and visual data.

However, there were some limitations in the adjustments made to the SDI methodology. For instance, restricting the number of participants in the settlement profile focus group discussions (FGDs) might have made the process manageable, but it may also have affected the diversity of information collected about the settlement. To address this, CPC conducted a series of FGDs and verified the findings with influential community members, blending SDI's methodology with Stein et al's (2018) PAA tools. Similarly, keeping the number of savings groups small probably enhanced trust and made it easier to conduct meetings and maintain social distancing rules, but it may also have limited their collective power. Nevertheless, the intervention successfully attempted to create a sense of collective identity among all the 25 savings group members through successive FGDs involving the research participants. Finally, while facilitating the FGDs via the local research partner, rather than by grassroots facilitators, as in the case of SDI-affiliated federations, may have proven effective and easy to manage, it may also have restricted the role of the research participants in the knowledge production about their settlement. The research team addressed these limitations by conducting a series of FGDs to ensure adequate capture of the perspectives of the research participants.

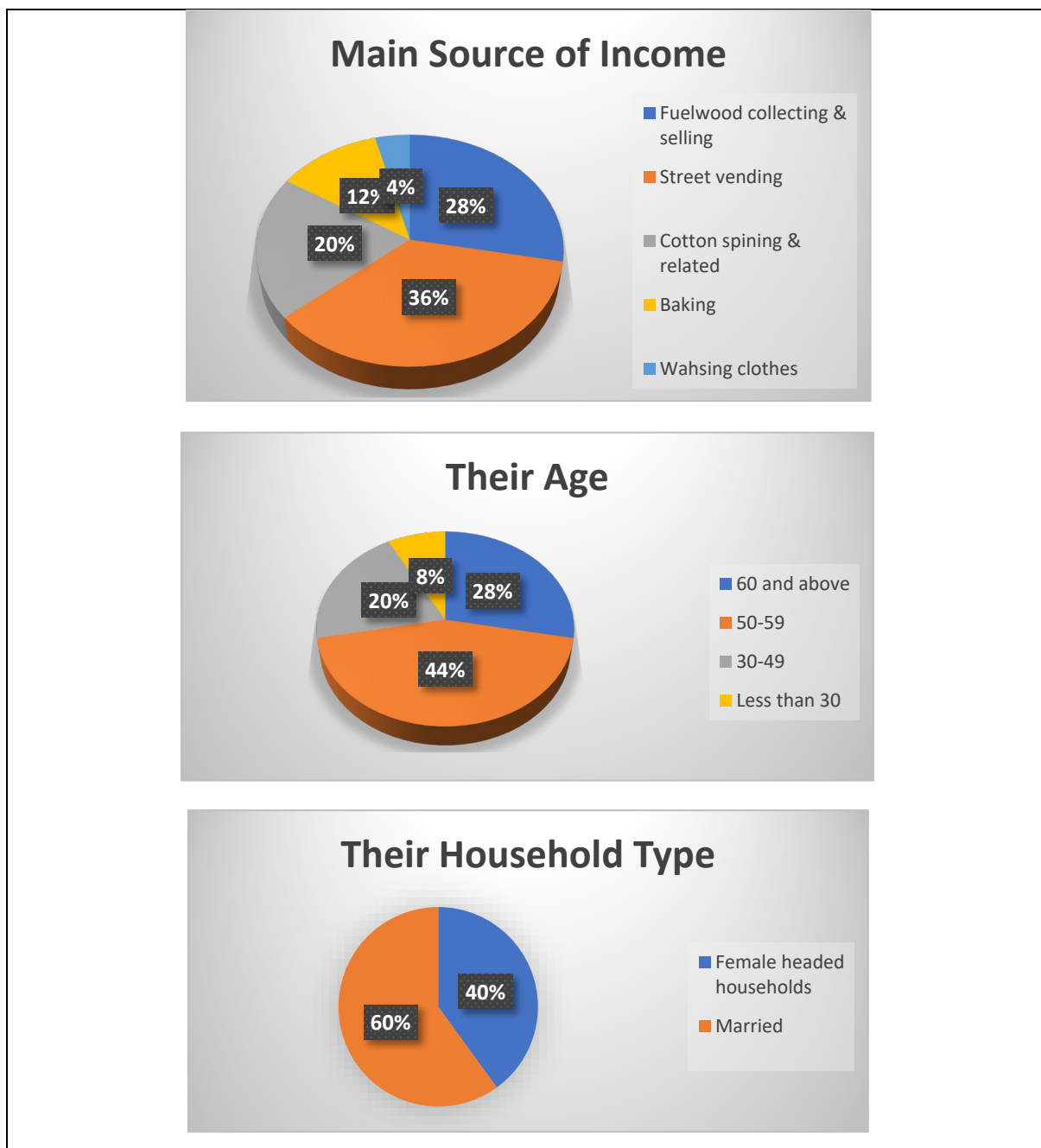
3.4 Initiating the action-oriented research

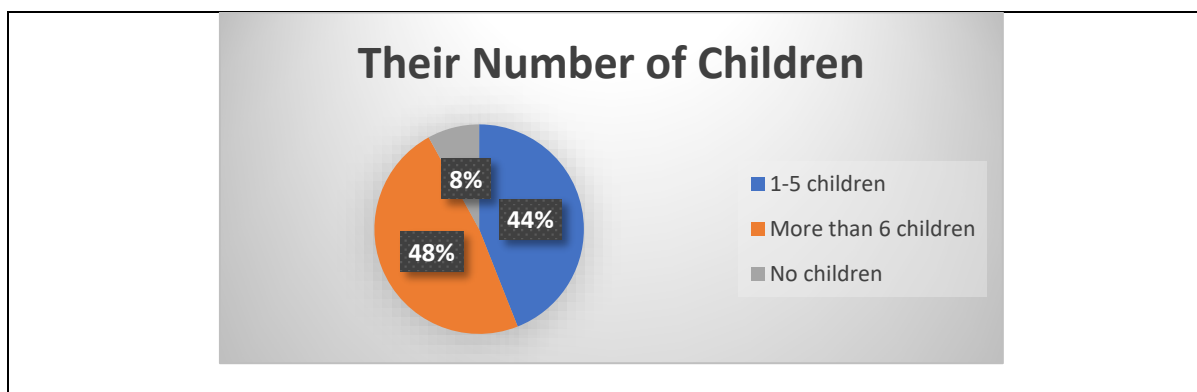
Gulele Sub-city, District 01, locally known as Shiro Meda, an inner-city slum, was selected on account of its concentration of minority ethnic groups, mainly from the Southern Ethiopia Nations, Nationalities and Peoples Regional State (SNNPRS) (Central Statistical Agency, 2007). Additionally, the sub-city has among the highest proportion of slum housing with limited access to services in Addis Ababa (UN-Habitat, nd). The research used an already established working relationship between the local research partner, CPC, and some residents of the area through previous interventions. Since the research was aiming to empower poor women and expand mobilisation, it set research selection criteria that participants must be women of 18 years and older, low-income earners and active participants in community affairs, as well as showing a willingness to be part of the

⁵ The fieldwork was supposed to start in April 2020 but was delayed until September 2020 because of the pandemic and the ethical clearance procedure.

intervention. CPC's interlocutors and the District Women and Children Affairs Office assisted in identifying 50 women who met the criteria. Out of these, the local research partner selected 25, whose economic conditions were poorer than the rest. All 25 women (see Figure 2) were strongly motivated to participate in the research and savings scheme. The local research partner explained the research objective, process and data protection and distributed a Participant Information Sheet (PIS) to the 25 women. A week later, from the initial contact and handing out of the PIS, the potential research participants were asked if they still wanted to be part of the research. They all agreed to be part of the study and signed a consent form.

Figure 2: Composition of the 25 research participants





Source: Authors' compilation.

In terms of conducting the study during the pandemic, city administration Covid-19 Task Force experts delivered Covid-19 training to the research participants and facilitators twice, on 12 and 19 September 2020.⁶ The facilitators then conducted all their research activities strictly following social distancing rules. In addition, the facilitators distributed face masks and hand sanitisers to the research participants in all sessions. The training also helped the research participants to disseminate information on Covid-19 prevention to their neighbours during social gatherings (FGD notes, 11/10/2020).

3.5 Establishing savings groups

Savings groups are the bedrock of SDI social mobilisation (Arputham, 2012). However, slum-dwellers are excluded from urban development planning processes in urban Ethiopia (Weldeghebrael, 2019). In particular, women are more marginalised in decision making in the country as a result of its dominant patriarchal culture, and they suffer disproportionately from the living condition in the slum (Issa, 2021). To counteract the marginalisation of women, this action-oriented research started the process by organising 25 of them into savings groups.

The 25 women received training on the importance of saving in collaboration with the district administration's Micro and Small Enterprises (MSE) development team. The MSE's development team members informed the women that they would support them in realising their business plans and facilitating micro-credit if they actively saved. The managing director of CPC shared the experience of SDI women-led savings schemes in Kenya, based on the briefing from the Muungano wa Wanavijiji representative on sample savings group constitutions and on other SDI literature (for example, D'cruz & Mudimu, 2013). The experience sharing focused on SDI savings groups' experiences in daily saving and lending to saving members, and held weekly meetings to discuss social issues.

All 25 women agreed to start the savings groups and discussed the best ways to establish them. They decided to organise into a savings group with a maximum of five people they

⁶ Professionals assembled by CPC (local partner) to facilitate various activities of the research.

trusted. Although SDI savings groups have a membership of between 15 and 50 (D’cruz & Mudimu, 2013), they wanted to keep it small until they had built trust. They also chose to open a bank account for their savings group and decided that all five members would manage the account. Once the terms were agreed, the 25 women organised themselves into five savings groups. They elected chairwomen and treasurers and approved the constitution of the groups after deliberation. Each group decided to meet once a week to discuss their social issues and financial updates.

On 19 September 2020, five savings groups, each having five members, were established. The women thus organised agreed to deposit their savings in the government-owned Microfinance Institution, in view of its 8% interest rate offer and its promise of micro-credit and business development support. The women initially started saving ETB 7 a week; they then raised this to ETB 10 after two weeks and to ETB 12 five weeks after the groups’ establishment. In addition, the research project deposited a seed fund equivalent to £100 into each savings group's account to incentivise the women to save.

SDI’s savings group-based social mobilisation aims to build “political fortitude and commitment to the collective good” beyond financial inclusion (Appadurai, 2002, p 33). Similarly, all the 25 women with one voice expressed their deep conviction and determination to continue saving and meeting weekly. During the evaluation FGD, one woman said, “the little money we have saved so far gives us moral encouragement and motivates us to continue saving” (FGD notes, 13/01/2021). Another woman said, “stopping saving means forgetting oneself...I am determined to continue to increase my saving and encourage my fellow saving group members to do the same” (Woman1, interview 13/01/2021).⁷

Despite their organisation into five smaller groups, the 25 women recognised themselves as an ‘organised entity’ (Appadurai, 2006). According to one of the participants in the evaluation FGD, “although our saving groups are different, the 25 women are one association” (FGD notes, 13/01/2021). They also expressed their commitment to advising other women on establishing a savings group based on their experience. However, as a result of a lack of trust, the women were sceptical about expanding the membership of their smaller saving groups. Nevertheless, despite their preference to save in small groups, their organisation was instrumental in the participatory research.

3.6 Settlement profile

The primary aim of community-led enumeration is the “deepening of the democratic process within and across...communities of the urban poor” (Appadurai, 2012, p 641). One of the SDI community-led enumerations, ie settlement profile, aims to provide a collective picture of the settlement and identify key actors (Patel et al, 2012). Accordingly, the

⁷ Aged 50, street vendor and household head.

participatory research began with a settlement profiling exercise after facilitating the savings groups' establishment. However, it was difficult to strictly follow the SDI methodology of settlement profile development. Notably, it was a challenge to train the community members to undertake settlement profiles and organise mass meetings as a result of Covid-19 travel restrictions and social distancing rules. Thus, the research team had to adapt its methodology to the changing circumstances.

A series of FGDs involving the organised women was therefore held between October and December 2020, involving members of the savings group and based on Stein et al's (2018, p 42) PAA tools. The research benefited from PAA's FGD format for problems and solutions listing and ranking, and community mapping exercises. Participants identified the historical establishment and composition of the settlements, social services and infrastructural conditions. They also identified Covid-19 transmission and community response status and listed priority development needs (as summarised in Table 1). The FGDs made clear that low-income women are well equipped to articulate their community's social problems, since they spend time within the settlement and are disproportionately more affected by said social problems.

Table 1: Summary of Shiro Meda area settlement profile

Dimension	Brief characteristics
Basic information	<ul style="list-style-type: none"> • The settlement was established at the same time as the city by the end of the 19th century • Inner-city slum (see section 3.2) • Major ethnic groups are Gamo, Amhara and Tigray • Estimated average household size 10–20 • More than 1,500 households (estimated) • It covers 20 hectares, divided into ten smaller neighbourhoods • The overwhelming majority of the residents are tenants of government-owned housing, and a small proportion are homeowners • Most of the houses are constructed using mud and wood without a solid foundation • Low crime and violence, but there is child labour abuse
Water	<ul style="list-style-type: none"> • Most households have a private or shared tap in their compound. Very few communal taps are still working • The settlement receives running water once a week or once a fortnight. • During the rainy season, people use river water and rainwater for washing • Average spending on water is ETB 60–80 monthly

Sanitation	<ul style="list-style-type: none"> • 2-5 households share one pit latrine toilet seat on average • There are communal toilets, which have six seats and are shared by more than 60 families; • Most of the pit latrine toilets in the settlement are poorly maintained, and because of groundwater levels, quickly fill up and overflow
Infrastructure	<ul style="list-style-type: none"> • Almost all households are connected to the electricity grid • Public buses heading to the city centre are accessible within 10-15 minutes walking distance • Most of the access/subsidiary roads within the settlement are narrow • Most open ditches are clogged by solid waste • Solid waste is not collected regularly • There is one public nursery, one public primary school, and one public secondary school within the settlement • There is accessibility to a health centre within walking distance
Commercial establishments	<ul style="list-style-type: none"> • There are multiple retail shops, consumer cooperative shops, commercial banks and microfinance institutions, and religious centres within the settlement
Organisational capacity	<ul style="list-style-type: none"> • There are five <i>iddirs</i> (funeral associations) • Ten influential community leaders were identified • The relationship with the district administration is tainted with a lack of trust • Five savings groups
Covid-19	<ul style="list-style-type: none"> • Many people tested positive, and one woman died; • Health extension workers were used to sensitise community members, but not anymore • It was a challenge to adhere to social distancing rules because of congested housing and living conditions • Many residents with pre-existing conditions avoided going to the health centre out of fear of contracting Covid-19
Most common diseases	<ul style="list-style-type: none"> • Water-borne diseases • Skin infections • Flu • HIV/AIDS • Tuberculosis • Typhoid • Typhus

Priority development intervention	<ol style="list-style-type: none"> 1. Toilets 2. Drainage system 3. Internal access roads 4. Streetlights for the internal access roads 5. Pavements on the main road
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Figure 3: Shiro Meda area settlement boundary



Source: Addis Ababa Mapping Agency, 2020.

The consecutive FGD sessions provided the 25 organised women with a platform to develop a settlement profile, start a conversation on the settlement's challenges and identify crucial assets. In particular, for social organisation, the settlement profile exercise helped the women identify influential community members for future development collaboration (Arputham, 2012, p. 28). Moreover, since developing a settlement profile is a starting point for future action (Patel et al, 2012), the women also identified their development priorities.

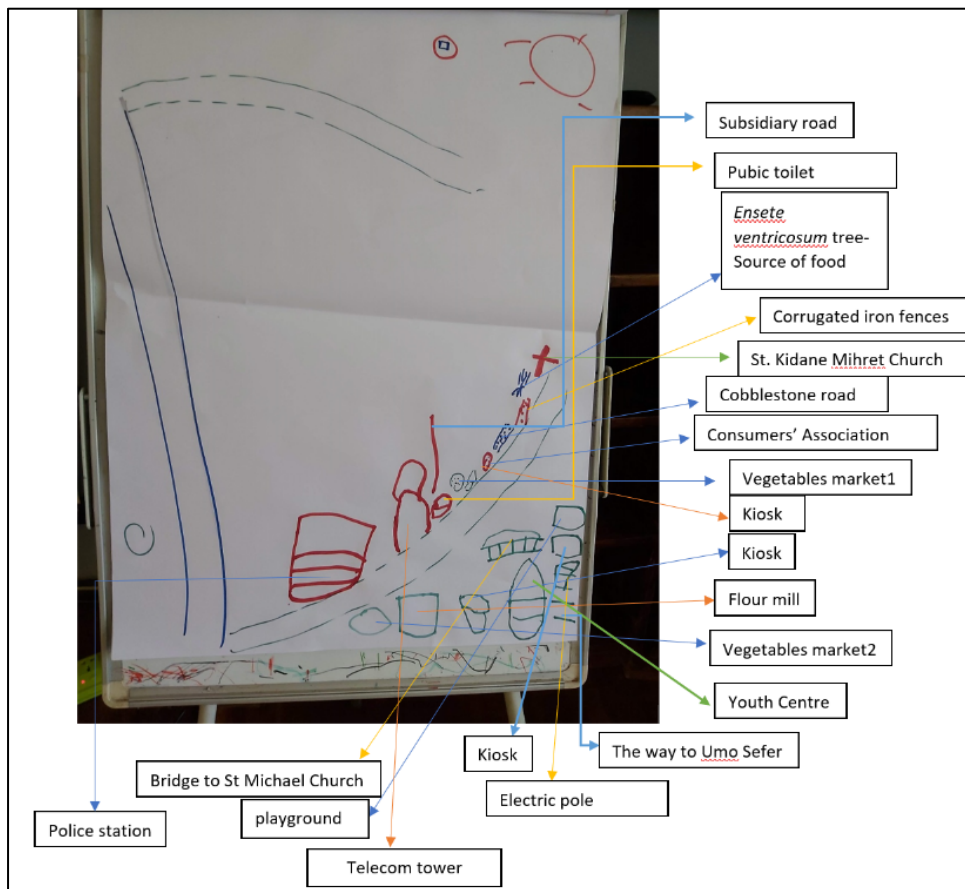
Most importantly, the consecutive FDGs conducted to develop the settlement profile helped the savings group members think collectively as an organised entity. It also helped them start thinking critically about the extent of the settlement's problems and how to respond to them. For example, one FGD participant said, "we [25 organised women] are already planning to clean the blocked ditches collectively" (FGD notes, 13/01/2021). This process was also fruitful in starting a conversation about the settlement's challenges and assets, making it easier for the subsequent exercises of participatory mapping and photovoice.

3.6 Participatory mapping

SDI's methodology of community-led mapping involves training community members to collect the GPS coordinates of settlement boundaries and service points using smartphones or tablets and pieces of paper. Once SDI federation-affiliated professionals generate the map, the community will verify the collected data (Beukes, 2015). In this study, the mapping exercise was split into two activities to generate in-depth information and enhance the role of the research participants in the process. This involved workshop-based participant mapping, blending (Stein et al, 2018) the community mapping exercise with SDI mapping, and the photovoice exercise (see below). The workshop-based participant mapping mainly focused on identifying and analysing the problems and assets of the settlement.

The participatory mapping exercise started with the research participants discussing their area, its key landmarks, and the name, meanings and spatial location of their specific neighbourhoods – the exercise aimed to get participants to think at the broader spatial scale. The discussion was followed by asking the women to put some of the settlement's key landmarks on a flipchart. Then, using their own symbols, participants identified those local landmarks they considered important. The landmarks and key points the women identified were closely linked to their daily lives (such as shops, street markets, a tree used for food, churches and flour mills) (see Figure 4). The significant achievement of this exercise was not spatial accuracy and a perfect representation of the area but capturing how the women perceived and represented their surroundings.

Figure 4: Community map



Source: Developed by the organised women on 21 October 2020.

The community mapping exercise was followed by a discussion animated by a satellite image of the settlement to allow the participants to undertake a spatial analysis of the challenges in the settlement. The facilitators displayed the study area's satellite image on a projector and invited participants to identify Covid-19 and other social problems on the image. A discussion about the specific problem followed this identification of the challenges. The participants highlighted vegetable markets, areas where people improperly disposed of solid waste, and local bars as potential sites for the spread of Covid-19. Interestingly, they identified the relationship between improper solid waste disposal and Covid-19 susceptibility and areas where people congregate without taking the necessary precautions. The discussion also highlighted the potential solutions to addressing Covid-19 and other settlement challenges.

Figure 5: Women explaining and discussing the settlement challenges and assets on the satellite image



Source: Authors' photos, 2020.

Finally, the facilitators laid the district's satellite image on A0 paper on the ground. Then they invited participants to put sticky notes on key landmarks, their specific neighbourhoods and their houses' location, with limited assistance from the facilitators (see Figure 6). With the help of Google Earth satellite images, the facilitators identified each point's specific location, the participants put sticky notes on, and they produced a map combined with the photovoice exercise (see Figure 8). This activity was instrumental in broadly delimiting the boundary of the settlement and the smaller neighbourhoods within it.

Overall, the participatory exercise enhanced the organised women's awareness of the settlement's challenges, imparted map reading skills and augmented their self-confidence through the open sharing of their experiential knowledge. Although their involvement in processing and visualising the map was limited thanks to the use of GIS software, their participation in spatial analysis and making sense of the map was significant.

Furthermore, participatory mapping made it easier for the following photovoice exercise by collectively identifying the key development concerns in the settlement.

Figure 6: Participants identifying key points on the satellite image of the district



Source: Authors' photo, 2020.

3.7 Photovoice

The photovoice exercise was added to enhance the role of the organised women in the research process and facilitate visual representation of the settlement's challenges and assets. The exercise also aimed to start conversations with the authorities and other development partners to address these (Wang & Burris, 1997). The exercise elaborated and visualised the development needs and assets of the settlement and its vulnerabilities to the spread of Covid-19. Two women professionals and a male participatory visual methodologies expert facilitated the exercise.

SDI-affiliated federations increasingly use smartphones to capture spatial data by taking advantage of mobile phones' widespread penetration in slum areas (Beukes, 2015). The SDI's Know Your City TV (KYC.TV) has also enabled youth living in informal settlements to produce documentaries and short films about life in the slums to tell their stories to the world and to engage them in a dialogue about the future of their settlements (Bolnick et al, 2018). For example, Muungano youth representatives used KYC.TV to actively document the planned upgrading of Mukuru (Nairobi) settlement and to create awareness by producing short films and live reporting about the challenges in the

settlement (Horn et al, 2020). KYC.TV shares commonality with the photovoice exercise used in this research in that it employs a participatory visual methodology to enable slum residents to tell their stories. However, photovoice is less sophisticated and does not need advanced training and equipment, making it suitable for the research participants in this study.

One of the goals of the photovoice exercise is “promot[ing] critical dialogue and knowledge about personal and community issues through large and small group discussion of their photographs” (Wang, 1999, p 185). The researchers therefore divided the research participants into two groups. The first comprised five research participants (organised women) who took pictures and discussed what each image represented. The second comprised 20 research participants who shared their additional perspectives on the pictures taken by the five women. The logic behind sub-dividing the group was to generate in-depth information and capture diverse interpretations of the pictures. The facilitators selected five women to take pictures based on their active participation during the participatory mapping exercise.

The five women received detailed training about the purpose of the exercise, the technicalities of taking pictures and ethical issues, particularly avoiding taking pictures of people without their informed consent. After the training, the facilitators gave the five women smartphones with which to take five pictures focusing on Covid-19 vulnerability and other social problems, and five images focusing on community assets. The five women took roughly a week to capture photos of whatever they thought important to them, bearing in mind the abovementioned criteria. Smartphones were chosen for the photography since they are easy to use and can capture GPS coordinates to integrate the pictures with the map.

After the five women had taken their pictures, two group discussions were conducted. The first was among the women who had taken the pictures. Each photovoice participant explained what their respective photos represented to the other four women and the facilitators (see Figure 7). The role of the facilitators was limited to seeking further elaboration and clarification. The other four participants also added to the discussion. A second FGD session was held with the other 20 participants to discuss selected pictures from those taken by the five women. As shown in plates 1–7 and 9, the 20 participants enriched the discussion and supplemented information to the description given by the five women who took the pictures.

Figure 7: One of the women explaining the picture she took



Source: Authors' photo, 2020.

Most pictures focused on the physical conditions in the settlement, livelihoods and Covid-19 vulnerabilities. The most recurrent theme was a clogged open ditch (see Plate 1), the poor conditions in the communal toilet (see Plate 2) and water shortages (see Plate 3). For example, one of the women used the picture of a communal toilet used by 60 households to describe how the toilet's poor condition exposed the children who play around it to various health risks (Plate 2). Two women poignantly captured water shortages by photographing the water containers in their respective kitchens (eg Plate 3). Another two women also highlighted vulnerability to Covid-19 transmission by photographing crowded spaces (eg Plate 4).

Plate 1: Blocked open ditch



“improper solid waste disposal blocking the drainage.”
(Photographer1)

“We usually clean the ditch but it is discouraging to see it blocked quickly.” (discussants)

Plate 2: Communal toilet shared by more than 60 households



"Sometimes it overflows. It has also bad smell [and] exposes the kids playing around the communal toilet to various health problems."

(Photographer5)

"This is a toilet we share with 60 households." (discussants)

Plate 3: Water shortages



"Water does not come regularly, hence many water containers."

(Photographer4)

"Not having enough water to wash our hands is another reason not to prevent Covid-19."

(discussants)

Plate 4: Street vegetable market

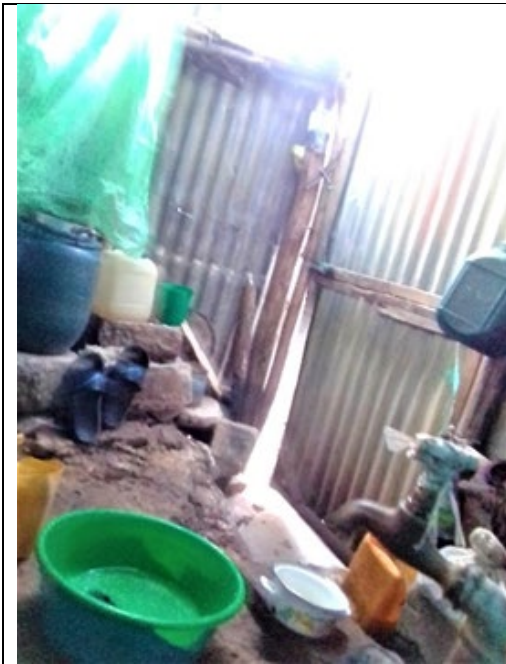


“Cars, street vendors and people all use the space in disorganised manner.” (Photographer3)

“No face mask and social distancing, we believe this is a disaster.” (discussants)

The women also captured images depicting their resourcefulness, improvisation skills and assets, such as minimising the risk of Covid-19 (Plate 5) and mixing charcoal with clay soil to make it last longer (see Plate 6). Since most women in the settlement earn their livelihood from collecting fuelwood from the nearby forest, four of the five women took pictures of fuelwood (see Plate 7). Thus, despite their challenging living conditions, the women's entrepreneurial skills could be harnessed to expand their businesses, supplemented by their savings, and by financial support and business advice from the government and other development partners.

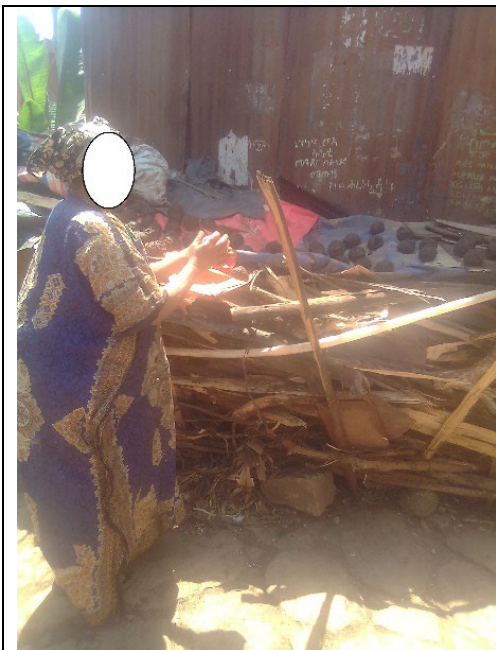
Plate 5: Minimising the risk of Covid-19



"I have put slippers for my children to change their shoes when they come to the house and a water basin to wash our hands to minimise the risk of Covid-19." (Photographer5)

"The water tap does not seem to be working and because of water shortages there are many jerry-cans." (discussants)

Plate 6: Locally made charcoal briquettes



"I sell briquettes by mixing the charcoal with soil so that it lasts longer." (Photographer4)

Plate 7: Fuelwood for sale



“Many women in the settlement live by selling fuelwood they collected from the nearby forest.”

(Photographer1)

“We sell fuelwood sitting next to a clogged open ditch, which stinks.”

(discussants)

In narrating the meaning of an image depicting a social problem in the settlement, participants in the photovoice exercise managed to show the problem’s causes and its actual or potential impacts. For instance, they identified the cause of the narrowing of alleys (Plate 8) as land encroachment by residents and its effect of making the settlement less accessible. Similarly, one of the women used a picture of the solid waste collection site to show the lack of periodic garbage collection and the health risks this created, exacerbated by stray dogs on the site (Plate 9). Thus, the photovoice exercise was instrumental in visualising and narrating the women’s problems.

Plate 8: Narrow alley



“Residents scrambling for more land to accommodate their increasing household size and to build a quarter for rent led to narrowing the access road.” (Photographer1)

“This is making our settlement inaccessible for emergency vehicles.” (discussants)

Plate 9: *Solid waste collection site*



“Stray dogs distribute the garbage all over the place, exposing the residents to various diseases.” (Photographer3)

“The garbage collectors do not come regularly. They say unless the truck is filled up, they do not get paid.” (participants in photovoice validation)

The photovoice exercise empowered the five women to capture and discuss issues, concerns and assets important to them. For example, the process allowed participants to capture and discuss issues about their kitchen (Plate 3), the principal means of livelihood for many women (see Plate 7), street vegetable vending (Plate 4) and innovative energy-efficient charcoal briquettes (Plate 6). These are all strongly associated with the prevailing patriarchal gender division of labour in the settlement. Thus, the exercise was instrumental in highlighting the significant challenges women face in their everyday lives (Wang, 1999).

Finally, one of the facilitators of the photovoice exercise integrated the pictures with the map. The integration allowed a visual representation of the settlement's development needs and assets on a spatial map (see Figure 8 for the map and Table 2 for the profile of the photovoice participants). In addition, the exercise served as a form of ‘counter-mapping’ (Rocheleau, 2005) able to map issues of concern to local communities, which are usually ignored on the official maps. According to one of the savings group members, the discussions, the photovoice and the mapping exercises “ha[ve] enabled us to identify the problems of the area and reflect what can we do to address the problems” (Woman2, interview 13/01/2021).⁸

⁸ Aged 65, engaged in yarn making, and married.

Figure 8: Participatory mapping and photovoice exercise spatial distribution



Source: Developed by the authors and research participants on an existing map.

Table 2: List of photovoice pictures and profile of the photovoice participants

Captured by	Image identifier	Caption
Photographer1 (50, divorced with four children, street vendor)	i1	Open ditch filled with solid waste1 (Plate 1)
	i2	Fuelwood for sale (Plate 7)
	i3	Second open ditch filled with solid waste
	i4	Communal toilet
	i5	Narrow alley (Plate 8)
	i6	Improper solid waste disposal

	i7	Vegetable market affected by road construction (Plate 4)
Photographer2 (49, married with seven children, street vendor)	i8	Open ditch
	i9	Open ditch
	i10	Children playing
	i11	Painting tar to protect the poor foundations
Photographer3 (45, married with six children, street vendor)	i12	Vegetable market affected by road construction
	i13	Solid waste disposal site (Plate 9)
Photographer4 (60, married with seven children, engaged in making yarn and spices for sale)	i14	Water shortage (Plate 3)
	i15	Handwashing station
	i16	Improper liquid waste disposal and bad smell
	i17	Communal tap
Photographer5 (50, divorced with three children)	i18	Wall cover
	i19	Communal toilet for 60 households (Plate 2)
	i20	Working, playing and storage space next to the communal toilet
	i21	Handwashing basin (Plate 5)
	i22	Small garden and drainage
	i23	Demolition notice

Although the photovoice exercise has the benefits mentioned above, there were also some security and ethical challenges. First, photovoice and other visual methods pose safety problems for the photographer and the device used to capture the image. For example, one of the five women engaged in taking pictures said that, out of fear for her safety, she avoided taking photos near a place where youngsters of the area hang out (Photographer2, interview 13/02/2021). Second, some of the settlement residents were sceptical about the motives for and benefits of the photovoice exercise by other community members. Most of the organised women revealed such suspicion and

rumours during the in-depth interviews and FGDs. One of them, who participated in the photovoice by taking pictures, said:

some people were suspicious. They ask us so many questions. I try to explain to them. However, some of them spread rumours that we are personally benefiting from taking pictures. (Photographer3, interview 13/01/2021).

Another woman who participated in the exercise added:

Some people spread a rumour saying “they [the women taking pictures] take our picture and sell it to aid organisations”. We also used to say this before when other organisations or tourists took pictures of our settlement. I did not experience any problems in my neighbourhood while taking pictures. However, it is good to bring on board the women spreading the rumour and organise them in our savings group. (Photographer4, interview 13/01/2021)

The photovoice training guided the women in explaining what they were doing to other community members. However, not involving other members of the community proved to be a limitation. These experiences revealed the need to involve the larger community in the photovoice exercise, at least through discussion.

Overall, the photovoice exercise helped enhance the role of the research participants in data capture, analysis and communication of the findings, despite some challenges. The photovoice exercise also proved crucial in highlighting the settlement's development needs and assets and for increasing its visibility on the spatial map. The settlement profile, participatory mapping and photovoice findings were presented to the key stakeholders for validation and building partnerships with the organised women.

3.8 Partnership-building workshop

In the SDI tradition, the stakeholder workshop must follow the settlement profile and mapping exercise in order to validate the findings, add more information and jointly strategise a future course of action for addressing the settlement's development needs (Arputham, 2012). Similarly, the photovoice exercise aims to influence policy makers and community leaders to act upon the development needs identified in the process (Wang & Burris, 1997; Wang, 1999). To this end, the local research partner (CPC) organised a partnership-building workshop to discuss the participatory research findings and introduce the 25 women as an organised key stakeholder within the settlement. The workshop involved representatives of the 25 women, the district administration, community-based organisations (CBOs), three NGOs active in the area and influential community members.

During the workshop, the research facilitator presented the key findings of the settlement profile, the participatory mapping and the photovoice exercise. The representatives of the

organised women shared their experience of setting up a savings group and of the participatory research. The women representatives also pleaded with the district administration to pay more attention to the challenges they were facing and to address the development needs they had identified. The workshop participants fully endorsed the settlement profile by adding more information on the settlement's history and widespread diseases, and emphasising the urgency of the development needs identified.

The community leaders appreciated the mobilisation of the women in their savings groups. However, they suggested that the savings groups should include male community members. One participant said, "it is impossible to clap with a single hand" (Workshop notes, 12/01/2021). Some participants suggested a settlement-wide savings scheme to fund community development activities. The organised women representatives also expressed their readiness to share their experience and coach people interested in establishing savings groups.

Further, the district administration and NGO representatives recognised the organised women as key stakeholders and promised to work with them to address the priority developments identified. The Head of the Labour and Social Affairs Office of the district encouraged the women to expand their membership and collaborate with them to address the challenges in the settlement. Likewise, NGO staff members promised to work with the women, despite their budget constraints.

The workshop participants recognised the organised women's collective agency and showed interest in expanding the savings-based mobilisation. This could be a stepping stone to broadening the mobilisation and building a long-lasting collaboration with authorities and development agencies. Additionally, the endorsement of the development needs identified by the organised women enhanced their agenda-setting role within the settlement. Nevertheless, the savings-based mobilisation needs to be expanded and strengthened to ensure that the promise of collaboration turns into concrete action. In this regard, the principal investigator and the local research partner are looking for opportunities to expand SDI mobilisation in Addis Ababa.

4 Analysis

This section presents the potential and limitations of the DjfD framework (Heeks, 2017; Heeks & Renken, 2018) in analysing the participatory research process. The analysis uses the five dimensions (ie procedural, instrumental, rights-based, structural and distributive) of data justice to analyse the action-oriented research. It shows that the research process achieved some gains, but that there is still a long way to go to achieve data justice. The analysis also shows that SDI-affiliated federations' social mobilisation provides plausible avenues for enhancing slum dwellers' data justice and their role in urban development in the Addis Ababa context.

4.1 Procedural data justice

This refers to fairness in how data is handled in all stages of the information value chain (see Figure 1) (Heeks, 2017). The organised women's role was limited to that of being information sources in the upstream data gathering for the settlement profile, and the facilitators captured the data. SDI methodology requires an established slum dwellers' federation to train community facilitators to capture the data necessary to develop a settlement profile (Makau et al, 2012). Most importantly, federations catalyse community-led learning, knowledge production, and the capacity to set priorities and decide on action (Appadurai, 2002; Mitlin, 2015). However, the plan to invite the SDI-affiliated Kenyan slum dwellers' federation to share their savings groups-based mobilisation and settlement profile experience was impossible thanks to Covid-19 travel restrictions. Hence the facilitators guided the settlement profile FGDs, blending the SDI methodology with PAA (Stein et al, 2018). The PAA-guided successive FGDs helped the facilitators to capture the data from the research participants adequately. All the organised women were involved in the data capture during the participatory mapping. Moreover, five women were actively involved in data capture during the photovoice exercises. This has shifted control in the participants' favour.

In the midstream information value chain (ie analysis, processing and visualisation), all 25 organised women actively participated in the analysis of the photovoice exercise. They managed to analyse what the picture represented and to tell their story and discuss their challenges on their terms. However, the facilitators undertook the documentation and geo-referencing of the pictures on the map. The key points identified during the participatory mapping were also entered into GIS software and processed by a specialist. The initial plan was to train young community members to be involved in spatial data analysis. However, Covid-19 travel restrictions and delays in securing ethical approval made it impossible to do this because of the short lifespan of the study. In the future, involving community members in the analysis and visualisation will be essential to avert the disempowering tendency of advanced software use (Chambers, 2006). The experience of KYC.TV in Kenya helps involve young people in participatory photography and storytelling. Nonetheless, in the downstream information value chain (decision and action), the findings have the procedural benefit of starting the conversation about tackling the problems and helping the organised women establish a partnership with key stakeholders.

Although it was not technically possible to involve the women at every stage of the process, the action-oriented research ensured procedural data justice for the participants through informed consent and the opportunity to correct the findings during the validation workshop. Additionally, the participatory research process provides procedural benefits for the women by imparting technical skills (photovoice and map reading) and enhancing their self-confidence and awareness about their settlement and about Covid-

19 vulnerabilities. According to a photovoice participant, “even when my son suggested to help me, I said no. I told him, I want to do it myself just like the women in the video you [facilitators] showed us taking pictures in other countries” (Photographer2, interview 15/01/2021).⁹

4.2 Instrumental data justice

Instrumental data justice refers to fairness in the results of the data being used (Heeks, 2017). There was no immediate decision or action taken based on the data collected. The direct result of the social mobilisation and participatory research was enhancing the collective identity of the organised women and facilitating their recognition by key stakeholders within the community. The women attested that they viewed the five savings groups as a single association (FGD notes, 13/01/2021). The partnership-building workshop participants also recognised the organised women and suggested the expansion of savings-based mobilisation. The 25 women were also willing to share their saving experiences with other community members and help them establish savings groups. This caused the women, who mostly lacked formal education and were low-income earners, to be recognised as owning special organisational skills valued by other people in the community. However, this was not the only outcome of the participatory research – the savings-based mobilisation that accompanied it was also important. The Covid-19 training, mapping and photovoice exercise also increased the women’s awareness of the areas where Covid-19 could potentially spread and of the necessary precautions (FGD notes, 11/10/2020; 13/01/2021).

4.3 Rights-based data justice

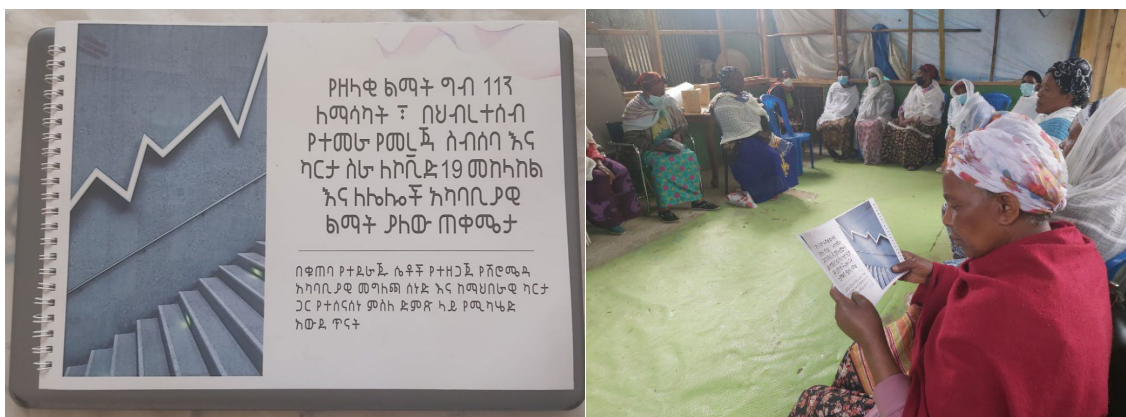
This term refers to adherence to fundamental data rights such as representation, privacy, access and ownership (Heeks & Shekhar, 2019). The initiative enhanced the representation of the settlement’s problem areas and assets, usually ignored in official maps. However, the lead author decided not to share the map developed openly on the Google map to minimise the vulnerability associated with external ‘legibility’ (Scott, 1998). The organised women did, however, give their full consent to sharing the findings in academic publications when they consented to participate in the study. The women’s right to privacy was also achieved by anonymising them in the write-up of the outputs of the action-oriented research.

Regarding the right to access and ownership, the findings and recommendations of the action-oriented research were translated into the local language (Amharic) and shared with the participants (see Figure 9) and local authorities. However, the women said they

⁹ During the photovoice training, the facilitators showed a photovoice exercise documentary video conducted in Kenyan slums.

preferred the data to be stored by the facilitators. They do not (yet) have the infrastructure to store the data thanks to the nascent level of their organisation. Thus, the research participants agreed that the principal investigator would store the data and outputs, and the women would authorise its sharing and further use. As stated in the PIS form, the principal investigator cannot share their data without their consent. Nonetheless, SDI's experience indicates that federating self-organised communities pooling their political and material resources is a necessary step in enhancing the right to ownership of their data (Appadurai, 2002; Patel et al, 2012; Beukes, 2015).

Figure 9: Sharing the research findings and recommendations with participants



Source: Authors' photo, 2021.

4.4 Structural data justice

This can be assessed by understanding the structural “power over” the functioning of a given data initiative and the “power to” of the data initiative in reshaping existing power relations, institutions and dominant knowledge systems (Heeks & Renken, 2018, p 97). The research intervention has made modest contribution in terms of structural data justice by putting marginalised women at the centre of knowledge production and building their relational power through grassroots social mobilisation and networking. This action-oriented research succeeded in organising 25 women and undertaking participatory research. The district administration was willing to collaborate with the women to address their challenges during the partnership-building workshop. However, realising the goodwill for cooperation and using the findings of the research by the district administration require further engagement.

Nevertheless, the absence of an institutional framework that ensures the incorporation of the priority development interventions identified in the district administration's development planning and budgeting is a major structural impediment. The primary focus of the action-oriented research on the development of settlement profiling supported by mapping and photovoice exercises was instrumental in highlighting the settlements' challenges and starting a conversation with stakeholders. However, as a

result of the short lifespan of the research and the Covid-19-related delays, there were limited time and resources available to use the findings in building relations and enhancing the organised women's voice in negotiating the allocation of resources to the settlement.

The participatory research had a minimal impact on the 'power to' of the data initiative on existing structures. There was a minor achievement in changing the purpose of knowledge production. With technical support from professionals, the settlement profile, mapping and photovoice exercise showed that the women in the area could highlight the settlement's problems using text, maps and pictures. As for social relations, the intervention facilitated the recognition of the participating women as an organised actor with agency in the eyes of other influential community members, NGOs and district administration representatives. As a result of their low income and the entrenched male-dominated culture, most of the women had previously had only limited participation in community affairs. One of them said, "no one listens to our problems; we are thankful to you [facilitators] for giving us the platform to discuss our issues every Friday" (Women3, interview 15/01/2021).¹⁰ However, the intervention was not able to bring about an institutional change in influencing formal and informal rules. The focus on mobilising the women into savings groups, giving them Covid-19 training and undertaking participatory research was not matched by using the outputs of the exercises to establish solid partnerships and influence change at the local level. The lesson from SDI-affiliated federation teaches us that bringing structural change requires building a more vigorous social mobilisation, collaboration with professionals, academics and transnational alliances, and negotiation and building relations with state officials (Mitlin, 2014; Lines & Makau, 2018).

4.5 Distributive data justice

Distributive data justice is an overarching dimension relating to the (in)equality of data-related outcomes within each of the other dimensions of data justice (Heeks & Shekhar, 2019). Regarding procedural data justice, the organised women were actively involved as sources of information, analysis (photovoice) and discussion based on the participatory research findings. They also gained some technical skills and enhanced their ability to mobilise. However, the women's involvement in documenting, analysing and processing the data was limited, as this was done by the external facilitators. Additionally, except for the community leaders invited to the partnership-building workshop, the other settlement residents were not actively involved in the participatory research and social mobilisation.

¹⁰ Age 50, fuelwood seller and married.

Nonetheless, the participatory output of the research was beneficial in allowing the wider community to identify the settlement's priority development needs and start a conversation with key stakeholders to address them. As a result of time and resource constraints, it makes sense to begin the action-oriented research with a small group of people. However, expanding the savings groups and involving the rest of the settlement residents in further participatory research and development planning is essential.

Regarding rights of representation and visibility, the participatory research made visible on the map the significant problems of the settlement's residents. This is beneficial to the organised women and the wider community. The study also secured the women's control over sharing the data and findings of the participatory research while storing the data with the principal investigator. However, the women's inability to store the data limits their complete ownership of them. Expanding the savings-based mobilisation and organising smaller savings groups into a federation with an office and better data infrastructure could enhance their complete control and ownership of the findings.

In instrumental terms, the participatory research and savings-based mobilisation enhanced the agenda-setting capacity of the women and the recognition of their saving mobilisation. Nevertheless, unless the participatory research findings guide the future actions of the district administration and NGOs in the area, the instrumental benefit to the wider community and the women will be limited. Additionally, the instrumental benefit of the action-oriented research in increasing awareness of Covid-19 directly benefited the women. The women savings-group members also disseminated the Covid-19 prevention awareness they had gained from the training and the participatory exercise to their neighbours (FGD notes, 11/10/2020). To further enhance the instrumental outcome of the process, it is crucial to experiment with SDI's community-led, "precedent-setting" (Patel & Mitlin, 2009, p 15) innovative strategies to address problems in order to influence government policies and/or intervention.

Furthermore, the existing structural inequalities facing the organised women and limited resources and time allocated to partnership building have constrained the utility of the findings in decision making and bringing about institutional changes. The small number of savings-based mobilisations limits the remaining residents' inclusion and weakens their capacity to negotiate with the authorities and other development partners. Thus, taking advantage of many residents' interest in being part of the savings group and the willingness of the 25 women to share their experience is vital to strengthen and expand the savings-based mobilisation in the settlement.

Overall, the analysis guided by the DjfD framework showed that the intervention has succeeded in identifying the pressing problems of the community, in starting a conversation on addressing them and in recognising the savings-based mobilisation. The

analysis also identified the gaps in action-oriented research in expanding the subjects' control of the research process and using the findings to influence resource allocation, decisions and institutional changes. However, the DjfD framework has limits in terms of capturing the role of community mobilisation and external professional support embedded in the community's organisation to enhance data justice for slum residents. At this juncture, SDI-affiliated federations' experience provides an instrumental lesson in expanding social mobilisation and using community-generated data to influence policy and institutional changes in Addis Ababa.

5 Conclusions

This action-oriented research aimed to test SDI's social mobilisation through women-led savings groups, settlement profiling and partnership building in the Addis Ababa context. It has also tested the efficacy of augmenting the SDI-inspired data collection process with participatory photography, specifically photovoice. The 'Data justice for development' framework (Heeks & Renken, 2018) was used to analyse the process from a justice perspective and to critically assess the framework's usefulness in exhaustively analysing participatory research. Significantly, we conducted the research during the Covid-19 pandemic, which posed major challenges in social mobilisation and participatory data collection.

The study experimented with the possibility and potential benefit of SDI-affiliated women-led savings-group mobilisation and partnership building in Addis Ababa. The intervention succeeded in mobilising 25 women into five savings groups. As a result, the women started saving regularly. The local administration and a government-owned microfinance institution promised to support the women's collective business plan and make microcredit available. The mobilisation of the 25 women through the savings group and their regular meetings helped them develop a collective identity and voice. They have already started building relations with the authorities and with NGOs operating in the area. Beyond the 25 women, the SDI savings-based mobilisation has also gained buy-in from community leaders in the study site.

The research has also used SDI-inspired settlement profiling and mapping to enhance the research participants' awareness about their community and help them identify local development priorities. SDI's data collection tools, ie enumeration and mapping, have proved critical in building relationships with authorities, gaining recognition of the existence of informal settlements and initiating settlement upgrading (Appadurai, 2002; Patel et al, 2012; Beukes, 2015). Accordingly, this intervention facilitated the development of a settlement profile and mapping, blending SDI methodology with Stein et al's (2018) PAA tools to compensate for the Covid-19 restrictions that limited the organisation of repeated consultation and discussion involving large groups of residents. The settlement

profiling and participatory mapping identified the area's settlement boundary, its challenges and assets and its urgent development priorities. Community leaders, authorities and NGOs working in the area validated the settlement profile and mapping findings. The tools enabled the otherwise marginalised women to set the development agenda and build relations with the local authorities and NGOs. Building on the achievement of this action-oriented research intervention, a transnational alliance with neighbouring countries' SDI-affiliated federations of slum dwellers could play an instrumental role in strengthening and expanding the nascent mobilisation.

The research also showed that professionals and academics could play a crucial role in stimulating and supporting social mobilisation and collaboration in producing evidence-based findings to influence action. Their role was also influential in creating a partnership-building platform between organised community members and key stakeholders. Heeks and Shekhar (2019) highlight the perpetuation of structural data inequalities posed by external agencies (NGOs and professionals) controlling digital technologies and other resources. However, professionals and academics determined to support slum residents could minimise this challenge by imparting knowledge and skills to the communities and building enduring relationships (Chambers, 2006; Mitlin et al, 2019).

Methodologically, the photovoice exercise was instrumental to the settlement profile and mapping exercise. It was beneficial in enhancing the role of the women in the research process and helping them visualise the settlement's problems and assets. Notably, integrating photovoice with the mapping empowered the women to narrate key challenges and assets in their settlement, stir discussion and communicate with decision makers and other stakeholders, benefiting from the powerful visual images. Further, the tool allowed the research participants to be involved from data capture to analysing and interpreting. While providing a camera for a small group of people was efficient in logistics and time, it limited the role of most of the research participants in data capture. Thus it is crucial to expand the use of participatory visual methodologies to document and tell life stories in the slums, especially by involving young people learning from the KYC.TV experience in Kenya (see Bolnick et al, 2018).

The DjfD framework (Heeks & Renken, 2018) was vital in analysing the process, given its usefulness in critically assessing the process of data generation, analysis and utilisation using the various dimensions of justice. The intervention thus identified settlement development needs, built the collective capacity of the organised women and established a partnership with stakeholders. However, the research process was limited in fully involving the communities in all stages of the information value chain (see Figure 1) and utilising the findings to influence decisions and structural changes.

Conceptually, this paper contends that data justice cannot be achieved solely through data initiatives. In the emerging data justice literature, considerable emphasis is given to

the fairness of the information value chain (for example, Heeks, 2017; Heeks & Renken, 2018; Heeks & Shekhar, 2019), with less attention paid to the role of informal settlement residents' social mobilisation. This action-oriented research inspired by SDI-affiliated federations facilitated women's mobilisation in Addis Ababa slum settlements through savings groups. The mobilisation gave them a collective identity recognised by the district administration and NGOs working in the area. By building their capacity and expanding membership of their groups, the women can potentially influence the allocation of more resources tailored to their needs, enhance their control over their data, improve their negotiating capability, and gradually influence policy and institutional changes.

The experience of SDI-affiliated federations in using community-led enumeration and mapping along with the other social mobilisation pillars is vital in taking a positive step towards achieving data justice and broader social justice goals (Appadurai, 2002; Mitlin, 2015; Weru et al, 2018).¹¹ Such social mobilisation and self-enumeration are crucial in challenging exclusionary urban planning institutions that filter out the interests of the urban low-income residents from "politics and political discourse" (Mosse & Mosse, 2010, p 1172). They also challenge "modes of [adverse] differential incorporation" (Elwood & Lawson, 2018, p 4) in the city systems that perpetuate the impoverishment of slum dwellers. Data justice and broader social justice goals can be achieved when slum dwellers collectively promote what Elwood and Lawson (2018, p 13-17) call "unthinkable poverty politics", which challenges exclusionary rules, redefining meaningful life in one's own terms and building solidarities of marginalised groups. Thus, social mobilisation and participatory research are a springboard for initiating "unthinkable poverty politics".

The practical implication of the action-oriented research was in showing ways of conducting social mobilisation and participatory research during the Covid-19 pandemic in a slum settlement without risking the safety of the participants. Since personal contact is essential to establish new social mobilisation and undertake participatory research, the intervention started with training on Covid-19. The training was instrumental in ensuring adherence to social distancing rules during and beyond the research process. As a result, it was possible to facilitate social mobilisation and participatory research by strictly observing social distancing rules, distributing face masks and sanitisers and holding sessions outdoors or in a ventilated room. The Covid-19 training also helped the organised women to remind their neighbours to take the necessary precautions as far as possible.

¹¹ The other pillars are settlement-level savings-based mobilisations coalescing into a national-level community project-financing institution of slum dweller federations, an NGO to support federations with technical expertise and a transnational alliance.

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