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Localising the SDGs in African Cities: A Grounded Methodology

Omar Nagati*, Hanaa Gad**, Amin Ali El-Didi***, Jacob M. Kihila****, Elinorata Mbuya***** & Emmanuel Njavike******

Abstract

This article's starting point is the recognition that urban Africa faces a set of economic, social, political and infrastructural challenges sufficiently specific to its context to warrant its own (hitherto modest) repertoire of the Sustainable Development Goal (SDG) localisation roadmaps. Drawing on field-based comparative research across Cairo and Dar es Salaam, and focusing on SDG 6 (water and sanitation) and SDG 11.2 (mobility), the article develops a research methodology that helps to detect fissures between the general SDG framework and microscopic realities on the ground in African cities. Although each of the two cities has a specific set of urban realities and development paradigms, the paper develops a localisation process that is applicable across both geographies (and beyond) based on the similar prevalence of urban informality in African cities, which the current SDG framework insufficiently, or at times inaccurately, factors in. The methodology comprises three key components: 1) a top-down policy analysis of SDG responses at national and city levels; 2) grounded field research of local practices at a neighbourhood level; and 3) revising the SDG targets and indicators through a proposed 'Toolkit for Localising'.

Keywords: Sustainable Development Goals (SDGs); localisation of SDGs; global South; informality; citizen science; water and sanitation; mobility

* Architect and Urban Planner, Co-founder, CLUSTER, Cairo. Email: onagati@cluster.org

** Architect and Community Development Leader, CLUSTER, Cairo. Email: hanaa.gad24@yahoo.com

*** Architect and Researcher, CLUSTER, Cairo. Email: amin_aldidi@hotmail.com

**** Senior Research Fellow, Ardhi University, Dar es Salaam. Email: kihilaj@gmail.com; ki-hilaj@yahoo.com

***** Research Fellow, Ardhi University, Dar es Salaam. Email: angelambuya@yahoo.co.uk

****** Research Assistant, Dar es Salaam. Email: enjavike@gmail.com

Résumé

Le point de départ de cet article est la reconnaissance que l'Afrique urbaine est confrontée à un ensemble de défis économiques, sociaux, politiques et infrastructurels suffisamment spécifiques à son contexte pour justifier son propre échantillon (jusqu'ici modeste) de feuilles de route de localisation des objectifs de développement durable (ODD). S'appuyant sur des recherches comparatives sur le terrain au Caire et à Dar es Salaam, et se focalisant sur l'ODD 6 (eau et assainissement) et l'ODD 11.2 (mobilité), le document développe une méthodologie de recherche qui aide à détecter les lacunes entre le cadre général des ODD et les réalités microscopiques. Sur le terrain dans les villes africaines. Bien que chacune des deux villes ait un ensemble spécifique de réalités urbaines et de paradigmes de développement, le document développe un processus de localisation applicable dans les deux zones géographiques (et au-delà) sur la base de la similarité de l'informalité urbaine dans les villes africaines, que le cadre actuel des ODD aborde insuffisamment ou, parfois, de manière inexacte. La méthodologie comprend trois éléments clés : 1) une analyse politique descendante des réponses aux ODD aux niveaux national et de la ville ; 2) une recherche sur le terrain fondée sur les pratiques locales au niveau du quartier ; et 3) une révision des cibles et des indicateurs des ODD par le biais d'une proposition de « boîte à outils pour la localisation ».

Mots-clés : objectifs de développement durable (ODD) ; localisation des ODD ; Sud global ; informalité; science citoyenne; eau et assainissement ; mobilité

Introduction

In 2015, Agenda 2030 was adopted by the United Nations and signed by 193 countries with the general stated aim of providing a 'blueprint to achieve a better and more sustainable future for all' (UN 2015). Consisting of seventeen Sustainable Development Goals (SDGs), the Agenda set a multitude of objectives for 2030, including: eliminating global poverty and hunger; safeguarding natural resources; achieving gender equality; and improving the quality of and access to healthcare. To translate such general aspirations into action, each goal is accompanied by a monitoring and evaluation framework comprising specific targets and measurable indicators against which each signatory government can measure its performance. However, even though the Agenda incorporates such a seemingly comprehensive roadmap for monitoring progress, its development at the supranational political level – and the related universal and at times indistinct language it wields – has meant that it does not easily translate at the local level when tested against the varied and complex realities on the

ground. A discourse focusing on the need to localise the SDGs has thus developed as an imperative remedy. Such an impetus to adapt the SDGs to local contexts naturally means the empowerment of subnational levels of government and favours co-operation between diverse external institutions, civil society organisations and the private sector, as needed (Valencia et al. 2019: 20). More generally, localisation can be understood as the process by which the SDG framework is adapted to specific geographical contexts through institutions of implementation, which in turn formulate sustainable development policies, projects and standards that are informed by local realities at each of the design, implementation and monitoring stages.

While much work has been done – conceptually and in practice – towards 'localising' the SDGs (see UCLG 2014; Global Taskforce for Local and Regional Governments 2016; Oosterhof 2018; Croese et al. 2020), the starting point of this study is the recognition that urban Africa faces a set of economic, social, political and infrastructural challenges specific to its context. These warrant its own SDG localisation roadmaps and modes of academic inquiry. This paper sets out to develop a general 'methodology' that would help detect fissures between the general SDG framework and microscopic realities on the ground, thus improving the outcomes of SDG implementation and evaluation efforts at the local level. Acknowledging the diversity of African cities and their development paths, and mindful not to fall into the trap of essentialisation and oversimplification, this methodology aims to serve as a toolkit for other African researchers and policy-makers who may be attempting to streamline the SDG localisation process in their respective cities. It stresses the importance of rethinking SDG localisation to mitigate the shortcomings of Agenda 2030 in its application to the global South, especially its take on urban informality.

As test beds for developing this methodology, the North African megapolis Cairo and the East African port-city Dar es Salaam were chosen as case studies, focusing on two sectors: water and sanitation (SDG targets 6.1, 6.2, 6.b), and transport and mobility (SDG target 11.2). Relying on extensive fieldwork and policy analysis in both cities, and building on existing critiques of the SDG framework, a localising methodology was developed to address shortcomings in the SDG monitoring apparatus for these two sectors. Yet it is equally pertinent for other SDGs. The paper first summarises critiques of the SDG framework and suggested reforms in Southern contexts. It then presents the localisation methodology, which is based on a process of mediation between existing national top-down policies and on-the-ground prevalent practices related to sanitation and public transport in Cairo and Dar es Salaam. This is followed by a brief

outline of the research findings, after applying the methodology in the two cities, and of the suggested reforms to the SDG targets and indicators.[1] As a whole, the article offers a mechanism to adapt the SDG 'blueprint' using local data and available resources, and invites the development and sharing of new localisation mechanisms that valourise local experiences, destigmatise informality and ultimately ensure development pathways that are fitting for our cities in Africa.

SDG Critiques, Urban Informality and the need for Localising Methodologies for African Cities

The post-2015 SDG agenda was developed as a revision of the Millennium Development Goals (MDGs), which were in place between 2000 and 2015. While the SDGs build on a number of achievements and progress made through the MDGs, the new agenda applies to all countries worldwide, unlike the MDGs, which applied to the 'developing' world only. This change sought to address the criticism that the previous development agenda further essentialised countries in the global South. It also responded to the self-evident view that working towards sustainability and resisting climate change is a global responsibility, and that the responsibility of 'development' cannot be borne by only some. However, while it can be argued that the changes made to develop the SDGs signified a substantial step towards inclusivity, criticism of Agenda 2030 has persisted. Besides weakening the Agenda's claim for 'universality', it reminds us of the generally 'violent history of developmentalism' that characterises big-organisation development plans – be they Agenda 2030, or the International Monetary Fund (IMF) and World Bank economic restructuring programmes, for instance (Malonza and Ortega 2020). These programmes hold developing countries 'responsible for their own development' yet force them to adhere to neoliberalising pathways that, instead of promoting development, further widen the North-South disparity (ibid; Kumi et al. 2014). However, rather than discredit the SDG framework – which we believe holds potential as a progressive tool for global development and solidarity – we argue for more engaged translations of it. This calls for grounded localisation efforts that are informed by local definitions of development, cater to otherwise-unheard voices, and thus correct inequalities created or perpetuated by the general SDG framework.

The SDG framework (and other global development agendas adopted post-2015, such as the Paris Climate Agreement or New Urban Agenda) has been criticised generally for prioritising the standardisation and harmonisation of development 'at the risk of decontextualizing and

devaluing the intrinsically local and social urban realities' (Caprotti et al. 2017: 370). Especially as the framework pertains to cities, Simon et al. (2015) convincingly argue that 'there are no standardised metrics for measuring the huge and complex domain of urban development, in which states are only one of many actors alongside local authorities, the private sector, non-governmental organisations and citizens' (Simon et al. 2015: 54). Not surprisingly, then, when a group of researchers reviewed the relevance of the urban SDG 11 in the cities of Cape Town, Gothenburg, Kisumu, Greater Manchester and Bangalore in 2015, they found that 'no city found the entire set of draft indicators under SDG 11 straightforward and important or appropriate' (Valencia et al. 2019: 7).

We are specifically wary of the Agenda's apparent insensitivity to the prevalence and specificity of informal urbanism in the global South, and how that has rendered many SDGs irrelevant to our African cities, or exclusive to certain geographies or livelihoods within them. Sexsmith and McMicheal (2015) take issue with the predominance of nation-state actors in the Agenda's planning process, similarly denouncing the goals themselves for routinely assuming the state to be the main provider of services. This state-centred bias directly marginalises informal solutions. For example, the sustainable housing target (11.1) is linked to the measured indicator that reads 'Proportion of urban population living in slums, informal settlements or inadequate housing'. This indicator reduces dwellings of dramatically different living standards, legal statuses, architectural characteristics and urban conditions to a single category. It makes it irrelevant whether an informal settlement is appropriate, affordable, well-connected, sustainable, safe or environmentally friendly. And the suggested benchmark upon which countries measure sustainable housing provision is simplified to the extent of excluding this category. By reinforcing the 'city without slums' development paradigm, it stigmatises this predominant urban reality that shapes the living conditions of most urbanites around the globe, paying no regard to the practical, economic and efficient possibilities for improving these housing options, which would be predicated on removing this inherent bias (Ministry of Planning, Monitoring and Administrative Reform Egypt 2016: 34).

Is there no way of assessing the functionality and sustainability of different housing solutions independently of who provides for them? More generally, can informal practices and structures be incorporated when implementing and evaluating SDGs locally, without any normative rejection or fear of 'informality' in and of itself? Rather than starting with the view of informal areas as an anomaly that needs to be eradicated, this paper positions itself within an emerging discourse that views informality

as a mainstream urbanisation process in the global South, and a form of resistance to the erosion of welfare programmes and urban services provision that has characterised the neoliberal turn of the past four decades (Nagati 2016: 257–8). We join other scholars in refuting the rigid formal-informal dichotomy (McGee 1978; Dick and Hammer 1980; Roy 2005) and subscribe to a view of (in)formality as a continuum, wherein 'formal' and 'informal' activities exhibit 'strong, complex, and dynamic complementarities and interrelationships' (Arfvidsson et al. 2016: 101; see also Groenewald et al. 2013; Nagati and Stryker 2021).

By ignoring such complexities and applying inherently negative value judgements to all practices that occupy relatively informal spaces or pathways, 'development' plans such as the SDGs are experienced by many as marginalisation, expropriation and dispossession. Acknowledging such complexities does not simply lead to the romanticisation of informality, or celebrating it as an expression of the 'tenacity of otherwise-marginalised groups' (Banks et al. 2019: 223). Informal solutions often do not remedy such marginality and can even be used as oppressive tools of marginalisation themselves. In other words, there should be neither a need to discredit the auto rickshaw (known as 'tuktuk' in Egypt, or 'bajaj' in Tanzania) as a mode of transportation simply for its current characterisation by formal legal institutions, nor a willingness to spare it the scrutiny of environmental or safety assessments – in accordance with the SDG framework – simply to overcompensate for its 'marginality'. Thus, to 'sustainably develop' cities in Africa – quintessential hosts of such complex, grey accounts of informality (see Hansen and Vaa 2004) – this paper calls for embracing the multiplicity of typologies, phenomena and subjectivities that overlap in any urban setting, and to resist the enticing prospects of simplifying cities into digestible statistics, or 'rendering development technical', as Li (2007) puts it.

Towards a Grounded Methodology for Localising

The SDG localising methodology presented here builds on the existing momentum in the Social Sciences to legitimise 'alternative' and participatory methods of collecting and producing data, and to highlight the importance of qualitative accounts, alongside quantitative analyses, to fully understand cities. In the context of the SDG framework in particular, much literature has recognised the productive potential of 'citizen science' – loosely characterised by the 'public engage[ment] in the process of research to generate new science-based knowledge' (Fraisl et al. 2020). In their review of citizen-science contributions to the improvement of the SDG framework,

Fraisl et al. (2020) prove that such participatory-based knowledge could contribute to the measurement of 76 of the 231 SDG indicators, including many pertaining to sanitation and public transport, which we take up here. Such community-based data helps fill the gaps created by the otherwise technocratic and big-data driven approaches to SDG implementation and evaluation processes (Fritz et al. 2019; Caprotti et al. 2017). The proposed 'grounded' methodology attempts to look beyond official narratives and national census data, which largely disregard informal activity, and supports engaging with people and activities on the ground both in defining the relevant SDG indicators and when monitoring progress. This research draws on interviews with community members in Cairo and Dar es Salaam, as well as 'auto-ethnographic' accounts of the cities, towards drafting revised indicators for transport and sanitation.

In the context of African cities, where formal and informal structures often overlap, co-operate or clash, analysing the disparities between the findings from grounded research and the formal narrative and policy around the same phenomena provides insight into the political discourse vis-à-vis concrete measures towards sustainable development. In many cases, for instance, we find that governmental authorities appropriate the SDGs or New Urban Agenda (NUA) discourse to justify lucrative real-estate projects or politically motivated urban policies under the guise of sustainability. This is usually more feasible in African cities, given the weakness of local governments and participatory modes of governance there that in turn solidify the state's hegemony over sustainability discourses. Thus, our proposed methodology also rests on formal policy analysis and interviews with different institutional and private stakeholders, as a way of detecting – following the recommendation of Valencia et al. (2019) – the degree of multi-level and 'integrated' governance present, and the ecosystem of actors involved in the SDG localisation process for a given goal or sector.

Introducing the Case Study Neighbourhoods

The case study sites for the fieldwork and comparative analysis are in Cairo, Egypt and Dar es Salaam, Tanzania. Both cities provide different perspectives of the urbanisation process entwined between formal and informal development and the relevance of the emerging interface that simultaneously divides and connects both spaces. The two cities, with their varying histories, sizes, regional contexts and modes of development, offer a broad spectrum of urban conditions, experiences and variables that are found in other African cities, and may thus prove a suitable starting point for broader comparative research in other cities. The analysis endeavours to compare service provision and

practices at the provincial level as well as at the level of the neighbourhoods of Ard al-Liwa, in Cairo, and Keko Machungwa, in Dar es Salaam. As two settlements built outside state planning, they can be considered representative of modern-day African urbanism.

Cairo

Cairo is located along the Nile Valley, where the delta fans out towards the Mediterranean Sea. It is one of the most significant and populous cities in Africa and the Middle East. In fact, the Greater Cairo Region is considered the sixteenth largest metropolitan area in the world, with a population of over 19,846,000 people in 2017, and a growth rate of around 2.2 per cent per year since 2000 (Worldpopulationreview.com 2020b). The city has progressively expanded to absorb numerous adjacent settlements, each with particular characteristics and socioeconomic profiles, resulting in a mosaic-like spatial composition (Mekawy and Yousry 2012; Elisa and Michele 2013). Today, the Greater Cairo Region comprises three governorates: Cairo, Giza and Qalyubiyah. It also includes eight 'New Cities', which are not managed by the governorates but by the New Urban Communities Authority (NUCA). Informality is one of Cairo's defining features, with blurred distinctions between formal systems and informal practices. The informal economy is estimated to employ over half of Cairo's labour force, and informal neighbourhoods are estimated to constitute 52.7 per cent of Greater Cairo's residential areas (Worldpopulationreview.com 2020b).

The neighbourhood of Ard al-Liwa, with a population of approximately 150,000,[2] lies within the west and north of the informal belt that surrounds the city of Giza. It is separated from the city by the railway and Zumur Canal, which extends from Imbaba and Bashtil to the north and 'Umraniya to the south. Ard al-Liwa is a focal point in the western part of Cairo's informal built environment, as it is surrounded by major city arteries. At the same time, it is a small, contained area compared to the larger surrounding neighbourhoods. Its administrative dependency changed from being an extension of Kirdasa (a rural centre, or *markaz*) to being part of the Agouza district, which is predominantly formal. As it is informally built on agricultural land, Ard al-Liwa is considered an unplanned area, characterised by a lack of regulations and local services. The district evolved from an agricultural settlement based on irrigation from canals, to having a local road network and housing blocks, which informally began to accommodate residential use and which have since been formalised.

Dar es Salaam

Dar es Salaam was the capital city of Tanzania until 1974, when Dodoma was named the new capital. However, the city remains the largest in the country in terms of population. In fact, with an estimated 2020 population of over 6.7 million (Lusagalika 2020; Saleem et al. 2021). Dar es Salaam is the largest city in all of East Africa. The current pattern of city growth is partially influenced by planning interventions that date back to the colonial era, during which settlements around the city were delineated for different races. In many parts of the city, informal settlements have developed next to formal planned areas. For instance, where there are planned and surveyed settlements within the Ministry of Lands, Housing and Human Settlements' (MLHHSD) projects, there are adjacent informal settlements that are growing exponentially. Among the reasons for the informal settlement growth in Dar es Salaam, suggested by Kyessi (2002), is the city boundary extension into areas designated as unsuitable for urban physical development. The study site, Keko Machungwa, is nevertheless not affected by this type of growth. Rather; it is a settlement that grew to saturation within the same boundaries.

The neighbourhood of Keko Machungwa is home to an estimated 23,407 people and is located in the Miburani ward. The Keko ward, including the Keko Machungwa sub-ward, was established around 1961 and spread steadily. However, significant changes in the settlement were observed around a couple of decades ago, when its proximity to the Central Business District, the port of Dar es Salaam and the main railway station, and its affordable prices, drew people to settle there. However, one of the reasons land was affordable is because most of the area covering Keko Machungwa was declared as hazardous. Sanitation is generally poor and the settlement is prone to flood risks, particularly in the low-lying areas.

Methodology and Research Design

This paper proposes a methodological framework premised on two main conceptual axes. The vertical axis mediates the top-down and bottom-up processes that led to the revised criteria for the evaluation and improvement of local practices. The horizontal axis compares the two neighbourhoods, cities and national policies through their similarities and differences (Fig. 1). This framework is then applied to two specific SDGs: water and sanitation (specifically SDG targets 6.1, 6.2 and 6.b), and transportation and mobility (SDG target 11.2), as shown in Table 1, and is manifest in the research methodology that follows.

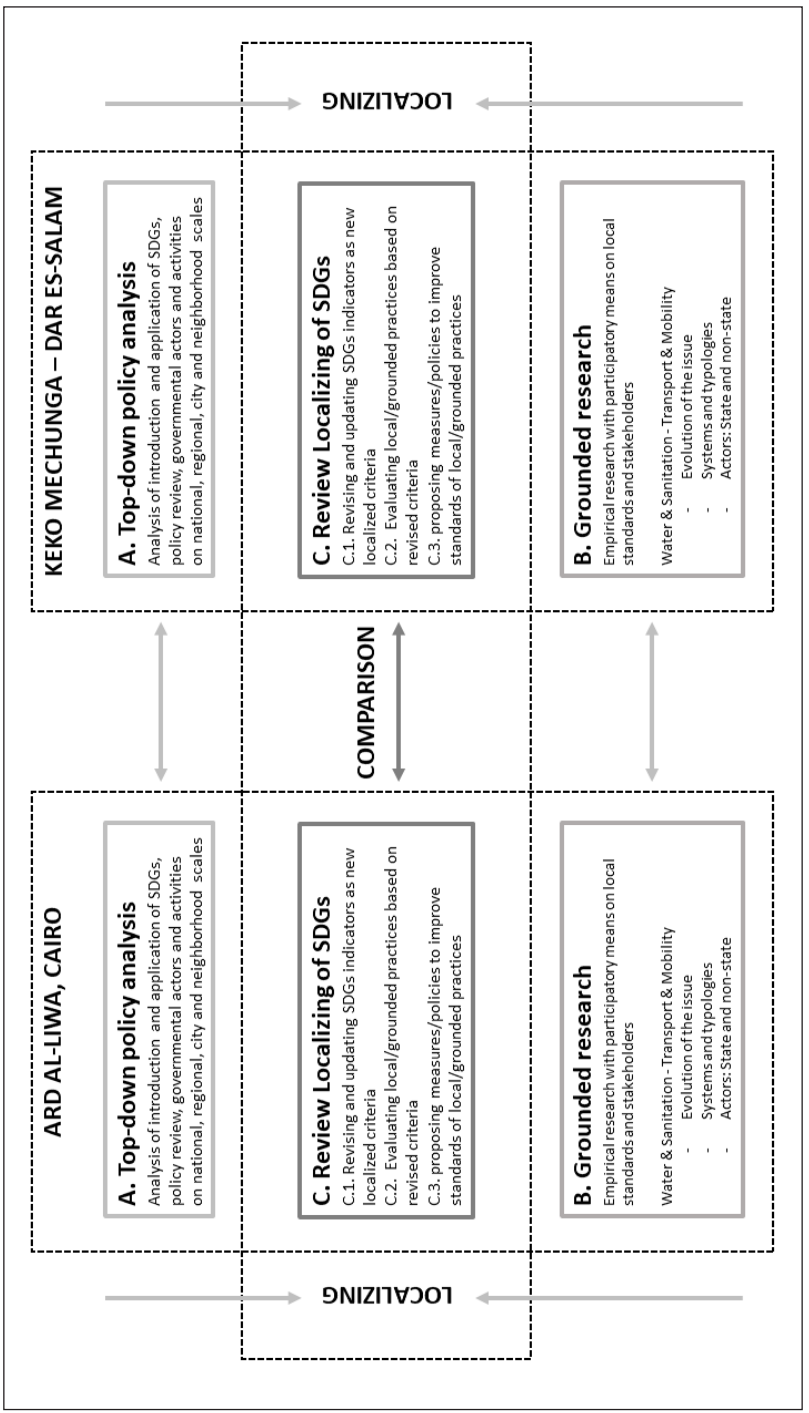

Figure 1: Overall Methodological Framework

Table1: SDGS 6 and 11, and their relevant targets and measuring indicators

Goal 6: Ensure availability and sustainable management of water and sanitation for all	**Target 6.1:** By 2030, achieve universal and equitable access to safe and affordable drinking water for all	**Indicator 6.2.1**: Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water
	Target 6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	**Indicator 6.2.1:** Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water
	Target 6.b: Support and strengthen the participation of local communities in improving water and sanitation management	**Indicator 6.b.1:** Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management
Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable	**Target 11.2:** By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons	**Indicator 11.2.1:** Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities

Source: UN General Assembly, 2015, *Transforming our world: the 2030 Agenda for Sustainable Development*: Sustainable Development Knowledge Platform

Available online at https://sustainabledevelopment. un.org/post2015/transformingourworld

The principal strategy of this research proposal hinges on countering the universal top-down development norms in the SDG by engaging in ethnographic research, exploring performance-based standards and proposing local codes and, thus, alternative and more responsive modes of development. The presented study design involves looking at two variables in these sites: access to water infrastructure and sanitation services, and access to mobility, such as efficient modes of transportation. These two variables are good measures of development through which we can address questions of urban inequality, since they affect the standard of living and experience of urban dwellers. Aspects of gender, age and class cross through our research, as these factors influence everyday urban experience. Whereas quality, price and distribution are key variables to evaluate access to water through boreholes, wells and tanks, street networks and modes of transportation are measured in terms of time, fares and level of comfort and safety.

Between November 2019 and March 2020, the research teams conducted extensive field research in Ard al-Liwa and Keko Machungwa, including a joint workshop in Dar es Salaam (February 2020), and another which was planned in Cairo in March but was cancelled due to Covid-19 travel restrictions. In both cities, the methods included in the field research ranged from direct participant observation and critical mapping to semi-structured interviews with municipal authorities, members of Parliament (MPs) and local community leaders, as well as a cross-section of neighbourhood residents, factoring in gender, age group and physical ability. This empirical data-gathering was conducted while continuing the literature review, which included previous academic studies, technical reports and census data and offered reference points against which the field research was evaluated.

The research design consists of three main components: 1) developing a policy analysis at national and city levels, 2) engaging in field research of local practices at a neighbourhood level, and 3) revising the SDGs' relevant indicators. The last includes developing measurable criteria for the assessment and improvement of local practices, ultimately presenting and testing the proposed revised criteria and new indicators through a 'Toolkit for Localising SDGs'.

Formal Policy Analysis

This stage entailed a comprehensive review and analysis of the existing framework for SDG implementation in each country. The data analysis entailed reviewing policy papers, planning strategies, ministerial papers and budgets in relation to the SDGs, including annual national SDG reports,

research papers and reports published by international organisations. Additionally, we assessed concrete governmental initiatives linked to SDG achievement. This included a rigorous analysis of Tanzania's and Egypt's approaches towards achieving SDG targets 6.1, 6.2 and 6.b, and SDG target 11.2.

Through the top-down analysis of various national documents in both countries, we identified gaps in the ways that SDGs 6 and 11 are being formulated and implemented. In both countries, substantive institutional initiatives have been undertaken at a national level, through the establishment of new state bodies to measure and monitor SDG indicators and the allocation of that responsibility to existing ministries. However, ambitions for SDG achievement are well integrated in development strategies backed by 'political will' across the Tanzanian government, while in Egypt SDG rhetoric seems to have been appropriated under economic investment agendas rather than local development. Secondly, both countries have anomalies in the representation of baseline data. This is evident in the large discrepancy between sources and interpretation in the Egyptian case, and in the lack of accuracy of some of the baseline data in the Tanzanian case. A third point of comparison is the absence of critical localising. This is most apparent in the ways the SDGs feature in the policies and urban visions of both countries, and in their wording, with no clear indication of how they are tailored to their respective context. Lastly, we highlight the difference in the urban governance systems of Egypt and Tanzania. In the former, a highly centralised state, the SDGs mostly feature at national, strategic levels in abstract terms, while the goals and targets of SDGs are more pronounced at a city level in Dar es Salaam, in transportation policies and health concerns around water and sanitation.

Bottom-up/Grounded Research and Fieldwork

Grounded research was based on fieldwork, which took the form of stakeholder interviews, site visits and analysis and review of policy papers and information at municipal and district level, including maps and legal information to assess property and land ownership, infrastructural networks and providers, and information on public services. The grounded research gives a detailed picture of life in the study areas, including the services, infrastructure and stakeholders.

The neighbourhood profiles for Ard al-Liwa and Keko Machungwa include an introduction to their demographics and geographical parameters, historical evolution and growth, distinct spatial features (such as infrastructural specificities, architectural styles and boundaries),

economic activities and public services. The grounded research revealed some core challenges relating to utility provision, housing conditions and local governance. Images, mapping exercises and illustrative diagrams were part of the outputs from this stage.

Secondly, we explored the historical evolution of the provision and management of services to better understand the factors that underlie the current state of infrastructure provision in the case studies. Referring to the comparative study on water and sanitation, some attributes included the introduction of and changes to fresh and sewerage water networks.

Lastly, compiling a typology of services and assessing them comparatively helped us to identify the infrastructure and services provided in the two cities, across technical, economic, legal and social axes. For instance, focusing on transport and mobility, researchers mapped out the diverse street hierarchies, their functions and relationships, and the transportation modes that are popularly used. Usage of transportation modes, routes, prices and elements related to safety and comfort were also documented.

Our grounded research in the neighbourhoods in both cities in turn revealed challenges for a parallel comparison between their priorities in SDG targets 6.1, 6.2 and 6.b (water and sanitation) and SDG target 11.2 (transport and mobility). Considering SDG 6, the differences between both case studies emphasised the need for on-the-ground analysis to inform implementation projects according to local priorities, if the indicators set by the SDGs are to be successfully pursued. While SDG target 6.1's indicator seeks to achieve universal and equitable access to safe and affordable drinking water for all, by measuring the percentage of the population with such access, there are stark differences between the reality of water provision in the city and the official census data, as highlighted by the Ard al-Liwa case study. This raises the question of whether informal areas have been included in such data sets, since the national agenda and its current development paradigm is to 'eliminate slums', rather than improve them.

The uneven topography of Keko Machungwa and its consequences for mobility differs from Ard al-Liwa's more complex road network and transport systems. This highlights implementation priorities, and that the SDG localisation process is inevitably subject to the complexities of either situation; the additional layer of local indicators must be negotiated in each context to address these differences. Perhaps more importantly is how this distinction is reflected in the ways in which state and non-state actors are involved in the operation, regulation and management of each system or network.

The interplay between systems of water/sanitation and transportation/mobility, on the one hand, and state versus non-state actors, on the other, may offer a framework to rethink the localisation of SDGs beyond a mere top-down implementation of a priori defined principles and goals into a more dynamic (dialectic) engagement between structure and agency. These indicate the importance of the final stage of the research, where local and informal practices are taken as starting points for localising the SDG framework through performance-based standards and revised criteria. The following methods and tools were used in the process.

Data Collection/Mapping

In the absence of adequate, accurate and accessible official data on the neighbourhoods, alternative data collection methods were devised, combining available literature and reports with on-site mapping and observation. As the data analysis section below illustrates, both stages of the research – formal policy analysis and grounded research – were conducted in parallel as a feedback loop, rather than in a linear fashion. This created a dialectical process whereby we would continuously detect incongruences between national discourse and policy on one side and realities on the ground on the other, and thus we were able to test and refine our propositions incrementally.

Official Documents

The starting point was searching for census data on the neighbourhoods as well as official plans or reports developed by the relevant authorities on various levels of governance. In Ard al-Liwa, this included reports by the General Organisation for Physical Planning (GOPP), and detailed plans on water and sanitation, and transportation and mobility, at Giza governorate and district authorities. Unpublished reports and presentations by the National Population Council were also reviewed (CAPMAS 2017; GOPP 2012; Hassan 2019). In addition to official documents, the research team was able to retrieve some academic research dissertations and previous studies commissioned by independent research and development organisations, such as AURI and ETH.

Maps

One of the key challenges facing the research in the informal neighbourhoods was the absence of accurate and updated maps for the area as a whole, and more importantly for the specific themes being studied. To overcome

this, the research team created the maps in three ways. The first was using cadastral maps of the agricultural tracts dating back forty years, where the urban morphology of the neighbourhood could still be traced, and updating them using the Google Maps archive. This strategy provided base maps with an acceptable overall level of accuracy on which they could map out the relevant infrastructure systems. Secondly, they used maps that had been developed by previous studies and reports, as outlined above. Thirdly, they were supplied with largely empirical maps by community members, who provided sketches and fragments of implementation maps by the water authorities at a street level. The researchers pieced together these fragments to create a more comprehensive plan of the extended network (Fig. 2).

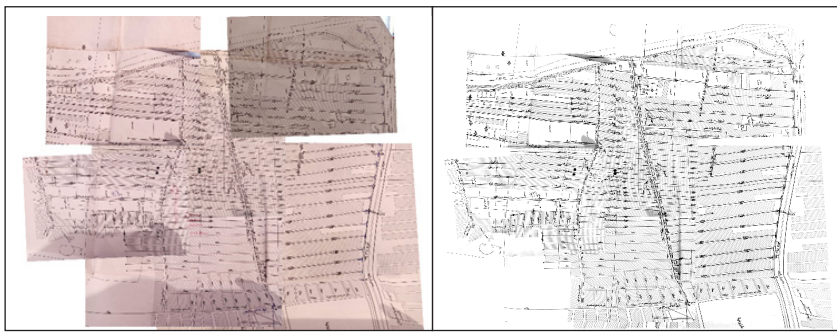

Figure 2: Collaged community map and its tracing of the water network in Ard al-Liwa

Transportation journeys

Mobility was measured by observations during field visits. The data was largely dependent on a participants' survey and could be summed up by two main strategies: The first was mapping the routes, transportation hubs and access points, and using sample surveys of volume and type of people using this transportation (by age, gender, physical ability, etc.), noting the cost of the trip, consumption of fuel, traffic rules, and safety and security, among other variables. The second observation strategy could be construed as 'auto-ethnography', whereby the research team used various modes of transportation to personally experience affordability, safety and gender issues, among others. Transportation journeys were mapped during morning and peak hours and evening periods, and representative samples were engaged with using semi-structured interviews, as the section below elaborates.

Interviews and meetings with stakeholders: institutional and community-based

In addition to mapping and participant observation, the main empirical research tool was interviews with key actors in the neighbourhood, both institutional and community-based. In Ard al-Liwa, for example, an interview with the Head of Ard al-Liwa Sector, Ahmad al-Jindi, in Agouza District, raised a number of questions concerning water provision in the neighbourhood. He offered the official perspective on the nature of the problem as well as current and future plans to address them, referring specifically to certain zones and sections, yet without providing official documents or maps. Similar interviews were conducted with representatives of Keko Manchungwa municipal office during the joint workshop, who gave an overall picture of the size and labour profile of the neighbourhood as well as general characteristics of the water and sanitation system. The limited data accessible to the public was complemented by direct conversations with a selected number of heads of households in both neighbourhoods, through semi-structured interviews, to gauge their views on water and sanitation questions in detail, using specific examples, photo documentation and sketches (Fig. 3). Interviews to address questions of transportation and mobility, in contrast, were conducted with larger groups of residents at transportation hubs and through participant observation during journeys taken by the researchers.

Figure 3: Research teams conducting field research in Ard al-Liwa and Keko Machungwa respectively, Feb 2020

Comparative Data Analysis

The data compiled through field visits and previous reports was subjected to a range of analytical tools, as discussed below. It should be noted that this analytical stage proceeded parallel to data collection and often informed and reshaped the data-gathering tools that were used. This enabled us to incrementally identify data gaps in the two sectors and to search for alternative sources of data accordingly. This method also helped us establish, very early into our investigation, a continuous conversation between the findings from Cairo and those from Dar es Salaam, thus enriching our comparison.

Comparative workshops

The joint workshop was a prime methodological tool organised by both teams. Each workshop was structured to include: a) a preliminary session to review progress and discuss the overall research framework; b) the introduction of the guest team to the neighbourhood, and a number of joint field trips over the course of a few days (Fig. 4), and c) focus group discussions to develop analytical and comparative frameworks. The outcome of the workshop was summarised in a report, including field data, analytical framework and an action plan for future steps (Nagati et al. 2016, 2021 (forthcoming); Angelil and Malterre-Barthes 2016).

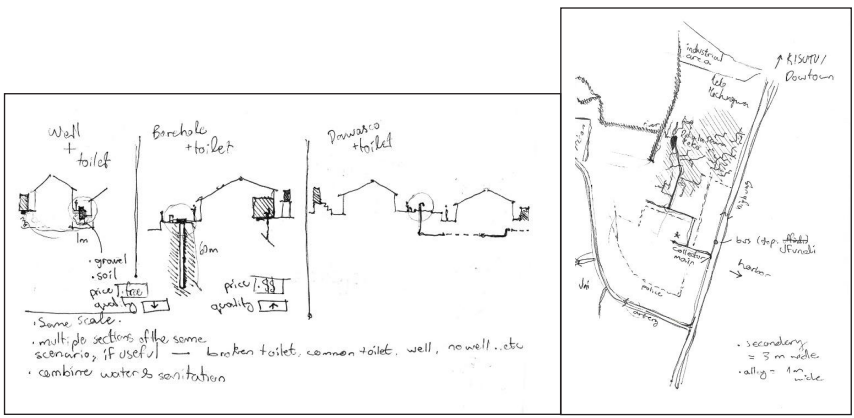

Figure 4: Example of onsite mapping of a water well in Keko Mechnugna during first joint workshop, Feb 2020

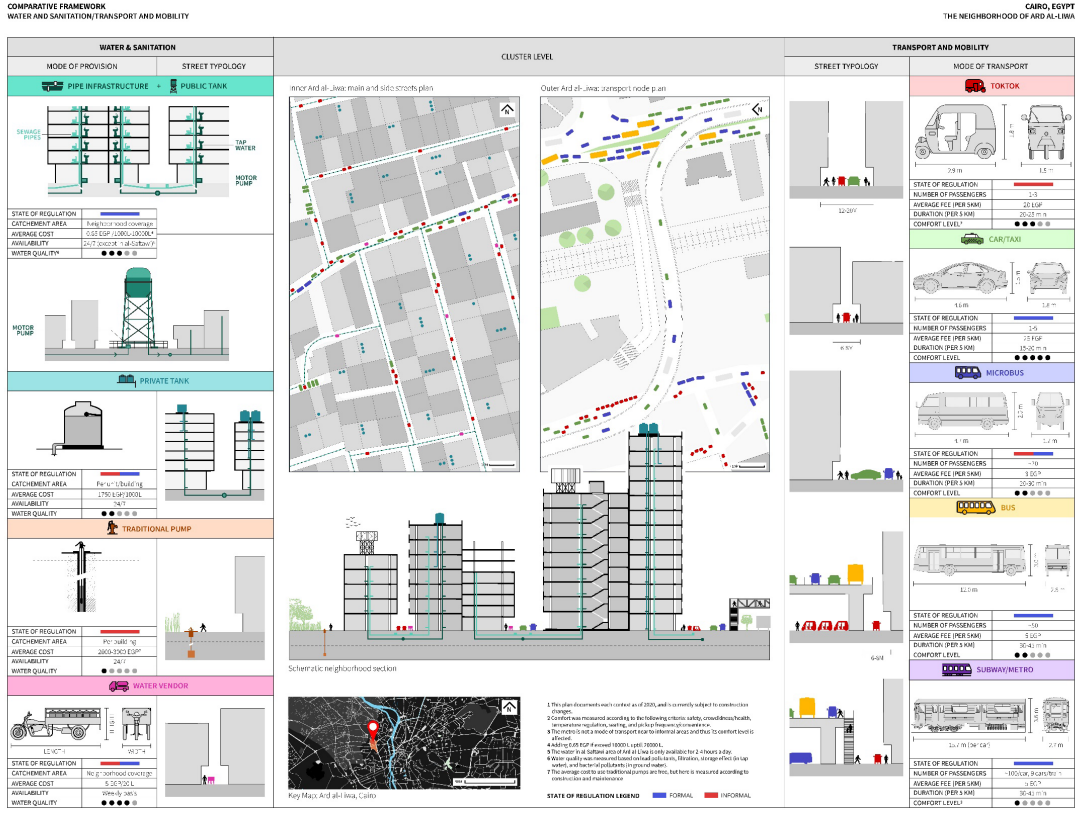

Figure 5: Matrix of comparison between visualized variables in Ard al-Liwa

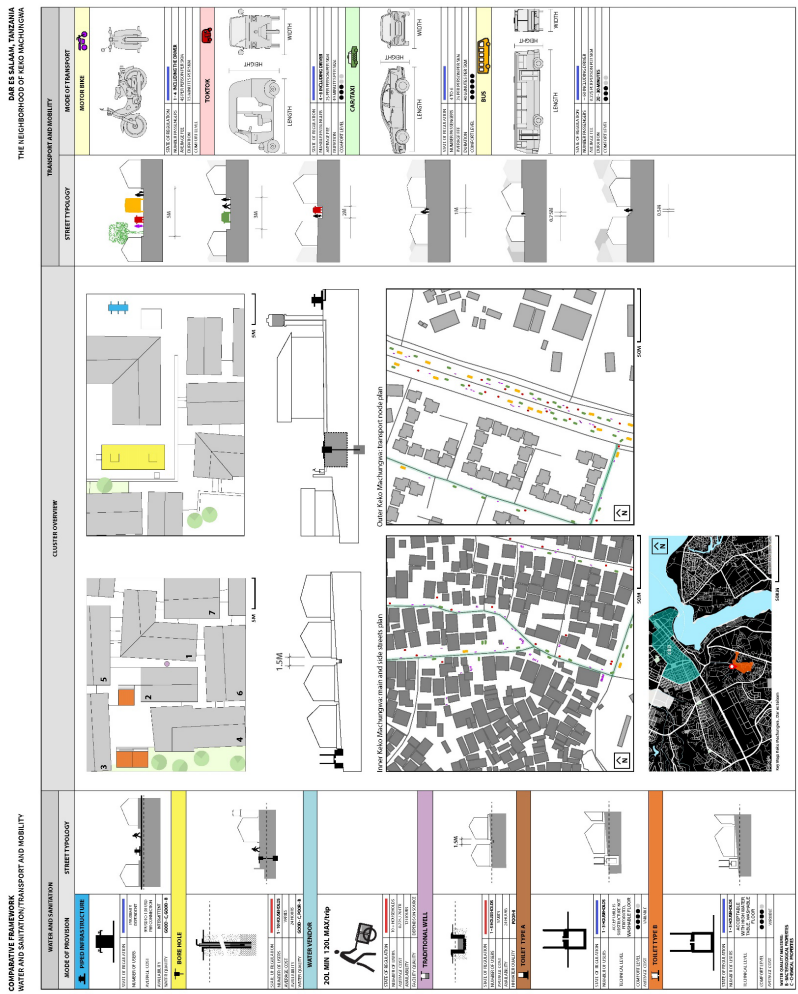

Figure 6: Matrix of comparison between visualized variables in both Keko Machungwa

Analytical tables with comparable variables

Data collected through interviews, sketches and maps was rigorously processed by breaking it down into variables along the two themes of study. Transport and mobility, for example, was analysed through both the hierarchy of street networks, including access points, transportation hubs, gasoline stations and so forth, as well as the various modes of transportation, such as tuktuks/bajaj, motorcycles, microbuses and public transit. Trips using each mode were then analysed in terms of duration, cost and comfort/convenience (including safety and accessibility). Similar variables were devised for the water and sanitation systems (water wells, boreholes, water tanks, reservoirs, eco toilets and so forth). Breaking down larger themes into elementary variables served two purposes: 1) more consistent comparative frameworks, and 2) better evaluation criteria. Figures 5 and 6 offer a glimpse of some of these variables and illustrates their potential for the two purposes.

Visualisation strategy and tools

Visualisation tools are not a mere representation of the data collected and analysed. They were used here to strategically abstract the analytical variables, and thus help formulate a more communicable comparative framework, and highlight similarities and differences through basic visualised elements. Another purpose of visualisation is conceptual, to help spatialise social and urban practices, and thus ground them into specific sites through a set of socio-spatial relations that can then be critically measured. Further, the spatialisation of social practices helps communicate the different scales of the issue being studied, such as the water well at the residential unit scale, the eco toilet at the street scale or the water reservoir at the block or neighbourhood scale.

Revising SDG Indicators: Towards a 'Toolkit for Localising SDGs'

The research findings and consequent proposed measures for the African case studies are detailed in a parallel paper outlining a bottom-up approach towards localising SDGs (Nagati et al. 2020). This section summarises the research findings as a means to validate and substantiate our proposed methodology. The extensive grounded research on and mapping of local practices, and the development of the revised criteria, revealed the possibility of improving SGDs 6.1, 6.2 and 6.b, and SDG 11.2. The research demonstrated that for any SDG indicator to be truly useful it must translate effectively across the multitude of contexts and scales where it is to be adopted. It showed that the existing global indicators fail to do this,

with their implicit bias against informal urbanism limiting the effectiveness of SDG indicators in some cases, and actively causing harmful policies in others. Instead, in response to local priorities in both case studies, and considering the specificity of each context, the outcome of the comparative workshop proposed to replace the existing SDG global indicators with a set of evaluation criteria.

The following step was to extract out of each criterion a set of measurable indicators for each SDG that would enable researchers to assess and potentially quantify, if applicable, local systems and practices. For example, for SDG 11.2 on transport and mobility, the proposed quantifiable measures included the time and cost of trips, the number of accidents, harassment cases, CO_2 emissions, etc. The revised indicators were thus applied to evaluate a sample of local informal practices, identifying gaps between these practices and the normative criteria. For instance, through a quantifiable assessment of the proposed indicators – the number of accidents and amount of CO_2 emission – the tuktuk, a mode of informal transportation, was shown to fail the safety and sustainability criteria. Having identified where the failures are, possible measures and policies could then be proposed to bring informal practices closer to the (revised) normative criteria. In this way, improvement and enhancement can take place by upgrading local systems rather than substituting them with imposed global norms.

Challenges and Limitations

A general lack of data availability, accessibility and accuracy was encountered with varying degrees in Cairo and Dar es Salaam. Acquiring necessary baseline data is a common constraint in other African cities. Furthermore, it is almost impossible to acquire security and permits to work in informal areas. Authorities fear the 'misrepresentation' of these areas, which they consider to be 'slums' and which are generally stigmatised. They therefore often restrict independent and foreign research groups from conducting field research by denying them permits. As a result, both research teams relied heavily on their previous connections and trust established with local communities in their respective neighbourhoods.

Another concern is devising a sensitive field research approach so as not to offend or alienate local inhabitants, who are often suspicious towards state plans and institutional interventions. This limitation could be mitigated by being transparent about the research goals and engaging local community members as partners in, rather than subjects of the research topic, by sharing the stakes they might have in improving sanitation or mobility services.

Lastly, the comparison between two rather different case studies, sites and contexts raised yet another set of challenges. Although both cities are located on the same continent, their histories, sizes and regional contexts vary widely.[3] A comparison between systems of urban governance in relation to localising SDGs was very informative, and so was the definition of informal areas in both countries. However, the grounded research in the two neighbourhoods proved to be more challenging, since their conditions and quality of infrastructure are substantially different. Further, while the water and sanitation issue is more prominent in Keko Machungwa, it appears to be less of a priority in Ard al-Liwa. Conversely, questions of transportation are far more complex and multi-layered in the larger and more consolidated street network of Ard al-Liwa, compared to the predominantly pedestrian settlement of Keko Machungwa. This divergence required a multifaceted comparative framework, using examples that were relevant for each theme, as opposed to one-to-one parallels throughout the research scope. To address the different conditions, the methodology developed a set of elementary variables, for both water/sanitation and transportation/mobility, that could cut across both contexts and were measurable. The second strategy was to use analytical visualisation to compare and contrast the two case studies in one comprehensible framework.

Conclusion

The methodology presented here explores how to understand, develop and evaluate local performance-based standards along comparable sustainability criteria. It seeks to understand, measure, represent and assess the multiple, entangled actions and actors involved in providing services and solutions in a local context. It thus attempts to go beyond the limits of a standardised approach and the 'problematisation' or particularism of a selected context, and accounts for the large multiplicity and diversity of actions involved on the ground. Ultimately, it seeks to put the variety of different services and institutions, whether governmental or private, community-driven or individual, under the same scrutiny of research and comparison, to evaluate their efficiency, find their limitations and blind spots, and thus establish ways to change and improve them. The focus on the target and indicator framework, and its proposed revision, thus becomes critical in addressing the discussed SDG critiques. The targets and indicators attempt to translate universal concepts and ambitions into practical tools that can be implemented and measured in a range of local contexts. The research perceives them as a productive basis for localising efforts to address issues

of data collection, measurability and applicability. But it also highlights the need to contextualise and inform the SDG framework with a grounded understanding of cities in the global South and in particular of the predominant and complex reality of informal urbanism.

Since the SDG framework operates in the first instance at a global universal level, yet also seeks to address and affect local change, a cohesive understanding of the framework and possibilities for its improvement and localisation is possible only while looking at it from both perspectives. The principal strategy of this research has thus hinged on the dual top-down/bottom-up approach, bridging the divide between global concepts and local practice. Crucially, this involved undertaking bottom-up, grounded fieldwork, through which the research shed light on the diversity of existing services in the case study areas, how these services work, their use and the stakeholders involved. This paper has carefully detailed the range of varied and sensitive tools incorporated to capture and synthesise complex realities, going far beyond the diluting abstractions of sweeping statistics. Such embedded research illuminates the multiplicity and diversity of actors on the ground who are essential in the delivery and sustainability of the urban services in question, yet are all too often excluded from the conversations that bring about the universal-scale agendas. As such, bridging the gap between the two perspectives was not merely conceptual, but sought to develop the routes of communication and engagement that are essential for effective SDG measuring, monitoring and intervention at the local level, and which should be institutionalised.

Finally, the comparative approach was essential to allow a deeper understanding of how the current SDG framework translates across contexts and what its limitations are. Analysing and comparing the informal neighbourhoods in Cairo and Dar es Salaam within the larger framework of African cities thus served the dual purpose of avoiding presenting them as exceptions (which could be dismissed) and contrasting them in order to highlight their specificity. The research confirmed a range of critical differences that allowed context-specific considerations to inform the design of the revised local indicators for each context. Furthermore, the SDG agenda inherently aspires towards generating tools for comparability. This makes it essential to consider multiple contexts and to allow the nuances and differences revealed to influence the design of the global aspects of the SDG framework that seek application across different contexts. The product of the comparative analysis, conducted at all research stages, was particularly apparent in the revision and proposal of new global evaluation criteria, which successfully comprise a

framework that is comparable, yet flexible, and avoids embedded biases.[4] The methodology proposed in this paper is thus a valuable tool for localising the SDG framework in the African context. Although it has been applied and tested in the contexts of Cairo and Dar es Salaam, the in-depth presentation of the methodology in this paper seeks to offer and exemplify a tool that may be used in other similar contexts, which could be particularly useful for academic researchers and policy-makers alike.

To conclude, this method paper attempted to address two key questions: how the proposed method might contribute to a process of grounded localising, and the extent to which the methodological framework could be applied to other cities in Africa and the global South. The paper highlights the challenges that face researchers and ways to overcome them, and finally presents a sample of the findings that could be extended to other case studies and lead to the production of policy papers beyond the scope of this research. More globally, the paper attempts to converse with other African researchers who are anxious for the sustainable development of their cities yet equally frustrated by the frequent incompatibilities between Agenda 2030 and our realities. It is an invitation for more scholarly work on the state of sustainable development in African cities and how to mediate between a global prognosis for catastrophe and our locally available tools to resist it.

Notes

1. For more on the findings of our comparative research, revised targets and indicators, and analysis of possible productive pathways to take in Cairo and Dar es Salaam see our paper: Nagati, O., El-Didi, A., Gad, H., Kihila, J., Mbuya, E. and Njavike, E., 2020 [Forthcoming]. 'Towards a Bottom-up Approach for Localising SDGs in African cities', Dakar: CODESRIA.
2. Recognition of inconsistent data: CAPMAS 2017 vs. GOPP 2012. After reviewing various statistics, what is referred to is the latest national census, CAPMAS: the population of Ard al-Liwa was 142,601 in 2017. According to Egypt's General Organisation for Physical Planning (GOPP), the population grew from 101,177 in 2006 to 145,811 in 2012. It is, however, unlikely that since 2012 the population has been decreasing, which confirms our initial assessment that data gathered on the neighbourhood is often contradictory.
3. This divergence of commonality is also viewed as a point of strength to expand the applicability of this method to other cities and contexts across Africa and potentially the global South.
4. C.f. note 1.

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