Africa Development, Volume XLVIII, No. 1, 2023, pp. 79-111

(ISSN: 0850 3907) (https://doi.org/10.57054/ad.v48i1.3033)

Towards a Bottom-up Approach for Localising SDGs in African Cities: Findings from Cairo and Dar es Salaam

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Abstract

This article attempts to apply a localisation methodology previously developed by the authors to analyse the current status of the implementation and monitoring apparatuses for SDGs 6 (water and sanitation) and 11.2 (mobility) in the case study cities – Cairo and Dar es Salaam. It uses comparative, top-down and grounded bottom-up analyses to identify gaps in the existing SDG framework and ultimately proposes a set of evaluation criteria to replace the global indicators with new localised and quantifiable indicators in the two cities. In doing so, it responds to prevalent critiques of SDGs specific to their application in the global South, including difficulties in measuring and monitoring urban conditions, misrepresentation due to the reduction of complex local conditions to abstracted data, and the inadequate capacity of the agenda to consider and assess informal activity. The proposed revisions to targets and indicators for SDG 6.1, 6.2 and 6.b, and SDG 11.2, were later discussed with community organisers and residents to bolster their validity, and represent a stepping stone towards negotiating better sustainable-development paradigms with Egyptian and Tanzanian policy-makers. More generally, these revisions invite further inquiries into other African cities or other geographies

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with a prominent urban informality in order to update the general SDG framework across its seventeen goals and develop locally embedded standards for different kinds of service provision and outcomes.

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

Résumé

Cet article s'ingénie à appliquer une méthodologie de localisation précédemment développée par les auteurs, afin d'analyser l'état actuel des dispositifs de mise en œuvre et de suivi des ODD 6 (eau et assainissement) et 11.2 (mobilité) dans nos villes d'étude, le Caire et Dar es Salaam. Il utilise des analyses comparatives, descendantes et ascendantes pour identifier les lacunes dans le cadre existant des ODD, et, propose un ensemble de critères d'évaluation pour remplacer les indicateurs mondiaux par de nouveaux, localisés et quantifiables dans les deux villes. Ce faisant, il répond aux critiques habituelles faites aux ODD et spécifiques à leur application dans les pays du Sud, avec les difficultés à mesurer et à suivre les conditions urbaines, les fausses représentations dues à la réduction de conditions locales complexes à des données abstraites, et l'inadéquation de l'agenda à examiner et évaluer l'activité informelle. Les révisions proposées des cibles et des indicateurs des ODD 6.1, 6.2 et 6.b, et l'ODD 11.2 ont ensuite été discutées avec les organisateurs communautaires et les résidents pour renforcer leur validité, et représentent un tremplin vers la négociation de meilleurs paradigmes de développement durable avec les décideurs égyptiens et tanzaniens. Plus généralement, ces révisions invitent à d'autres enquêtes sur d'autres villes africaines ou d'autres zones géographiques à fort caractère informel urbain, afin d'actualiser le cadre général des ODD à travers ses dix-sept objectifs, et développer des normes intégrées localement pour différents types de prestation de services et de résultats.

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

Introduction

In June 2019, global, regional and national stakeholders from African governments, multilateral and bilateral institutions, foundations and non-governmental organisations (NGOs), the private sector, academia and civil society met in Kigali to discuss the progress of Agenda 2030 in Africa, and to outline future steps towards Sustainable Development Goal (SDG) achievement for the continent. The final diagnosis of this conference, entitled 'SDGs Implementation in Africa: Reflections on a Three-Year Journey', was alarming. This final report pointed to the multiplicity of 'unfinished

business' for the continent and indicated that African governments were largely oblivious to the efforts needed to reach the SDGs (The Sustainable Development Goals Centre for Africa 2019: 4). It referred most prominently to shortages in funding, in the requisite political will and devolution of governance and, finally, in reliable data across different social, economic and demographic variables, with only 96 out of 231 SDG indicators currently having data in African countries (Ibid: 8).

Albeit already known to most researchers and policy-makers across Africa, the report's reification of such challenges re-emphasised the need for more efficient methods of adapting the SDGs to local realities, improved local data and clearer frameworks for holding governments accountable. These relative shortcomings in Africa also remind us that, as 'discursive formations of power/knowledge […] aiming to shape lives and conducts' (Malonza and Ortega 2020: 5), the SDGs risk embodying one more example of developmentalism whereby the North, by virtue of its rank within power/knowledge hegemonies, dictates development models to countries in the global South. And while the SDGs offer a substantial improvement compared to their predecessor, which had been formulated entirely without the participation of the global South, they are still not disconnected from Eurocentric understandings of 'development' manifest in imposed worldviews surrounding informality. This echoes the importance of better SDG localisation strategies and the general urgency for locally developed (or at least locally honed) models for sustainable development that correct misrepresentations or the oversimplification of the complex realities of the global South.

While the SDGs seek to provide a comprehensive system for defining and measuring progress towards achieving the goals at global and national scales, their applicability and relevance in Southern contexts have been deemed lacking (Valencia et al. 2019). This is especially so given the prevalence and specificity of informal urbanism in the global South, and, conversely, the over-reliance on state actors and formal policy interventions within the SDG planning and monitoring processes, and the generally negative view of informality that underpins much of the framework's language. Reinforcing the 'city without slums' development paradigms and national programmes (see, for example, Ministry of Planning, Monitoring and Administrative Reform 2016: 34), many SDG benchmarks are simplified to the extent of the very absence of informal urban developments or activities, or rely on formal data sources that exclude informal activity. This, it is argued here, ignores the inevitability of informality as a mainstream urbanisation process, in the context of neoliberalising cities in the global South and the ensuing retreat of state-sponsored service provision.

Thus, this research project rests on the conviction that working with informality is not an option but the only modus operandi for researchers and policy-makers alike for the next generation (Nagati 2016: 257–8). The overarching issue that the localising methodology presented here attempts to address can be construed as the interplay between universalism and particularism. Using a comparative approach with Cairo and Dar es Salaam as our case studies, the research herein attempted to develop an SDG localisation methodology that accounts for the myriad of informal or quasi-formal practices characteristic of African cities, yet retains the ambition to achieve the general goals as laid out by the original SDG targets. The case studies explore questions of evolution, land ownership, availability of services, proximity to the city centre, and the role of state and non-state actors, further complicating the single definition of informality in African cities and the global South and offering a more nuanced and dynamic framework of urban practices on an analytical and a normative level.

A three-legged approach, proposed as a general methodological framework, offers an opportunity to mediate the universal principles of the SDGs in question, with specific practices at a local level, through a set of revised and grounded criteria that both fairly assess and identify potential improvements to local practices (Fig. 1). This is done by, firstly, a policy analysis stage, investigating the ways in which governments translate the SDGs into policies and programmes, exposing the gaps between the various levels of urban governance and highlighting the differences between highly centralised states (as in the case of Egypt) and more empowered local authorities (as in Tanzania). Secondly, a grounded research stage, whereby the local practices with respect to water/sanitation and transportation/mobility are described and translated to the informal neighbourhood level. The way in which these two themes evolved as systems, or networks, and the role of state and non-state actors in creating, advancing or limiting the capacity of such infrastructure systems, is comparatively analysed. Finally, we suggest a framework for mediating the relevant SDG indicators, developing a toolkit to evaluate and potentially improve performance-based criteria on local practices.

The research has two principal outcomes: the development of a localising methodology, and the generation of research findings through the application of this methodology to our case studies. While the paper will present the latter, detailing the research findings and comparatively and critically analysing them, it will first briefly outline the methodology developed before presenting the research findings across three sections. Taking the North African megapolis Cairo and the East African port-city

Dar es Salaam as case studies, the first of these sections will comparatively assess the application of the SDG framework from a formal policy perspective. The second section will present the bottom-up grounded fieldwork in informal neighbourhoods in each city, comparatively unpacking the nuances, differences and complexities across each site, with a specific focus on sanitation and mobility. The third section presents the results of a comparative workshop where researchers from each city came together to synthesise the findings. This resulted in the development and testing of an alternative approach to measuring local standards and practices along sustainable development criteria, thus proposing revisions to the SDG targets and corresponding indicators related to achieving universal and equitable access to safe and affordable drinking water and adequate and equitable sanitation and hygiene for all, through the participation of local communities (SDG 6.1, 6.2 and 6.b), and access to safe, affordable, accessible and sustainable transport systems for all (SDG 11.2), in accordance with our findings.

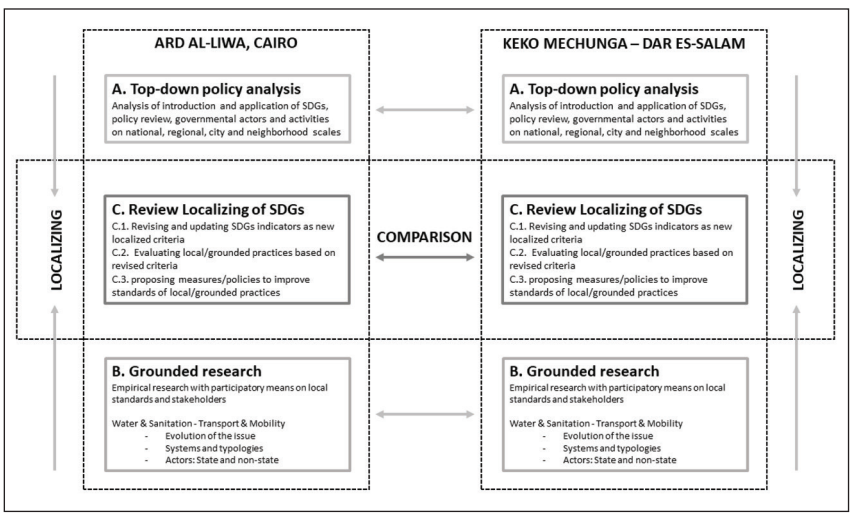

Figure 1: Overall methodological framework

Policy Analysis

National Scale

Egypt and Tanzania are signatories of Agenda 2030 and are expected to take ownership of and establish national frameworks for the achievement of the seventeen SDGs (UN 2018). Despite the submission of a Voluntary National Review (VNR) to the UN High-Level Political Forum (HLPF) on Sustainable Development by the Egyptian government in 2016, only 41

per cent of baseline data was available for the SDG indicators (Ministry of International Cooperation 2016: 20). This mirrors the pronounced data gap present in many African countries and the global South at large (Woolfrey 2020; The Sustainable Development Goals Centre for Africa 2019). There are particular discrepancies in the data used to track and report on the progress and conditions of water and sanitation in Egypt. For instance, a joint publication by WHO and UNICEF, in 2017, shows that Egypt has 100 per cent water coverage (UN-Water 2016), whereas we noted a different level of household coverage of nationwide access to both drinking water and sanitation. Key Performance Indicators (KPIs), on the other hand, report that more than 90 per cent of households in Egypt have access to clean water and 50 per cent have access to sanitation, which presents a roadmap for improvement (Ministry of Planning, Monitoring and Administrative Reform 2016). A clear difference between the WHO/UNICEF figures and those of Vision 2030, Egypt's key policy roadmap, is therefore apparent (Ministry of Planning, Monitoring and Administrative Reform 2016: 25). Furthermore, while Vision 2030 is structured along the three dimensions of sustainable development (economic, social and environmental), it exhibits a clear focus on the economic dimension. This is illustrated by plans for the construction of several new cities and industrial areas, and new desert land reclamation schemes, with the aim of attracting national and international investment and accommodating a growing population and workforce.[1]

In Tanzania, progress monitoring shows that as of 2019 the country had not yet adequately progressed towards achieving the SDGs (Office of Auditor General 2018). Issues affecting implementation included poor identification of the required resources and capacities, and insufficiencies in establishing mechanisms for monitoring and reporting on SDG implementation performance (ibid). Despite the objective of co-ordinating and directing people's efforts, minds and the country's national resources, Tanzania's Vision 2025 is unlikely to be attained (Planning Commission 1999). Generally, a gap exists between the way in which the SDGs have been framed when it comes to sanitation and mobility, and the actual plans and programmes in place to address the challenges of slum dwellers. In parallel to Tanzania's Vision 2025, the Second Five Year Development Plan (FYDP II), 2016/17 to 2020/21, seeks to improve efficiency in implementation through organising and rationalising national resources under one framework and addressing critical challenges (Ministry of Finance and Planning of Tanzania 2016). One of the objectives of the FYDP II is to ensure that global and regional agreements (such as Africa Agenda 2063 and SDGs) are adequately mainstreamed into national development planning and implementation

frameworks for the benefit of the country. The responsible organ for domesticating (training at local level) the SDGs is the Ministry of Finance and Planning (MoFP). It does this by: incorporating the SDGs into national plans; mobilising resources for their implementation; mainstreaming the SDG indicators; collecting data for monitoring SDG implementation at the national level; and reporting on implementation progress to the UN High-level Political Forum on Sustainable Development (HLPF). However, while the need to localise the SDGs is recognised, the strategies adopted remain too aggregate and do not account for the specific conditions and issues faced by different urban or rural contexts in Tanzania.

Provincial/City Scale

Concerning the monitoring and reporting on the implementation of SDG targets 6.1, 6.2, 6.b and SDG 11.2 and their respective indicators at provincial level in Egypt, the country lacks comparable data sets, as highlighted by the Central Agency for Public Mobilisation and Statistics (CAPMAS) in the 2016 VNR. This report attributed the main challenges to the data gap and the availability of updated data, as well as the need for capacity-building in institutions and of individuals involved in the data collection process (Ministry of International Cooperation 2016: 20).

In addition, with reference to SDG 11, the VNR took a number of measures to account for urban development and to formulate adequate programmes and projects for reaching universal norms. This led to the development of the National Urban Policy (NUP) to guide urban development for the next 30 to 50 years (UN 2016). This NUP outlines plans for the implementation of SDG 11-related targets through the use of one governorate (Qena) as a pilot case by the General Organisation for Physical Planning (GOPP), the establishment of a National Observatory, the renewal of the concept of New Towns, and the upgrading of slum areas and informal settlements (UN 2016: 31–32). The two last strategic plans represent the core of the national urban development strategy of Egypt's Vision 2030.

The Key Performance Indicators (KPIs) of Vision 2030 with regard to urban improvements rest on two, interlinked major concerns. One is the elimination of informal (and insecure) areas, and the second is the expansion of new urban communities. New urban communities are satellite cities, towns or entire cities constructed either by private large-scale real estate developers or through state-led initiatives. Vision 2030 further extends this urban planning model ideal. The KPIs focus on building up new urban communities, many of them in the Greater Cairo region, and settling urban

dwellers in these new areas. This goes hand in hand with the elimination of 'slums', as well as the eviction of people from areas that are declared 'unsafe'.

Within the larger scope of urban development, one KPI addresses mass transit, which aims to double the public transportation ridership by 2030 through increasing the capacity and quality of existing transit systems. However, there are no indications that current Egyptian urban policy will allow for these goals to be met. Of EGP 26 billion planned to be allocated to the transport sector in the state's national Fiscal Year (FY) 2016/2017 budget, only 5.5 billion, or 21 per cent, went to public transport (Shawkat 2017). Although this represents an EGP 1.5 billion increase from the FY2015/2016 budget, it remains insufficient relative to demand. Moreover, expenditure on the underground metro in Greater Cairo accounted for 91.8 per cent of the public transport budget, where 81 per cent of that was in Cairo governorate, while spending on public buses through the Cairo Transport Authority and the Alexandria Public Transport Authority accounted for only 8.2 per cent of the Public Transport budget. This calls attention to the focus on one form of transportation present in formal areas only, the neglect of a deteriorating public bus system (which is often the transit mode nearest to informal areas), and the lack of recognition of informal modes of transportation.

In Tanzania, the 'Dar es Salaam Master Plan' seeks to address water provision and sanitation and their particular issues at the provincial level (Ministry of Land, Housing and Human Settlement Development 2018: 86). The plan states that the city has severe shortfalls in its sanitation systems and hence there is a need to undertake community-level programmes to raise public awareness of improved sanitation practices. A key risk associated with the sanitation and sewerage system is the contamination of water, leading to poor water quality and threats to public health (Mkanga and Ndezi 2014). In informal areas in general, sanitation issues are closely linked with poor health, worsened by a relatively high water table, poor surface drainage and highly inadequate toilet and wastewater facilities. Particularly in the area of sanitation, critical interventions are needed if citizens are to be appropriately served and serviced, as per the aim of SDG target 6.2 on sanitation. As for mobility, the 'Dar es Salaam Transport Policy and System Development Master Plan' of 2008 provides a classification of community roads as access roads within communities and residential areas, linking to feeder roads (JICA 2008). This clause of the policy is expected to positively contribute to improved mobility within the city of Dar es Salaam and the informal areas, by ensuring local circulation and property access.

Comparisons and Conclusions

Firstly, considering how SDGs are incorporated by both governments in their respective development agendas, there is a differentiation between institutional responses and political rhetoric. In both countries, it can be said that there has been a substantive institutional initiative at national level, where new state bodies were established to measure and monitor indicators or that responsibility was allotted to existing ministries. However, ambitions rooted in SDG achievement seem well integrated in rhetoric, 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. In practice, the clarity of indicators in representing an accurate picture of on-the-ground conditions is crucial to prevent the co-option of data and to facilitate the applicability of SDGs within local communities. It is also an imperative step in facilitating the shift from 'measuring' to useful intervention.

Secondly, both countries are facing a data gap in terms of the representation of baseline data, in addition to a lack of recent data sets at provincial and district scale. This is pronounced in the large discrepancy present in SDG 6 sources and interpretations in the Egyptian case, and the accuracy of some of the base data in the Tanzanian case. It can be concluded that indicators need to be flexible and responsive to on-the-ground limitations if they are to be useful and translatable into easily monitored data.

A third point of comparison revolves around the absence of critical localising. This is mostly apparent in the ways in which SDGs are pronounced in governmental policies and the urban visions of both countries, and in their wording, with no clear indication of how they are tailored to their respective context. For example, in Egypt there is no contextual critical interpretation of goals undertaken as part of existing localising practices, equating good housing to the very absence of 'slums', while new indicators added locally reinforce the biases in 'universal' SDGs.

Lastly, the difference in urban governance systems of Egypt and Tanzania is reflected in the prominent appearance of SDGs at national and strategic levels in rather abstract terms in the former, highly centralised state, while the translation of the goals and targets of SDGs at a city level in Dar es Salaam, in both transportation policies and health concerns around water and sanitation, is more pronounced. There is thus a need to develop alternative tools to integrate local priorities into SDG targets, including participatory modes of data collection and frameworks for the co-production of knowledge.

Grounded Research

The overall methodological framework of this research seeks to understand, develop and evaluate local performance-based standards along comparable sustainability criteria beyond the limits of a standardised approach. It proposes to combine the analysis of formal policy, government actions and plans, in the context of the SDGs, with a bottom-up assessment of local practices and performance-based standards. To achieve this, field research was conducted between November 2019 and March 2020 through a series of visits, community workshops (involving three to ten community actors with a range of positions, from municipal representatives to participating residents), participant observation and mapping, semi-structured interviews and meetings (Fig. 2). Secondary data was used to substantiate and fill in missing information. In addition, maps and visual documentation by community-advocacy social-media platforms were employed.[2] Lastly, the SDG framework was refined through the development of a 'Toolkit for Localising SDGs'. A second round of community engagement was conducted towards the end of the project through feedback workshops to assess some of the research findings and proposed measures.

Figure 2: Visit in Ard al-Liwa

Table 1: SDGS 6 And 11, 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 6.1.1:** Pro-portion of population using safely managed drinking water services
	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:** Pro-portion of population using (a) safely man- aged 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

Figure 3: Field Visit in Keko Machungwa

Engaging at the Neighbourhood Level

Within the broader context of each country's national policy and institutional response to the SDG agenda, local practices were analysed and compared at the neighbourhood level in both cities: Ard al-Liwa in Cairo and Keko Machungwa (Fig. 3) in Dar es Salaam. The choice of these two sites was based on their history, size and location vis-à-vis their respective cities, including their representations of broader informal areas. Further, practical considerations, such as proximity and strong connections with local community organisations, were also taken into account by the two leading research teams in Cairo and Dar es Salaam. The main themes of the two goals under analysis (access to water and sanitation in targets 6.1, 6.2 and 6.b in SDG 6, and transportation and mobility in target 11.2 under the umbrella of bettering cities in SDG 11 – as shown in Table 1) are examined through three analytical lenses: historic evolution, systems and actors. Each lens addresses local practices for each theme in both neighbourhoods through a comparative framework to explore the gaps between the formal policy measures corresponding to SDGs and local needs and priorities. Also addressed is the extent to which these practices live up to the standards and indicators developed by SDGs, and how to develop an SDG indicator framework that is more sensitive to the local context, yet aspires to international standards.

Water and Sanitation

Water and sanitation provision in Ard al-Liwa differs from that of Keko Machungwa. While the census data indicates no problems with water access in the former, the reality of the situation on the ground is very different (CAPMAS 2017). Interviews with the local community indicate that the northern part of Ard al-Liwa, which is the most recently built, suffers from a lack of many services, including water. Although most households have the necessary water infrastructure and are linked to the public network, residents keep reporting water shortage issues (for instance, water running for only two hours a day) to the authorities or through social media.[3] By tracking design interventions that seek to upgrade plans and make changes at the local level (Fig. 4), the reasons behind water shortages become clear. In short, the quantity and pressure of water is inadequate and does not match the high population density in the area. According to local authority officials, the area needs a stronger water pump, which requires the necessary supporting infrastructure, this being the first phase in the water upgrading system[4].

The many actors in water systems transcend the main provider and beneficiaries of the service – the government and residents respectively – to include other integrated systems that control either the quantity or the quality of water. Based on the analysis of water system evolution and typologies, institutions and actors are divided into three main categories – government institutions, international donors and community initiatives – which have built up a body of knowledge on their local infrastructure. In some cases, the roles of these actors overlap or complement one another to help achieve community needs in times of shortage in resources. For instance, the French Agency for Development (AFD), in collaboration with governmental institutions, is implementing water projects in Ard al-Liwa to install 14.8 kilometres of sewerage network; lay 34.6 kilometres of water pipe network; pave 138 kilometres of road network, install fire hydrants and support electricity networks and the installation of 100 lighting poles.[5] These interventions, which were led by operative NGOs in the area, were steered by a participatory process that began with questionnaires and interviews with residents and continued by forming a focus group of active community leaders.

In Keko Machungwa, there are three main sources of water: the municipal supply obtained from a pipe network which is available within the area; deep boreholes with submersible pumps; and traditional wells. Through field visits and communication with local residents, it was determined that municipal water is provided primarily through standpipes and a few

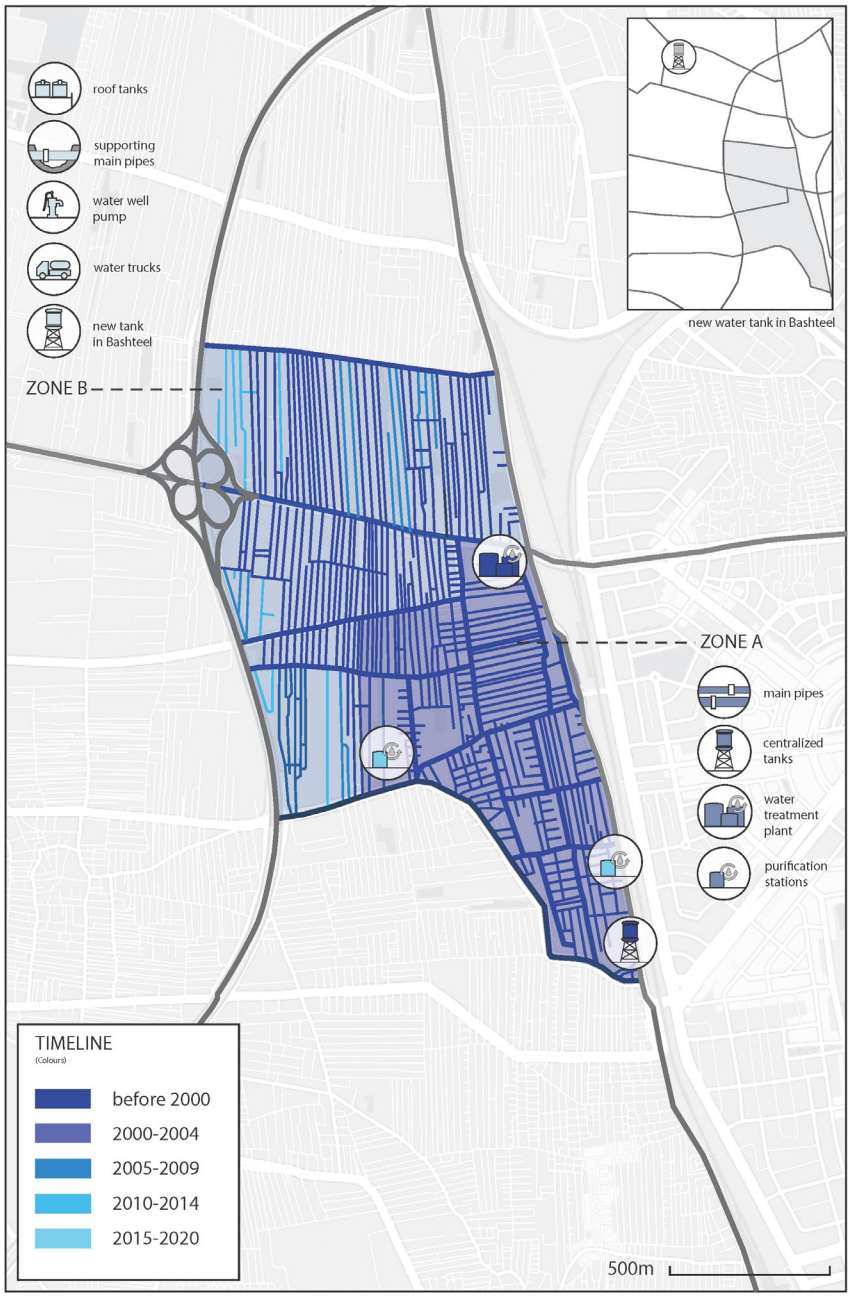

Figure 4: Water and Sanitation Map

house connections, with water from the network mainly used for drinking purposes. Deep boreholes are privately owned and supply water for the neighbourhood at a relatively cheaper price than the municipal supply. Individuals with access to this source of water normally install a submersible pump, which pumps the water to an overhead or ground tank, from which the water is distributed to the consumers. Usually, one borehole serves an average of fifty households.

In some cases, where a neighbourhood is far from a private borehole or a household selling municipal water, water is obtained from vendors who collect and sell it to the needy. Traditional wells are shallow and manually cultivated and collect subsurface water. But even though the wells often appear clean, the water can be polluted and unsafe for drinking purposes. The residents use this freely available water for all purposes other than drinking. The distribution of types of water supply and use is mainly influenced by economic status. The number of households that can afford the municipal supply connection costs and water bills are few. The number of connections is therefore much less than the number of households/plots.

The main type of sanitation in the neighbourhood is on-site sanitation, as the settlement has no sewerage network. The majority of the residents use pit latrines – improved (with a washable floor, superstructure, roof, pit cover and offering privacy) or unimproved (lacking one of the features of improved latrines). Few modern houses have water closets (pour flush) or toilets connected to septic tanks or pits, and few others use ecological toilets. The distribution of the toilets is mainly influenced by environmental conditions, economic status, level of awareness, external intervention, such as from NGOs, and accessibility. The ecological toilets, for example, are evenly distributed in general terms while supplied by different sources of funding.[6] Traditional pit latrines are mostly found in poor houses and along the drainage river. Poor housing conditions reflect the economic status of the household and their inability to construct an improved toilet because of its relatively high cost. Areas along the river have very high water tables, which means that although it is possible to construct improved toilets in such areas their installation entails more cost than in a different environmental setting.

Transportation and Mobility

An analysis of transport systems and their evolution reveals a number of distinctions between the two neighbourhoods in terms of mobility. Ard al- Liwa's mobility structure follows an organic, semi-geometrical division of land. This is characterised by long, narrow streets. The area is bordered by a railway to the east, 26th of July Road to the north and Ring Road to

the west. These arteries work as separators in drawing the relation between formal and informal areas, which are connected by pedestrian stairs, bridges and vehicular ramps (Fig. 5). Ground-level pedestrian crossings over the railway were closed in 2015, due to frequent train accidents at those points. They were replaced by bridges for vehicles and pedestrian overpasses. The heavy pedestrian traffic attracts commercial and entertainment activities at both ends of the bridges, which also provide access to public transport, such as tuktuk (auto rickshaw, bus and microbus, heading towards multiple destinations across the city.

The formal and the informal intersect at these nodes. The formal is manifest in the bridge infrastructure, whereas the surrounding activities began informally.[7] A number of these activities have become regulated and formalised, such as microbus transport and their stations, operating alongside the informal, such as 'tuktuk' in the two cities, or sometimes 'bajaj' in Dar es Salaam). There are semi-formal markets at these points, which are formal in terms of paying rent to district authorities. However, the limits of expansion for each seller are not clearly defined and are under constant negotiation. From the aspect of measuring official presence, we note fewer or even no traffic stations and officials to organise the movement of vehicles.[8]

The Egyptian government has led a number of projects in the neighbourhood to address issues of mobility. These include, among others, a side street improvement scheme which began in 2014, paving the side streets with interlocking tiles to restore and improve them and protect them from the effects of rain, as well as adding lighting. The actors in this endeavour included the Egyptian Armed Forces in collaboration with the Giza governorate and the Informal Settlements Development Fund (ISDF), as well as a number of local private contractors who were hired in the implementation of the project.

Movement in the Dar es Salaam case study follows different patterns, grounded in the stark contrast between the topographical nature of both areas. Keko Machungwa's proximity to the city of Dar es Salaam makes it possible for the residents to walk to the city centre. The area can also be reached from different parts of the city by public transport, largely in the form of minibuses, called 'daladalas'. While external mobility is therefore not a challenge, movement within the neighbourhood is difficult. There is no sophisticated transportation infrastructure within the area. The roads are unpaved and have drainage channels along them. As a result, the residents have built simple bridges between the houses, and these, as well as existing footpaths, are the main routes of foot traffic.

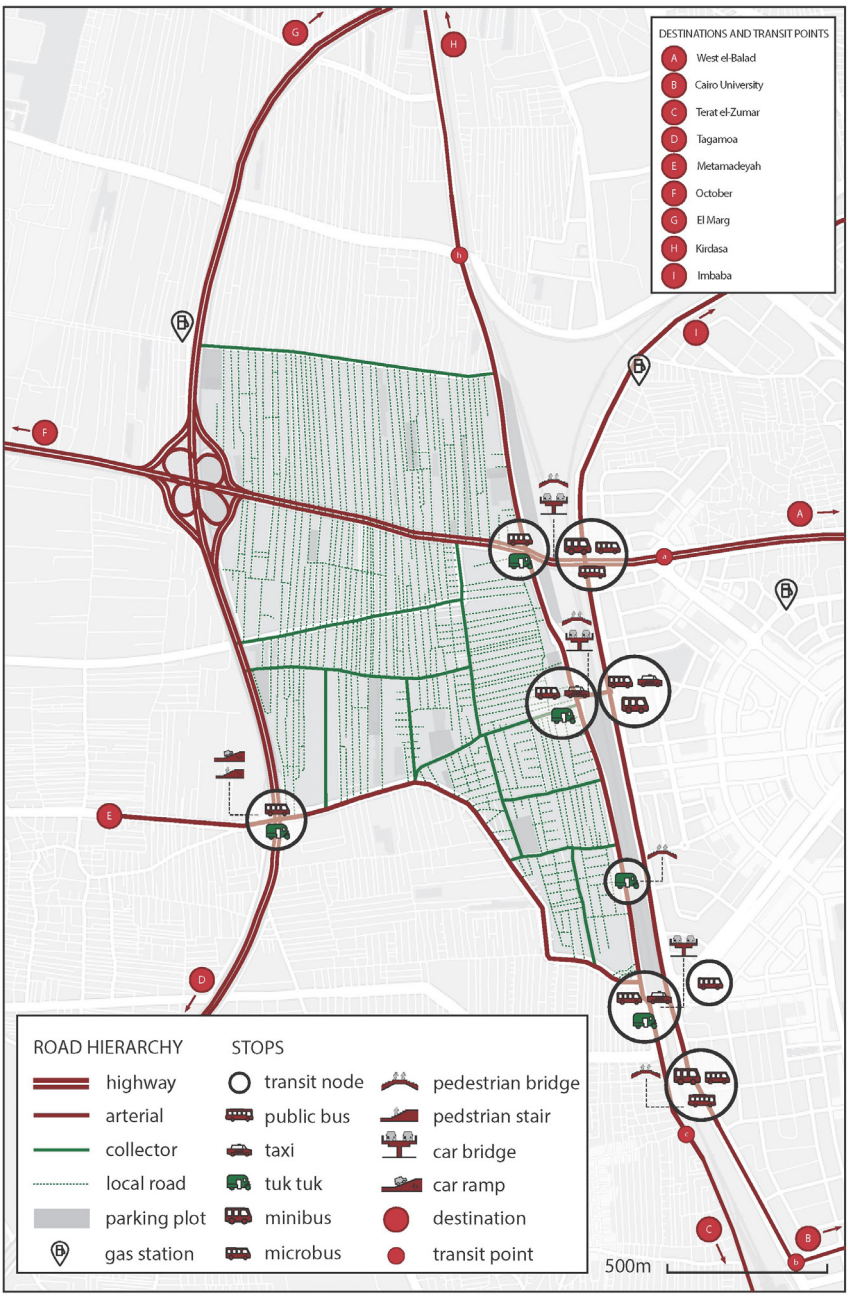

Figure 5: Transit and Road Network Map

Comparisons and Conclusions

While indicators for SDG target 6.1 seek to achieve universal and equitable access to safe and affordable drinking water for all, by measuring the percentage of the population with such access in Cairo, there is a stark difference between the reality of water provision in the city and the image portrayed by the official census data (as highlighted in Ard al-Liwa). This raises the question of whether informal areas are included in such data sets, when the national agenda and its current development paradigm is to 'eliminate slums', rather than improving them. To recognise and improve informal settlements and networks would entail understanding and representing such neighbourhoods as functional; they would also reflect in the census data collected. The lack of strategies to recognise informal areas serves as a critique of SDGs at a larger scale. The disparity between the classification of informal neighbourhoods/slums, the consequences of such classification on the measurement of other SDGs, and whether certain districts are included or excluded from data sets, is a problem that needs to be addressed by the indicators posed.

Secondly, the uneven topographical nature of Keko Machungwa and its effect on mobility differs from Ard al-Liwa's more complex, geometrical road network and transport systems. This raises the issue of implementation priorities, of the SDG localisation process being inevitably subject to the complexities of each situation, and of the local indicators that must be negotiated in each context to address these differences. This distinction is apparent not only in the street and transportation network in each neighbourhood, but, more relevantly, in how state and non-state actors are involved in the operation, regulation and management of each system or network. In Ard al-Liwa, tuktuk licensing, routes and fares are generally unregulated, and thus operate informally for the most part, whereas the microbuses, which link the neighbourhood to the city at large, are usually semi-regulated and licensed. In Keko Machungwa, on the other hand, public transportation and regulated commuter buses (daladalas) are limited to the main street outside the neighbourhood. Tuktuks and motorcycles, both operated by private actors, also extend their services only to the main street surrounding the area. The rest of the neighbourhood is predominantly accessible only to pedestrians. Questions of safety, accessibility and inclusion are thus intricately linked to these spatial and social hierarchies, and should be formulated as such.

Thirdly, 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 localising of SDGs beyond a mere top-down implementation of a priori principles and

goals into a more dynamic (dialectic) engagement between structure and agency. Rather than being based on abstract ideals, such as sustainability and inclusion, such a framework would take the tuktuk driver or the water carrier as a point of departure to assess service delivery and performance. The framework proposed below hinges on local and informal practices as starting points to localise the SDG framework through performance-based standards and revised criteria.

In conclusion, the field analysis of local practices in both neighbourhoods demonstrates the vibrancy and creativity of solutions to fill the gap between individual and community needs, on the one hand, and formal state provision of urban services, on the other. While many of these solutions address this gap, the question of standards and quality of life remains a fundamental challenge, both technically and ethically, facing politicians and researchers alike. Are universal standards, proposed by SDGs or other international norms, applicable to these local contexts? If not, what are the yardsticks to measure and evaluate these practices? Do informal practices and survival measures offer a starting point to develop performance-based standards and codes to mitigate the gap between imposed universalism and romanticised localism? The section below attempts to tackle this dilemma by mediating between top-down policies and bottom-up practices.

Mediating SDGs

A Toolkit for Evaluating and Improving Local Practices

The following toolkit for SDGs involves three steps: localising the global indicators to produce revised criteria; extracting measurable indicators; and testing the revised framework by evaluating local practices and proposing improvement measures. The first two steps contribute to localising the existing SDG framework; i.e. adapting the global and regional/national SDG indicator framework to better suit local application. The final step, with its two sub-components, then serves the purpose of validating and piloting the revised SDG indicator framework, illustrating how it may be applied to evaluate existing practices and propose improvements.

Revised Criteria

In response to the contextual specificities and local priorities in each case study, the comparative workshop held to synthesise the findings of the research proposed to replace the existing SDG global indicators with a set of evaluation criteria. These modify the existing global indicators to produce mutually exclusive principles or ideals that any urban system may be fairly

and consistently evaluated against. Rather than using the existing indicators, which carry within them added biases and priorities, we suggest the following six criteria: safety, affordability, accessibility, sustainability, inclusiveness and convenience. These criteria go beyond the existing SDG targets, extracting from them key ambitions and framing them as potentially quantifiable attributes that are specific in what they seek to measure, but can be flexibly applied according to local specificity. For example, the ambitions for 'access' to 'safe' drinking water expressed in SDG target 6.1, are encompassed in the quantifiable attributes of 'accessibility' and 'safety.' These criteria can then be applied to a variety of elements within water systems, regardless of scale or actor.

The revised criteria avoid the linguistic biases embedded in the existing attempt to produce globally relevant statistics, and offer flexibility in how they may be appropriately measured in different contexts. The revised criteria thus straddle the 'conceptual' and 'measurable' scales of the existing SDG targets and indicators, offering a middle ground that is better suited to the global scale, and better facilitates application at the local scale.

Measurable Indicators

The second step extracts out of each criterion a set of measurable indicators for each SDG that would enable researchers to assess and quantify (if applicable) local systems and practices. For example, for SDG 11.2, the proposed quantifiable measures include the time and cost of trips, the number of accidents, harassment cases, CO2 emissions, etc. The revised indicators, which stem from the criteria defined above, seek to minimise embedded biases in order to allow any kind of urban service or intervention to be measured and fairly assessed. Secondly, the proposed framework offers a greater degree of flexibility to accommodate a variety of local conditions and the potential of context-specific difficulties in data collection. The methods for measuring the revised criteria can be adapted through the design of localised indicators for specific contexts (in this case Cairo and Dar es Salaam). The more flexible nature of the proposed global evaluation criteria (affordability, for example) facilitates this, allowing the most appropriate and accessible methods for data collection to be used in different locations, while maintaining global comparability and minimising the misrepresentation caused by unsuitable indicators (Figs 6 and 7).

As such, the proposed global criteria offer an adaptable framework for monitoring, while the revised SDG indicators offer more appropriate and locally embedded standards for measuring different kinds of service provision in an unbiased, yet quantifiable and comparable way. The next part of this section imagines these indicators being in place, and puts them to the test by testing and demonstrating the benefits of the revised indicators.

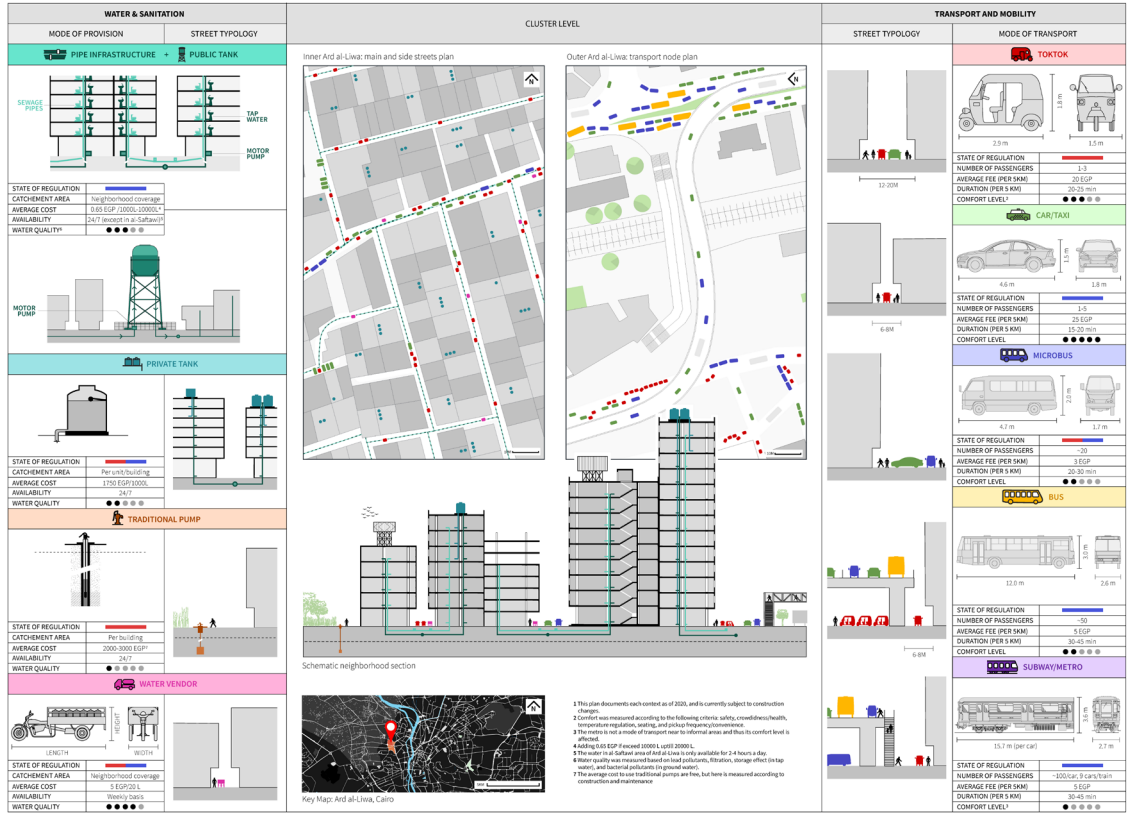

Figure 6: Comparative Framework, water and sanitation/transport and mobility Cairo, Egypt / The Neighborhood of ARD Al-Liwa

Figure 7: Comparative Framework: Water and sanitation/transport and mobility Dar es Salaam, Tanzania / The Neighborhood of Keko Machungwa

Evaluating local practices and proposing improvement measures

The work of grounded fieldwork continues beyond the revision of indicators, in order to ensure their effective application. For example, through a quantifiable assessment of the proposed indicators that show the number of accidents and amount of CO2 emissions, the tuktuk as a mode of informal transportation fails to meet the safety and sustainability criteria. Once these gaps are identified, possible measures and policies could then be proposed to narrow these gaps and bring informal practices closer to the (revised) normative criteria, by upgrading local systems to improve and enhance them rather than substituting them with imposed global norms. To demonstrate the ways in which the measurable indicators may be applied to local practices, the case of the tuktuk is discussed further, looking at a) how to evaluate performance vis-à-vis the SDGs, and b) what measures and policies could be proposed to improve their standards.

Research Findings I

The tuktuk/ bajaj as an example to assess indicators and propose measures for improvement.

The tuktuk is an omnipresent mode of transportation in most informal areas in African cities, due to its small size and ability to manoeuvre in narrow streets, its relatively affordable fare, and its resilient routing in response to the ever-expanding informal sprawl outside the planning frameworks. However, despite its relative success, the tuktuk can hardly be considered as meeting international or national standards (Mohan and Tiwari 2019: 272). To evaluate its performance, the above toolkit proposes a number of measurable indicators, using the criteria of safety, inclusiveness and sustainability.

Firstly, safety could be measured through the number of accidents and fatalities compared to other modes of transport, and in absolute terms based on the volume of ridership. The tuktuk may represent risks and hazards not only to passengers, but to other drivers and passers-by as well, particularly in informal areas where sidewalks are not always available for pedestrians. Further, tuktuk drivers, many of whom are under-age in Cairo, often do not abide by traffic rules and directions, and often drive against oncoming traffic or make abrupt turns or U-turns.[9] Finally, in Cairo, there have been numerous publicised cases of abduction and violence against women by unregulated tuktuk drivers (Alaa El-Din 2015). Therefore, unreported harassment incidents may also serve as indicators of safety.[10]

Secondly, while tuktuks may be more affordable and a more flexible trip in terms of pick-up and drop-off points, their access by elderly citizens and those with physical disability is limited, due to their seating configuration and low level of comfort. This criterion could be measured by a simple observation of the social makeup of tuktuk passengers, in terms of gender, age, physical ability and income level, compared to other modes of transportation offered in the same area, through a representative sample that considers trip times, locations and routes, and peak hour journeys.[11]

Thirdly, compared to other modes of public transportation, the tuktuk's consumption of petrol and its CO2 emission are quite low: one gallon of fuel burns for an average of 5.3 litres per 100 kilometres travelled in town (Rickshaw Challenge 2020), compared to a minibus with seventeen seats, which uses 6.2 litres per 100 kilometres (Car-emissions.com), and taxis, which use 13.16 litres per 100 kilometres (El-Dorghamy 2015).

These measurable criteria for evaluation may then offer direct recommendations to improve the tuktuk's performance indicators, such as regulated and monitored routes, licensing trained drivers, and designing solutions to address passengers with special needs, such as designated stops and lower steps to make it easier to get in and out. High-tech solutions, such as GPS and other rider-sharing software to track drivers, may also help mitigate the harassment and violence issues. Switching fuel consumption to natural gas and potentially to electric engines would enhance the environmental performance of this informal mode of transportation, bringing it closer to SDG targets and criteria from the bottom-up.

Across the city of Dar es Salaam, although different modes of transport are used, including private cars, the rapid bus transit system, the city's commuter buses (daladalas) and motorcycles (known as bodaboda), the bajaj (three-wheeler) is used with relatively high frequency in the city, and more so in informal settlements. In Tanzania, the use of motorised three-wheelers as taxis is legal.

Safety could be measured by assessing the frequency of accidents, as well as 'the safety-related practices' of the bajaj riders, compared to those of other means of transport. A comparatively high percentage of bajaj drivers learn to drive through informal coaching with friends.[12] This poses a huge risk, even if other safety regulatory measures are in place, such as regular vehicle inspection by the police force.[13] It was interesting to find communities who categorised themselves as non-users of bajaj, claiming that these vehicles did not keep their balance while on the road, risked overturning, particularly

when it rained, and that their drivers were careless. Quite a large number of users had their own means of transport, to ensure their safety, but when they used the bajaj, would ride only with bajaj owners/drivers whom they trusted, who were trained, observed safety measures and the speed limit, and generally drove safely. They trusted these drivers to take care of family members, dropping off and picking up young children from school, taking family to health care facilities, and other such important services. Accessibility to the available transport services was enhanced by the use of mobile phones by most households. The majority of the community expressed their preference for using bajaj over motorcycles, which were said to be cheaper but highly unsafe. Age and gender featured in the choice, with the bajaj preferred mostly by women and the elderly, contrary to men and youth. It is important to note that all the bajaj drivers seen in Keko Machungwa were male.

This assessment is important for the formulation of recommendations to improve the safety of the bajaj. One of the major reasons includes the ever- growing informality in housing construction, making the use of bajaj an indispensable practice. Its other advantages include affordability (resulting from its low fuel consumption),[14] flexibility (readily available when required either for sharing or for private use), and reduced waiting time as few passengers fill it. The extensive use of the bajaj in unplanned areas where there is a poor network of routes for both motorised and non-motorised transport conforms with previous studies on informal transport systems (Vahidi and Yan 2016). The routes are created informally as mobility is sought. Apart from the main access road at the centre of the settlement, most passages are narrow and bajaj are therefore not only the most preferred, but the most practical solution.

An evaluation of the findings and general recommendations favour the use of the bajaj as a standard mode of transport especially with regard to safety, hence it can be promoted. Otherwise, mobility in the informal areas would remain poor and exclude many of the inhabitants. In terms of en route experiences, in the findings, no cases were reported/experienced of harassment or any other gender-based offence while using a bajaj.

It was acknowledged that, to improve safety, it is important to establish proper regulatory frameworks and realistic enforcement methods. One of the initiatives in place was an agreement between SUMATRA (the public transport regulatory authority) and local councils, which was formed in 2015, encouraging motorcycle and three-wheeler taxi operators to form associations and generate revenue to support road safety operations. However, it has had a comparatively low uptake from the stakeholders

(Bishop et al. 2018). Other suggestions include 'upgrading' the design or adding accessories that would protect passengers from the weather and increase their comfort, since bajaj are not safe or comfortable to use during the rainy season. The findings highlighted the need to formulate and/or reform the legislation geared to improving mobility, particularly the need for more recognition and use of the bajaj. Bottom-up interventions are needed, as these have the potential to be more efficient than the currently used guiding criteria, many of which were established through a top-down approach, or with very minimal public consultation.

While the tuktuk/bajaj is becoming almost universal as a mode of transport in cities in Africa and the global South, it varies in its functions, routes and regulations, and, therefore, its image in the city culture. In Cairo, the tuktuk is not regulated and officially not acknowledged as part of the transportation network. It is limited, in theory, to informal areas and back streets, since the drivers have no licence and if caught on a main road could have the tuktuk confiscated. In practice, however, tuktuk drivers find ways to cut corners, drive against the traffic and negotiate informal fines with traffic police. The stigma attached to tuktuks in mainstream culture is directly linked to the term that defines informality in Egypt, 'ashwa'iyat', meaning 'chaotic' or 'random'. It indicates a denial of informal urbanism and practices, viewing them as an exception that will eventually be eradicated or give way to more 'civilised' urban conditions.

This image and related practice is different in Dar es Salaam, where the bajaj industry is more regulated and acknowledged as part of the transportation network. Bajaj are licensed, and even though their fares are informally negotiated, they are incorporated into the Uber app. They are allowed onto main streets and highways, even though they often take side or service lanes, alongside other modes of transportation. These distinctions are relevant to the current research with direct implications for issues of safety, accessibility and sustainability. In Ard al-Liwa, which is a much larger neighbourhood than Keko Machungwa, the tuktuk is the main mode of transportation other than microbuses, which are limited to routes along major arteries and collector streets Moreover, given that they are illegal outside the neighbourhood, when they do interface with formal districts outside the area's boundaries they are more visible and pronounced. In contrast, Keko Machungwa is a smaller and more walkable neighbourhood, and the use of bajaj is not limited to its main streets since bajaj can negotiate the available passages. However, the legality of driving 'outside' into the city at large means its interface with other modes of transportation is less apparent. With regulatory frameworks in place, enforcing mechanisms for

safety and environmental quality are more effective than when they are not and when the tuktuks are dismissed by traffic police as completely illegal, as in the case of Ard al-Liwa.

In conclusion, some proposed measures to improve the standards with reference to SDG target 11.2 may be applicable to both case studies, such as finding solutions to make vehicles more accessible to the disabled and switching fuel consumption to natural gas while exploring the use of electric engines, as seen in cars and buses. However, other indicators and measures are specific to each context and regulatory status, such as introducing a licensing system for tuktuk usage in Cairo, repeating the regulation process that the previously informal microbus industry went through, and revisiting the formation of an association that plays an active role in addressing issues of road safety in Dar es Salaam.

Research Findings II

Community feedback workshops on revised indicators and proposed measures

As a follow-up to the empirical data-gathering, a final round of community engagement through feedback workshops was conducted at both sites to assess the research findings. In Ard al-Liwa, three separate meetings were organised due to social distancing restrictions. These involved four community members, from a community centre, a youth association and two individuals representing a range of age, gender and vocational backgrounds. In Keko Machungwa the research team conducted one focus group discussion involving nine community participants, including the Tumaini Letu women group, Amka group and Keko youth community group.[15]

In contrast with the first round of engagements, this workshop focused on the community to propose measures to improve the standards of water and sanitation, and transport and mobility. In Ard al-Liwa, where the transportation issue was more pressing than water, proposals concerning the regulation of tuktuks, including licensing, designated lanes and stops were considered favourably. Some suggested a regulatory body at an intermediate level between formal institutions and informal practices. Although tracking drivers through phone applications was viewed as a positive step to address the safety of women and potential violence against them, it was considered a far-fetched possibility within such informal networks of transportation. Suggestions proposed by the research team for microbuses included better-lit and more spacious stops, and an additional metro station close to the neighbourhood. These were viewed as a major step forward, while contested as unrealistic.

In Keko Machungwa, respondents were positive about the proposed measures, but concerned about the cost implications of the suggested improvements. For instance, the idea of the registration of boreholes was positively received but it was feared that this would drive up the costs to access water and sanitation services. Moreover, among the suggested improvements, some were not positively received by the respondents, based on their experience. For instance, suggestions to improve rainwater harvesting with large catchment and storage facilities were met with claims that the challenge is not with storage but rather the deteriorating quality of rainwater when stored. Respondents therefore suggested that the collected rainwater be treated. Trust was also an element that arose during the discussion, particularly regarding water treatment on site. The respondents were skeptical about this suggestion because it might cause doubt about the ways in which the treatment was performed, which would have implications for its usage.

In addition to the different priorities of the two communities – water and sanitation in Keko Machungwa, and transportation in Ard al-Liwa – a number of other distinctions could be inferred from the response of their respective communities. Firstly, due to the varying sizes of the two neighbourhoods, the visible presence of community organisations in Keko Machungwa, and their ability to mobilise and communicate with local authorities, contrasted with the weaker communal ties of the much larger and more heterogeneous area of Ard al-Liwa, which was clearly reflected in the poorer ability to organise community workshops. Secondly, while in Cairo most of the suggestions for improvement were viewed with scepticism towards government willingness to implement such improvement measures, since most infrastructure investments are related to city-scale projects, in Dar es Salaam the issue of cost was raised multiple times in relation to the proposed measures. Thirdly, while the issue of enforcing measures of safety, accessibility and sustainability was of common interest in the two communities, in Keko Machungwa the respondents expressed their interest in enforcing them by means of 'social codes' rather than the police. In Ard al-Liwa, on the other hand, most of the respondents called for stronger regulatory measures and presence of law enforcement, which was viewed as generally lacking yet necessary in the neighbourhood.

Conclusion

This article has used a localising methodology to investigate the utility of the current SDG framework relating to water and sanitation and transport and mobility in Cairo and Dar es Salaam. Our findings revealed opportunities for improvement across different targets and indicators linked to SDGs

6 and 11.2, and corroborated our general emphasis on considering and destigmatising urban informality when localising the SDGs. For example, while under the existing SDG framework an informal transport solution such as the tuktuk would be entirely dismissed, the localised framework allows us to fairly assess the type of vehicle and its contextualised use in order to make the most of its opportunities. Conversely, the formal railway crossing at Ard al-Liwa, although seemingly providing 'convenient access to public transport' infrastructure, was found to be an inadequate intervention, based on the majority of interviews done with local users, and given the broader ambition of the SDGs.

The proposed indicators offer a more grounded tool to bridge the scales of global and local within the SDG framework itself, allowing it to become more effective in achieving its proclaimed goals, all the while accounting for informal solutions, which are often ignored, discredited or even persecuted by policy interventions. Derived from an engaged, in-the-field comparative project in Tanzania and Egypt, the toolkit is proposed as a useful method for going beyond sweeping statistics and top-down census perspectives, favouring a more nuanced understanding of on-the-ground conditions in other geographies, which could be applied across all seventeen SDGs. If there is real political will and an interest to engage with informal areas and activities, the toolkit provides an effective mechanism through which the SDG framework can be effectively applied to on-the-ground realities, without diluting or romanticising the complexity of informal urban life. Beyond specific localising efforts, however, the research has sought to localise the global framework itself. This research has ultimately argued that for the SDG framework to be effective, it must be influenced and shaped by experiences from the bottom up. Through a comparative South-South analysis, the research offers an iteration to the global framework that removes embedded biases, translates more effectively across multiple contexts and thus better facilitates localising processes at the national, provincial and neighbourhood level.

Notes

1. Examples of this are the Suez Canal Development Corridor, the construction of a new administrative capital, the development of the 'Golden Triangle' project, New Galaa City and the building and provision of one million social housing units.
2. Based on reviewing CAPMAS (Central Agency for Public Mobilisation and Statistics) data and GOPP (General Organisation of Physical Planning) related documents to identify water and mobility problems.

3. According to various typical posts from community social media platforms and petitions to local authorities, such as 'Shabab wa-Banat Ard al-Liwa' (Young Men and Women of Ard al-Liwa) https://www.facebook.com/groups/ardellwaa. Accessed 10 June 2020.
4. Interview held by the research team with Ard al-Liwa sector manager, in the municipal authority, 2 November 2019.
5. Interview held by the research team with the project's construction engineers on site during the implementation of the project, 28 January 2020.
6. For instance, Ardhi University is building a toilet in collaboration with the Centre for Community Initiatives (CCI) where social factors were used to decide where to construct it.
7. Observation by the researcher on site, 28 January 2020.
8. According to local leaders, an initiative was introduced by them and members of Parliament proposing the establishment of a traffic station in Ard al-Liwa in January 2020.
9. Researchers observation at field visit, 28 January 2020.
10. Interviews with women talking about their journey to work and girls to their schools during a community meeting, as part of a workshop on Gender and Safety organised by the Women and Society Association workshop, July 2019; R. Hassan, 2019, Creating A Safe Zone for Girls in Informal Areas in Cairo, Powerpoint presentation, Population Council.
11. Observation by the research team during field visit on 28 January 2020.
12. Interviews with sub-ward leaders, discussions with local communities and observation by the researchers.
13. Interview and field work, 7 May 2020.
14. Interview and field work, 7 May 2020: none of the interviewees complained of unaffordability.
15. According to community feedback workshops conducted in Cairo and Dar es Salaam between 15 and 31 August 2020.

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