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COMMENTARY

Toward achieving smart cities in Africa: challenges to data use and the way forward

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Abstract

The advent of smart and digital cities is bringing data to the forefront as a critical resource for addressing the multifaceted transitions faced by African cities from rapid urbanization to the climate crisis. However, this commentary highlights the formidable considerations that must be addressed to realize the potential of data-driven urban planning and management. We argue that data should be viewed as a tool, not a panacea, drawing from our experience in modeling and mapping the accessibility of transport systems in Accra and Kumasi, Ghana. We identify five key considerations, including data choice, imperfections, resource intensity, validation, and data market dynamics, and propose three actionable points for progress: local data sharing, centralized repositories, and capacity-building. While our focus is on Kumasi and Accra, the considerations discussed are relevant to cities across the African continent.

Policy Significance Statement

The findings in this paper will guide policymakers in Africa and beyond to identify the key barriers besetting the full attainment of the innovation imperative agenda in making cities smart, resilient, and sustainable. The paper further highlights the necessity of policy actors undertaking proactive measures in building local capacity, establishing centralized data repositories, contributing to open source and global ones, and fostering local-level data-sharing initiatives for a more informed and resilient urban planning landscape in African cities.

1. Introduction

There is a strategic commitment by policymakers across Africa to embrace innovation and digitalization as outlined in the Agenda 2063 development framework (African Union Commission, 2023). Indeed, during the 32nd African Union Assembly of Heads of State and Government during a high-level luncheon dubbed "Digital Transformation for Africa: leaping into the African Century," a representative of the African Union Development Agency (AUDA-NEPAD), Mr. Symerre Grey-Johnson, delivering his keynote speech, noted, "as we enter into the fourth industrial revolution, we have to ensure that our policies and guiding frameworks for infrastructure development evolve and to develop the complementary skills that will drive smart infrastructure that Africa urgently requires" (AU Commission, 2019). However, in Africa, strategies and measures to fully adopt the smart city concept—underpinned by the notion that "rational and

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optimal decisions, as well as intelligent behaviors, can be attained in city environments through the use of information and communication technologies (ICTs)" (Slavova and Okwechime, 2016, p. 214)—are isolated and limited. Notable initiatives so far include Rwanda's Smart City Masterplan (UN-Habitat, 2017), Nigeria's Smart City Initiative, and Ethiopia's Smart Parking Initiatives (Siba and Sow, 2017). The rest are Morocco's City of Casablanca Digital Project, Mauritius' Moka Smart City, and Kenya's iHub Initiative (Maphangwa and van der Waldt, 2023). Despite the limited number of smart cities on the continent, Bandauko and Arku (2023) argue that the concept holds transformative potential in the planning, management, and governance of African cities.

Elsewhere, it has been found that by adopting such innovative technologies and solutions, cities may advance their unique position to tackle many of the sustainability challenges faced globally today (Cuperstein, 2022; Nilssen and Hanssen, 2022). It is recognized that cities can drive global change at an unprecedented scale by transforming land cover, hydrological systems, climate, biogeochemistry, and habitats (Espey et al., 2024). This expected global change is premised on better coordinated and innovative smart city policies that are obtained through data to foster the political and social inclusion of citizens when it comes to decision-making and service provision, which then leads to improvement in the quality of life (Dawes et al., 2016; Pereira et al., 2018; Liva et al., 2023). However, even in the wealthier and more industrialized countries of the Global North, several organizational, technological, and legal barriers beset the potential of cities to reap the full dividends accruing from the smart city agenda (Liva et al., 2023). It, therefore, comes as no surprise that in poorer countries of the Global South, formidable barriers to smart cities, from legislative (Danquah et al., 2019) to governance, technological, social, legal, and ethical issues, continue to persist (Kolandaisami, 2020). Thus, an enabling environment is still needed to facilitate the transition toward smart cities to effectively reduce social, economic, and environmental disparities emerging in cities. Otherwise, smart cities risk entrenching inequalities, as highlighted by Dos Santos and Mota (2019).

Central to the realization of smart cities in Africa, in particular, is the recognition of data as an indispensable asset to empower decision-making capacities among diverse stakeholders. Open data, in particular, assume a pivotal role in addressing the swift transitions (e.g., urbanization) and intricate challenges (e.g., climate crisis) confronting African cities. Nikiforova et al. (2023) underscore its role in providing insights and solutions within compressed time frames. Despite the critical importance of open data, a counteractive trend is emerging in the African context, creating a potentially adverse environment for smart cities to reach their full potential. Case studies drawn from East Africa highlight the key challenges involved in sourcing open data on the African continent ranging from over-reliance on external donor support, governmental restrictions, and limited motivation for community engagement. For instance, national open data portals, which had been launched in Kenya and Tanzania, failed to thrive and became self-sustaining following the cessation of continued donor support (Vasileva, 2022). Earlier, Ranchod (2020) had highlighted bureaucratic management and compliance protocols, limited and fragmented organizational capacity, and politicization of data as key constraints toward the use of open data in South African secondary cities. Ricker et al. (2020) also found that city authorities, perhaps viewing civil society organizations as risky or confrontational, have been half-heartedly involved in promoting their open data and wider data activism initiatives. Consequently, the rapid adoption of digital technologies in Africa occurs organically and often without public intervention. This phenomenon, exemplified by the "datafication of cities" (Oksman and Raunio, 2018; Bibri and Krogstie, 2020; Plantinga, 2022), raises concerns about the potential detachment of local authorities from the evolving digital landscape. Such detachment may manifest in the development of alternative digital services by external entities, disrupting or competing with locally provided public services. Additionally, the risk exists that local authorities may face constraints in accessing comprehensive data generated by users and businesses within their jurisdiction, hampering informed decision-making and, ultimately, the transition to smart cities. Because of this, the data landscape unfolding in African cities today is notably intricate, characterized by a multitude of sources, ranging from private to public entities. Importantly, this data ecosystem is far from being scarce, particularly concerning geospatial data. Establishing a conducive environment for smart cities entails adeptly navigating the complexities inherent in these emerging data environments to facilitate informed

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decision-making. It is crucial to contemplate the methodologies for data utilization and the consequential implications of decisions to formulate standards and best practices. Surprisingly, the discourse on this aspect appears relatively sparse within the existing literature.

This commentary delves deeper into issues surrounding the use of data, particularly open data, in decision-making in African cities and draws on our experience working with local actors and funders to analyze the accessibility and sustainability of transport systems in Accra and Kumasi (Ghana). This project grew out of one critical urban management challenge in cities, the inability of transportation systems to keep pace with rapid urban growth. Accra and Kumasi, along with other cities across the continent, are experiencing increased disconnection, burdening residents with longer travel times, greater congestion, and rising pollution and emissions, along with increasing motorization rates. Therefore, our project sought to spatially map accessibility to primary schools; hospitals, pharmacies, and clinics; markets (informal/formal); and transport hubs and green spaces, by transport modes (i.e., walking, biking, public transport—trotros and taxis—ride-hailing, motorcycles, and cars) across the city, in order to identify possibilities to improve the accessibility, sustainability, and equity of transport systems moving forward. For example, by providing better road space allocation, the reliability, convenience, and safety of active and shared modes will be promoted (OECD, 2021; Pajares et al., 2021; Allam et al., 2023). The reliance on active and shared transport modes among urban dwellers when accessing essential services ideally within relatively short commute distances (i.e., typically 15 or 30 minutes), also known as the "X-Minute City," has gained considerable traction and acceptance among urban planners and policy actors as a sustainable development pathway (Allam et al., 2023; Birkenfeld et al., 2023; Vich et al., 2023; Willberg et al., 2023).

We generated a primary dataset for building accessibility models through strategic partnerships involving researchers from the University of Ghana, the University of Manchester Spatial Policy and Analysis Laboratory, and the Organisation for Economic Co-operation and Development (OECD), together with the International Transport Forum (ITF). We adapted the ITF/OECD (2023) Accessibility Model to suit the Ghanaian context. Such a modeling exercise, as was undertaken in our previous study, however, requires copious amounts of spatial data from points of interest (e.g., clinics) to the transport network. Throughout our project, a concerted effort was made to leverage open-source data whenever feasible. In addition, household surveys involving 1,000 participants recruited from both Accra and Kumasi were undertaken. A comprehensive overview of the research design, including the sampling approach and the initial results generated, has been articulated elsewhere (see Agyemang et al., 2023).

This commentary contributes to the literature since it stands as an applied exploration of utilizing existing data for decision-making, offering practical insights for a transition to smart cities in Africa. Notably, our review of the existing literature identified the work of Peprah et al. (2019) as a solitary contribution to our understanding of smart cities in Ghana. Nevertheless, the implications derived from our commentary extend beyond the Ghanaian context and hold relevance for smart city initiatives across the African continent. The next section expands on five key considerations that warrant heightened attention in future endeavors: selecting which source of open data to use, imperfections in nearly all datasets whether open or private, the resource intensity (in terms of time) required to use these datasets, the continued need for ground truth validation, and the lack of access to public data sources. The third section discusses the actionable points and examples to overcome these obstacles: the need for capacity-building at the local level along with several initiatives, improved data sharing among different entities, and, lastly, the need for a centralized repository for data collection. The final section concludes on our experience and underscores the imperative that, notwithstanding the abundance of available data, discerning choices and meticulous due diligence must be exercised in its utilization. Decision-makers in urban contexts must critically reflect upon these considerations to ensure that smart city ambitions enhance rather than deteriorate the quality of life.

2. Key considerations on using data moving forward

Our experience mapping the accessibility of transport systems in Ghana highlighted different considerations as we move into this era of smart cities, not only for African cities—but worldwide. Some of the issues that emerged from our study are presented and discussed in the ensuing section.

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2.1. Data source selection

We were often confronted with a multitude of data sources related to the same aspect (e.g., urban boundaries, road networks, points of interest), sometimes open and others not, but often it can be unclear which data source is "best." For instance, in the context of defining boundaries for the two cities under consideration, we found it necessary to opt for an administrative area-based boundary delineation. However, it is worth noting that alternative choices, such as functional urban areas or the delineation based on built-up urban extent, were equally feasible and, in some respects, potentially more "accurate" due to the rapid pace of urbanization.

There are at least four *open* datasets available solely for defining urban boundaries. These include administrative data (i.e., the Database of Global Administrative Areas or locally sourced administrative boundaries datasets), Africapolis (only available for 2015) (reflecting functional urban extent) (OECD/SWAC, 2020), the Global Human Settlement Layer (GHS) Functional Urban Areas (only available for 2015) (Schiavina et al., 2019), and the GHS Urban Centers Database (available for 1975, 1990, 2000, 2015, and 2019) (Florczyk et al., 2019). Moreover, there are several different global datasets that allow the identification of built-up areas globally (that are also open source) and that could serve as a starting point to delineate the urban extension. These include the GHS built-up surface dataset (latest release 2023) (Pesaresi and Politis, 2023), the World Settlement Footprint from the German Aerospace Center (latest release 2019) (Marconcini et al., 2020), the Annual Urban Extents from harmonized nighttime lights (latest release 2020) (Zhao et al., 2022), and the Global Urban Entities based on consistent nighttime light data (latest release 2020) (Shi et al., 2023). As illustrated in Figure 1, each dataset draws a different boundary for the reference year 2015 (since this year is available in all datasets), with stark differences between these datasets. Notably, the administrative boundary, Africapolis, and GHS Functional Urban Area cover more extension, in general, than the other datasets, which are more contained in the consolidated urban cores. The latter tend to exclude the peri-urban areas that are very likely to access services and amenities located in the urban core.

All these data sources are freely available—and perhaps, there will be even more potential sources in the future. The selection of boundaries has far-reaching implications in our project and for others pursuing spatial analysis, since the model only examines accessibility within the boundaries, meaning some urban residents could be inadvertently left out. Administrative area-based boundaries tend to align more closely with local decision-making processes. Yet, accessibility fundamentally pertains to where people reside, which may not always correspond with administrative realities, and areas that are not recognized as urban can have population densities high enough to be considered in transport and mobility planning processes (Gao and O'Neill, 2020). Beyond the challenge of inconsistency in the definition of boundaries, quality problems such as inaccuracy, out-of-dateness, and incompleteness may limit the full exploitation of linked open data (Rula et al., 2016). As we move forward and contemplate the integration of such diverse data sources into the decision-making processes of local stakeholders and researchers, it is essential to consider the far-reaching implications of these choices, particularly with respect to resource allocation and future infrastructure, to create best practices.

2.2. Data imperfections: Integration

Our project requires road network information, including aspects such as road surface type, road classification, speed limits, and traffic speeds during peak and off-peak hours. The research project procured data from a private provider, specializing in the road network of Ghana, offering essential details including road classifications, speed estimations, and surface attributes. The private data provider leverages a visual training algorithm, in tandem with ground-level validation, to process satellite imagery.

Upon thorough examination, gaps in the road network from the private provider were identified, particularly in the western region of Accra, supported by satellite imagery (Figure 2). This revealed a completeness issue (Vetrò et al., 2016; Torchiano et al., 2017) that required addressing before modeling. To resolve this, an amalgamation of datasets from OpenStreetMap and the private provider was undertaken to create a comprehensive network. The consistency issues (Vetrò et al., 2016; Torchiano et al., 2017) between

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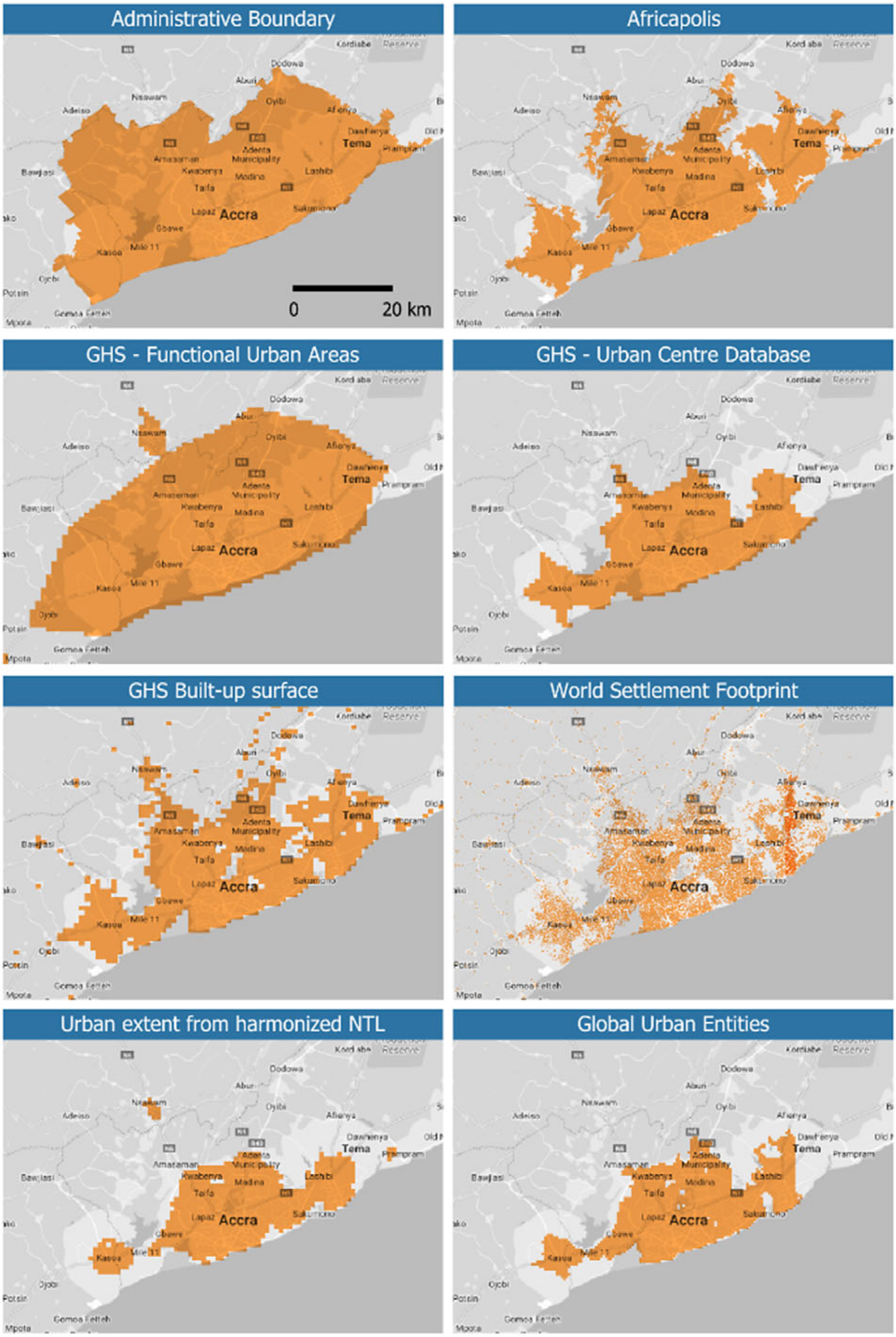

Figure 1. *Delimitation of the urban functional area in the Greater Accra Metropolitan Area by year 2015 as defined by several open geospatial datasets available in 2023. Top row, from left to right: administrative boundaries of the districts in the conurbation; Africapolis (OECD/SWAC, 2020); GHS Functional Urban Area (Schiavina et al., 2019); GHS Urban Centers Database (Florczyk et al., 2019). Bottom row, from left to right: GHS built-up surface (Pesaresi and Politis, 2023); World Settlement Footprint from DLR (Marconcini et al., 2020); urban extent from harmonized nighttime light imagery (Zhao et al., 2022); urban area from the Global Urban Entities (Shi et al., 2023). All maps are shown at the same spatial scale. Basemap: OpenStreetMap web map service (© OpenStreetMap contributors). Source: The authors.*

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Figure 2. *Data gap of the privately sourced road network, located in the southwestern part of the Greater Accra Metropolitan Area. Basemap: Google Satellite web map service accessed in June 2023 (© Google). The privately sourced road network is shown in yellow. The overlay of the road network dataset with the satellite base map shows that a significant portion of the urban layout in this area lacked data from the private provider. Source: The authors.*

datasets led to increased data processing time and the need for specialized resources to produce a suitable road network for modeling.

This amalgamation process underscores the imperative recognition that no dataset is immune to imperfections, as noted in previous studies (Batton-Hubert et al., 2019; Le Galès and Robinson, 2024). While commercially procured datasets may possess certain advantages, such as, in our case, speed estimates and classification of pavement, they are not devoid of shortcomings—that is, the absence of critical road segments being a noteworthy concern. Moreover, this confluence of data sources underscores the diverse origins of data, each with its unique strengths and weaknesses, which are critical considerations moving forward.

2.3. Temporal and financial resources

In addition, as already alluded to above, the team made formidable investments, primarily in terms of not only time but also financial resources, to acquire specific datasets for our model. Spatial data have the potential to bring a significant change in urban management. However, it is not always readily available from public sources. This means that considerable time is needed to procure and process open data or financial resources to purchase them from private providers.

Our project, initiated in September 2022, involved an extensive data processing and validation phase, which extended beyond six months, specifically focused on two urban centers. The extended timeline was primarily attributable to a multifaceted approach. Firstly, the identification of requisite data sources involved the curation of information from various open-source and private providers. Subsequently, a meticulous data processing effort was undertaken to prepare the data for use. Thirdly, the assurance of data quality—defined as the ability of data to meet the "needs and expectations of the data user" (Nikiforova, 2020, p. 419)—was a pivotal concern throughout this endeavor, necessitating comprehensive validation procedures.

Remarkably, this project was executed by a team of eight individuals, geographically dispersed across different regions of the world. This collaborative effort underscores the challenges and complexities associated with data acquisition and processing for urban spatial analysis (Liu et al., 2021; Le Galès and Robinson, 2024). If spatial data are to play a more active role in enhancing urban management, it is imperative that availability and usability be prioritized, streamlining the intricate processes involved in data procurement and analysis.

2.4. Ground truth validation

Throughout the duration of this project, the inherent constraints associated with spatial data, whether of open or private origin, have become progressively conspicuous. This underscores the pressing need for ground truth validation, underpinned by insights from local experts of various backgrounds. In the current era of smart cities, there may be a propensity to view data as an all-encompassing solution for informed decision-making. However, our experience has revealed that ground truth validation is an indispensable step for garnering support and safeguarding the precision and dependability of our analytical outcomes.

This validation process offers the opportunity to fine-tune and rectify the data. When disparities emerge between the collected data and ground truth observations, necessary adjustments can be made to align the data with real-world conditions, consequently enhancing data quality, as has been found elsewhere (Yan et al., 2018). Furthermore, our findings highlight the enhanced trustworthiness of validated data. Users, stakeholders, and decision-makers exhibit a greater inclination to place their trust and reliance on data that have undergone the rigor of ground truth validation, ultimately resulting in more enlightened and assured decision-making practices.

2.5. Data market: Absence of public sector

It is worth noting that none of the data used in the project came from public entities, which is not by choice. We struggled to even access population density data from the National Statistical Office, even though we were working alongside local authorities. The Ghana Statistical Service (GSS) has been mandated under the Statistical Service Act, 2019 (Act 1003), to act "as the central statistics producing and coordinating institution for the National Statistical System and to strengthen the production of quality, relevant, accurate and timely statistical information for the purpose of national development." On its website, the GSS boasts of being "consistent in performing its legal functions to serve the needs of individuals, organizations, development partners and the government without hindrance." The practice is simply for a requester, as either individuals or organizations, to fill out a Data Request Agreement form for submission online. For our research, we initially requested enumeration area (EA) level census data obtained during the 2021 Population and Housing Census (PHC) conducted on Sunday, June 27, 2021. In addition, we requested geographic information system (GIS) shapefiles for selected districts in Accra and Kumasi. Our request was submitted in December 2022. The first email response that we received was that the GSS does not release data at such micro-level but typically shares data aggregated at the locality, regional, or district level. We complied and requested a locality-level dataset instead.

However, the second and final email response we received was that such data, even at the locality level, were not readily available, some 18 months after the census was conducted. Even though this project feeds into ongoing work by the local administrations in Accra and Kumasi, we were unable to access the data needed from the public administration. There might be valid reasons for this, such as privacy and data protection concerns. Public entities often handle sensitive data, and sharing data could raise concerns about privacy violations. Public entities might be subject to a complex web of regulations and laws that govern data sharing. Government agencies may have bureaucratic structures and procedures that can slow down or hinder data-sharing efforts. The answer could also be simpler—lack of resources or interdepartmental conflicts. Many public entities may lack the necessary resources, in terms of both technology and staff, to effectively manage and share data. Likewise, different government agencies or departments may have conflicting interests or objectives. As mentioned earlier, fragmented governance and half-hearted engagements of city authorities are seen as major barriers to the development of smart cities and the development of open data ecosystems worldwide (Ranchod, 2020; Ricker et al., 2020; Kitchin and Moore-Cherry, 2021; Vasileva, 2022).

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We, therefore, were compelled to utilize data from the privately operated community or emanating from the open-source community. It cannot be overemphasized that whatever the reason was that led to our inability to procure the data from the GSS, if these barriers and hurdles are not resolved, Accra and Kumasi, and other cities in Africa, risk being left behind and missing out on reaping the full potentials associated with the “innovation imperative” agenda, as has been cautioned elsewhere in Europe (Liva et al., 2023).

3. Policy implications: Points of action

As we navigate the era of enhanced data access and management, the policy implications in addressing how data are used and shared in public administrations, at both local and national levels, are pivotal. This consideration is intertwined with the evolving discourse of decentralization in many African countries. Cities play a critical role in addressing climate change and rapid urbanization, and better access to and sharing of data among international organizations, government, non-profit or private sectors, and the general public are imperative to enable them to fulfill this role effectively.

Against this backdrop, we propose three policy points of action to help address some of these considerations. **First, investing in capacity-building at the local level to enhance data literacy and analytical skills among urban planning professionals will ensure the implications of data choices and imperfections are reasonably well understood**. Training programs and educational initiatives can empower local governments to harness the full potential of data, while being some of the best actors for ground truth validation of the data. Specifically, for Ghana, we think collaborations like the Ghana-India Kofi Annan Centre of Excellence in ICT (AITI-KACE), an ongoing strategic partnership to enhance digital skills acquisition and inclusivity in the digital economy, particularly among vulnerable groups, are a step in the right direction.

For the rest of the African continent, specializations, such as those in the Executive Masters in City Management at the African Local Governments Academy (UCLG Africa), are dedicated to equipping professionals with the skills to utilize freely accessible spatial data in land-based planning and financing. Similarly, initiatives like Digital Earth Africa offer courses to local actors, enabling them to effectively employ open geospatial data. Empowering individuals with these capabilities enhances their ability to assess and evaluate the implications of data-driven choices, reducing reliance on external expertise for territorial development guidance.

Second, local data-sharing initiatives foster collaboration among African stakeholders, including government agencies, researchers, and businesses and lead to more comprehensive and context-specific datasets that better serve the needs of smart cities. This also helps varying actors understand the implications and limitations of using various sources. Promoting the open exchange of data at the grassroots level is imperative. Encouraging contributions to open-source mapping platforms, such as OpenStreetMap, can ensure the ongoing maintenance and updating of critical geospatial datasets, including road networks, buildings, and service and amenity locations within cities. Neglecting such initiatives could result in missed opportunities for comprehensive planning and resilience in the face of urbanization and climate challenges. Additionally, failing to engage in these efforts may inadvertently enable the private sector to dominate the data landscape, potentially undermining public interests.

To this end, we commend the Open Cities Africa initiative, which has been developing comprehensive points of action for eleven cities in sub-Saharan Africa (including Accra). Its core mission is to foster collaboration among local government entities, civil society organizations, and private sector stakeholders. The overarching objective is to establish the critical information infrastructure needed to address the intricate urban resilience challenges characteristic of the twenty-first century. This initiative represents a unique partnership forged between the Global Facility for Disaster Reduction and Recovery (GFDRR), the World Bank, municipal authorities throughout the African continent, and a consortium of regional scientific and technological organizations, development partners, and technology enterprises. Another noteworthy local data sharing and collaboration project is that of the MapMakoko project in Lagos

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(Nigeria). This initiative brought on board Code for Africa, Humanitarian OpenStreetMap, the Pulitzer Center on Crisis Reporting, africanDRONE, Makoko Dream, CcHUB's American Corner, and the Guardian Nigeria. They implemented a bottom-up mapping approach combining data from satellite images and drones along with community participation to map waterways and the location of critical infrastructure within the settlement. More than 80 points of interest were added to the map, illustrating how innovative technologies (such as drones and satellite imagery) often provide the data that underpin and advance the aims of smart cities. Technologies, such as the installation of sensors and telecommunication systems, or even artificial intelligence, as well as machine learning technologies, can make it feasible to collect near real-time data; providing a deeper understanding of how cities evolve, adapt, and respond to various conditions (Allam and Dhunny, 2019; Gartoumi and Tékouabou, 2023).

Third, **African policy actors must prioritize the creation of centralized repositories whether at the local, regional, or national levels, to ensure equitable access and diffusion of data resources**. These repositories can facilitate data discovery, sharing, and maintenance, reducing the dependency on third-party data providers, in addition to offering an opportunity for policy actors to create a shared vision, which helps to foster smart city data ecosystems (Gupta et al., 2020). Yet as is often the case, as already noted by Slavova and Okwechime (2016, p. 224), "visionary leadership is critical in avoiding this pitfall, as well as developing mechanisms for shared governance, empowerment and co-creation."

4. Conclusion

In a nutshell, this commentary sought to explore the pivotal considerations and challenges that surround the use of data in urban planning and management. Our work has highlighted five critical considerations as cities start to increasingly use data in urban management. (1) Data selection: The choice of which data to use will become increasingly complicated as data become progressively available with greater digitalization, but this selection can lead to varying conclusions and has profound implications for investment and infrastructure development. Decisions about data sources and types should be made with utmost care. (2) Data imperfections: Every dataset, no matter how seemingly technical or robust, whether open source or private, will contain limitations. These imperfections may include errors, biases, and gaps. It is crucial for data users to be aware of these and account for them in their analyses and decision-making processes. (3) Resource intensity: Our project's experience underscores the considerable time and resource intensity associated with collecting, managing, curating, and analyzing the data. (4) Ground truth validation: Data ideally should be validated against ground truth, to the greatest extent possible. The absence of ground truth validation can introduce uncertainties and potential inaccuracies into decision-making processes, emphasizing the need for robust validation methods. (5) Data market dynamics: We observed a prevalence of third-party entities dominating the data market, while comprehensive access to publicly provided data is conspicuously absent. This dearth of accessible data poses a significant impediment to local government's capacity to formulate informed policies and initiatives.

While our focus has been on the experiences gained in Kumasi and Accra, it is essential to recognize that the challenges and considerations discussed in this commentary are endemic to cities throughout the African continent. Data-driven urban planning holds immense promise, especially given the pivotal role that cities play in tackling the climate crisis. Yet, realizing this potential requires a comprehensive understanding of the complexities and a concerted effort to overcome the identified challenges.

By adopting a strategic approach that includes local data sharing, centralized repositories, and capacity-building, African cities can harness the power of data to tackle their urban challenges effectively.

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