

The Impact of Free Municipal Wi-Fi on the Citizens' Right to the City, Good Governance, and Service Delivery in an African Context: the Perspectives of the Residents of Pretoria Central Business District (CBD) in the City of Tshwane, South Africa

Tlou Phillemon Mathane, Trynos Gumbo

(Tlou Phillemon Mathane, University of Johannesburg, Department of Urban and Regional Planning, Johannesburg, South Africa, phillemonmathane@gmail.com)

(Prof. Trynos Gumbo, University of Johannesburg, Department of Urban and Regional Planning, Johannesburg, South Africa, tgumbo@uj.ac.za)

1 ABSTRACT

Just after the year 2010, big cities in South Africa started to introduce programmes to provide free data, especially to their disadvantaged communities. This came in the context of a broader appreciation that access to data is no more a luxury, but rather a basic necessity for daily livelihood in the context of the fourth industrial revolution. The increasing explosion of the fourth industrial revolution is been driven partly by the pervasive digitization of things, which results in big volumes and a variety of data flowing from heterogeneous sources at increasing velocity. In this regard, all eight (8) metropolitan municipalities in South Africa (Buffalo City, Tshwane, Johannesburg, eThekweni, Ekurhuleni, Mangaung, Nelson Mandela Bay, and Cape Town) are currently implementing free Wi-Fi programmes to improve access to data. Some of the secondary cities in South Africa have also followed suit. Non-governmental role players have also started to provide free wireless internet sites as well. These efforts are most commendable in an African context, noting that the average internet penetration level in Africa is approximately 43.1%, compared to the global average of 66.2%. Significantly, these interventions are also commendable because they are in sync with the Sustainable Development Goal (SDG) 11, that of building sustainable cities and communities. However, from an empirical research perspective, the impact of such incredible initiatives on imperatives such as improving the citizen's right to the city, good governance, and enhanced service delivery in an African context is yet to be fully understood. So, the question is: to what extent can free municipal Wi-Fi to assist citizens to realize these three development imperatives, viz: realize their right to the city, good governance, and enhanced service delivery? To this end, this study empirically investigated the perspectives of the residents in the Pretoria Central Business District (CBD) in the City of Tshwane, South Africa. The City of Tshwane is the Capital City of South Africa. This study utilized a case study design and is qualitative in nature. Both primary and secondary sources were used. Fifty (50) residents in the Pretoria CBD responded to a randomly administered online survey. The results were analyzed by categorical aggregation and content analysis. The findings reveal that the Pretoria CBD residents feel that the Tshwane free Wi-Fi is making more impact in enabling the citizens to enjoy the informational right to the city and good governance, and lesser compared to improving service delivery. In conclusion, the researchers recommend an expansion of more free Wi-Fi sites in the Pretoria CBD to accommodate an increasing student population in the area, to make the Pretoria CBD more liveable, and sustainable, and to entrench social justice. However, the City of Tshwane would need to find an innovative funding model because the free Wi-Fi programmes are not cheap.

Keywords: Sustainable Development, Sustainability, Smart city, Free Wi-Fi. Tshwane

2 INTRODUCTION

In the past two decades, there have been different academic contributions on the role of smart technologies in cities and urban sustainability. One contribution is that smart city implementation reproduces the inequalities of marginalized people in the city (Willis, 2019). Another contribution is that smart cities do produce inequality (Caragliu and Del Bo, 2022). Yet another contribution is that the deployment of smart technologies makes cities/communities more sustainable (Hamza, 2021), thus bringing positive impacts on communities (Alavi, et al 2018). Yet, another contribution is critical to this notion (Hamza, 2021). So, despite all these diverse contributions, there are still some knowledge gaps. One of the gaps is that the majority of the studies are not based on empirical data. Another gap is that the majority of these studies are done in developed economies, and very few in the African context.

3 CONCEPTUAL FRAMEWORK

3.1 Framing the study conceptually

There are several conceptual constructs that the study engaged with. They are discussed below:

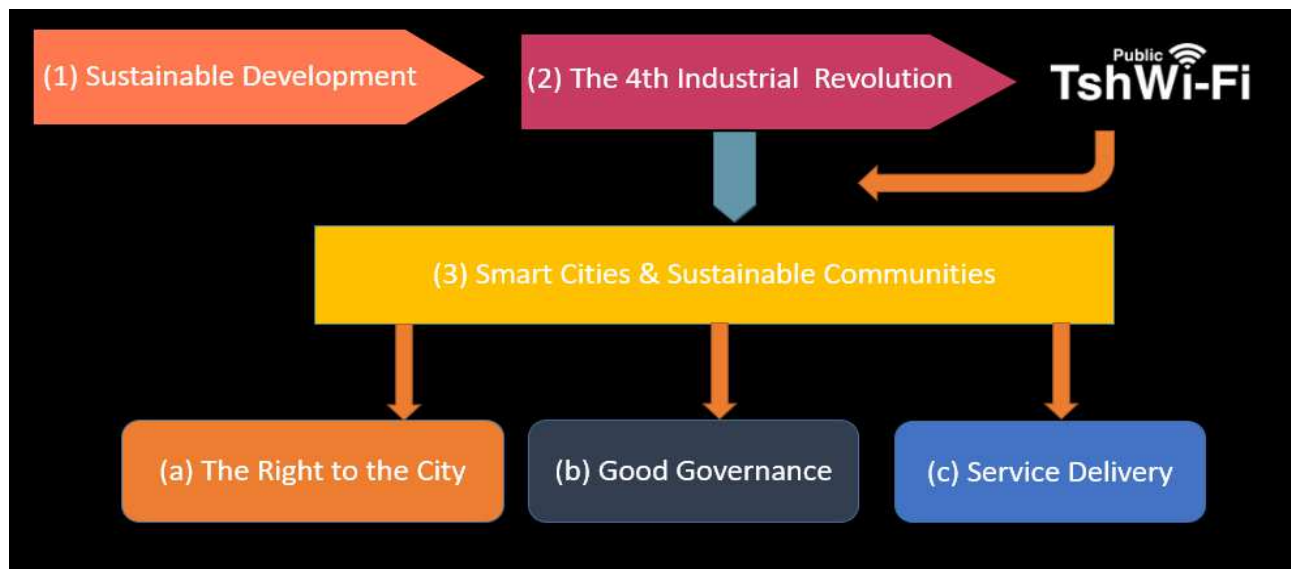


Figure 1: Conceptual Framework of the study: Source, Author (2023)

3.2 Sustainable development

The concept of sustainable development encapsulates the pillars of the economy, society, environment, and governance (Cecchin, et al. 2021). However, in the context of the fast-changing digital world and rapid urbanization, some scholars, e.g. Mondini (2019), posit that the technological pillar is very relevant. It is believed, at least by scholars such as Kopnina (2020), and Schopp, et al. (2020) that sustainable development is about raising the living standards of the next generations. Many other scholars agree that smart digital technologies tend to address urban management challenges in the 21st Century (Onyango, et al 2021). However, the empirical efforts to assess the efficacy of smart city interventions in Africa remain limited. In the context of the fast-changing digital world, the technological pillar is also relevant to the discourse of sustainable development (Mondini, 2019).

3.3 The Fourth Industrial Revolution

The Fourth Industrial Revolution (4IR) is challenging all fields of life all over the world (Korczak and Kijewska, 2019). It has made access to data and the internet lifestyle more popular. In countries such as China, digital technologies and the internet are vital for public involvement in planning and governance processes. This is positively associated with economic and social transformation. However, it is still acknowledged that the huge digital divide in communities creates unequal power relations (Zhao, et al., 2018). The 4IR (Industry 4.0) is about connections (Onik, et al. 2019). These connections affect how people live their lives (Xu, et al., 2018). The 4IR also incorporates things such as Artificial Intelligence (AI), advanced robotics, data analytics nanotechnology, 3D printing, the Internet of Things (IoT), blockchain neurotech, cloud technology, and biotechnology. These bring some sophistication in terms of how things are being done now (Korczak and Kijewska, 2019).

3.4 Smart and sustainable cities and communities

The creation of sustainable cities is one of the most pressing central challenges of this age (Yang and Taufen, 2022), especially due to increasing technological advances (Steputat, et al., 2020). There is a need for sustainable cities and sustainable communities, as espoused by Sustainable Development Goal 11 (Mondini, 2019). The notion of smart cities and their linkages to sustainable communities is prominent today in policy discourses internationally. Zielinska-Dabkowska and Bobkowska (2022) underscore the need to build sustainable cities and communities. Similarly, Yang and Taufen (2022) emphasize this in the context of the COVID-19 disruptions that have challenged the resilience systems of cities. So, the implementation of

modern digital technologies by municipalities must make cities and communities more sustainable (Hamza, 2021) because, today, like never before, cities face the challenges of being sustainable (Fell and Mattsson, 2021). The high rate of urbanization is adding to the sustainability challenges (Vaidya and Chatterji, 2020). There is also a broader realization and appreciation that what is needed is not just smart cities, but sustainable smart cities (Yigitcanlar, et al., 2019). Sustainable smart cities deploy digital technologies to improve the quality of life for residents (Zvolska, et al., 2019).

3.5 The right to the city

The concept of the right to the city is a sustainability question. This concept was inspired by Henri Lefebvre's work *The Right to the City* (1968). Influenced by the thoughts of Henri Lefebvre's work *The Right to the City*, Willis (2019) asks a question: "Whose Right to the Smart City?" Ben-Lulu (2021) asks an important question: who has the right to the city? Urban policies should promote the notion of citizenship for all (Borja, 2019). The right to the city is seen as an agenda for social change (Vergara-Perucich, and Arias-Loyola, 2019), especially in the context of smart cities (Van der Graaf, 2020). Smart cities are not just about data; but they are about citizens (Breuer, and Pierson, 2021). So, citizen participation is an essential element of the right to the city (Anastasiu, 2019). The citizens must be able to inhabit the city freely (Aquino, et al., 2020). In the context of smart cities, pertinent questions are asked about the right of citizens to apply their rights (De Frantz, 2021). The right to the city is about citizen-centric digital cities (Breuer, and Pierson, 2021), as it is also about citizens claiming their rights within a city (De Frantz, 2021). When the playground is unequal, the attainment of the right to the city becomes a difficult feat (Diaz-Parra, and Jover, 2021). Progressive social movements have placed inclusion (Hintjens, and Kurian, 2019) and social justice agenda at the center of the right to the city (Yang, et al., 2019). The right to the city is also about the informational right to the city. In South Africa, the Promotion of Access to Information Act (PAIA) is important in this regard. It reinforces the constitutional right of access to information.

3.6 Service delivery and good governance

Smart cities are perceived to solve a range of complex urban management challenges (Allen, et al. 2020) to offer value to residents (Timeus, et al. 2020). One of the value offerings is efficiency in the delivery of public services because smart cities must be citizen-centered (Yang, et al. 2019). Allen, et al. (2020) found that most citizens use e-government platforms for complex issues than for basic service delivery routine services. Whereas Gil, et al. (2019) found that digital platforms do benefit citizens, other scholars argue that it benefits most technology-savvy citizens compared to the poorest of the poor. Aurigi and Odendaal (2022) posit that the use of smart digital technologies should be context and place-based so that they enhance social sustainability. It has been found that e-platforms encourage more citizen participation, and also improve service delivery (Gil, et al. 2019). Smart city technologies can also save traveling costs and time (Jaiswal, et al. 2020). In addition, smart digital tools and platforms can be used by cities to strengthen governance systems (Rodríguez Bolívar, 2019). Information Communication Technologies (ICTs) can introduce some governance reforms to enhance accountability (Basu, 2019). Smart city technologies allow citizens to be engaged, and participate in public consultations (Gade, 2019). However, different planning cultures in cities do affect governance aspects (Lim, et al. 2022). It is also noted that the use of modern technologies tends to attract younger people more than older people (Kopackova and Komarkova, 2020).

4 METHODOLOGY

This research investigated the views of the residents in the Pretoria CBD and surrounding suburbs in the City of Tshwane, South Africa, as far as the impact of the Tshwane free Wi-Fi on the citizen's right to the city, good governance, and service delivery. The study used an online survey tool, which was administered to fifty (50) residents in the Pretoria CBD. A majority were from Hatfield (48%), Sunnyside (24%), and CBD (12%). The profile of respondents is quite mixed and dynamic. In terms of occupation, 53% of the respondents were students; and 30% were employed. In addition, 10% were unemployed graduates, and 6% were self-employed residents. As far as the age is concerned 90% are youth between the ages of 18 and 34, followed by 10% above the age of 45. The education level of respondents is also mixed: 42% with a 3-year post-matric qualification, 44% with an honors degree and above, and 14% with just matric. The voices of these residents were captured, synthesized, and analyzed. Surveys are popular for qualitative data (Mellinger

The Impact of Free Municipal Wi-Fi on the Citizens' Right to the City, Good Governance, and Service Delivery in an African Context: the Perspectives of the Residents of Pretoria Central Business District (CBD) in the City of Tshwane, South Africa and Hanson, 2020). In addition, secondary sources (reports, academic journals, books, etc) were used. So, the research is qualitative in nature and was guided by the qualitative approach.

5 FINDINGS

5.1 Findings regarding access to free data in Africa

5.1.1 The politicization of data in Africa

The internet penetration level in Africa is 43.1%, compared to the global average of 66.2% (Internet World Stats, 2022). Some of the underlying causes of the slow digital uptake of ICTs in African countries are related to political interference and the sheer lack of political vision. The use of digital technologies to fight political battles is also a major factor of concern. For instance, in the Democratic Republic of Congo, reports of the government quelling civil unrest by suspending internet services - referred to as “blackouts” are common (Braun, and Buse, 2020). In Ethiopia, Tanzania, and Uganda the central governments tend to implement ‘Internet Shutdowns’ and “social media shutdowns”. In Angola, authoritarian politicians use internet control to disadvantage political opponents (Garbe, 2021). Cameroon is also known for muzzling the digital rights of the residents due to the autocratic government’s tight grip on the media (Murrey, 2022).

5.1.2 Best-case African models in terms of access to data

There are approximately five (5) African countries whose share of internet users exceeds the 50% population threshold. These are Morocco (84%), Seychelles (79%), Egypt (71%), South Africa (68%), and Tunisia 66% (Statista, 2022). An interesting observation is that although free Wi-Fi initiatives provide approximately 40% of data in the African continent (Danquah, Marful, and Duah, 2019), in these African countries, it is not easy to establish if the provision of free Wi-Fi is the key/main driver of higher levels of access to the internet. This is an area worth researching because academic and empirical research on the provision of free Wi-Fi initiatives is generally scanty in the African continent.

5.1.3 Worst-case African models in terms of access to data

There are African countries that need to, as a matter of urgency, do more in terms of reducing the digital divide through free Wi-Fi programmes. These include Sudan (only 10% of the population have access to the internet); the Democratic Republic of Congo (only 17% have access); Tanzania (25% have access); and Ethiopia (25%). The case of Ethiopia requires urgent attention because of Internet Shutdowns. Other stats looks as follows: Rwanda (26%); Zambia (only 28%); Uganda (29%); Zimbabwe (30%); Angola (35); Cameroon (36); Kenya (42%); Nigeria (51%); and Ghana (53%) (Statista, 2022). These countries need to galvanize the private sector, NGOs, CBOs, global multinational organizations, etc, to invest more in digital transformation. Of course, they need to improve financial management, root out corruption, and maladministration, to attract local and Foreign Direct Investments (FDIs).

5.1.4 Internet user gender gap in Sub-Saharan Africa: an overview

As far as the internet user gender gap between men and women is concerned, the situation in Africa calls for serious concern. Internet access for men is 33, 8%, compared to women at a meager 22.6%. This does not compare favorably with the world average, with access for men being 58, 3%, compared to women at 48.4%. Neither does it compare favorably with the developed economies (average), where access for men is 87, 6%, compared to women at 86.0%, whereas, in the developing economies (average), access for men is 52, 8%, compared to women at 40.7% (ITU, 2019). So, Sub-Saharan Africa has a lot to catch up on as far as access to the internet is concerned.

5.1.5 African Countries with more than 10 million internet users

The top 3 African countries with more internet users are Nigeria (109 million), followed by Egypt secondly (75 million), and South Africa third at 41 million (Statista, 2022). Morocco has 31 million internet users, followed by Ethiopia at 29 million, and Kenya at 23 million. Then follows Ghana (16 million), the Democratic Republic of Congo (16 million), Tanzania (15 million), and Sudan, Uganda, Angola, and Cameroon at 14 million, 13 million, 12 million, and 10 million respectively (Statista, 2022).

5.2 African Countries with less than 10 million internet users

There are several African countries with less than 10 million internet users by 2022. Cote d'Ivoire has 9, 9 million, followed by Senegal and Tunisia (8 million) and Mozambique at 7, 5 million (Statista, 2022). Some African countries with less than 7 million internet users include Mali (6, 3 million), Burkina Faso (5, 9 million), Zambia (5, 4 million), Zimbabwe (4, 5 million), and Benin, Rwanda, and Libya at 3, 6 million, 3.5 million and 3, 4 million respectively (Statista, 2022).

5.3 African Countries with a share of internet users exceeding 50% of their population threshold

There are also African countries with a share of internet users exceeding 50% of their population. Morocco leads (84%), followed by Seychelles (79%), Egypt (71%), and South Africa (68%). Tunisia follows (66%), then Mauritius (64%), and Gabon, Cabo Verde, Western Sahara, Botswana, and Algeria at 62%, 61%.9, 61.3%, 61%, and 60% respectively (Statista, 2022). Those whose share falls below 60% include Djibouti (59%), Ghana (53%), and Lesotho, Nigeria, Namibia, and Gambia all averaging around 51% share (Statista, 2022). It is important to juxtapose the statistics about the share of internet users with the statistics on the number of internet users. Table 1 present this kind of analysis. For instance, even though Nigeria leads in terms of the number of internet users, those only make up 51% of the share of internet users.

African Country	Number of internet users	Share of internet users
Nigeria	109 million	51.0%
Egypt	75 million	71.9%
South Africa	41 million	68.2%
Morocco	31 million	84.1%
Ethiopia	29 million	25.0%

Table 1: Juxtaposing the share of internet users with the number of internet users in selected African countries, Mathane (2023), based on Statista (2022).

The African country with a bigger share of internet users in Morocco, but in terms of the number of users, the country lies fourth at 31 million – less than Nigeria, Egypt, and South Africa. Interestingly, Egypt has the second number of internet users in the continent, and the share of internet users is also equally competitively high at about 72%, followed by South Africa with 41 million internet users with a share of 68%. This is an important point about the possibly institutionalized digital divide within African nations themselves.

5.4 African Countries with a share of internet users below the 50% population threshold

There are over 35 African countries whose share of internet users is less than the 50% population threshold. This speaks to the direness of the situation of a digital divide in the African continent. The worst-case scenarios are found in countries like Chad, where 19% of the population has access to the internet. The Democratic Republic of Congo (DRC) is also battling, with only 17% of the population accessing the internet, similar to Burundi, Niger, and Somalia – all of which have 14% of the population accessing the internet. South Sudan is no better at 10%, similarly with Comoros and Eritrez at 8% (Statista, 2022). These are cases in the African continent where digital access must be addressed as a matter of urgency.

5.5 Arguments for decolonization (neo-liberalization) in the context of access to data in African cities

The implementation of free data programmes must appreciate the fact that African cities have their peculiar urban management challenges, socio-economic inequalities, governance failures, etc. So, the implementation must be rooted in the contextual realities of the cities (Bandauko, and Nutifafa Arku, 2022). Some scholars suggest that African cities should free themselves from reliance on neo-liberal policies crafted by the West. In this regard, they suggest that one way of doing this is for African cities to start investing in accessing free WI-Fi and internet services (Wissink, 2020). Indeed, other scholars call for decolonial thinking about technology, cautioning that if Africa continues to rely on foreign capitalist actors, this would endanger their well-being and sustainability (Oyedemi, 2021).

5.6 Findings regarding the free Wi-Fi in the City of Tshwane

5.6.1 SWOT Analysis of Tshwane free Wi-Fi

Table 2 below shows Ramokgopa's (2018:226) insightful thoughts about the SWOT analysis of free Wi-Fi in Tshwane. From the perspective of strengths, strong executive commitment, coupled with administrative and technical internal competency in the area of ICT is a must. From a Business Continuity Management (BCM) perspective, it is also commendable that when the Democratic Alliance (DA) took over governance in the CoT, this programme was continued. From the perspective of weaknesses, the fact that the city does not own bandwidth is one of the strategic risks which should be managed judiciously. It can also be added that the fact that the City of Tshwane has not yet found a sustainable solution for theft and vandalism constitutes a weakness within the CoT management ecosystem. Another major weakness relates to the lack of clarity on the funding model.

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> Executive Leadership is committed to the programme. Internal CoT ICT technical team. Partnership model with competent service providers. 	<ul style="list-style-type: none"> The funding model is not yet clarified Lack of CoT ownership of bandwidth Lack of specialized and experienced legal team for contract management
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> Increased smartphone usage in CoT. Universal access to the internet Increasing education levels of CoT residents CoT enjoyed first-mover advantages Online learning opportunities in CoT. Revenue generation opportunities Internet-based businesses can grow. More private-sector investments Increases engagements between city management and communities Real-time communication 	<ul style="list-style-type: none"> The perception that the internet is a luxury can result in unfavorable funding decisions. CoT can face possible litigation by some private sector internet providers. Likely to commit mistakes as first movers Negating the potential scale benefits. Financial unsustainability. Cyber security risks Delayed legislative clarity because municipalities are not designated as internet service providers. Impersonal community interactions

From the perspective of opportunities, there are many positives – increasing internet access, accelerating usage of smartphones, internet-based and/or online learning for teachers and learners, as well as opportunities for local online businesses Ramokgopa (2018). However, there are also missed opportunities currently, including opportunities for the CoT to partner with CBOs, NGOs, and the residents themselves. Opportunities for crowd sourcing funding also need to be explored. The City is not optimally pursuing raising its revenue (monetizing) with this platform. From the perspective of a threat, some of the key challenges include cyber security risks and financial unsustainability. At the level of social justice, the rate at which the CoT would engage citizens in impersonal ways would increase. Significantly, lack of legislative clarity considering that municipalities are not designated as internet service providers; including the fact that free data is not yet gazetted as a basic function of municipalities in South Africa is one of the strategic threats affecting free municipal Wi-Fi in South Africa as a whole. Policy and legislative lethargy and procrastination in this regard need to be corrected, particularly in the context of coalition politics, which have proven rather unpredictable.

5.6.2 Tshwane free Wi-Fi and the right to the city

The right to the city is a loaded and multilayered concept. So different aspects of this concept were dealt with in the survey. For instance, the respondents were asked their opinion regarding the Tshwane free Wi-Fi's contribution to enhancing the capacity of residents to exercise their informational rights to the city of Tshwane. In this regard, a majority of respondents (42%) felt that the free Wi-Fi is making a modest contribution, followed by 30% who believe that it is making a lot of contribution. About 22% felt that the contribution is there, but very modest in terms of impact. The respondents were also asked their opinion regarding the Tshwane free Wi-Fi's contribution to enhancing social justice in Tshwane. In this regard, 76%

agreed (of these, 56% just agreed, whereas 20% strongly agreed). Only 20% were not sure, and just 1% disagreed. The respondents believe that a significantly high proportion of Tshwane residents (80%) rely on the Tshwane free Wi-Fi to engage on social media platforms. However, only 32% of the respondents indicate that they use the Tshwane free Wi-Fi to engage on social media platforms. More respondents (46%) use their private data and use the Tshwane free data when their private data is exhausted. This means that a lot of the students (53%) tend to use private data first before they use Tshwane's free Wi-Fi.

The respondents were asked their opinion regarding the Tshwane free Wi-Fi's contribution to enhancing spatial justice in Tshwane. In this regard, 72% agreed. However, 18% disagree, and only 10% disagree. In addition, the respondents have diverse views about the Tshwane Free Wi-Fi serving all people of Tshwane equally well irrespective of their geographic location. About 48% agree, and 20% disagree. About 18% were not sure, and 14% strongly disagree. In terms of accessibility, 40% of the respondents feel that the Tshwane Free Wi-Fi accommodates all people (accessible for all), followed by 30% who disagree. In addition, only 46% of the respondents believe that in its current format, the Tshwane free Wi-Fi responds to the local contexts of communities. About 38% are neutral, whilst 26% disagree with the notion. Rather surprisingly, 60% of the respondents believe that the Tshwane Free Wi-Fi is directly informed by the socio-economic needs of the community. A small percentage (9%) disagrees, whilst 28% is neutral. As far as traveling inconvenience/costs are concerned, 62% of the respondents believe that since the introduction of the Tshwane Free Wi-Fi, some people no longer have to travel to the central city/town to do things that can be done through digital platforms. About 26% disagree, and 12% are neutral. The respondents were asked their opinion regarding the Tshwane free Wi-Fi's contribution to enhancing economic justice in Tshwane. In this regard, 44% of the respondents believe that the Tshwane free Wi-Fi makes a good contribution to enhancing economic justice in Tshwane. About 20% are of the view that the contribution is modest, and 22% believe that the contribution is low. On another factor, 78% of the respondents believe that many residents in Tshwane rely on the Tshwane Free Wi-Fi for economic opportunities such as job applications and business transactions. Only 10% disagree with this notion.

In terms of stakeholder analysis, the respondents were asked their opinion regarding whether the Tshwane free Wi-Fi implementation embraces partnerships and contributions. In this regard, 62% agreed, and 28% were not sure, whilst 9% felt that there is no involvement of external partners. Similarly, the respondents were asked their opinion regarding whether the Tshwane free Wi-Fi implementation embraces community involvement. About 64% agree, and 24% are neutral, whereas 9% disagree with the notion. As far as private sector involvement is concerned, 60% feel that there is adequate involvement, followed by 26% who are not sure; and 14% don't agree with the notion. The involvement of organized civil society formations also attracted diverse opinions; with 58% agreeing that there is adequate involvement of civil society groups in the conceptualization and implementation of the Tshwane Free Wi-Fi. However, 26% were not sure, whilst 16% disagreed with the notion.

5.6.3 Tshwane free Wi-Fi and service delivery and governance

Similarly, the respondents were asked their opinion regarding the Tshwane free Wi-Fi's contribution to enhancing service delivery in Tshwane. In this regard, 36% feel that a lot of contribution can be seen; whilst 32% believe the contribution is modest. About 26% of the respondents are not sure, whilst only 6% disagree. Nonetheless, approximately 44% of the respondents believe that many residents in Tshwane rely on the Tshwane Free Wi-Fi to engage the city on service delivery matters. About 34% are not sure; whilst 22% believe that generally, Tshwane residents prefer traditional (non-digital) ways of engaging the city. Similarly, about 22% of the respondents indicated that they are part of the Tshwane residents who use Tshwane Free Wi-Fi to engage the city on service delivery matters. Interestingly, 42% indicate that they use Tshwane free data for service delivery engagements only when their private data is finished. The rest (22%) indicate that they prefer residents prefer traditional (non-digital) ways of engaging the city.

The respondents were also asked their opinion regarding whether many residents in Tshwane rely on the Tshwane Free Wi-Fi to pay their bills, check statements, etc. Nearly half of the respondents (46%) believe that many Tshwane residents use the Tshwane Free Wi-Fi to pay their bills, check statements, etc. And, 12% believe that residents still prefer the traditional (non-digital) ways of paying their utility bills. Approximately 42% were not sure. Respondents were also asked if they are part of those Tshwane residents who use Tshwane Free Wi-Fi to pay their bills, check statements, etc. Interestingly, 42% of the respondents indicate

that they always use their private data. Another 42% indicate that they use Tshwane free data when their private data is finished. The rest (16%) indicate that they prefer residents prefer traditional (non-digital) ways of engaging the city. Finally, the respondents were asked to share their opinions regarding whether the Tshwane Free Wi-Fi is contributing to allowing residents to participate in governance processes in the City of Tshwane. Some 36% of the respondents feel that the Tshwane free Wi-Fi is making a lot of contribution in this regard. However, another 36% believe that the contribution does exist, albeit just modestly. Some feel that free Wi-Fi is not contributing in this regard. They make up 20% of the respondents. Finally, only 8% feel that the free Wi-Fi program is not making any contribution whatsoever in this regard.

6 CONCLUSIONS AND RECOMMENDATION

There are compelling reasons for African cities to deploy digital technologies so that they are not left behind as global cities are now more than ever before heavily influenced by intelligent technologies to interact directly with people. Africa is expected to reach a population of about 2.5 billion in 2050 (INED, 2019). This would be the fastest growth rate in the world. So, the deployment of sustainable and free Wi-Fi systems in African cities is more urgently needed (Ndiaye, et al 2022). The underlying problems causing poor access to internet connectivity in Africa have less to do with a lack of infrastructure, but more to do with a lack of commitment to good governance. African leaders and authorities need to do away with the politicization of data. This is untenable from a sustainable governance point of view. As far as the City of Tshwane Pretoria CBD case study is concerned, a majority of respondents agree that the Tshwane free Wi-Fi is greatly assisting in improving the citizen's right to the city. In terms of good governance, the study concludes that the Tshwane free Wi-Fi is also greatly assisting in entrenching social justice. However, when it comes to improving service delivery access and quality, the Tshwane free Wi-Fi is found to be used by fewer residents. In conclusion, there are some implications for the future. This means that cities can no longer approach planning from traditional planning approaches. Data is more than an essential need today, than it was in the pre Covid period. For the longer term, access to data will occupy similar position of significance as basic services such as water electricity, sanitation, etc. Access to data may even be a human right. Should such an eventuality arise, from a legal perspective, municipalities may not longer have an option of providing free access to data voluntarily, as this could be a Constitutionally mandated basic service. Cities should proactively plan for such eventualities, and partner with private and non governmental stakeholders to piggy back on their strengths and unique capabilities. past as well as projected future ones for the use of free wifi and its rolling out pace. In the case of Tshwane, the researchers recommend an expansion of more free Wi-Fi sites in the Pretoria CBD to accommodate an increasing student population in the area, thus increasing the possibilities of making the Pretoria CBD more liveable, sustainable, and entrenching social justice. However, the City of Tshwane needs to find innovative funding models because the free Wi-Fi programmes do not come cheap.

7 REFERENCES

- Allen, B., Tamindael, L. E., Bickerton, S. H., & Cho, W. (2020). Does citizen coproduction lead to better urban services in smart cities projects? An empirical study on e-participation in a mobile big data platform. *Government Information Quarterly*, 37(1), 101412.
- Anastasiu, I. (2019). Unpacking the smart city through the lens of the right to the city: A taxonomy as a way forward in participatory city-making. In *The hackable city* (pp. 239-260). Springer, Singapore.
- Aquino, K., Wise, A., Velayutham, S., Parry, K. D., & Neal, S. (2020). The right to the city: outdoor informal sport and urban belonging in multicultural spaces. *Annals of Leisure Research*, 1-19.
- Aurigi, A., & Odendaal, N. (2022). From "smart in the box" to "smart in the city": Rethinking the socially sustainable smart city in context. In *Sustainable Smart City Transitions* (pp. 53-68). Routledge.
- Bandauko, E., & Nutifafa Arku, R. (2022). A critical analysis of 'smart cities' as an urban development strategy in Africa. *International Planning Studies*, 1-18.
- Basu, I. (2019). Elite discourse coalitions and the governance of 'smart spaces': Politics, power, and privilege in India's Smart Cities Mission. *Political Geography*, 68, 77-85.
- Ben-Lulu, E. (2021). Who has the right to the city? Reform Jewish rituals of gender-religious resistance in Tel Aviv-Jaffa. *Gender, Place & Culture*, 1-23.
- Borja, J. (2019). The Right to the City: from the Street to Globalisation. *Monografias CIDOB*, 76, 33-42.
- Braun, L. N., & Buse, R. N. B. (2020). Infectious Images: Viral Internet Content in the Democratic Republic of Congo. *Critical Arts*, 34(4), 103-116.
- Breuer, J., & Pierson, J. (2021). The right to the city and data protection for developing citizen-centric digital cities. *Information, Communication & Society*, 24(6), 797-812.
- Caragliu, A., & Del Bo, C. F. (2022). Smart cities and urban inequality. *Regional Studies*, 56(7), 1097-1112.

- Cecchin, A., Salomone, R., Deutz, P., Raggi, A., & Cutaia, L. (2021). What is in a name? The rising star of the circular economy as a resource-related concept for sustainable development. *Circular Economy and Sustainability*, 1(1), 83-97.
- De Frantz, M. (2021). The politics of the EU Urban Agenda: Mobilising the 'Right to the City' for European governance?. *Urban Research & Practice*, 1-24.
- Diaz-Parra, I., & Jover, J. (2021). Overtourism, place alienation and the right to the city: Insights from the historic centre of Seville, Spain. *Journal of Sustainable Tourism*, 29(2-3), 158-175.
- Fell, T., & Mattsson, J. (2021). The role of public-private partnerships in housing as a potential contributor to sustainable cities and communities: a systematic review. *Sustainability*, 13(14), 7783.
- Gade, D. (2019). Technology Trends and Digital Solutions for Smart Cities Development. *International Journal of Advance and Innovative Research*, 6(1), 29-37.
- Garbe, L. M. (2021). Authoritarian Survival in the Digital Age. Internet Access and Control in African Autocracies (Doctoral dissertation, Universität St. Gallen).
- Gil, O., Cortés-Cediel, M. E., & Cantador, I. (2019). Citizen participation and the rise of digital media platforms in smart governance and smart cities. *International Journal of E-Planning Research (IJEPR)*, 8(1), 19-34.
- Hamza, M. (2021). Blockchain and Artificial Intelligence in Sustainable City: Can These Technologies Create Sustainable Cities and Communities? (Bachelor's thesis, University of Twente).
- Hintjens, H., & Kurian, R. (2019). Enacting Citizenship and the Right to the City: Towards Inclusion through Deepening Democracy?. *Social Inclusion*, 7(4), 71-78.
- Internet World Stats (2022). Internet penetration in 2021: <https://www.google.com/search?q=access+to+data+in+africa+by+country+2021&oq=access&aqs=chrome.2.69i59j69i57j35i39j46i20i199i263i465i512j46i199i433i465i512j0i20i263i512j0i433i512i2j46i131i175i199i433j0i512.5647j0j15&sourceid=chrome&ie=UTF-8>
- ITU (2019). Access to the internet. <https://www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx>
- ITU (2021). Measuring digital development Facts and figures 2021. <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2021.pdf>
- Jaiswal, R., Agarwal, A., & Negi, R. (2020). Smart solution for reducing the COVID-19 risk using smart city technology. *IET Smart Cities*, 2(2), 82-88.
- Korczak, J., & Kijewska, K. (2019). Smart Logistics in the development of Smart Cities. *Transportation Research Procedia*, 39, 201-211.
- Mondini, G. (2019). Sustainability assessment: From Brundtland report to sustainable development goals. *Valori e Valutazioni*, (23).
- Murrey, A. (2022). A decolonial political geography of resistance and digital infrastructural harm in Cameroon and Ethiopia. *Globalizations*, 1-27.
- Onyango, J., Kiano, E., & Saina, E. (2021). Environmental Damage Theory Applicable to Kenya. *Asian Journal of Business Environment*, 11(1), 39-50.
- Oyedemi, T. D. (2021). Digital coloniality and 'Next Billion Users': the political economy of Google Station in Nigeria. *Information, Communication & Society*, 24(3), 329-343.
- Ramokgopa, K. D. (2018). Leadership in establishing the Gauteng City-Region: the case of the City of Tshwane Metropolitan Municipality (Doctoral dissertation, University of Pretoria).
- Rodríguez Bolívar, M. P. (2019). In the search for the 'Smart' Source of the Perception of Quality of Life in European Smart Cities.
- Schopp, K., Bornemann, M., & Potthast, T. (2020). The whole-institution approach at the University of Tübingen: Sustainable development set in practice. *Sustainability*, 12(3), 861.
- Statista, (2020a). Technology spending into smart city initiatives worldwide from 2018 to 2023 (in billion U.S. dollars). Available at: <https://www.statista.com/statistics/884092/worldwide-spending-smart-cityinitiatives/#:~:text=Technology%20spending%20on%20smart%20city,to%20189.5%20billion%20in%202023> (Accessed 15 December 2022).
- Statista, (2020b). Spending on smart city projects worldwide from 2019 to 2025* (in billion U.S. dollars). Available at: <https://www.statista.com/statistics/1111626/worldwide-smart-city-market-revenue/#:~:text=Smart%20city%20market%20revenue%20worldwide%202019%2D2025&text=Global%20spending%20on%20smart%20city,U.S.%20dollars%20by%202024%20worldwide> (Accessed 15 December 2022).
- Statista,(2019). Smart city spending share worldwide in 2019. Available at: <https://www.statista.com/statistics/884130/worldwide-smart-city-investment-initiatives-use-case/> (Accessed 15 December 2022).
- Statista. (2021). Smart city initiatives spending share worldwide in 2020. Available at: <https://www.statista.com/statistics/757638/spending-on-smart-cities-worldwide/> (Accessed 15 December 2022).
- Statista. (2021). Smart city initiatives spending share worldwide in 2020. Available at: <https://www.statista.com/statistics/757638/spending-on-smart-cities-worldwide/> (Accessed 15 December 2022).
- Steputat, C.C., Ural, D. and Nanni, A. (2020). Sustainable cities and communities through GFRP secant-pile seawall innovation, sustainability, fortification and hurricane storm surge protection. In *IOP Conference Series: Earth and Environmental Science* (Vol. 588, No. 4, p. 042063). IOP Publishing.
- Timeus, K., Vinaixa, J., and Pardo-Bosch, F. (2020). Creating business models for smart cities: A practical framework. *Public Management Review*, 22(5), 726-745.
- Vaidya, H., & Chatterji, T. (2020). SDG 11 sustainable cities and communities. In *Actioning the Global Goals for Local Impact* (pp. 173-185). Springer, Singapore.
- Van der Graaf, S. (2020). The right to the city in the platform age: Child-friendly city and smart city premises in contention. *Information*, 11(6), 285.
- Vergara-Perucich, J. F., & Arias-Loyola, M. (2019). Bread for advancing the right to the city: academia, grassroots groups and the first cooperative bakery in a Chilean informal settlement. *Environment and Urbanization*, 31(2), 533-551.
- Willis, K. S. (2019). Whose right to the smart city?. In *The right to the smart city*. Emerald Publishing Limited.
- Wissink, H. (2020). Evaluating the Aerotropolis Model for African Cities: The Case of the Durban Aerotropolis. In *Reflections on African Cities in Transition* (pp. 183-211). Springer, Cham.

- Xu, M., David, J. M., & Kim, S. H. (2018). The fourth industrial revolution: Opportunities and challenges. *International journal of financial research*, 9(2), 90-95.
- Yang, L., Elisa, N., & Eliot, N. (2019). Privacy and security aspects of E-government in smart cities. In *Smart cities cybersecurity and privacy* (pp. 89-102). Elsevier.
- Yang, Y., & Taufen, A. (2022). Sustainable cities and landscapes: Cultivating infrastructures of health. In *The Routledge Handbook of Sustainable Cities and Landscapes in the Pacific Rim*. Taylor & Francis.
- Yang, Y., & Taufen, A. (2022). Sustainable cities and landscapes: Cultivating infrastructures of health. In *The Routledge Handbook of Sustainable Cities and Landscapes in the Pacific Rim*. Taylor & Francis.
- Yigitcanlar, T., Han, H., & Kamruzzaman, M. (2019). Approaches, advances, and applications in the sustainable development of smart cities: A commentary from the guest editors. *Energies*, 12(23), 4554.
- Zhao, M., Lin, Y., & Derudder, B. (2018). Demonstration of public participation and communication through social media in the network society within Shanghai. *Environment and Planning B: Urban Analytics and City Science*, 45(3), 529-547.
- Zielinska-Dabkowska, K. M., & Bobkowska, K. (2022). Rethinking Sustainable Cities at Night: Paradigm Shifts in Urban Design and City Lighting. *Sustainability*, 14(10), 6062.
- Zvolska, L., Lehner, M., Voytenko Palgan, Y., Mont, O., & Plepys, A. (2019). Urban sharing in smart cities: the cases of Berlin and London. *Local Environment*, 24(7), 628-645.