

Closing Africa's Infrastructure Deficit: The Role of Gender Responsiveness in Urban Planning

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Abstract—Although urbanization in Africa has been characterized by fragile socio-economic successes, the sustainability of city infrastructure is now central to planning processes as a pathway to closing the deficit in terms of coverage and access. This paper builds on survey and interview data from Kampala city, to demonstrate how the principle gender responsiveness can inform improvements in urban infrastructure and service delivery. We discovered that women prefer infrastructure that combines living and working spaces for reduced labour and travel burdens between homes, markets, schools, and other urban spaces. Men's conception of infrastructure needs on the other hand, mirrored public security and connectivity concerns along city streets and work places. However, the urban planning approach at city-level is guided by mainstream engineering and architectural designs that do not necessarily reflect the social context within which urban infrastructure influences gender roles and the attendant mobility needs. To address the challenge across cities of similar context, the paper concludes with a set of analytic steps on how the gendered influences on infrastructure-use can be considered in urban planning cycles.

Keywords—African cities, gender responsiveness, city infrastructure, urban planning.

I. INTRODUCTION

SINCE the re-designing of infrastructure has become a substantial part of urban sustainability—definitions of which may sometimes be buttressed in local imaginations, the evolutionary nature of planning regimes and politics—cities around the world have found it inevitable to embark on long-term investments that are targeted at reinvigorating urban road networks, railways, drainage systems, physical building and leisure zones. While much of the attention in the global south has been given to Asian and South American cities, like Bengaluru, Kuala Lumpur and Rio de Janeiro—as apt locations for decongestion through south-south cooperation—African cities too have shown initiative with potential to sustainably address economic and environmental challenges for better living, working and recreation [41], [29, p. 64], [19], [22], [47].

Such initiatives have centered on improving municipal

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revenue performance to meet financing requirements; modernizing regulatory frameworks; introducing user charges for maintenance; risk reduction through partnerships between local and transnational contractors; and pursuing regional integration to reduce costs [62]. Whereas the rhetoric of these steps appears neo-liberal in nature and skewed towards policy reform and legal-based approaches to infrastructure development, the attendant projects like road transport corridors, have targeted escalations in demand, since the number of city dwellers and businesses requiring a valuable stock of infrastructure has surpassed provision due to bulging urban populations in countries like Tanzania, the Democratic Republic of Congo, Ethiopia, Uganda, and Niger, while posing urban governance challenges [3], [27], [5], [49], [37], [33].

Infrastructure availability being outpaced by urban population growth rates has given rise to the deficit in terms of coverage and access. Closing the deficit requires a 12 percent expenditure of the continent's Gross Domestic Product (GDP), which would in turn increase per capita growth and economic performance by 2.2 percentage points [16]. Mauritius in North Africa, has realized economic improvements through embracing the multi-dimensionality of local and global demands on city infrastructure, that is; accessible, safe, fashionable, socially inclusive and green infrastructure [30], [7]. Similarly, cities like Durban in South Africa have widened their municipal revenue base by promoting both environmental sustainability and economic restructuring in infrastructure projects [39], [40], [56], [15]. But since human conceptions of urban infrastructure are defined by the routines in (and of) social roles, relations and practices, which also constitute, and are a constituent element of the structures that make and unmake planning decisions, responsiveness along gender and social group characteristics is vital with informal settlements inadvertently marginalized [1], [60], [24], [35], [11], [34].

Many times, however, the use of gender responsiveness as a sociological approach to urban planning, has been sought with limited effort in both developed and developing cities. Local and global debates on infrastructure are still pre-dominated by physical, economic and environmental aspects of city formation [13], [25], [26], [50], [43], [61], [17], [51], [10]. Even the study of feminism in urban locations—which would potentially produce knowledge on gender responsiveness in infrastructure provision—has largely focused on the emancipatory conception of gender needs within social service sectors, particularly water, health and education, especially with regard to sub-Saharan Africa. Emphasis on infrastructure

as a point of departure to understanding how everyday domestic and commercial routines and roles determine infrastructure-use amongst women compared to men, is still peripheral to urban feminism. The dominant stand point is the relationship between the formation/renewal of urban areas and women's safety in public spaces, thereby calling for urban governance structures that recognize women's vulnerability to city crime and violence [48], [8], [28, p. 256], [36, p. 45], [23]. This is the assumption that, for example, underlies the work of [59, p. 2], [57, p. 9], who drew insights on how urban design can be attuned to community-level prevention of violence against women.

However, such analyses in the safe-city context do not draw on the social divisions in safety needs across segments in urban populations and the attendant variations in infrastructure uses. It should be noted that even amongst women, the nature of constraints faced with regard to safety from urban violence and personal security is differentiated along social group characteristics. Women's safety needs differ not only on account of poverty status and type of settlement in the city, but also according to age, household characteristics and degree of engagement in income-generating activities [18], [14], [38], [32]. This implies that women-specific issues cannot be addressed using programmes that are separate from those targeted at other city residents. Gendered pluralism—a disaggregation of needs using not only sex but also location and demographic indices—is therefore inevitable in analyzing how infrastructure and attendant services can respond to city population needs.

Although pluralistic gender analysis has sometimes been referred to as a detachment from the feminist roots of gender equality discourse [4], [2], possibilities are created to align planners' views with end-user needs on different forms of urban infrastructure provision. Ultimately, the architectural and engineering concepts embedded in infrastructure provision become more beneficial to different social groupings while enhancing creativity and producing new knowledge in field of urban planning [67]. This is partly the issue that the proponents of participatory urban planning have emphasized by contending that innovativeness in planning cycles should largely focus on pathways that offer meaningful and functional partnerships with the local population in setting service provision priorities [21], [6]. As such, urban planning in cities of Africa should embrace gender responsiveness, as a socially-inclusive pathway to lessening demand-side shortfalls in city infrastructure.

II. THE TWO-PRONGED APPROACH TO INFRASTRUCTURE PROVISION IN KAMPALA CITY UGANDA

Kampala city in Uganda is occupied by 40% of the national urban population [52]. The mandate of delivering services and infrastructure is under Kampala Capital City Authority (KCCA), which until 2011 was known as Kampala City Council (KCC). This mandate also entails the transfer of planning and service delivery functions to five municipal agencies in the city including Kawempe, Makindye, Nakawa, Rubaga and Central division [45]. Together with KCCA, these

agencies through their political and technical teams ought to plan and deliver services including core (physical and transport facilities) and social infrastructure such as water, public health and education utilities.

Planning for urban infrastructure and services is done within a framework of policies, laws and regulations in Uganda which provide the modalities on how different departments in the city authority come into play in the provision of infrastructure [64], [65], [45]. Characteristic to these policies and laws, is the decentralization of services and their provision by municipal agencies, with policy oversight from central government ministries and departments that mainly include: works and transport; housing and urban development; and water and environment ministry. From a gender perspective, laws contain provisions on the presence of women in the political arm of the city authority. But the general approach to urban development is by technical teams in sectors with limited integration of urban planning functions across departments in the city authority and the national-level ministries. Thus it is common in the administrative structures of the city to have designated offices to sectors including water, transport, road works, health and schools among others.

The decentralized approach to urban planning in Kampala has yielded two implementation approaches to the delivery of infrastructure, namely; the project-based and the sector-wide approaches. The project-based approach is considered realistic and relatively easier to monitor when specific projects are identified and activities planned out with associated investments. Currently, urban infrastructure provision in Uganda and Kampala in particular follows this implementation approach. This approach is associated with local governments and lower scales of implementation.

The second implementation approach is the sector-wide approach which recently been introduced at national level. This approach is characterized by national priorities and needs assessment within a sector where planning and design of infrastructure is at national level. However, often implementation is accomplished through projects whether these are designed as pilot projects or on off projects. Project-based approach has been critiqued because it is usually not linked with follow up on pilot projects to complete the cycle and coverage. This leaves some communities un-serviced compared to the communities in which pilot activities are implemented. But the infrastructure developed in piloted communities become unsustainable in relatively short time periods due to the usually overwhelming demand and use. At the national level, urban infrastructure development is not integrated to provide better services nor spatially organized for balanced development. There is a concentration of infrastructure investment in the central region and Kampala city gets a biggest share of investments while other major towns remain under-funded. Even within Kampala city, services and infrastructure development has not corresponded to the 4.9 percent annual growth rate of city service gaps and accentuating urban poverty [44], [53]. It is this background that provided the basis for a triangulated study in Kampala city, on how gendered the demand of services and

infrastructure is.

III. MATERIALS AND METHODS

The study undertook an end-user service satisfaction survey across the five municipal agencies: Kawempe, Makindye, Nakawa, Rubaga and Central division. The focus was laid focus on urban sanitation at neighborhood scale; public transport; physical infrastructure; and recreation services. The choice of these urban sectors enabled the design of both close and open-ended questions for capturing the gender differentials in residential, travel, working and leisure needs. A survey questionnaire was therefore used to collect data on such gender needs as well as the levels of awareness, access and satisfaction with city infrastructure and services by sex of the respondent. Purposive sampling was chosen to reliably permit the selection of female and male respondents, who have at one time accessed one or more city service. One hundred (100) respondents were interviewed in each division but since many of these had to be contacted from home, at the work place or from urban traffic, the survey acquired a response outcome of 470 out of the expected 500 respondents (244 male and 226 female respondents).

Data processing was done using descriptive statistics on the level of awareness, access and satisfaction with city services and infrastructure. The survey data was complimented with two separate-sex focus groups amongst city residents in order to profile and rank gender roles, mobility needs and preferences around the utilization of infrastructure. Additionally, key informant interviews were undertaken amongst planning departments in KCAA. The departments included physical planning and works, engineering, environmental services, labor, gender and community development. Analysis of focus group and interview data was conducted as conversations were being carried out. This allowed immediate grouping of responses to ultimately triangulate end-users', service providers' and planners' experiences on the delivery of services and infrastructure in Kampala city.

IV. THE GENDERED INFLUENCES ON THE UTILIZATION OF CITY INFRASTRUCTURE IN KAMPALA

In Kampala city, the utilization of infrastructure is socially conditioned by differentials in roles ascribed to women relative to men in domestic and commercial realms. From the separate-sex focus groups, we found out that women have triple gender roles: domestic care taking; income provision through participation in paid work; and communal roles that involve networking at neighborhood level as a way building new or maintaining already existing social capital. Men on the other hand, mainly focus on the search for paid work around the city and are much less involved in domestic care. This three-layered profiling of women's roles into domestic, commercial and communal was associated with shorter but multiple trips. This is because women usually prefer jobs or self-employment that is stationed nearer to the areas of residence for reduced travel time and distance between home

and the workplace, as they multi-task their care and commercial responsibilities. For this reason, women depend much on the available pedestrian footpath network, although a number of them opt for public Omni buses and private means if the travel involves reaching out to the city center or up-country. This kind of mobility pattern underlies women's preference for infrastructure that offers personal security, flexible pedestrian walkability, hygiene, physical comfort and working spaces that offer child care facilities.

Men's, greater presence in search for paid employment and the related aspects of family provisioning, makes them travel longer but fewer trips. We found out that men highly depend on cycling and driving to access places of work and back home, except in situations where walking is done at neighborhood level and along the streets in the city center. Therefore men were largely concerned about alternative travel routes for punctuality, safety in usage, convenience and quicker connectivity to public utilities. The study concluded that the utilization of infrastructure and the associated service delivery aspects is socially preconditioned by socio-economic preferences, which are determined by gender differentials in mobility needs.

V. SATISFACTION WITH SERVICES AND INFRASTRUCTURE IN THE CITY

A. Sanitation Services

Since urban environmental service provisioning is predominated by sanitation and waste management systems, we studied end-user satisfaction with sanitation services in Kampala. These mainly involve the removal of liquid and solid waste from commercial and residential areas by private and public entities to landfill centers in the peripheral parts of the city. The provision of community-level sensitization on public hygiene and installation of supportive environmental infrastructure follows including drainage systems, public toilets and waste skips. But from an end-use perspective, rating of performance in the sanitation sector was very low. Most of the male respondents (50.0%) and female respondents (51.0%) said that sanitation in the city is bad, as indicated in Table I.

TABLE I
 RATE OF SATISFACTION WITH SANITATION SERVICES

Sex of the respondent	Very Good	Good	Fair	Bad	Not able to tell
Male	2.4%	11.4%	23.3%	50.0%	12.9%
Female		6.1%	33.7%	51.0%	9.2%

The challenge according to officials from KCCA is environmentally irresponsible behavior amongst end-users, who keep throwing plastics in drainage channels and illegally dumping other waste on the streets. This leads to clogging of drainages, flash floods during heavy rains, contamination of air, water sources and exposure to diseases, malaria and cholera in particular.

The end-users, however, attributed the low ratings of performance to hygiene and sanitation difficulties in

neighborhoods and the city center. Although KCCA has raised awareness and involved community members in hygiene promotion and sanitation, the study discovered that women do not have inadequate provision of toiletries (especially sanitary bins) in public toilets whereas the men noted that the entry-charge of using a public toilet is most times not reallocated to bettering the services and improving the environmental quality around public facilities. The physical security and integrity of women around such facilities is constrained due to inadequate lighting, thereby a reduction in the levels of utilization at night. Furthermore, public toilets are not user-friendly for the disabled due to access-steps and toilet seats that are not aligned to their physical impairments. Accordingly, livability in sanitation terms is constrained by a combination of factors that include environmentally insensitive behavior and flaws in the design of infrastructure among others. .

B. Urban Transportation

We surveyed female relative to male end-users of public transportation to establish satisfaction from a gendered view point but also performance of the operationalization of public transport. Public transport in Kampala comprises 16 seater Omni buses in addition to passenger buses operated by town companies. The biggest share of passengers and trips of motorized transport is by the omni buses at 39%, followed by motor cycles at 8.9% and bus services at 0.1% [46]. Based on this distribution, users of transportation services indicated that all modes of transportation are blind about specific gender needs in public transportation. The gender groups identified as negatively affected are the pregnant women, elderly, PWDs while certain gaps in public transportation affect the entire population.

A close look at the bus services, users acknowledged that all vehicles operated on this service are gender insensitive because the design does not meet the boarding, sitting and disembarking needs of physically challenged persons and pregnant women. This is because of high steps for boarding and alighting while the disabled would find it difficult to board with wheel chairs and clutches in addition to the bus corridors not being wide enough to accommodate wheel chairs. For omni buses, the disabled group cannot use the service due to space limits. In addition to specific gendered needs around design of the vehicles used in transport, there are issues around operations the critical one being bus stops which are non-existent on many of the roads and where they exist, they are used and crowded by omni buses for picking passengers. The gender dimension of this shortcoming is a public transport system which is devoid of facilities that would bring about convenience, effective and efficient public transportation for all social groups. As part of operations, omni buses stop just anywhere and everywhere and this has affected traffic flow and inconveniences that translates into high costs associated with traffic jams and delays. According to a recent study by the Ministry of Works and Transport, the average travel speed is 2.5 km per minute in Kampala region [46]. This speed is low and the trips are too time-consuming; when we consider intra-city trips, traffic delays at peak hours

increases this time. The design of gender sensitive buses would have to utilize kneeling buses with wide corridors to enable use by the mentioned gender groups who need help, support and time to use the service.

Another issue for transportation services relates to road signage and usage. The signage placing is characterized by competition for space on and off the carriage way with advertisement. Walking and cycling take the biggest share of transportation in Kampala with 43% of all trips [46]. Yet pedestrians and cyclists compete with motorized transportation for space on the roads. Analyzed data indicates a fair to low satisfaction rating about adequacy of pavements usually utilized by cyclists and pedestrians. In practical gendered sense, the dominance of youths, low income earners and women as users of pavement spaces for walking and cycling is undoubted. These experiences are reinforced by the low levels of satisfaction with the transportation network that were captured from the survey and presented in Table II.

TABLE II
 RATE OF SATISFACTION WITH TRANSPORT SERVICES

Sex of the respondent	Very Good	Good	Fair	Bad	Not able to tell
Male	1.4%	17.7%	43.2%	32.7%	5.0%
Female	1.9%	21.2%	39.9%	30.8%	6.3%

The table shows that only 1.4% and 1.9% of the female and male respondents respectively indicated “very good”, in regards to public transport in Kampala city. This low level of rating on satisfaction with public transport was also attributed to persistent limitations in safety while travelling to, from and within the city. Both female and male respondents expressed concerns about competition for space on and off the carriage. The observation made is that the city road network is characterized by absence of segregated lanes for pedestrians, motorists and cyclists. This shortfall partly explains the prevalence of road accidents amongst pedestrians and cyclists. The highest number of victims in road accidents is usually pedestrians and cyclists [66]. At Kira Road police station in Nakawa division, for example, 43% of the accidents recorded affected pedestrians whereas 21% affected passengers in vehicles. A similar pattern was recorded at another police station in Kawempe division, where 32% of the accidents recorded had pedestrians as the victims and 25% were passengers. Respondents admitted that road crashes have time and labor consequences for women as custodians of family health who must take care of the injured and shoulder the household economic burden in case the main income generator dies.

The study revealed that women’s mobility is constrained by narrow sidewalks and the absence of pedestrian precincts, as they take short but multiple trips that maintain the household at neighborhood level. For the men, overcrowding and delays associated with traffic congestion mean that they have to take longer travel times and cannot rely on driving to take them to their destinations. Results of the survey on constraints showed that the overriding burden in transport amongst males is time constraints stemming from traffic congestion, represented by

72% of men's responses compared to 19% of the female responses. These gendered patterns and experiences signify the usefulness of comprehensive and accurate gender disaggregated information on urban transportation, as the entry point towards placement of end-user expectations at the center of delivering services and infrastructure.

C. Urban Physical Infrastructure

Study findings revealed that signage on roads, in and around buildings together with street lighting are not reliable in providing physical and visual clues to women and men for easing passage and access to other city services. Women said that it is usual to forego a travel if the street or neighborhood access road is not well-lit or if there is a perceived threat of getting lost or failing to find parking while shopping due to overcrowdings in the city center. Men on the other hand are usually victims of injuries and sometimes fatalities because they sit in the driving wheel and have to ensure the safety of pedestrians, other motorists and cyclists at road junctions and on the main streets of the city, due to inadequate lighting or failure to adhere to directional signage or the absence of it. Narrow pavements were also noted to be a limitation when seeking to overtake a person ahead of you or crossing from one road side to another. Respondents in the survey further noted that road signage is more dedicated to cars than pedestrians. They were also quick to note that even the available signage is not well maintained and sometimes obscured by advertisements and election posters, thus giving an impression of mess and negligence.

Data further indicated that the rating for ramps that ease of movement among persons with disabilities, is poor, with over 57.4% of the respondents rating as so. But the gender statistics indicated a higher proportion of female respondents rating their satisfaction with ramps as poor compared to men. This was further attributed to women's concerns about drainage works at neighborhood level that have no ramps, which hampers movement by disabled family members. The study also found out that sight impaired people move around the city with difficulty requiring support. For example, sound signals at road junctions with traffic lights are not installed. Sight-impaired road users would have to rely on other road users to get to know where it is safe to pass, which in some cases may not be available. In addition on-road guides for sight impaired people are also not installed like proper kerbs for them to know at what point they would when walking. Whereas this can be defrayed during day when pedestrian population is at its highest and can offer help to the blind, in the evenings and night, the blind would get serious problems. Women in need of bus stops with sheds (during day) and lighting (at night) to await a public taxi or other means of arrival to public places also commented on the absence facilities that guarantee personal security. These study findings indicate how essential and gender-differentiated the use of physical infrastructure is, in terms of facilitating movement and communication amongst women and men as they explore socio-economic opportunities around the city.

D. Recreation and Social Amenities

Recreation facilitates the existence of green infrastructure which makes planning for recreation parks, tree planting, green corridors and other environmental-friendly areas vital in Kampala. City authorities are in charge of well-maintained, lit and furnished green areas, squares, parks, entertainment halls, and play fields—all of which integrate environmental with physical development planning for the city. We found out that the location of a household determines women's access to leisure facilities and choice of travel means as well as number of hours to be spent on leisure activities. Respondents argued that since women are the primary care takers of the home, their preference usually lies in recreation facilities that are nearer to their residence or within the neighborhood. Further probing revealed that women at the lower scale of income rely on neighborhood/commuter routes to access entertainment centers in the evenings, and therefore safety on such routes is not only a physical but also leisure need. Women in relatively higher income groups can afford recreation facilities that are located far away from their homes, and therefore need well-lit streets and buildings to guarantee their physical integrity and safety from sexual violence while walking, cycling or driving back home in the night.

Responses showed that women and children need play fields nearer to homesteads or within recreation centers that can guarantee safe and amenable access by boys and girls, especially during weekends and school holidays. The same category of urban service-users require good lighting and landscaping, which creates active spaces for women to rest and not feel isolated during their chain of trips and varied destinations at neighborhood level. On the contrary, men were more concerned about the prices of family leisure trips because most green areas and entertainment centers are now privately owned with entry-user fees for maintenance and profit. Respondents argued that prices for family leisure trips are high, especially for low income groups, and therefore men prefer shorter and cheaper travel to recreation centers.

Urban service providers in KCCA noted that commercial developments within the center and at neighborhood scale should be the area of focus in responding to leisure needs while sustaining green spaces. However, during the survey we observed that commercial developments in Kampala have to a greater extent undermined the ways in which integrated urban land use can be applied to respond to leisure needs. There is a huge neglect of social amenities that they have been left to private sector. Though this might not be a problem, guidelines are yet to be in place on how private providers can value compatibility of land uses (environmental, physical and commercial). Such guidelines according to key informants should focus on interdependence between the natural and built environment in the recreation sector. However, an interviewee commented that it is increasingly becoming a hard-to-implement principle due to influence peddling during the approval of commercial and residential developments at KCCA.

E. Urban Planning Services

Urban planning in Kampala is one of the city authority's responsibilities, in which the institutional structure and processes guide at strategic and local-level configuration and development of urban space. But planning processes have not transcended the physical, economic and environmental accounts of urban service provision to include responsiveness to the gendered nature of infrastructure needs. The planning acts that form the basis for supporting social, economic, political and now environmental amenities are devoid of provisions on gender considerations in urban planning. The legal context within which physical plans are conceived and implemented is characteristic of the gender bias built into architecture and engineering and the broader arena of science and technology. The creativity that comes with undertaking a gender analysis around infrastructure needs has not been harnessed according to key informants at the city authority. The respondents added that there is limited strategic urban planning and it is piecemeal planning that characterizes local-level development.

Kampala has a recently approved Physical Development Plan that is a broad framework for spatial development. At city-wide level planning focuses on strategic location of land use and activities, infrastructure, environmental conservation and promotion of economic activity. At neighborhood level planning considers issues including accessibility, circulation network, physical infrastructure, connectivity and local economic opportunities. At site or plot level, planning looks at specific issues like provision for kitchen, bath places space utilization and adequacy in a house.

From interviews with planners in KCCA, development in the city is largely occurring informally and not aligned with the spatial plan. In addition such development is also inadequate in responding to the needs of women relative to men in respect to housing, safe community roads and amenities. On this back drop of systemic failure of planning at all levels, there is an amenity deficit and need that many people in Kampala have taken individual ingenuity to fill the gap. The result is a cumulative imprint of informal neighborhoods characterized by conflicts and poor conditions of living that have pushed the majority to marginal places such as low lying areas prone to flooding. The gendered impacts of failed planning and inadequate livability in the city are far reaching with female dwellers exposed to various forms of gender violence during day and at night [9]. The linkage between systemic failure of planning and gender violence is partly shown by the rating of safety on community roads. The majority respondents of 80% rated safety as fair or poor and the gender differentials on the same rating indicate a slightly differing rate between women and men by 2%. This close rating points to the wider effect of safety to all social groups and categories in the city which speaks to a normative call for engendering the city infrastructure to enable livability in Kampala. From in-depth interviews, it was established for example most people in slum areas are single mothers and that livelihood strategies are very much locale based in the neighborhood.

The challenges of raising children in informal settlements with no basic infrastructure are far reaching let alone the specific challenges around leaving a backyard with skeletal drainage characterized by flowing grey water that exposes the children, the disabled and women to environmental health risks [34]. In line with proposals regarding gendered needs of infrastructure, urban planning needs to respond in a more innovative way that considers affordability, social inclusiveness and sustenance minimum housing and neighborhood level service standards to support these groups. The standards can be used as a tool for mainstreaming gender concerns but also for evaluation of progress. For community level infrastructure planning is done but implementation does not cater for pedestrian precincts. According to the planners in KCCA, an eight (8) meters of carriage way of a road reserve of 20 meters is commonly implemented because the compensation requirements to occupiers of the land. This implies a limitation in adequately responding to the desired reduction in competition amongst the gendered groups of road-users on the carriage way.

VI. APPLYING GENDER RESPONSIVENESS TO URBAN PLANNING PROCESSES: A FRAMEWORK FOR CITIES IN AFRICA

Much of the infrastructure planning in African cities relies on technical designs that are based on the way planners are socialized in training institutions. The values that lie beneath such training are largely traceable to conceptions and rationalities of urban sustainability in global north contexts. This is partly why planning is underpinned by engineering designs that do not question the social divisions amongst cities within and across regions. The findings from Kampala signify that traditional engineering and architectural designs do not necessarily mirror the social context within which African city dwellers—be it men or women—perceive urban living and working in relation to infrastructure usage.

Gender responsiveness may not provide all the answers but brings the lived realities of urban dwellers to the center of planning processes and their effects. For instance, urban planning and design in many African cities tends to separate living and working spaces, which translates into higher travel times for all segments in the urban population between homes, markets, schools, and other urban spaces. This type of urban design is burdensome for women who traditionally combine employment with care and other claims on their labour. To address the challenge, gender responsive urban designs would for example create housing and neighborhoods with on-site child-care and elder-care facilities, shops for basic everyday needs, and often primary-care medical facilities.

But such design would have to be preceded by disaggregating end-user demand for services and infrastructure by sex, location and connectivity to public utilities, thus deepening the analysis on needs to inform the design of plans, programmes and policy decisions that respond accordingly. But the capacity to conceive, design and deliver infrastructure and services that are customized to differentials in women's relative to men's needs, is still lacking amongst planners in much of urban Africa. The study found out that

several capacity building workshops and trainings have been conducted for this purpose in across municipalities in the region, but at the time of the study there was no indication of applying the knowledge and skills gained to the routine procedures of economic, physical and environmental planning, yet not less than 10% of the official development assistance (ODA) to African cities is spent on this purpose.

If the knowledge acquired could be effectively used to mainstream gender into planning, processes such as procurement and contracts management, which is one of the key interfaces between service providers and end-user demands, could involve tasking the physical planning and works departments to input gender considerations into the Bill of Quantities (BoQs) for contractors. Examples of such gender considerations include signage that provides visual and physical clues for all gendered categories of road users (pedestrians, motorist and cyclists), obliging construction firms to comply with the stipulated width and length of pedestrian precincts, the positioning and design of signage and providing equal employment opportunities to female and male casual laborers while ensuring that the design of urban spaces caters for the physically impaired, adequate lighting within and outside the building, parking slots for wheel chair users, door-way signs and toilets that have sanitary bins for women's comfort. To achieve this, we propose a framework for gender responsive planning at city level as below;

a) Conceptual Planning and Design;

In all urban sectors, one of the initial steps in service provision is the thinking behind the design of a plan and or its strategy, a process known as conceptualization. This step is very crucial in gender responsive planning because it is where tools for baselines and situational analyzes need to be disaggregated to ensure capture of gender differentials in needs and design requirements for a planned infrastructure, service and or system. At this stage, the gender needs are identified, detailed according to sex, location and socio-economic status. This leads to the attainment of gender disaggregated data and analysis for proper identification of differentials in needs by urban sector and category of end-user.

b) Installation and Implementation;

Following design is installation for infrastructure and or implementation if it is more of a procedure or system like decision making processes. At this stage is the importance of supervision to ensure that gender responsive designs, for example road signage that heeds to differences in language proficiency and visualization, are adhered to during installation. Gender responsive planning is implemented at this stage. A key function is the procuring of services and or equipment that is aligned to gender needs, something that is often thought of as an additional cost, yet if well understood and appreciated from the end-user point of view, can be budgeted for using the available resource envelope. In KCCA, it is common for procurement and financial processes to consider gender mainstreaming as an issue that is either

irrelevant in physical work or a donor-driven requirement that needs a separate budget. However, it is costlier to neglect end-user demands than investing a service or infrastructure that is not user-friendly in strategic terms.

c) Operationalization;

This stage is characterized by detailing the procedures and arrangements for putting into operation the designed and implemented infrastructure or service action plan. Operationalization includes rules of use, modalities for operation, incentives and penalties for female relative to male users. This requires close monitoring for compliance including security against vandalism and theft in the case of urban furniture, like phone booths for real-time communication while on travel around the city. It is at the operationalization stage that differences in end-user needs are neglected, for example enforcing rules of designated spaces for disabled persons in parking slots to ensure that they access these spaces. Whereas many a time regulations and rules exist, city authorities in Kampala city have perpetually lamented about enforcement challenges. This an area for improvement and change if planning is to be successful but it stems from the whole set of activities required for operationalization.

d) Evaluation;

At this stage, the aim is to track progress on the results gained from at the earlier steps of gender responsive planning. Such results may have been planned or unplanned, but the essence to gain feedback for purposes re-aligning the gender responsive planning process to consolidate the gains made in the interim and devise strategies for addressing the challenges that have emerged. This further interlinks the earlier stages of gender responsive planning through a feedback loop, for purposes of continuous improvement in the design and delivery of services and infrastructure.

The framework presented contributes to the closure of Africa's infrastructure deficit by providing an entry point to understanding how the physical, environmental and economic aspects of cities can be integrated to positively affect the lives of women and men. Gender responsiveness framework has the potential to match planners' ideas about service delivery with end-user needs, something that is crucial in ensuring that the design of physical and social spaces in cities is guided by decisions that are based on the ideals and preferences of city residents [55], [56]. Gender responsiveness further makes women and men not only community-level participants but also partners in shaping the urban planning agenda. This is an issue that has been earlier emphasized by participatory urban planning, as a pathway to improving the quality of places in ways that offer a sense of not only livability but also belonging and ownership to the local population [21], [61], [54].

However, striking a balance between the idea of gender responsiveness in urban planning with the emerging demand for green, inclusive and safe cities is something that African planners ought to consider. Such a balance is obtainable if planning processes follow a holistic path, where end-user

needs are the basis for defining how green, inclusive, gender responsive and safe a given city should be and further analyzing how planning processes can be adjusted to take on priorities that benefit the entire urban population [20], [58], [31], [63]. Although the application of such plurality to urban planning processes has been critiqued for being generalistic and un-standardized [12], [42, p. 29], there is need for African cities to appreciate and understand how the integrated nature of urban planning functions and gender responsiveness in particular, can support the innovative use of information about service end-user needs in the design and implementation of programmes for effective response in different urban sectors. This is what underlies the step-wise framework for applying gender responsiveness to urban planning processes. Since the study findings revealed how the use of services and infrastructure is differentiated by gender roles and mobility needs, it is rational for African cities to adopt the framework while designing city infrastructure and related service delivery programmes.

ACKNOWLEDGMENT

We thank the World Bank, Uganda Country Office for the financial support towards the research, under the Kampala Institutional and Infrastructure Development Project (KIIDP). Special thanks go to colleagues under the same project, Dativa Nabimanya and Professor Ahikire Josephine as well as the KCCA Team, including Harriet Mudondo, Josephine Lubwama, Ruth Muguta and Kigundu Tamale.

REFERENCES

- [1] J. Abbott, 'An analysis of informal settlement upgrading and critique of existing methodological approaches,' *Habitat International*, 26(3), pp. 303-315, 2002.
- [2] A. Acquah, 'Agents of change: an analysis of gender planning for development in Africa at the Canadian International Development Agency,' Doctoral dissertation, University of Ottawa, pp. 25-26 (2012).
- [3] African Development Bank, 'An integrated approach to infrastructure provision in Africa: Economic Brief,' African Development Bank, 2013.
- [4] J. Ahikire, 'Gender training and the politics of mainstreaming in post-Beijing Uganda. Revisiting gender training. The making and remaking of gender knowledge', 39, 2007.
- [5] J. Alm, 'Financing urban infrastructure: knowns, unknowns, and a way forward,' *Journal of Economic Surveys*, 23(4), pp. 234, 2013.
- [6] F. Alparone, and A. Rissotto, 'Children's citizenship and participation models: participation in planning urban spaces and children's councils,' *Journal of community & applied social psychology*, 11(6), pp. 13-14, 2001.
- [7] A. Anttiroiko, P. Valkama, and S. Bailey, 'Smart cities in the new service economy: building platforms for smart services,' *AI & SOCIETY*, 1(12), pp. 10-11, 2013.
- [8] L. Bondi, and D. Rose, 'Constructing gender, constructing the urban: a review of Anglo-American feminist urban geography,' *Gender, Place and Culture: A Journal of Feminist Geography*, 10(3), pp. 229-245, 2003.
- [9] C. Boomsma, and L. Steg, 'Feeling Safe in the Dark: Examining the Effect of Entrapment, Lighting Levels, and Gender on Feelings of Safety and Lighting Policy Acceptability,' *Environment and Behavior*, 34(9), p. 6, 2012.
- [10] W. Buhr, 'Infrastructure of the market economy (No. 132). Volkswirtschaftliche Diskussionsbeiträge/Universität Siegen,' pp. 26-29, 2009.
- [11] K. Buyana, and S. Lwasa, 'Gender responsiveness in infrastructure provision for African cities: The case of Kampala in Uganda,' *Journal of Geography and Regional Planning*, 7(1), pp. 1-9, 2014.

- [12] K. Cao, and Y. Zhang, 'Urban planning in generalized non-Euclidean Space,' *Planning Theory*, 12(4), p.6, 2013.
- [13] G. Cappiello, P. Garrone, and P. Nardi, 'Cooperation between Local Actors in Infrastructure Projects-Evidence from Italian Utilities,' pp.30-31, 2011.
- [14] S. Chant, 'Cities through a "gender lens": a golden "urban age" for women in the global South?' *Environment and Urbanization*, 25(1), pp. 9-29, 2013.
- [15] S. Connelly, S. Markey, and M. Roseland, 'We Know Enough: Achieving Action Through the Convergence of Sustainable Community Development and the Social Economy,' *The Economy of Green Cities*. 12 (6), p. 2, 2013.
- [16] E. Dabla-Norris, J. Brumby, A. Kyobe, Z. Mills, and C. Papageorgiou, 'Investing in public investment: an index of public investment efficiency,' *Journal of Economic Growth*, 17(3) p.5, 2012.
- [17] N. Dempsey, G. Bramley, S. Power, and C. Brown, 'The social dimension of sustainable development: Defining urban social sustainability,' *Sustainable Development*, 19(5), p. 6, 2011.
- [18] J. Ennew, and J. Swart-Kruger, 'Introduction: Homes, places and spaces in the construction of street children and street youth,' *Children, youth and environments*, 13(1), p.6, 2003.
- [19] V. Foster, and C. Briceño-Garmendia, (Eds.), 'Africa's infrastructure: a time for transformation,' World Bank-free PDF, pp. 45-60, 2010.
- [20] M. French, and C. Lalonde, 'Green Cities Require Green Housing: Advancing the Economic and Environmental Sustainability of Housing and Slum Upgrading in Cities in Developing Countries,' *The Economy of Green Cities*, 12 (1), pp. 1-6, 2013.
- [21] M. Garcia-Ramon, D. Maria, O. Anna, and P. Maria, 'Urban planning, gender and the use of public space in a peripheral neighbourhood of Barcelona,' *Cities* 21 (3), p.6, 2004.
- [22] S. Geertman, J. Stillwell, and F. Toppen, 'Introduction to Planning Support Systems for Sustainable Urban Development,' *Planning Support Systems for Sustainable Urban Development*, 195 (1-15), p. 8, 2013.
- [23] T. Harada, 'Transnationalism reversed, women organizing against gendered violence in Bangladesh,' *Gender, Place & Culture*, 20(7), 934-936, 2013.
- [24] P. Harrison, 'On the edge of reason: planning and urban futures in Africa,' *Urban Studies*, 43(2), p.7, 2006.
- [25] D. Helm, and T. Tindall, 'The evolution of infrastructure and utility ownership and its implications,' *Oxford Review of Economic Policy*, 25 (3), pp. 23-24, 2009
- [26] C. Hoehner, L. Brennan, R. Brownson, S. Handy, and R. Killingsworth, 'Opportunities for integrating public health and urban planning approaches to promote active community environments,' *American Journal of Health Promotion*, 18(1), p. 11, 2003.
- [27] M. Hove, E. Ngwerume, and C. Muchemwa, 'The Urban Crisis in Sub-Saharan Africa: A Threat to Human Security and Sustainable Development. Stability,' *International Journal of Security and Development*, 2(1), p.9, 2013
- [28] H. Jarvis, J. Cloke, and P. Kantor, *Cities and gender*, Routledge London, pp. 256-257, 2009.
- [29] C. Kessides, *The urban transition in Sub-Saharan Africa: Implications for economic growth and poverty reduction*, Cities Alliance, Washington DC, p.64, 2006.
- [30] J. Khadaroo, and B. Seetana, 'Transport and economic performance: The case of Mauritius,' *Journal of Transport Economics and Policy*, 17(3), pp. 3-7, 2008.
- [31] F. Klodawsky, 'Gendered livelihoods and inclusive cities. Building Inclusive Cities,' *Women's Safety and the Right to the City*, 19, p. 7, 2013.
- [32] A. Lacey, R. Miller, D. Reeves, and Y. Tankel, 'From gender mainstreaming to intersectionality. Building Inclusive Cities,' *Women's Safety and the Right to the City*, 143, p. 10, 2013.
- [33] C. Linard, A. Tatem, and M. Gilbert, 'Modelling spatial patterns of urban growth in Africa,' *Applied Geography*, 44, pp. 23-32, 2013.
- [34] S. Lwasa, M. Tenywa, G. Mwanjalolo, H. Sengendo, and G. Prain, 'Enhancing adaptation of poor urban dwellers to the effects of climate variability and change,' *Earth and Environmental Science*, 6(33), p. 10, 2009.
- [35] M. Mayer, 'The 'Right to the City' in the context of shifting mottos of urban social movements,' *City*, 13(2-3), p.7, 2009.
- [36] L. McDowell, *Capital culture: Gender at work in the city* (Vol. 65), John Wiley & Sons : London, pp. 45-67, 2011.

- [37] M. McHale, D. Bunn, S. Pickett, and W. Twine, 'Urban ecology in a developing world: why advanced socio-ecological theory needs Africa,' *Frontiers in Ecology and the Environment*, 11(10), 556-564, 2013.
- [38] C. McIlwaine, 'Urbanization and gender-based violence: exploring the paradoxes in the global South,' *Environment and Urbanization*, 25(1), p. 10, 2013
- [39] A. McRobbie, 'Clubs to companies: Notes on the decline of political culture in speeded up creative worlds,' *Cultural studies*, 16(4), p. 6, 2002.
- [40] R. Mudambi, 'Location, control and innovation in knowledge-intensive industries,' *Journal of Economic Geography*, 8(5), p. 10, 2008.
- [41] B. Ndulu, 'Infrastructure, regional integration and growth in sub-Saharan Africa: dealing with the disadvantages of geography and sovereign fragmentation,' *Journal of African Economies*, 15(suppl 2), pp. 212-244, 2006.
- [42] M. Ng, and J. Xu, *Second Metamorphosis? Urban Restructuring and Planning Responses in Guangzhou and Shenzhen in the Twenty-First Century*, Springer : Netherlands, pp. 29-60, 2014.
- [43] Nwaka, G. I. (2005). The urban informal sector in Nigeria: towards economic development, environmental health, and social harmony. *Global Urban Development Magazine*, 1(1).
- [44] P. Okwi, T. Emwanu, and J. Hoogeveen, *Poverty and Inequality in Uganda: Evidence from Small Area Estimation Techniques*. World Bank and UBOS working paper, 2003.
- [45] Republic of Uganda 2010. Kampala Capital City Authority Act
- [46] ROM and KCCA (2012). Draft Final Report on the Kampala Physical Development Plan. Kampala, Uganda
- [47] A. Roy, 'Slum-free cities of the Asian century: Postcolonial government and the project of inclusive growth,' *Singapore Journal of Tropical Geography*, 3(4), p. 7, 2014.
- [48] A. Larsson, 'From equal opportunities to gender awareness in strategic spatial planning: Reflections based on Swedish experiences,' *Town Planning Review*, 77(5), pp. 507-530, 2006.
- [49] K. Seto, B. Güneralp, and L. Hutyra, 'Global forecasts of urban expansion to 2030 and direct impacts on biodiversity and carbon pools,' *Proceedings of the National Academy of Sciences*, 109(40), pp. 16083-16088, 2012.
- [50] C. Thompson, 'Urban open space in the 21st century,' *Landscape and urban planning*, 60(2), p. 10, 2002.
- [51] J. Turner, and P. Fouracre, 'Women and transport in developing countries,' *Transport Reviews*, 15(1), p. 7, 1995.
- [52] Uganda Bureau of Statistics: Uganda Demographic and Health Survey, 2000/2001. Entebbe,
- [53] Ministry of Finance and Economic Planning and Macro International Inc., Calverton, Maryland, USA 2002.
- [54] M. Van den Berg, 'City Children and Genderfied Neighborhoods: The New Generation as Urban Regeneration Strategy,' *International Journal of Urban and Regional Research*, 10, p. 12, 2012.
- [55] T. Van Dijk, N. Aarts, and A. De Wit, 'Frames to the Planning Game,' *International Journal of Urban and Regional Research*, 35, p.7, 2011.
- [56] R. van Stigt, P. Driessen, and T. Spit, 'A window on urban sustainability: Integration of environmental interests in urban planning through 'decision windows,' *Environmental Impact Assessment Review*, 42, p. 33, 2013.
- [57] R. Wekerle, *Women's rights to the city. Democracy, Citizenship and the Global City*, Routledge: London, p. 9, 2013
- [58] E. Werna, 'Working in Green Cities: Improving the Urban Environment While Creating Jobs and Enhancing Working Conditions,' *The Economy of Green Cities*, 34(1), p.7, 2013.
- [59] C. Whitman, C. Legacy, C. Andrew, F. Klodawsky, M. Shaw, and K. Viswanath, (Eds.), *Building Inclusive Cities: Women's Safety and the Right to the City*, Routledge: London, p.2, 2013.
- [60] L. Winayanti, and H. Lang, 'Provision of urban services in an informal settlement: a case study of Kampung Penas Tanggul, Jakarta,' *Habitat International*, 28(1), p.12, 2004.
- [61] T. Yigitcanlar, K. Velibeyoglu, and S. Baum, 'Knowledge-based urban development: planning and applications in the information era,' *Information Science Reference*, 24(3), pp. 4-7, 2008.
- [62] <http://siteresources.worldbank.org>
- [63] <http://gender.stanford.edu/news/2014/gendered-innovations-transform-housing-and-neighborhood-design>
- [64] Republic of Uganda 1997. Local Governments Act
- [65] Republic of Uganda 2000. Physical Planning Act
- [66] Republic of Uganda 2011. Police Records Kampala Metropolitan
- [67] L. Schiebinger, and M. Schraudner, 'Interdisciplinary Approaches to Achieving Gendered Innovations in Science, Medicine, and Engineering,' *Interdisciplinary Science Reviews* 36(2) pp. 154-167, 2011