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# Are sub-Saharan African cities walkable?

## Peoples' perspectives on the walking environment in rapidly growing cities: The case of Dar es Salaam City

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***ABSTRACT***

**Context and background:**

This paper explorers the perspectives of pedestrians on the walking environment in Dar es Salaam in order to inform the land use and transport planners to think of walking spaces in a situation of increased motorised means of transport for enhancing pedestrian safety. Despite a significant number of urban trips in Sub-Saharan African cities are made on foot; still the infrastructural facilities for pedestrians and the other Non-Motorised Transport have largely been neglected. Faced with high rates of motorisation and the advent of transportation technology; city authorities are more preoccupied with road-based motorised transport systems. Most city authorities including Dar es Salaam are busy building arterial streets, Rapid Bus Transport systems (BRTs), flyovers and expansion of highways to inter alia reduce motorised congestion, while the needs of pedestrians are widely ignored, a situation that expose pedestrians to road accidents and poor spatial quality on the ground.

**Goal and Objectives:**

The overall objective of this paper is to examine the perspectives of pedestrians on the walking environmennt in a stuation of increased transport and to recommend for policy and planning interventions through which the walking environment in cities of developing countries can be improved.

**Methodology:**

On methodological fronts, the study adopted a mixed research methodological approach and a caste study research strategy. Data were collected by using observations, unguided group discussions, questionnaire and checklist. Open and closed questions were developed and addressed to the resident households, pedestrians and professional experts to provide views regarding the walking environment in Sub Saharan African cities. A total of 100 respondents (72 resident households and 28 pedestrians) and 22 pupils were purposely selected from three sub/cases for in-depth interviews. Out of 100 respondents 28 were women, 12 were people with disabilities and 15 were the elderly (aged 60+) persons.

**Results:**

The findings revealed that the physical environment in Dar es Salaam is not pedestrian friendly as the pedestrians' requirements are inadequately considered in the national related policies and project implementations. People in Dar es Salaam perceive that the walking environment is uncomfortable, dangerous and insecure from crime. The walkways provided lacked continuity, maintenances, safety, street furniture and fixtures. The walkways also experienced encroachments by street vendors, flooding and damping of solid wastes. The National policies give little attention to pedestrians and other NMT road users, who are often the losers in the struggle for urban space and have little power to influence the urban transport agenda.

***Keywords:***

*Walking, Walkability, perceptions; pedestrians*

## 1. Context and background

Walking is a common and basic mode of transport among all societies across the world (WHO, 2013). Walking is probably a major transport mode in cities of developing countries as it provides mobility to a high percentage of the urban population (Gwilliam 2002; Krambeck 2006). Urban transport studies in Africa show that walking and cycling contribute 50% of all trips (Pendakur, 2005; Montgomery and Roberts, 2008; Mosha and Mosha, 2012). Sub-Saharan African cities hold the largest numbers of walkers. The share of walking trips is 70% in Addis Ababa and Kinshasa, 63% in Harare, approximately 62% in Ugandan and Zimbabwean cities, and 61% in Cape Town, South Africa, especially the lower income people in Cape Town. He adds that the modal share for walking accounts for 60% in Bamako and Niame, 47% in Nairobi, 45% in Dar es Salaam and 42% in Ouagadougou (Pendakur, 2005).

Even though the significant number of trips in Sub-Saharan African cities is made on foot, yet infrastructural facilities for pedestrians and the other Non-Motorised Means of Transport are inadequate. City authorities make improvements in vehicular rights of way at the expense of pedestrians with a substantial decrease in the quality of public realms and walking environment (Mosha and Mosha, 2012). The availability of motor vehicles in private households and the accessibility of affordable land have led to extensive suburbanisation processes at the urban fringe). Dependency on cars characterises the mobility patterns of middle-class households which are thus based on the use of private vehicles, contributing massively to urban sprawl, traffic congestion, air pollution, noise and makes a more unsafe environment for pedestrians of all ages and abilities. (Lukenangula and Baumgart, 2020). With the high level of car use, public space is contested: on the one hand there is a dominance of streets and parking lots; on the other hand the demands of pedestrians and cyclists are becoming more explicit, calling for safety and quality of stay. However, urban-planning strategies still only focus on giving equal priority to all road users to a limited extent (ibid).

Generally, the welfare of pedestrians is often sacrificed to planning for the fast flow of vehicles and investment in facilities for pedestrians is comparatively low (Pendakur, 2005; Montgomery and Roberts, 2008). Pedestrian infrastructure, amenities and services are often neglected in municipal planning and budgets (Krambeck, 2006). Although eliminating usage of automobiles is impossible, however, eliminating the use of a vehicle for short trips could be drastically reduced if walkability is promoted in residential neighbourhoods.

Apart from facilitating pedestrian movements and access to livelihoods, walking spaces may also promote public health, safety, social equity, economy, sustainability and inclusiveness. Inclusive mobility is a precondition for active living, sustainable, safe and resilient cities (Montgomery and Roberts; 2008; McNally, 2010; Lo, 2009; Matchett, 2010; Paulo, 2012; WHO, 2015; Lukenangula, 2017).

The issue of convenient and efficient pedestrian spaces in the Sub-Saharan African cities is particularly a concern that has eluded policies and action among governments. This is a very relevant urban development challenge that is of great interest not only in Tanzania but in almost all countries in the South. Faced with high rates of motorization, cities in the Global South are more preoccupied with motorised transport systems. In so doing, the needs of pedestrians that constitute the biggest

users of streets are often ignored. The urban poor who comprise bulk of the urban population in all cities in the South suffer most due to lack of accessible, safe and convenient connectivity especially pedestrian walkways; and most importantly their sources of livelihoods are highly impeded. In most cities of the Global South, pedestrian walkways including provision of supporting facilities are generally neglected or considered an unimportant aspect.

However, the International Charter for Walking argue that pedestrians are entitled to a right of way on public owned streets mainly because the important part of the public realm is public owned streets. Access, circulation, and enhancements to the visual character of the urban form are some of the inter-related roles that the public realm serves (Mosha and Mosha 2012). The International Charter for Walking has itemized eight rights that:

- Communities have the right to expect land-use and spatial planning policies which allow them to walk to the majority of everyday services and facilities, maximizing the opportunities for walking, reducing car-dependency and contributing to community life;
- Communities have the right for their streets to be designed to prevent accidents and to be enjoyable, safe and convenient for people walking – especially children, the elderly and people with limited abilities;
- Communities have a right to up-to-date, good quality, accessible information on where they can walk and the quality of the experience. People should be given opportunities to celebrate and enjoy walking as part of their everyday social, cultural and political life;
- Communities have the right to a network of connected, direct and easy to follow walking routes which are safe, comfortable, attractive and well maintained, linking their homes, shops, schools, parks, public transport interchanges, green spaces and other important destinations;
- People in communities have the right to access streets, squares, buildings and public transport systems, regardless of their age, ability, gender, income level, language, ethnic, cultural or religious background, strengthening the freedom and autonomy of all people, and contributing to social inclusion, solidarity and democracy;
- Communities have the right to live in a healthy, convenient and attractive environment tailored to their needs, and to freely enjoy the amenities of public areas in comfort and safety away from intrusive noise and pollution;
- Communities have the right to expect an urban environment designed, maintained and policed to reduce crime and the fear of crime; and
- Communities have the right to expect authorities to provide for, support and safeguard their ability and choice to walk" (www.walk21.com/charter).

According to the International Charter for Walking, people have the right to walk, access, and use urban public spaces. This argument is in line with the concept of the right to the city developed by Henri Lefebvre in 1968. This implies that if such rights are not realized in a particular city, people have the right to reclaim for urban public space (Lukenengula, 2017). Despite the fact that pedestrians have the rights to access and use urban public spaces, these rights are rarely realized in cities of developing countries. Contrary to cities of the developed world which have plans to

transform arterial streets to accommodate pedestrians and further to create livable streets, cities of the developing world are more preoccupied with building arterial streets for motorized vehicles, thereby ignoring the needs of pedestrians that constitute the biggest users of streets (UN-Habitat, 2013b). However, it should be noted that prioritization of motorized vehicles is a short-term approach that temporarily eases traffic flow, but also stimulates growth in vehicle numbers and use that will again result in more congestion. ITF (2012) adds that ensured walking is not only an attractive alternative that complements to motorized transport, but also a core response to the challenges of climate change, fossil fuel dependence, pollution, maintaining mobility for an ageing population, health and managing the explosion in motorization expected in low-income and middle-income countries.

Continued disregard of planning for pedestrian friendly environment has also resulted in increased numbers of pedestrian fatalities, injuries and crashes as well as rise in household expenditure on transport costs, travelling time, insecure streets, decreased quality of the public realm, and hostile pedestrian environment (WHO, 2015). To address these challenges, the concept of walkability concerns: "the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network" (Southworth, 2005: 148). This is in line with Goal 11 of 2030 Agenda for Sustainable Development that aims to make cities inclusive, safe, resilient and sustainable.

Research and scholarly debates have identified insufficient knowledge on safety management in urban areas of the developing countries. However, there is limited knowledge on how the pedestrian requirements are considered in policy making, planning and implementation of plans in the situation of increased motorised transport. From this background, the overall objective of this study was to explore the perspectives of pedestrians on walking environment and suggest policy and planning interventions through which the walking environment in cities of developing countries can be improved.

## 2. Conceptualizing pedestrian requirements

### Hierarchy of walking needs

The derivation of this hierarchy was inspired by the work of Southworth (2005: 148) whereby connectivity of path network, linkage with other modes, fine grained and varied land use patterns, safety, quality of path and path context including street designs and visual interest of the built environment constitutes the attributes of a walkable network. The essence of deriving the hierarchy of walking needs is to establish a relationship that can help to appreciate why does one choose to walk along a certain route when it is sunny, but this other route when it is raining, or completely stop from walking the time when he/she manages to own a car after which he/she resort to become rich enough to own and drive?. The literature indicates that people are willing to walk if the pedestrian route contains the following four tiers;

**Connectivity**; The first level of walking and which is the base and fundamentally required is *connectivity.* This means that the basic need to travel is first influenced by the continuity/connectivity of the route (i.e. without barriers in between). The literature shows that dis-connectivity of

pedestrian routes is a genuine problem in many cities of developing countries, particularly in Sub-Saharan African cities. As motorization increase, pedestrians are often neglected in infrastructure provision. Pedestrians often detour to overcome any barriers unless they are really overwhelming. Pedestrians in these cities are traced going through low lying areas which are sometimes impassable during rainy days. Unlike developing cities, a lack of connectivity in developed cities will not cause pedestrians to detour or overcome barriers via walking, instead they give up and hop straight into their cars or taxis to gain 'accessibility' which is the third tier of the walking needs and which is discussed in the next sections. This is because people in high-income countries have an alternative choice other than walking. Therefore, it is necessary to assess the perspectives of pedestrians in relation to connectivity of pedestrian network.

**Safety and security;** the second tier of walking is about the *safety and security* of the walking route. Having satisfied that there is a connected path to walk on, the next one can start worrying about the threat of vehicles or other danger along a particular walking route. This implies that safety is a second level to the first connectivity tier, that is to say, without being connected, safety is not an issue. Safety and security is inspired by the literature regarding walking in cities of developing countries where the key improvement measures involve traffic segregation, pedestrian crossings and other traffic calming measures so as to enhance the pedestrian safety. In cities of developing countries street muggings, pick pocketing and other form of crime influence the desire to whether walk or not. For developed cities, pedestrians can also be victims of crime issues and bad driving habits, and hence pedestrian safety and security are always important variables to be considered.

***Accessibility*;** that is the ease of getting to destinations and to the other modes and for mobility impaired to use. This tier of accessibility is of great significance to the vulnerable groups (i.e. children, women, the elderly and the people with disabilities) who simply do not have a choice to switch from walking. This third level is derived from the fact that having improved the connectivity, safety and security of walking routes, people's expectations and mobility increase and hence are likely to demand getting to various land uses destinations or connect to other transit nodes quicker and easier. Furthermore, the accessibility level is also associated with the accessibility for the mobility-impaired and the demand for better quality walkways. This tier implies that cities should not end by just connecting pedestrians to a certain not, pedestrians will not be happy. They tend to demand these connections to be accessible and usable by all, short and direct with least physical and mental effort to use.

**Convenience and attractiveness**; The final level of the hierarchy of walking needs is the convenience and attractiveness of the walking routes where comfort and aesthetics of the walking environment come in to derive the best walking experience. Although this tier seems abstract since it is psychologically and contextual too, the Author is of the opinion that enjoyment and comfort of the walking routes have the ability to influence the accessibility to various destinations both positively and negatively. The author is of the opinion that given any urban walking environment where connectivity, safety and security needs are fulfilled, still convenience, attractiveness, and enjoyment of the route are the key factors that can influence walking behavior with a reasonable level of accessibility needs being met.

This question regarding what constitutes a 'walking friendly environment' has been addressed in the work by Transport for London (COST 358, 2010), where the *Pedestrians' quality needs* were interpreted into five 5Cs (i.e. Connectivity, conspicuity, comfort, convenience and conviviality). The 5Cs reflects the pedestrians' desire to make their journeys in the shortest and most convenient way possible, as a safe, pleasant and comfortable journey experience (ibid). Apart from the 5Cs, Paulo (2012) adds that when assessing the pedestrian needs two more dimensions need to be considered. These are namely, coexistence and commitment.

*Commitment* refer to the engagement of the policy makers, spatial and transport planners in promoting pedestrian friendly environments (Paul, 2012). *Coexistence* refer to the extent to which pedestrians and other transport modes can exist at the same time and place with order and peace (Paulo, 2012). The role of motorized means of transport in influencing the attitude towards walking is felt at different levels. Firstly, motorized vehicles need space to circulate, a situation that results into the encroachments of the pedestrian space. Secondly, as a number of accidents and conflicts occur daily in the urban space and hence understanding the motorists' behaviour is of great significance as pedestrian safety is concerned.

## 3. Research Methodology

### 3.1 A brief introduction to the three case study area:

Dar es Salaam is one of the fastest growing megacities in Sub-Saharan Africa with huge urban development pressure with annual growth of around 6%. Dar es Salaam is the commercial City and main port of Tanzania with a total surface area of 1,800 square kilometres, comprising of 1, 393square kilometres of land mass (DCC, 2004:6). The population of Dar es Salaam as a metropolitan City is two times larger than the second City (Mwanza) (NBS, 2013: 2). The increased birth rates coupled with rural-urban migration rates are the two main drivers of the rapid population growth in the City. Dar es Salaam has a road network of a total length of about 1,950 kms of which only 1120 kms are paved (DCC, 2004). The majority of these roads are of poor surface conditions caused partly by lack of maintenance due to, among other factors, financial constraints. Moreover, most of these roads do not have walkways and bicycle-ways, leading to non-segregation of traffic.

Regarding housing development, formal and informal settlements are the two predominant forms of settlements within the City. Over 70% of the urban population live in unplanned settlements, only a few reside in the formally planned settlements. Kyessi (2002) adds that urban residents, especially the urban poor, are attracted to informal settlements that are located close to the city centre, due to on-foot access to urban services and facilities, and the possibility to look for work and attend to their jobs on foot. Hence, it was important to investigate the walking environment in both the planned and unplanned settlement. This being the case, the study was conducted in three sub-cases, namely Sinza, Kariakoo and Buguruni. The sub-cases were chosen after conducting a pilot study that came up with striking characteristics which justified conducting the study there. All the three sub-cases are located within the inner city zone (about 3kilometers radius from the CBD), and intermediate zone (about 3-10 kilometres from the CBD). The inner city and intermediate zones were chosen with the assumption that people living in these zones walk more often than those in the peri-urban zone who have to use public transport.

The literature shows that the use of a case study is fundamental when dealing with a present-day observable fact within real-life contexts such as the one of pedestrian's walking environment. In this sense the research not only relies on theoretical knowledge but also on real life practical examples and experiences as they occur and perceived in space and time. Both the three sub-cases are very interesting to this research because are surrounded and are home of a variety of social amenities that attract a huge rate of both vehicular and pedestrian activity. In this settlements the concept of walkability and its challenges can be investigated to held fruitful insights and finding. What is most important about the three case studies is the fact even though they are unique they are also very reflective of many settlements and streets in Dar es Salaam. So in this way most of the finding to be obtained from these case study areas will be a reflection of many other settlements and streets in Dar es Salaam City.

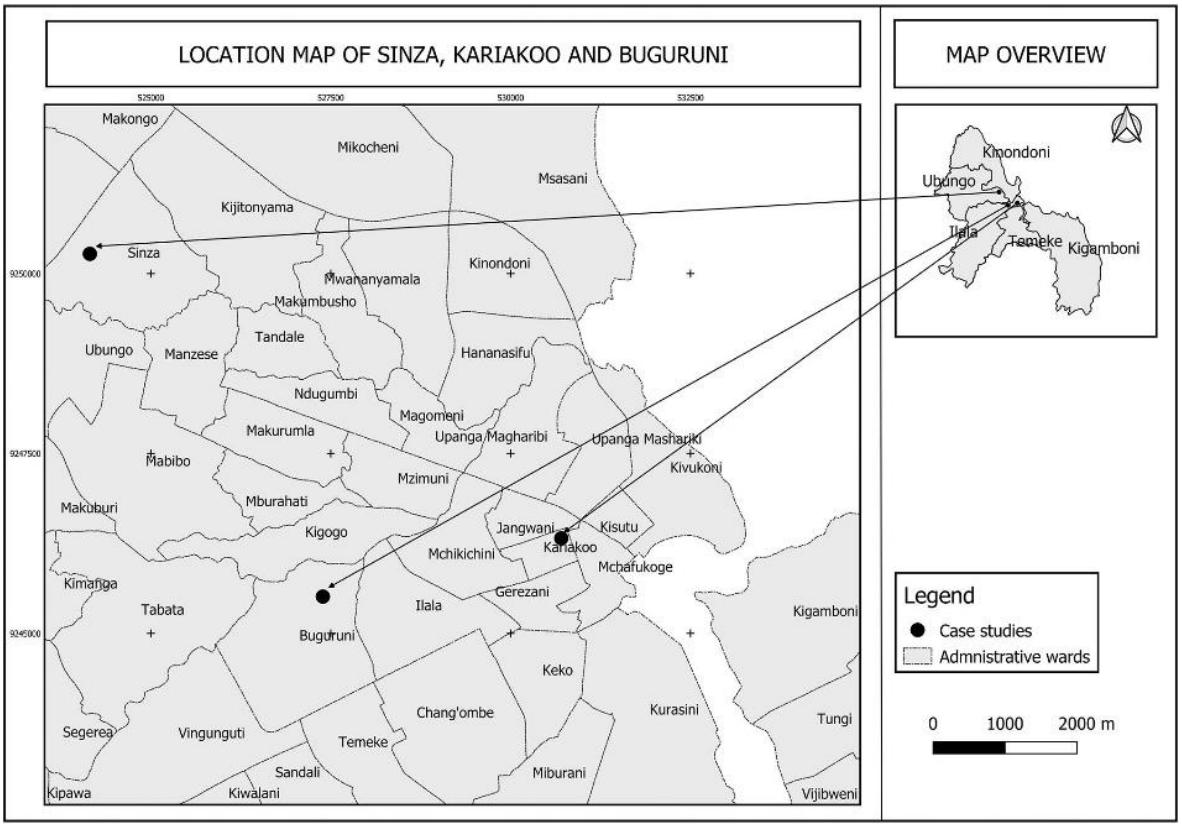


*Fig.* Location of Sinza, Kariakoo and Buguruni in the urban continuum

*Source*: Adopted from Lukenangula and Baumgart 2020

### 3.2 Data collection procedures and analysis

Based on the objectives of this study which is to explore peoples' perspectives on the walking environment, specifically the extent to which the physical environment supports pedestrian movements in planned and unplanned settlements, and how the existing policies consider pedestrians requirements in a situation of increased motorised transport. The author used field observations, pre-structured group discussions, 100 structured questionnaire, and 22 formal interviews with urban professionals. While physical observations aided collection of primary data especially the extent to which the physical environment supports pedestrian movements in planned and unplanned settlements, structured questionnaires and formal interviews helped to acquire

peoples' point of views on the walking environment and how the existing policies consider pedestrian requirements in a situation of increased motorised transport. In-fact, data collection from field observations were intended to support primary data obtained during both formal interview and structure questionnaire. These worked out through taking photos showing the physical walking environment within the City. Questionnaires were composed of both open and closed questions administered to 72 resident households and 28 pedestrians in three sub-case study areas in Dar es Salaam City namely; Buguruni, Sinza and Kariakoo. Regarding ethical issues, considerations were made at each stage in the data collection process. It is for this regard that all the respondents were briefed concerning the objectives of the study and confidentiality of their answers before the start of data collection. Additionally, community participation in research was voluntary; no one was forced to answer questions. The data collected was retrieved, processed and analysed in line with the themes of the study. Data processing involved; editing, coding, classifications, tabulation and converting into simple graphics, amenable for interpretation. The findings were presented in text, tables, figures, quotes, sketches and maps. Thus, qualitative data were analyzed by generating themes through SPSS and Excel while quantitative data were analyzed by using statistical tools to generate percentages and frequencies.

## 4. Results

### 4.1 Walking frequencies of the respondents

Prior to assessing how people perceived the walking environment in Dar es Salaam, it was necessary to administer a survey question to gauge the frequency of walking so as to examine the level of walking activity among the respondents. The respondents were asked whether they had walked at least 5 to 10 minutes or 400 to 800 metres in the previous two days. The aim was to comprehend whether they qualified for interviews or not. In this case, 100 respondents (72 resident households and 28 pedestrians) who depended most on walking were interviewed. This sample consisted of the vulnerable groups (women, school children, the elderly and impaired persons) who are the biggest users of streets.

The results from finding were as summarized in Table 1.

Table 1: Survey results on walking frequency of the respondents

| Walking frequency | Buguruni | | Kariakoo | | Sinza | | Total | |
|---|---|---|---|---|---|---|---|---|
| | HHs | PDs | HHs | PDs | HHs | PDs | HHs | PDs |
| At least 5-10 minutes in the previous two days | 27 | 8 | 20 | 14 | 25 | 6 | 72 | 28 |
| Never walked | - | | - | - | - | - | - | - |
| Total | 35 | | 35 | | 31 | | 100 | |

***Source:*** *Fieldwork, February–April, 2015* *Note: HHs=Households, PDs=Pedestrians*

Table 1 shows that all the respondents (100%) had walked at least 5 to 10 minutes in the previous two days. None of them said that he/she had never walked. Although the result do not establish the walking distance covered per day, it is obvious that all of the respondents depend on walking for everyday life activities. The results are in line with WHO (2013) and Krambeck (2006) that all human beings are pedestrians to some extent as every journey starts and ends with walking.

### 4.2 Perspectives of pedestrians on the walking environment

Rapoport (1987) argues that the pleasure of walking is inspired by the perceptual characteristics of the urban environment as it stimulates exploratory activity and is related to the latent functions of pleasure, delight, interest, exploration, lucid behaviour and the like. People's perceptions can influence the travel behaviour (Handy, 2005). The literature shows that there 7 C's (i. e. connectivity, convenience, comfort, conviviality, conspicuousness, coexistence and commitment) that are being used to assess whether an area is pedestrian friendly (Paul, 2012). In this study four tiers of walking were analysed. These are namely; *connectivity, safety from danger, security from crime, and attractiveness and convenience* of the pedestrian network. The scale used to rate the walking environment comprised of five levels: *strongly agree, agree, neutral, disagree and strongly disagree*. The perspectives of pedestrians on each parameter are as follows:

#### 4.2.1 Connectivity:

Across the three cases, all the respondents interviewed (100%) perceived that the pedestrian network in Dar es Salaam is not continuous from one destination to another. Across the three case studies, the respondents complained that the pedestrian infrastructures like sidewalks were lacking. Where existed they were encroached by motorists, informal vending activities and building extensions. During fieldwork, the author observed pedestrians competing for road space with many other motorised and non-motorised means of transport. The public space was competed for various land uses in such a way that some of the land uses seemed to dominate over the other uses. The dominant uses like car parking and street vending had encroached upon the walking public space. As a result, the weaker groups like pedestrians were pushed out of their walking space, thereby forcing them to walk on the same carriageway with motorised and other non-motorised traffic.

**Figure.1**: Pedestrian mobility blocked by parked cars along Uhuru street, Kariakoo

Source: Fieldwork in Karikaoo, March 2015

Following the walking challenges encountered, some resident households in Sinza claimed that building extensions and informal vending activities along Sheik-lango Road had blocked the connectivity of the walking paths in some Streets. Mr. K.D, a 71 elderly person and who is a retired officer complained that: *"In Dar es Salaam, don't expect to walk from home to your final destination without barriers in between. First of all, most of the urban roads including Shekilango and Tandare-Uzuri roads completely lack pedestrian walkways. Even where they were provided, already they are encroached by parked cars, Bodaboda, street vendors and building extension. Despite the small plot*

*sizes in Sinza, yet land developers force to erect fence walls surrounding their buildings. This practice has jeopardized the walking space, and therefore pedestrians end-up mixing-up with the motorized means of transport, a situation which is very dangerous for our lives"*

**Figure 2:** Pedestrian walking space locked by building extensions, parking lots and building extensions

S*ource: Field observations in Sinza, March 2015*

As figure 2 indicates encroachments from street vending activities had affected continuity and widths to the extent that the marginalised groups such as people with disabilities could not utilise walkways on their own. With the high level of car use and increased demand for space for vending activities, the public space in Dar es Salaam is contested: on the one hand there is a dominance of streets vendors and parking lots; on the other hand the demands of pedestrians and cyclists are becoming more explicit, calling for safety and quality of stay. However, urban planning strategies still only focus on giving equal priority to all road users to a limited extend. When the public spaces become contested, the weaker groups like the elderly and handicapped pedestrians have a little chance of accessing and effective utilizing the public space.

The motion to evict the street vendors came to stand still when the government issued directives to stop eviction in 2018. Street vendors were allowed to operate freely in the city, including the walkways as long as they had identity cards. These directives triggered an influx of street vendors into the BRT walkways which were seen as perfect area for business. Connected to that, a Town planner was quoted saying: *We know street vendors have encroached our infrastructures, the walkways inclusive. It is the top office which has issued the directives to allow street vendors to operate freely in the city. Who are we to stop them from operating on the BRT walkways?*

The Town planner's quotation implies the City authorities had given up and surrendered to an ever increasing encroachment of the walkways by street vendors in the name of the directives from the President. Some pedestrians interviewed felt looked down upon by street vendors who did not respect their right to use the walkways. A pedestrian was quoted saying *"the businessmen disrespect us as they have occupied walkways to the extent that we cannot use them properly. The passage available is less than one meter instead of more than two meters constructed".* Therefore, there is a need to rethink the improvement of the walking environment in Dar es Salaam, especially in a situation of increased motorised transport. The question to be asked is, if the pedestrian network is completely lacking, and where provided it is blocked. Then how do pedestrians perceive safety of the walking environment? This question is answered in the next section.

### 4.2.2 Exclusion from urban mobility

The study revealed that urban roads in Dar es Salaam were not inclusive to be accessible by all people as it is required. People with impaired vision could not use the walkways without help from others. When asked to respond whether the roads in the case study areas were inclusively designed for all road/street users, the majority of the respondents strongly disagreed. Across the three cases the respondents were of the opinion that pedestrians are excluded from the urban mobility.

Table 2: Attitudes of the respondents regarding inclusion of all the roads/streets users

| | Buguruni | | Kariakoo | | Sinza | | Total | |
|---|---|---|---|---|---|---|---|---|
| | HHs | PDs | HHs | PDs | HHs | PDs | HHs | PDs |
| Strongly disagree | 27 | 8 | 19 | 14 | 25 | 6 | 71 | 28 |
| Strongly agree | - | - | 1 | - | - | - | 1 | - |
| Total | 27 | 8 | 20 | 14 | 25 | 6 | 72 | 28 |

***Source:*** *Fieldwork, February to May 2015* Note: HHs=Household residents, PDs=pedestrians

As Table 2 shows both pedestrians and household residents are of the opinion that pedestrians are excluded from urban transport. Additionally, the people with disabilities complained of the lack of disability infrastructure and signs along the urban road, in the public buses and high raised buildings.

Giving her own experience, Ms. S.H, a 37 years old and a resident of Kariakoo area, and who is a visually impaired explained about her incidence that in 2012 she fall in a dirty water drain and was injured by a group of street vendors. She narrated her story: *"In 2012 when I was walking along Uhuru Road in Ilala Boma, opposite to the Regional Commissioner's Office, I was accused of hitting and breaking juice glasses of a certain food vendor who was operating in the pedestrian space. Actually I do not see properly, I suffer from impaired vision. When I hit those glasses, suddenly a crowd of street vendors came closer and started beating me up. I was badly injured. After the incidence, the vendor required me to pay a total of 20,000 TZS. Again, the second incidence was in March 2015. While walking along Uhuru Road, I fell in an open drainage which was full of dirty water. All these happened because of lack of segregated lanes for pedestrians and infrastructure for people with disabilities"*

Likewise, one of the resident households interviewed in Sinza, Mr. K.L, a 34 years aged, an artist noted: *"We always walk in the same carriageway with motorized means of transport such as cars, bodaboda, bajaji, bicycles, three wheelers and pushcarts. We are sometimes forced to walk along the edges of the roads besides the open side drainage systems. This situation makes us vulnerable to road accidents. For instance, in January 2015, when I was cycling along the busy Shekilango road, I was badly pushed aside by a motorcyclist. I was almost about to fall down into the side drainage system which was full of dirty water".*

Through physical observations, the author observed pedestrians competing for road space with many other motorized and non-motorized transport users, including passengers waiting and being dropped by public min-buses and hence making this area a zone of confusion. Pedestrians were using the same carriageway with vehicular traffic or walking along the shoulders of the road, thereby mixing up with the other means of transports. In some places, pedestrians were forced to walk very close to the open storm water drains (Figure 3). The roads were being constructed without regards to pedestrians' needs.

**Figure 3:** Exclusion of pedestrian infrastructure along collector and access roads in Sinza

***Source:*** *Fieldwork observations in Sinza, April 2015*

Figure 3 illustrates that the infrastructure for pedestrians and other Non-Motorized Transport are completely excluded. This includes lack of sidewalks along the collector/primary distributor and access roads. This implies that pedestrians (including people with disabilities) seem to escape the attention of the spatial and transport planners in the designs. The designs of areas like Sinza do not seem to augur well with the SDGs, Goal 11 which aims to make cities inclusive, safe, resilient and sustainable.

Overall, across the three cases pedestrian needs were not adequately considered in neighbourhood planning whereby motorized transport is given more attention than walking. Pedestrians are usually an afterthought, space to locate their facilities is usually inadequate due to earlier planning which did not consider them. The exclusion of pedestrians from urban roads/streets forced them to the chaotic mix of various modes of transport which is unsafe.

According to the road engineers at TANROADS, the exclusion of pedestrian infrastructure is in most cases attributed to the fact that pedestrian infrastructure does not generate any revenues to the government and hence it is given low priority. This means that private investors and international lending agencies are not very keen to provide funding for such project, which will not have financial returns. This results from findings in line with UN (2013) where it was argued that the space to accommodate different modes of transport in developing countries is inadequately considered compared to developed countries where streets are designed to accommodate various modes of transport including walking, cycling and driving. Likewise, the empirical findings concur with Dimitrious and Banjo (1990) who found out that the needs of pedestrians in developing countries are inadequately addressed due to lack of prioritization in urban design.

### 4.2.3 Dangerous from safety

Across the three cases, the majority (98.0%) of the respondents perceived that the walking environment in Dar es Salaam is dangerous for pedestrians. When asked whether the walking environment was safe from danger, the majority (i.e. 96 out of 100 respondents) strongly disagreed. Only two respondents agreed to some extent. Summary in table 3 is for more details.

Table 3: Attitudes of the respondents about safety from danger

| | Buguruni | | Kariakoo | | Sinza | | Total | |
|---|---|---|---|---|---|---|---|---|
| | HHs | PDs | HHs | PDs | HHs | PDs | HHs | PDs |
| Strongly disagree | 26 | 7 | 18 | 14 | 25 | 6 | 69 | 27 |
| Disagree | 1 | - | 1 | - | - | - | 2 | - |
| Neutral | - | - | - | - | - | - | - | - |
| Agree | - | 1 | 1 | - | - | - | 1 | 1 |
| Strongly agree | - | - | - | - | - | - | - | - |
| Total | 27 | 8 | 20 | 14 | 25 | 6 | 72 | 28 |

***Source:*** *Fieldwork, February to May 2015 HH=Resident households PDs=Pedestrians*

Table 3 shows that both the resident households and the pedestrians interviewed in the three sub-cases had similar perspectives on the walking environment. The majority replied that the walking environment is not safe from danger. A pattern depicting a slight difference opinion can be noted in Buguruni and Kariakoo, where two respondents were of the opinion that the walking environment is safe from danger. They perceived this way simply because they had most of their livelihood activities done within convenient walking distances. Mr. S. A, 73 aged, and who was a resident of Sinza B complained of road safety that: "*Crossing the busy roads like Shekilango is very challenging and time consuming. Sometime once can wait for 15 to 20 minutes to cross the busy road, especially the elderly like us, the school children, child mother and people with disability. Most motorists never give way to pedestrians to cross, only a few can do. Personally, in the past years, I used to watch football matches on the other side of Shekilango road, but today I never tamper to go there for fear of being knocked down by the motorists".*

The respondents further reported that due to fear of crossing the busy roads, sometimes parents are forced to accompany their children to cross the busy roads while going to school. When explaining his daily routine from morning to evening, Mr I. S, 76 years aged and who is a resident of Sinza D complained: *"...::because of difficult and uncomfortable walking environment, I am forced to accompany my grandsons to cross the road to school four times a day, and this is now my daily routine. I always wake-up around 7:30 to prepare myself; thereafter, I accompany my grandsons to school. Again, at 13:00 hours I always go to pick them during lunch time. Having finished eating, around 14:00 I have to accompany them once again back to school for the evening sessions, which goes up to 17:00 hours. Having completed their classes, around 17:15, I normally go to pick them back at home. In short I am forced to accompany them to cross the road, because vehicles are always moving at high speeds and do not stop for pedestrians to cross. We simply cross at our own risk."*

**Figure 4: Far right parents/adults assisting the school children to cross Shekilango Road**

**Source: Field observations along Mandera and Shekilango Road**

The study has revealed that dangerous of the walking environment in Dar es Salaam is contributed by the lack of pedestrian infrastructures such as sidewalks, zebra crossings in some places, pedestrian signals at traffic lights, road bumps, uncontrolled road use behaviour, lack of street lights for night walking residential streets, and the lack of infrastructure for people with disabilities. The respondents complained about sharing the same carriage-way with the other motorized and non-motorized means of transport, a situation which exposed them to road accidents.

These results from findings are in line with Pendakur (2005) who reported that the issue of road accidents in Dar es Salaam City were contributed by the lack of safe pedestrian ways, difficulties in crossing at various intersections, encroachment of the available pedestrian walkways by vehicles and petty traders, and also safety awareness to the public is inadequate. A report by the UN Habitat (2000) also revealed similar results that 61 per cent of people in Dar es Salaam feel unsafe in residential areas after dark.

### 4.2.4 Insecure from crime

Across the case studies, the respondents claimed that the walking environment in Dar es is not secure from crime. When asked whether the neighbourhood streets were secure from crime, the majority of the respondents across the three cases strongly disagreed. Summary in table 4 is for more details.

**Table 4**: Attitudes of the respondents about secure from crime

| Agreement levels | Buguruni | | Kariakoo | | Sinza | | Total | |
|---|---|---|---|---|---|---|---|---|
| | HHs | PDs | HHs | PDs | HHs | PDs | HHs | PDs |
| Strongly disagree | 23 | 5 | 15 | 12 | 12 | 4 | 50 | 21 |
| Disagree | 2 | 2 | 1 | 1 | 4 | 1 | 7 | 4 |
| Neutral | 1 | 1 | 3 | 1 | - | - | 4 | 2 |
| Agree | 1 | - | 1 | - | 4 | 1 | 6 | 1 |
| Strongly agree | - | - | - | - | 5 | - | 5 | - |
| Total | 27 | 8 | 20 | 14 | 25 | 6 | 72 | 28 |

***Source:*** *Fieldwork, February-April 2015*

In Table 4, a slight difference can be observed in rating the security from crime among the resident households across the three case studies. While 9 out of 25 resident households in Sinza agreed to some extent that the walking environment was secure from crime, in Buguruni and Kariakoo the majority strongly disagreed. The marginal difference is due to the fact that there is high population and concentration of human activities in Kariakoo and Buguruni compared to Sinza, where mugging issues were rare during day time though a few were witnessed during night times. However, across the three cases petty theft cases were reported to be widespread. Similar patterns can also be observed among the pedestrians interviewed. Across the three case studies, the majority of the pedestrians (25 out of 28) strongly disagreed as well. One of the woman interviewed in Buguruni had this to say: *"Walking at night ideally is not safe anywhere especially for women like I. Anything can happen at a time. One can be mugged especially on these dark streets which lack lighting. I would rather board a tax if I'm late or spend the night where I am".*

It was further reported that muggers tend to collaborate with motorcyclists *(bodaboda)*. Ms.T.S, a 30 years old and who was a resident household in Sinza 'C' Sub-ward explained that nowadays there is a new mugging style, whereby some of the thieves hire the motorcyclists (nicknamed '*bodaboda')* pretending to be passengers. When they suspect anyone who may have something valuable like mobile phones, money wallets, laptop bags or long hearings, they start following him/her stealthily and suddenly grab the victim, start pick-pocketing the belongings. As soon as they manage taking away the bag or wallet, the motorist speeds up to the extent that it is difficult to catch them. Although Ms.T.S has not been a victim, she knows two of her friends who have lost mobile phones. She said: *"Currently, thieves are so clever and you cannot realize them while walking. The simple theft of mobile phones, wallets and laptops nowadays is done through bodaboda, especially along this Shekilango road. Though I have never been victimized, but I know two of my friends whose mobile phones were stolen using this technique. The first event happened in January 2016 and the second one was in July of 2017. All these events happened along the busy Shekilango road".*

According to the respondents, the lack of segregated lanes for pedestrians force pedestrian to compete for the limited road space with other motorized and non-motorized means of transport, including passengers waiting and being dropped by public min-buses and/or BRT buses making this areas a zone of confusion. It is in this zone of confusion where pedestrians lose their belongings to thieves. Lupala (2002) and Dunge (2014) also noted the widespread of pick-pocketing in Kariakoo and Sinza. In Kariakoo, pick pocketing issues are in most cases caused by congestion (high population densities). This finding is in line with Montgomery and Roberts (2008) who argued that in cities of developing countries, street muggings, pick-pocketing and other forms of pedestrian-directed crimes influence the ability and willingness to walk. In addition to that, across the three cases, the women were aware and more sensitive to security issues compared to men, especially when walking in the congested and poorly lit streets. They felt more vulnerable to petty theft and assault. This observation is line with studies conducted in Wuhan where it was revealed that women were keenly aware of security issues compared to men; they feel vulnerable to theft and assault, especially at night because street lighting is poor (Montgomery and Roberts, 2008 and McNeil et al, 2003). Montgomery and Roberts (2008) argue that security is particularly relevant to women and children who, may not choose alternate modes (use a taxi to cross the street, rather than walk) or may be forced to eliminate trips due to a perception of dangerous pedestrian conditions.

### 4.2.5 Motorist not to obey traffic laws

With regard to the motorists' behaviour against pedestrians, the majority (95 out of 100 of respondents) perceived that pedestrians are not respected by the motorists. When asked to respond whether the motorists respect the pedestrians, the majority strongly disagreed (Table 5).

Also, Table 5 shows that across the three cases, the majority were not satisfied with the behaviour of motorists. According to the respondents, motorized travel in Dar es Salaam is totally chaotic. The unruly road users such as *bodaboda, bajaji and daladala* drivers were particularly a matter of concern. Across the cases, suffering life of pedestrians in the areas were threatened by motorists. Based on the respondents' opinions, most motorists, especially motorcyclists (*bodaboda)* cannot be expected to obey traffic laws, and rarely stop when pedestrians are crossing even at zebra crossings.

The motorists were blamed of not giving way for pedestrians to cross the busy roads, and sometimes splashed dirty water on the pedestrians.

**Table 5: Attitudes of the respondents about respect by motorists**

| | Buguruni | | Kariakoo | | Sinza | | Total | |
|---|---|---|---|---|---|---|---|---|
| | HHs | PDs | HHs | PDs | HHs | PDs | HHs | PDs |
| Strongly disagree | 21 | 7 | 17 | 10 | 24 | 4 | 62 | 21 |
| Disagree | 3 | 1 | 2 | 4 | 1 | 1 | 6 | 6 |
| Neutral | 2 | - | - | - | - | 1 | 2 | 1 |
| Agree | 1 | - | - | - | - | - | 1 | - |
| Strongly agree | - | - | 1 | - | - | - | 1 | - |
| Total | 27 | 8 | 20 | 14 | 25 | 6 | 72 | 28 |

***Source:*** *Fieldwork, February to May 2015*

In addition to that, the respondents complained that motorists drive and park on the existing walkways, thereby forcing pedestrians to share the same carriageway with the vehicular traffic. These events made pedestrians feel not respected and valued by motorists. Mr. K.L, a 34 years old, an artist, a resident of sinza C, had this to say: *personally, I remember it was in December 2016 when I had all my clothes splashed with dirty water by a motorist. As I was walking along the edges of the Shekilango road, besides, there was an open side drainage channel in such a way that it was too difficult for me to escape from the moving vehicles. Suddenly, a Motorcyclist came at high speed and then splashed dirty water on me, and yet he did not stop or even said sorry".*

The respondents argued that it had become a common attitude for drivers to over-speed after escaping traffic congestion and traffic jam with no respect of other road users like pedestrians, and without consideration of the high volume of pedestrians and the roadside commercial activities.

### 4.2.6 Uncomfortable and inconvenience walking environment

Across the three cases, the majority perceived that the walking environment in Dar es Salaam is of poor condition and inconvenient for walking. When asked to respond whether the walking routes were passable throughout the year, 92 out of 100 respondents strongly disagreed. Table 6 summarizes the views of the residents and pedestrians on the condition of the walking environment.

**Table 6:** Views of respondents regarding whether walking routes are passable throughout a year

| | Buguruni | | Kariakoo | | Sinza | | Total | |
|---|---|---|---|---|---|---|---|---|
| | HHs | PDs | HHs | PDs | HHs | PDs | HHs | PDs |
| Strongly disagree | 22 | 6 | 19 | 14 | 25 | 6 | 66 | 26 |
| Disagree | 2 | 1 | - | - | - | - | 2 | 1 |
| Neutral | 1 | - | - | - | - | - | 1 | - |
| Agree | 1 | 1 | - | - | - | - | 1 | 1 |
| Strongly agree | 1 | - | 1 | - | - | - | 2 | - |
| Total | 27 | 8 | 20 | 14 | 25 | 6 | 72 | 28 |

***Source:*** *Fieldwork, February to May 2015*

Table 6 shows that the majority of the respondents across the cases were not satisfied with the condition of the walking routes, particularly footpaths and access roads. According to the respondents, the neighbourhoods are uncomfortable and inconvenient for walking. The neighbourhood streets are narrow, unpaved, covered with uncollected garbage and flooded with

water when it rains. Sidewalks in most commercial and residential streets were lacking. In the unplanned settlements like Buguruni Mnyamani and Madenge, footpaths were too narrow. The poor state of the streets ad led to uncomfortable walking, especially during rainy season when they are muddy. At night, the situation was reported to be worse since the street lighting to facilitate night walking were not provided. The mixing up with the other motorised and non-motorised traffic also made walking along this space unsafe for pedestrians, the consequences of which are poor quality of the space to function as a walkway. During household interviews, Ms. H, a 48 aged, a nurse by professional explained the situation like this: *"It is not only in Sinza where access roads and walkways are in poor condition, but almost the whole of Dar es Salaam the situation is the same. The Access roads in our settlement are narrow, muddy, rough and full of pot holes. We are used to walk on muddy roads which are always flooded with water even during dry season resulting from waste water released from Individual plots. When it rains, the area is difficult to walk on, but as soon as it stops raining all the water get dried up. This is due to the nature of the soil in Sinza; normally it doesn't retain water for a longer time".*

Moreover, across the three cases, walking, standing and sitting activities were poorly promoted due to the lack of standing and sitting facilities such as benches, standing supports like shade devices at the bus stops. The lack of street lights in all cases makes protection against crime and the sense of insecurity more pervasive especially during the night. Furthermore, across the three sub-cases, pedestrian facilities like garbage bins and public toilets were also lacking.

Across the three cases, in some spaces, garbage was haphazardly dumped or burnt creating polluted and smoky environments. The haphazardly disposal of solid waste creates difficulties for people with disabilities to walk on. In all the three cases, the dusty and muddy conditions of spaces during the dry and rainy season have rendered walking in these spaces uncomfortable.

## 5. Discussion

This study has empirically examined the pedestrian perspectives on the walking environment in planned and unplanned settlements. Walking is a typical practice characterising the life in the city of Dar es Salaam. As a result of the practice, it has been quite common to witness cases of pedestrians being knocked by motorists in the city. While on roads, one can observe the way pedestrians struggle for their safety in day to day walking, especially when crossing the busy roads. To understand safety issues of pedestrians, I decided to take a trip from my residential neighbourhood to the Central Business District on foot. This gave me a clear picture of what pedestrians face daily as they make their trips. The walk was not comfortable at all. In an incidence, a lady who was walking in front of me accidentally slide and fell into an open drain which was full of mud and waste water. At a junction of the main highway, a motorcycle collided with an oncoming private car, thereby severely injuring a young man who was walking by the roadside. I wondered whether these accident incidences were coincidental or simply events regarded as the normal routines that one should not even bother to reflect on what they meant.

The majority of the respondents perceive that the walking environment is Dar es Salaam is very dangerous, and not secure from crime. Pedestrians were reluctant to use walkways at night because of feeling of being attacked by pick pocketing and bags thieves. Pick-pocketing was reported to be a serious problem within the City, especially in the congested streets. Also location and accessibility

to public services to the majority of the residents were inconvenient. Overall, pedestrians felt that they are not respected by motorists, and hence pedestrian rights are ignored.

Furthermore the study has revealed that pedestrian requirements are inadequately considered in most sectoral national level policies and documents. Where considered, still there are gaps that require policy attention. These include: the non-recognition of walking as a means and mode of transport; the inadequate considerations of disability infrastructure; the lack of policy provisions regarding what mechanisms to achieve the set objectives, the lack of coordination mechanisms among the policy makers and implementing authorities and agencies, the non-adherence of the building height-street width ratio in the redevelopment projects where high rise buildings are emerging, and the lack of approved planning standards to guide the upgrading of informal settlements.

It appeared that pedestrians had no right of way, even in areas where the pedestrian infrastructure such as crossing facilities were available. As such, people had to wait for a long time to cross the highway irrespective of the zebra crossings provided. At the traffic lights, the case is not different. Neither the motorists nor pedestrians seem to bother about pedestrians. In most areas, there are no lanes provided for pedestrians, the situation that force pedestrians to share the road space with motorists and cyclists. In some areas, where pedestrian lanes were provided, they were encroached upon by parked cars and street vendors, and when it rains in some places the walking space are muddy with burst sewers.

Similarly, the rights of the weaker groups like pedestrians including the elderly, people with disabilities, women, and school children are not a priority in road design and planning in general. Consideration for pedestrians seems to be an afterthought. This was justifies by one of the urban planners interviewed at Kinondoni Municipality who attested that: *"Frankly speaking, while preparing residential neighbourhood plans, we do not have pedestrians in mind. Very little consideration is made when doing detailed plans in the busy commercial areas*[1]*"*

Across the three cases, the pedestrian infrastructure in most residential and commercial streets was lacking. Even for the upgraded informal settlements like Buguruni, more emphasis was put on improving carriageway for motorized means of transport at the expense of the other road users like pedestrians. Since pedestrians are an afterthought, space to provide facilities is usually inadequate. The author is of the opinion that there was accessibility misconception in implementing the upgrading projects like those in Buguruni-Mnyamani and Madenge. The municipal authority saved cost related to compensation costs at the expense of pedestrian lives. This is contrary to the Goal 11 of the SDGs that aims at making cities inclusive, safe, resilient and sustainable.

When asked as to why the pedestrian walkways in Sinza settlement are inadequately provided, the Acting Municipal Engineer at the Kinondoni Municipality noted that the non-provision of pedestrian walkways is due to financial constraints facing their day to day operations. There are no specific budgets are made for pedestrians. He noted: *"Every year we budget wisely for infrastructure provision, but, the allocation is usually half the amount budgeted. How can we then effectively provide for*

[1] Interview with the urban planner (in-charge of Sinza neighbourhoods) at the Kinondoni Municipal Council on 20th February 2015

*pedestrian infrastructure?* According to the Municipal engineer, the inadequate fund provided for road improvements in Sinza neighbourhoods and the Kinondoni Municipality as a whole has led to the failure to implement all components of the road cross-sections, pedestrian walkways being inclusive.

Furthermore, some of the respondents confirmed that they had been the victims of road accidents. Some of them were hospitalized while others were killed on the spot. At City level, the argument of the pedestrians being exposed to road accidents is supported by the road traffic records collected by the researcher at the traffic police headquarter. According to the road traffic records on road injuries and fatalities, the pedestrians in Dar es Salaamare more vulnerable to road traffic deaths than any other single road user group as Table 8.10 shows:

**Table 8:** Road traffic deaths and injuries by road user groups in Dar es Salaam (2008-2015)

| | Drivers | | Passengers | | Motorcyclists | | Pedalcyclists | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | Killed | Injured | Killed | Injured | Killed | Injured | Killed | Injured | Killed | Injured |
| 2008 | 27 | 318 | 63 | 2221 | 30 | 407 | 23 | 364 | 257 | 2363 |
| 2009 | 25 | 539 | 58 | 2593 | 45 | 692 | 16 | 336 | 273 | 2412 |
| 2010 | 8 | 254 | 27 | 1178 | 31 | 402 | 12 | 114 | 129 | 1104 |
| 2012 | 56 | 608 | 83 | 2173 | 158 | 2555 | 23 | 340 | 244 | 1938 |
| 2013 | 38 | 698 | 84 | 2258 | 161 | 3024 | 33 | 418 | 224 | 2005 |
| 2014 | 32 | 456 | 92 | 1670 | 160 | 1852 | 19 | 198 | 197 | 1540 |
| Jan-Mar 2015 | 12 | 60 | 23 | 304 | 32 | 325 | 4 | 12 | 43 | 315 |

*Source: Traffic Police Headquarter - Dar es Salaam zone, May 2015*

Table 8 shows that, pedestrians are more vulnerable to road traffic deaths than other road users. This finding result is in line with WHO (2015:8) that the African Region has the highest proportion of pedestrian and cyclist deaths accounting for 43% of all road traffic deaths. Similarly, a study by Zimmerman et al., (2011) revealed that in Tanzania pedestrian victims of road accidents stand at 55.1 per cent.

Economically, such road traffic related deaths have negative impacts on the Tanzanian society at large. The road traffic injuries and deaths have negative impacts on the affected households as they incur funeral expenses, costs associated with caring for the injured, and the loss of income that occurs when a household member stops working due to death or disability. Additionally, such deaths lead to the increased number of widows, widowers and orphans.

## 6. Conclusion

This paper presents the findings of people's perspectives on the walking environment using the case of Dar es Salaam. Overwhelmingly, people in the City of Dar es Salaam commented that pedestrians are excluded from urban mobility and are not respected by motorists. Respondents further asserted that the walking environment in Dar es Salaam City is uncomfortable, dangerous, insecure due to crime, and that public facilities are inconveniently located. The study has also empirically demonstrated that, in a situation of increased motorised transport, the pedestrians' requirements are generally inadequately considered in the National and sectoral policies. Even where the pedestrian requirements are considered, their implementation was generally poor. In a few cases,

where they are adequately provided, their protection and maintenance were given little or no attention by the respective authorities.

Findings indicate that the proximity of destinations, attractive and convenient walking environment, connected pedestrian routes, safety from danger and crime, controlled motorists behavior as well as designed pedestrian facilities can significantly contribute to better perceptions of the walking environment. In planning a walkable city to promote sustainable transport in Dar es Salaam City, planners should look into a plan that promotes crime prevention and safety, density (compact and mixed use development) that would encourage people to walk to activities and man-made or natural environment that provide ease of walking.

## 7. Recommendations

- *Formation of pedestrian advocacy organizations/groups*

The study has revealed the exclusion of pedestrian requirements in policy making, planning and implementation of urban development projects including upgrading of informal settlements. The existing walkways have been encroached upon by parked cars/motorcyclists, street vendors, woodworks and building setbacks. The privately operated public buses and most high rise buildings are not pedestrian friendly. To address the limited public awareness regarding the pedestrians' rights to walk, there is a need to encourage and facilitate establishment of pedestrian advocacy organizations/groups that will raise the voice of pedestrians to the decision makers, spatial and transport planners, urban designers, Architects, land developers and the implementers of the upgrading programs like CIUP. If the pedestrian advocacy group is established and operationalized, it will help in changing the mind-set of city authorities and other spatial and transport professionals who believe that transport and land use planning should prioritize vehicles over pedestrians. With respect to Dar es Salaam City, the study recommends establishment of *Dar es Salaam Association of Pedestrians (DAPE).* The objectives and a number of activities to be accomplished by DAPE may include:

- Reclaim the removal of encroachments and any obstructions into pedestrian spaces (such as street vendors, building extensions, unguided pedestrian shopping arcades, utilities, and parking activities). The organisation/groups need to proclaim that *"let the walkways be walkways and not parking and commercial spaces, and let roads be roads and not walking spaces and bazaars";*
- Reclaim inclusive designed streets/roads such as installation of sidewalks, inclusive public transport friendly to people with disabilities, and also to reclaim lift systems in the high-rise buildings;
- Reclaim provision of pedestrian signals at intersection points, painting of zebra crossings, road signs for people with disabilities, pedestrian overpass bridges where necessary and other traffic calming measures so as to improve pedestrian comfort and safety;
- Reclaim pedestrian amenities (public toilets, public benches along the walking street and other public spaces, dust bins and street lights to facilitate night walking in the street);

- Lobby and convince the City and Municipal authorities establish specific Units or Section for dealing with the non-motorized transport within the city/municipal structure;
- Promote pedestrian friendly land use and transport related policies;
- Suggest and discuss pedestrian improvement proposals and present to the government officials; and
- Reclaim for relocation of street vendors within the prime locations and along the walking corridors to minimize encroachment of walkways.

➢ *Need for the formulation of a stand-alone solid Pedestrian Policy*

The study has revealed that the pedestrian requirements are scattered in different ministerial policies and legislation, a situation that makes the policy implementers fail to capture the pedestrian requirements suggested in the other sectoral policies out of their fields. In order to comprehensively address pedestrian concerns, it is strongly recommended that a separate policy directed at pedestrians be formulated. This has been successfully applied in some developing cities such as New Delhi in India and Bogota in Colombia. Grouping of pedestrian elements in one document will even make it easy for decision makers and service providers to make informed decisions on this often neglected group. Therefore, it is hereby recommended that all the provisions regarding pedestrian requirements that are proposed in the various urban sectoral policies such as the National Transport Policy, the National Education and Training Policy, the National Health Policy, the National Human Settlement Policy, the National Road Safety Policy, the Urban Planning Act No 8 and the National Policy on People with Disability be organised in a stand-alone Pedestrian Policy. It is recommended that the Ministry of Infrastructure Planning take the responsibility of formulating the comprehensive Pedestrian Policy.

➢ *Promote the concept of sharing space*

The study noted that across the three cases, almost all the residential and commercial access roads/streets had no pedestrian walkways and the space to accommodate pedestrian lanes is limited. As a result, pedestrian had to use the same carriageway with many motorized and non-motorised traffic/road users. In order to improve pedestrians' rights of belonging and protect them from the increasing road accidents, it is recommended to promote the concept of sharing space. If implemented, the concept of sharing space will enable people and vehicles to share the whole of the road space safely, and on equal terms, thereby improving the quality of living of the vulnerable groups (the poor residents, the elderly, the school children, people with disability and women). Shared zone concepts are now being used more commonly in Netherlands, Denmark, Sweden, Germany and UK.

➢ *Promote pedestrianisation schemes*

The study has revealed that the street vendors have encroached upon many existing pedestrian walkways including the road space in the prime locations like Congo Street in Kariakoo area. As a consequence, walking in the congested streets like Congo Street is uncomfortable and insecure. To improve pedestrian accessibility, safety and security needs in the congested streets like Congo Street in Kariakoo, the author recommends that the municipal councils need to promote and enforce the

pedestrian precinct concept (pedestrianisation schemes) so as to make these streets exclusively for pedestrians only.

- *Provide for segregation of pedestrians from motorists road users*

Regarding the existence of mixed means of transport on the same carriageway, separation of non-motorized from motorized means of transport is recommended. Pedestrians need to be separated from other road users, especially at the local distributor/collector roads (30 metres ROW) passing through the neighbourhoods such as the Shekilango Road in Sinza. This can be achieved by provision of sidewalks along side carriages, and safe zebra crossing areas as are important traffic component in these busy roads. Moreover, in case the existing residential/commercial access roads are already narrow, separation can be achieved by earmarking some roads as pedestrian streets where cars are not allowed or make them as one way drive to reserve space for pedestrian walkways. The walkways should be made friendly and safer by separating them from the main roads by encouraging on-street parking or use of planted trees which calm traffic flow. Additionally, the sidewalks provided within the residential blocks need to be connected to the public bus stops, and other land uses destinations, particularly to public facilities like schools, markets, health facilities, religious facilities and recreational areas within the neighbourhood. If implemented, the pedestrian safety needs will be improved.

- *Improve pedestrian safety measures*

The study has revealed that safety measures are lacking in the study areas; also, access roads and footpaths are not passable throughout the year. The neighbourhood roads should be improved to make them useable and user friendly. The roads improvements should be done in line with traffic management measures to control the speed of vehicles which is likely to increase once the roads are in good condition. These may include use of speed bumps, narrowing road in residential areas, on-street parking and use of road speed islands and curb extensions to shorten crossing distances across a road. Street lighting should be provided to light the streets, especially during the night. At the intersections, proper designs should be done, which provide pedestrian facilities like traffic lights, zebra crossing, refuge islands and pedestrian signals/massages. Pedestrian underpasses and pedestrian bridges can also be an option for long term solution, especially along the highways, like Sam Nujoma Road in Sinza and Madera Road in Buguruni.

- *Promote mixed land use and compact development*

Urban designers/spatial planners ought to change their mind-set from zoning residential areas based on fixed land use categories to the *mixed land use* and *compact city* concepts with planned integration of some combination of residential, retail, office, hotel, multi-story building, home based income generation activities, recreational areas and other functions. This implies that when implementing the redevelopment schemes like those in Sinza, Kariakoo, Buguruni and other planned neighbourhoods within Dar es Salaam City, all land use functions required, should be considered within (mixed land use and compact development). Encouraging mixed land use development will help create destinations within short walking distances, and hence reduce the burden of crossing in busy roads and intersections. This will also promote walking as opposed to motorised trips which are expensive and sometimes time consuming due to traffic jams.

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## 10. AUTHORS CONTRIBUTION

The author developed the idea of the study based on his interest in walking and drawing on the practical case experience acquired in living and working in Dar es Salaam City, where it has been quite common to witness cases of pedestrians being knocked by motorists in the city. Later he reviewed literature, collected and analysed data on perspectives of pedestrians and wrote as part of his PhD thesis under the supervision. Prof. Dr.-Ing. Sabine Baumgart of TU Dortmund University, who raised comments, revised and proof read the draft.

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## 12. KEY TERMS AND DEFINITIONS:

**Walking** : is simply a form of physical activity (Glanz, 2011). Walking can be described as the most natural human way of getting around, of integrating and living the urban space and of accomplishing

salutary physical activity (Paulo, 2012). John Butcher, Founder of Walk21, 1999[2] argues that: "Walking is the first thing an infant wants to do and the last thing an older person wants to give up. Walking is the exercise that does not need a gym. It is the prescription without medicine, the weight control without diet, and the cosmetic that can't be found in a chemist. It is the tranquilliser without a pill, the therapy without a psychoanalyst, and the holiday that does not cost a penny. What's more, it does not pollute, consumes few natural resources and is highly efficient. Walking is convenient, it needs no special equipment, is self-regulating and inherently safe. Walking is as natural as breathing".

**Walkability** : is "the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network" (Southworth, 2005:148). According to Southworth, a walkable network comprises six important attributes namely: connectivity of path network (both locally and in the larger urban setting); linkage with other modes (bus, streetcar, subway, train); fine grained and varied land use patterns (especially for local serving uses); safety (both from traffic and social crime); quality of path (including width, paving, landscaping, signing, and lighting); and path context (including street design, visual interest of the built environment, transparency, spatial definition, landscape, and overall explorability) (ibid).

**Pedestrian** : is anyone on foot (WHO, 2013). This includes also those aided by some equipment like wheelchairs, walkers, canes, roller blades and motorized scooters. A person is considered a pedestrian while jogging, running, hiking or lying down by roadside (ibid).

Perception is defined in the urban planning literature as the process of attaining awareness of understanding of sensory information. Ewing and Handy (2009) argue that what is perceived normally results from "interplays between past experiences, one's culture and the interpretation of the perceived"- As explained by Paulo (2012), the theories of planned behavior drawn from the field of psychology have included the individual 'perceptions' as an insight component towards understanding and identifying factors that determine behaviour. With regard to walking, the presence or absence of sidewalks, presence or absence of traffic calming measures for instance, can facilitate or limit a behaviour; and hence peoples' perceptions are likely to encourage or discourage people whether to walk or not

[2] In International charter for walking