

Assessment of Space Standards that are used to Improve Roads Network in Upgrading Informal Settlements: The Case of Dar es Salaam City, Tanzania

Dr. Emmanuel Elifadhili Mchome

Lecturer

Ardhi University

Department of Urban and Regional Planning

P.O. Box 35176

Dar es Salaam, Tanzania

Abstract

Upgrading of informal settlements involves improvement of roads network that is carried-out by each upgrading project and/or program to develop its own space standards according to the existing space on the ground. The purpose of using the existing space for roads improvement is to avoid massive demolition of houses in roads widening by using approved space standards due to lack of funds required for compensation of the affected properties. However, there is no limit of minimum space required in roads widening for transportation improvement in upgrading informal settlements. Furthermore, there is no study that has been made to examine whether the minimum space standards used in upgrading informal settlements achieve transportation improvement in-terms of traffic mobility and accessibility. This study has therefore; assessed space standards that are used to upgrade/improve roads network in informal settlement to examine whether they achieve improvement of traffic mobility and accessibility.

Keywords: Accessibility, Assessment, Informal settlement, Mobility, Road network, Space standard

1. Introduction

Assessment of space standards that are used to improve roads network in upgrading informal settlements has been preceded by the discussion of the approaches that are used to upgrade informal settlements. These approaches explain the concept behind upgrading of informal settlements, such as settlements regularization, land tenure regularization and infrastructure upgrading that have been applied in different parts in the world. Application of these concepts in upgrading informal settlements paves way to provision of space for roads improvement.

2. Approaches Used to Upgrade Informal Settlements

Upgrading of informal settlements has been taking place in different parts of the world so-as-to make them regular by rectifying irregularities that exist in the settlements. Generally, there are three main irregularities that characterize informal settlements. Firstly is lack of basic service infrastructures such as paved roads and footpaths, storm water drains, street lights, water, electricity and sewerage (Mercado and Uzin, 1996). These service infrastructures are provided along the right-of-way of different types of roads. Right-of-way, which is also called road reserve, is defined as the entire area included by the boundaries of roads (URT, 2000). Secondly is un-coordinated individual land subdivision without consideration of land use plans (general planning schemes) and plots sub-division layout plans (detailed planning schemes) prepared and/or approved by local and/or central government authorities (Mercado and Uzin, 1996). This results to haphazard land development in informal settlements with little and/or without space left for community facilities and roads network according to the government approved space standards. Mercado and Uzin (1996) also explain the third irregularity of informal settlements being un-authorized occupation and/or development of land without clear tenure rights. These three irregularities are very common in Asia and Latin America compared to Tanzania and other Sub-Saharan African countries (Mercado and Uzin, 1996; Mghweno, 2002; URT, 2012). There are therefore, three main approaches that are used to upgrade informal settlements for the purpose of addressing the above mentioned irregularities. These approaches are settlement regularization, land tenure regularization, and infrastructure upgrading.

This study focus on settlement regularization and infrastructure upgrading that involves provision of space for roads improvement. Settlement regularization anchors to address the problems of un-coordinated individual land subdivisions and lack of basic service infrastructures through preparation of regularization layout plans (regularization schemes). Preparation of regularization layout plan involves land use restructuring and redefinition of plot boundaries. The main aim of land use restructuring is to secure land for public facilities such as market, educational and health facilities. The aim of redefinition of plot boundaries are mainly two, the first one is to secure land for right-of-way of different types of roads so-as-to improve roads network and provide basic service infrastructures. The second aim of redefinition of plot boundaries is to make property boundaries regular upon which individual property owners get legal document (title deed and/or residential license) to safeguard their rights on land and property ownerships. This approach has been applied in different parts of the world, such as Latin America at the city of La Paz in Bolivia, the city of Santiago in Chile, and the city of Lima in Peru (Mercado and Uzin, 1996). The same approach was also used to upgrade informal settlements at the city of Medellin in Colombia (Betancur, 2007), to mention just a few. With reference to Sub-Saharan Africa, the Gauteng Province in South Africa used the same approach to upgrade informal settlements (GDH, 2008). The government of Kenya also had a programme to upgrade informal settlements within the administrative boundaries of the Nairobi, Mavoko, Mombasa and Kisumu through the same approach (KENSUP, 2016). In Tanzania, this approach was used to upgrade Isamilo and Ibungilo informal settlements in Mwanza, which is a typical example of other regularized informal settlements in Tanzania (see Figure 1).

Figure 1: Part of the proposed Ibungilo settlement regularization layout scheme



Source: Ibungilo Regularization Scheme (Drawing No. 14/165/1/8002)

Infrastructure upgrading in informal settlements focus is to provide basic service infrastructures such as paved roads and footpaths, street lights, storm water drains, water and electricity. Informal settlements upgrading through infrastructure upgrading has been implemented in different parts of the world through the Sustainable Cities Programme, which is a global programme of the United Nations Centre for Human Settlements (UN-Habitat) and the United Nations Environmental Programme (UNEP). It has been applied in different parts of the world such as Ghana, Senegal, Tanzania, Nigeria, Zambia, Mozambique, Egypt and Tunisia in Africa; Sri Lanka, India, Philippines and China in Asia; Poland and Russia in Central and Eastern Europe (UNCHS and UNEP, 1999). Furthermore, the UN-Habitat included provision of infrastructure and urban services to be one of the indicators to measure progress in implementation of Goal 7 Target 11 of the Millennium Development Goals so-as-to achieve significant improvement of the lives of at least 100 million informal settlement dwellers by the year 2020 (UN-Habitat, 2007).

3. The experience of infrastructure upgrading in tanzania

In Tanzania, infrastructure upgrading in informal settlements was implemented through a demonstration project called Sustainable Dar es Salaam Project (SDP). This project upgraded Hanna Nassif informal settlement in phase one from 1994-1996 with provision of basic service infrastructures. The project was then replicated at Kijitonyama and Tabata informal settlements from 1996 to 1999 through Community Infrastructure Programme (CIP) after successful implementation at Hanna Nassif settlement. Furthermore, the project of infrastructure upgrading in informal settlements was replicated in Dar es Salaam City to upgrade 32 informal settlements from 2003 to 2012 through Community Infrastructure Upgrading Programme (CIUP) after successful implementation at Hanna Nassif, Tabata and Kijitonyama. Also the government is in a process to upgrade 34 informal settlements in Dar es Salaam City from 2012 through Dar es Salaam Metropolitan Development Project (DMDP) after official closure of CIUP project on 30th June, 2012 (CIUP, 2003; Kyessi, 2002; Nnkya, 2005; URT, 2012).

Upgrading/improvement of roads network in informal settlements by the use of existing approved space standards (URT, 2011) in-terms of right-of-way is associated with massive demolition of houses while there is lack of funds for compensation (Nnkya, 2002). Consequently, each informal settlements upgrading project and/or upgrading program develops its own space standards according to the existing space on the ground (CIUP, 2002a; UCLAS, 1999; UCLAS, 2000a; b) so-as-to minimize compensation costs. In Dar es Salaam City, three upgrading projects/program have been taken for illustration to represent other upgrading projects and/or programs that developed their own space standards to avoid massive demolition of houses and minimize compensation costs. They are Hanna Nassif informal settlement upgrading project that was implemented in 1997 (UCLAS, 1999); Ubungo Darajani informal settlement upgrading project that was implemented in 2000 (UCLAS, 2000a; b); and Community Infrastructure Upgrading Program (CIUP) that was implemented from 2002 to 2012 in Dar es Salaam City to upgrade 32 informal settlements (CIUP, 2002a; b). Table one explains space standards in-terms of right-of-way that were developed and used for roads network in these settlements.

Table 1: Types of roads and space standards used to upgrade informal settlements

Type of Road		Hanna Nassif Upgrading Standards	Ubungo Darajani Upgrading Standards	CIUP Upgrading Standards
Local Distributor Roads	RoW (Metre)	8.0	7.0-8.0	10.0-12.0
Access Roads	RoW (Metre)	6.0	5.0-6.0	10.0-12.0
Pedestrian Footpaths	RoW (Metre)	1.5-3.0	2.0-4.0	2.0-4.0

Source: UCLAS, 1999, UCLAS, 2000a; b

However, the proposed space standards for roads widening were not realized due to lack of funds for compensation and thus the upgrading continued with the existing space on the ground. Consequently, all of these upgraded settlements are associated with transportation problems in-terms of traffic mobility and accessibility after improvement of roads network. Assessment of space standards that were used for upgrading of these settlements are therefore, carried-out in the subsequent section.

4. Assessment of roads space standards

Assessment of space standards used to upgrade roads network in informal settlements was carried-out by using transportation variables, which are traffic mobility and accessibility.

4.1 Traffic Mobility

Improvement of local distributor roads by using lower space standards that exists on the ground results into the increased problems of traffic mobility in informal settlements and thus hinders the road to achieve its functional performances. According to De Chiara and Koppelman (1984) and De Langen and Tembele (2001), some of the functional performances of local distributor roads are to provide access to the housing clusters; abutting properties, economic activities and public facilities. The term mobility refers to the movement of motorized and non-motorized traffic (ITE, 2011; VTPI, 2016). This increase of traffic mobility problems on local distributor roads is contributed by four main reasons, which are high traffic volumes, high traffic compositions, concentration of roadside commercial activities, and narrow carriageway. The main manifestation of traffic mobility problems are traffic congestions, traffic jam, and un-controlled road use behaviours.

4.1.1 Traffic Congestion

Traffic congestion is the first manifestation of traffic mobility problems along local distributor roads. This problem is contributed by high traffic volumes beyond capacity of the roads to accommodate. Design standards for local distributor roads, according to the UK Transport Research Laboratory that is mostly used in roads design in developing countries, including Tanzania, is to accommodate the average daily traffic of about 100-400 motorized traffic per day (TRL, 1991). However, local distributor roads in informal settlements accommodate the average of 1,000 motorized traffic per day with the peak hour of 800 vehicles. Furthermore, this high concentration of motorized traffic is accommodated with high volume of non-motorized traffic, which is about 30,000 per day. This high traffic volume is accommodated along the same carriageway, which is narrowed by housing development towards the road to about 5.0-6.0 metre wide with roadside commercial activities on both sides.

Figure 2: Concentration of motorized and non-motorized traffic with roadside commercial activities along Mnyamani road



Figure 2 explains concentration of motorized and non-motorized traffic along Mnyamani road in Buguruni Ward, which is a typical characteristic of local distributor roads in highly developed informal settlements in Dar es Salaam City.

4.1.2 Traffic Jam

Traffic jam is the second manifestation of traffic mobility problems along local distributor roads. This problem is contributed by insufficient space for turning clearance radius at corner points as well as concentration of roadside commercial activities. As a result, most of the 2-axles trucks traversing along the road fail to negotiate corner easily and henceforth cause traffic jam. Poor turning clearance radius and lack of visibility at corner points is caused by housing encroachments to the carriageways along local distributor roads. Planning and design space standards for road intersections, according to De Chiara and Koppelman (1984) that is mostly used in town planning in Tanzania, is to provide the minimum sight distance of about 90 feet (27.43 meter) along each approaching leg of intersection. However, sight distances at local distributor road intersections in most parts of informal settlements are less than 2 meter.

Figure 3 shows a 2-axles truck that makes back and forth movement to negotiate a corner along Mnyamani road and cause traffic jam.



4.1.3 Uncontrolled Road Use Behavior

Uncontrolled road use behavior is the third manifestation of traffic mobility problems along local distributor roads in informal settlements. This problem is propelled by tired public transport commuter minibus (*dala-dala*) drivers as well as commercial vehicle (2-axles, van and taxi) drivers due to too many hours of working per day. Furthermore, uncontrolled road use behavior of *dala-dala* drivers is caused by over ambition of making many commercial trips per day and traffic jam and traffic congestions that delays them on the road. It is therefore, a common attitude for drivers to over-speed after escaping traffic congestion and traffic jam with no respect of other road users and without consideration of high volume of pedestrians using the same road as well as concentration of roadside commercial activities. Besides, pedestrians are crossing from one side of the road to the other side for commercial transactions and/or for easy movement with no regard of the moving vehicles as they have notion that drivers will see them. Other pedestrians are just moving at the center of the road so-as-to walk fast by escaping roadside commercial transactions.

4.2 Accessibility of Motorized Vehicles

Accessibility refers to the ability of traffic to move and reach desired destinations (ITE, 2011; VTPI, 2016). Improvement of local distributor roads in informal settlements by using lower space standards that exists on the ground results into the increased problems of accessibility. The main manifestation of this problem is lack of accessibility for emergency and service vehicles, lack of accessibility for public transport as well as lack of space for bus stops and parking bays.

4.2.1 Lack of Accessibility for Emergency and Services Vehicles

Accessibility for emergence vehicles such as fire engines and ambulance and service vehicles such as cesspit emptying trucks and garbage collection trucks are not realized in the upgraded informal settlements. Lack of access for emergency vehicles such as fire engines is a threat in highly developed informal settlements. This is because in-case of fire outbreak at the inner parts of the settlement it is very difficult for fire engines to penetrate for fire rescue. Furthermore, it is possible for fire outbreak to spread from one house to another due to housing densifications in highly developed informal settlements. Similar situation of lack of accessibility for emergency vehicles by fire engines was reported by Chris *et al.* (2014) in South Africa, citing an example of Litha Park in Cape Town. It was reported that lack of access for emergency vehicles to reach the interior of Litha Park is exacerbated by winding paths and lack of roads or corridors wide enough to fit fire engines. Furthermore, Lupala (1995) reported that Rama IV informal settlement in the city of Bangkok (Thailand) was cleared to the ground by fire outbreak caused by “*arson*”. If no consideration is taken for accessibility improvement in roads upgrading/improvement in informal settlements, there is a possibility for the same to happen in Dar es Salaam especially in such cases that about 99% of land in highly developed informal settlements is gross built-up area.

Taking an example of Mnyamani settlement that was upgraded during Community Infrastructure Upgrading Program in 2002, the northern part of the settlement was not improved with local distributor roads, access roads, and pedestrian footpaths. Due to this shortfall, this part of the settlement is accessed through natural meandering footpaths only. Henceforth, in-case of emergency vehicles, the area is not accessed completely by fire engines and ambulance. Furthermore, the area is not accessible by service vehicles such as sewerage dislodge by cesspit emptying trucks and for solid waste by garbage collection trucks.

Figure 4: Lack of accessibility at the northern part of Mnyamani settlement

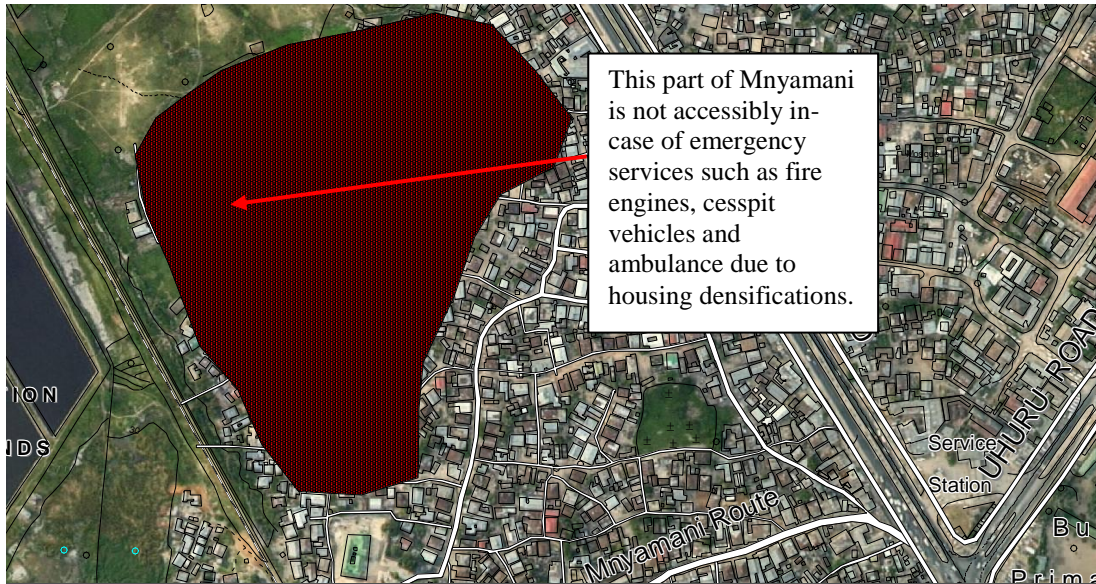


Figure 4 unveils the northern part of Mnyamani that is not accessible for emergency and service vehicles.

Furthermore, there are no considerations given to open-up the blocked roads for emergency and service vehicles in the upgraded settlements. As a result, dead-end roads and bottleneck roads are very common in informal settlements that hinder accessibility for emergency vehicles and service vehicles. Taking the case of the southern part of Mnyamani settlement, for illustration, there was no consideration given to open the encroached parts of road MN1-2 (see Figure 5) so-as-to connect Mnyamani road with Mandela road for accessibility improvement. As a result, the central area of the southern part of Mnyamani settlement is not accessible for emergency vehicles and service vehicles.

Figure 5: Housing extension obstructing MN1-2 road at Mnyamani settlement



Lack of accessibility for fire rescue threatens informal settlements that are developing into commercial hub, such as Mnazi Mmoja Sub-ward in Manzese Ward that is build up into high rise buildings mostly for commercial activities such as hotels.

Figure 6: Development of Mnazi Mmoja settlement into high rise commercial buildings

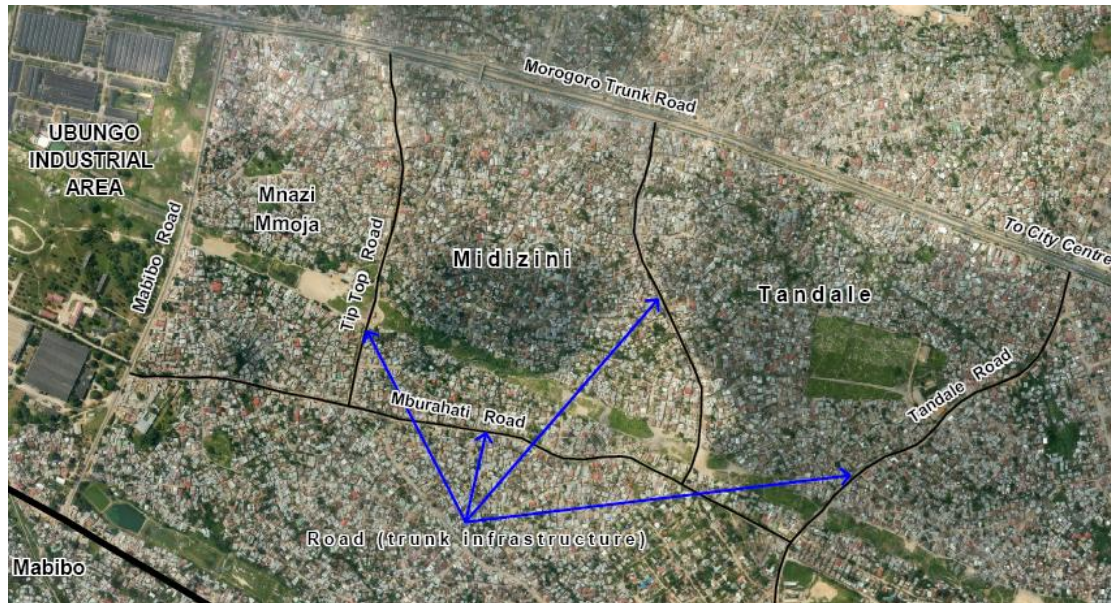


Figure 6 shows development of Mnazi Mmoja settlement into high rise buildings for commercial activities. Such settlements require good accessibility for fire engines in-case of fire outbreak; dislodge trucks due to lack of central sewerage system and garbage collection trucks for collection of solid wastes. Lack of consideration for dislodge services either by accessibility of sewerage emptying trucks or provision of central sewerage system is a big omission that continues to exist in upgrading informal settlements in Dar es Salaam City. Due to lack of accessibility for dislodge trucks, the common method that is used during the rain is discharge of the sewage from the filled up pits into storm water drains. Thus, the existing storm water drains also function as open sewers. Another method used is to dig another pit within the site into which sewage from the filled-up pits is discharged. However, due to unavailability of space due to housing densification, this method is not widely used. Instead, most of people discharge sewage into natural drains in rain season.

4.2.2 Lack of Accessibility for Public Transport

Public transport within the city fabric is formed of district distributor roads and local distributor roads. The approved space standards for district/secondary distributor roads is 60.0 metre right-of-way while the approved space standards for local distributor roads is 30.0 metre right-of-way (URT, 2011). Nevertheless, local distributor roads in informal settlements exist with minimum space of 5.0 metre right-of-way. In the hierarchy of roads network as used in town planning, local distributor roads in the planned (formal) settlements with 30.0 metre right-of-way cannot be linked with the same roads in the unplanned (informal) settlements with 5.0-12.0 metre right-of-way. Furthermore, local distributor roads in informal settlements with 5.0-12.0 metre right-of-way cannot be connected with district/secondary distributor roads with space standards of 60.0 metre right-of-way for connectivity of the public transport within the city fabric. With this framework, local distributor roads collect traffic from the residential areas and feed them to the district distributor roads that are distributed all over the city.

Figure 7: Part of local distributor roads at Manzese settlement proposed for establishment of trunk infrastructure network



Taking the case of Manzese informal settlement, Tip-Top road, Mburahati road and Tandale road (see Figure 7) were proposed by Community Infrastructure Upgrading Program in 2002 to be upgraded as local distributor roads with 10.0 metre right-way for establishment of public transport trunk infrastructure network. These roads were connected with Mabibo road that has a space standard of 18.0 metre right-of-way for the purpose of collecting people from Mburahati, Mabibo, Mnazi Mmoja, Midizini and Tandale informal settlements and feed them to Morogoro road for public transport to the rest of the city. However, the lower space standards hindered the roads in Manzese to realize their functional performances.

4.2.3 Lack of Space for Provision of Bus Stops and Parking Bays

Improvement of local distributor roads with 5.0-6.0 metre carriageway with storm water drains on both sides without consideration of other road functions due to lack of space on the ground results into lack of bus stops and parking bays along local distributor roads. According to De Chiara and Koppelman (1984), De Langen and Tembele (2001) and Kildebogaard (1985), some of the functional performances of local distributor roads is to permits on-street parking and/or parking bays for economic activities along the road, such as shops, small business and workshops as well as bus stops for public transport. Due to this problem, most of commercial vehicles stop along the carriageways to pick/deliver commercial goods from/to commercial premises that are located along the road.

Figure 8: Upcountry bus unloading commercial goods along Mnyamani road



Therefore, it is very difficult to manoeuvre in-case of traffic jam caused by vehicles that stop for delivery of commercial goods along local distributor roads. Figure 8 shows an upcountry bus unloading commercial goods along Mnyamani road while figure 8 shows the resultant traffic jam.

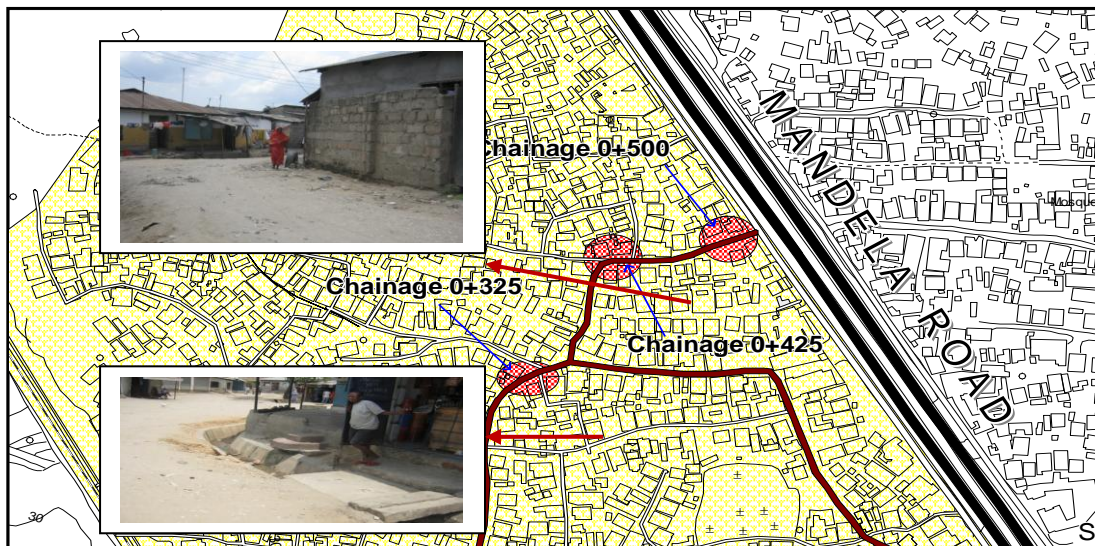
4.3 Damage of Houses beside the Improved Roads

Due to lack of sufficient space in-terms of right-of-way for construction of roadways in informal settlements, several houses are damaged by vibrations caused by road compaction machines (rollers). This is contributed by the fact that about 99% of land in highly developed informal settlements such as Mnyamani in Buguruni ward and Mnazi Mmoja in Manzese ward is gross built-up area. These houses which are very close to the improved roads, at a range of about 1-2 meter from the improved carriageway developed cracks as they failed to withstand the impact of vibrators. For instance, road MN2-1 at chainages 0+325, 0+425, and 0+500 at Mnyamani settlement were improved with minimum width of 2.5 metre wide due to housing encroachment. Therefore, it was difficult for the road compaction machines (rollers) to work in this area without destruction of the nearby houses. Consequently, several property owners whose houses were damaged by development of cracks due to the working of roads compaction machines at Mnyamani settlement forwarded their complaints in October and November, 2006 to the chairman of Mtaa government. In response, the chairman registered their complaints and forwarded them to the Kinondoni Municipal Director through Buguruni Ward Executive Officer for consideration. Nonetheless, no consideration has been given to the affected property owners to-date.

Figure 9: Traffic jam along Mnyamani road



Figure 10: Part of Road MN2-1 at chainage 0+325, 0+425, and 0+500



With this experience, it is obvious that roads improvement does not need only availability of carriageway space in highly developed informal settlements. It also needs space for road construction machines. Figure 10 shows part of Road NM2-1 at chainage 0+325, 0+425, and 0+500 where road improvement at Mnyamani settlement caused destruction to the nearby houses due to lack of space.

5. Conclusion

Unapproved space standards that are developed and used in informal settlements upgrading projects and/or program for roads network according to space available on the ground does not improve transport network. This is because the standards are too low and thus when they are applied in roads upgrading/improvement they increase crisis of traffic mobility and accessibility for emergency and services vehicles. Furthermore, they cause destruction of houses beside the improved roads and they lack links/connectivity with the road network in the surrounding planned settlements and public transport network within the city fabric. Therefore, it is recommended to develop a framework of space standards for roads network for the purpose of providing the lower limit cut-off point for roads improvement so-as-to improve transport network in upgrading informal settlements.

References

- Betancur, J.J. (2007) 'Approaches to the Regularization of Informal Settlements: The Case of PRIMED in Medellin, Colombia', *Global Urban Development Magazine*, Volume 3 Issue 1
- Chris, A., Katie, G., Yijing, H., Yung-ting, H., and Mandi, S. (2014) Improving a Shack Settlement: Enhancing Quality of Life for Litha Park (Internet). Available from: <http://www.arch.umd.edu.ursp/projects>. Accessed 19.08.2016.
- Community Infrastructure Upgrading Program, 2002a. *Proposed Community Prioritization Process (CPP) for Upgrading Unplanned Settlements in Dar es Salaam City*. Dodoma: President' Office, Regional Administration and Local Government.
- Community Infrastructure Upgrading Program, 2002b. *Application of Community Prioritization Process (CPP) and Selection of 20 Priority Settlements for Upgrading in Dar es Salaam City*. Dodoma: President' Office, Regional Administration and Local Government.
- Community Infrastructure Upgrading Program. (2003) *CIUP Stage 1 Report Volume II*: Unpublished Report: Dar es Salaam
- De Chiara, J. and Koppelman, L., 1984. *Time-Saver Standards for Site Planning*. New York: McGraw Hill Book Company.
- De Langen, M. and Tembele, R., 2001. *Productive and Liveable Cities: Guidelines for Pedestrian and Bicycle Traffic in African Cities*. Lisse/Abingdon/Exton (PA)/Tokyo: A.A. Balkema Publishers.
- Gauteng Department of Housing. (2008) SA: Mokonyane: Upgrading of Informal Settlements (Internet). Available from: <http://www.search.gov.za>. Accessed 23.08.2016.
- Institute of Transportation Engineers, 2011. *Measuring Transportation: Traffic, Mobility and Accessibility*. (online) Worshington: Institute of Transportation Engineers. Available at: <http://vtpi.org/measure.pdf> (Accessed 23.08.2016).
- Kenya Slum Upgrading Program. (2016) Informal Settlements Upgrading in Kenya (Internet). Available from: http://www.ardhi.go.ke/?page_id=20 (Accessed 23.08.2016)
- Kildebogaard, J., 1985. *Traffic Engianeering*. Dar es Salaam: Ardhi Institute.
- Kyessi, A.G. (2002) *Community Participation in Urban Infrastructure Provision: Servicing Informal Settlements in Dar es Salaam (SPRING Research Series Number 33)*. PhD Thesis, University of Dortmund
- Lupala, J., 1995. *Potentials of Community Based Organizations for Sustainable Informal Housing Upgrading in Tanzania: The Case Study of Hanna Nassif Pilot Project in Dar es salaam City*. M.Sc. Dissertation, Katholieke University of Leuven.
- Mercado, R. and Uzin, R. (1996) *Regularization of Spontaneous Settlements*. Lund: Lund Centre for Habitat Studies
- Mghweno, J. (2002) 'Informal Settlements in Tanzania: The Magnitude of the Problem', in Kreibich, V. and Olima, W. (eds) *Land Management in Africa (SPRING Research Series Number 40)*. Dortmund: SPRING Centre: 253-263

- Nnkya, T.J., 2002. Many Plans but no Planning: Whatever Happened to Planning for Informal Settlements in Tanzania? In Kreibich, V. and Olima, W., (eds.). *Urban Land Management in Africa (SPRING Research Series Number 40)*. Dortmund: SPRING Centre, pp.226-252.
- Nnkya, T.J. (2005) *The Sustainable Cities Programme in Tanzania 1993-2003*. Nairobi: UN-Habitat/UNDP
- Transport Research Laboratory, 1991. *Towards Safer Roads in Developing Countries: A Guide for Planners and Engineers*. London: Her Majesty's Stationery Office.
- University College of Lands and Architectural Studies, 1999. *Planning through Negotiations: Hanna Nassif Settlement Upgrading*. Dar es Salaam: UCLAS.
- University College of Lands and Architectural Studies, 2000a. *Ubungo Darajani Settlement Upgrading Through Negotiations*. Dar es Salaam: UCLAS.
- University College of Lands and Architectural Studies, (2000b): *Ubungo Darajani Settlement Plan*. Dar es Salaam: UCLAS.
- UNCHS and UNEP. (1999) *The SCP Source Book Series, Volume 3: Establishing and Supporting a Working Group Process*. Nairobi: UNCHS
- UN-Habitat. (2007) *Enhancing Urban Safety and Security: Global Report on Human Settlements 2007*. London: Earthscan Publications Ltd
- United Republic of Tanzania. (2000) *Standard Specification for Road Works*. Skjetten: Novum Grafisk AS
- United Republic of Tanzania. (2011) *The Urban Planning and Space Standards Regulations, 2011*. Gazette of the United Republic of Tanzania Number 48 Volume Number 92.
- United Republic of Tanzania. (2012) *Tanzania Strategic Cities Project (IDA Credit No.4727-TZ: Tender No. ME/022/2011/2012/C/13 for the Provision of Consultancy Services for Infrastructure Upgrading in Unplanned Settlements in Dar es Salaam in Support of Preparation of the Proposed Dar es Salaam Metropolitan Development Project – Request for Proposal*. Dar es Salaam: Prime Minister's Office Regional Administration and Local Government
- Victoria Transport Policy Institute, 2016. *Evaluating Non-motorized Transport: Techniques for Measuring Walking and Cycling Activity and Conditions*. (doc) Victoria, Canada: Victoria Transport Policy Institute. Available at: <http://www.vtpi.org.tdm/tdm.63.htm> (Accessed 23.08.2016).