Causes and Spatial Implications of violating Building Space Standards in Mwanza (Rock) City: Case of Mahina Settlement

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Abstract
Urban centres emerge, develop and expand. In the course of development or expansion, housing development on hilly landscapes may be more challenging than on relatively flat or flat terrains, forcing developers not to comply with building standards. By focusing on one of the neighbourhoods developed on hills, this argument forms the platform to find out the factors that drive developers to violate and how these factors affect the spatial qualities. The study considers building setbacks, plot coverage, Floor Area Ratios (FARs) and the streetscape to analyze the spatial development of the neighbourhood. In this regard, interviews were employed to reveal the building construction practices at a plot level while aerial photos facilitated mapping the extent of spatial growth. Measurements and observations revealed the building standards adopted by house developers.

The study finds that natural, economic, technical and social factors drive developers to violate the official building standards. However, natural factors – hilly and rocky topography and small plot sizes are the main driving forces of violation. Also, developers do not comply because of ignorance of the set out standards and household size increase. The property market, rental units in particular, has driven developers to maximize plot space use in order to increase revenues from rented spaces. The results inform a review of plot sizes and building space standards on hilly areas, availing and provision of building space standards to the grassroots institutions, as well as instituting accountability measures for professional misconduct.

Key words: building space standards, violation, house developers, urban development, hilly landscape, Mwanza city
1. INTRODUCTION

The challenge facing the world today is how to create sustainable cities. However, the population living in urban centers continues to grow at approximately twice the rate of that at the rural areas. For instance, the global city population had increased to 2.76 billion in 1995 and projections have indicated that there will be 5.34 billion people in 2025, and thus exerting greater pressure on the natural environment than ever before (Ngetich et al., 2014). This rapid urbanization will therefore need to be guided with effective urban development control instruments, determine their efficacy as well as their implication on the urban environment (ibid). In general, physical planning standards are formulated by planning agencies to regulate the use and control of land (Olujimi, 2008).

Urban development planning and control challenges are not new in the current urban scenarios and they have existed ever since man started urbanizing. Currently, urbanization trends have been increasing subsequently resulting into urban expansions. Gateri (2002) argues that authorities charged with the responsibilities of managing urban growth and controlling development have not been able to perform their duties effectively so as to manage urban expansion. The result has been unguided and unsustainable urban growth by any means whatsoever leading to urban decay and environmental degradation (ibid). This has manifested itself in the deplorable state of urban infrastructure and services coupled with the increase of unauthorized developments and the inherently low levels of compliance with the requirements of plans and policies (Gateri, 2002).

Therefore, it is necessary to note that development control attempts to check activities of developers and land users by ensuring that they do not develop or use their properties to the detriment of public interest in particular and the environment in general (Olujimi, 2012). This statement depicts the role of development control in ensuring safety amongst and within the living environment.

On land use decision, Cloke (1989) observes that if land use decisions were merely made by the landowners alone, then not only would there be a potentially random intermixture of uses but also there would be no protective mechanism against changes to existing cherished landscapes or to strategically necessary land uses. Olujimi (2008) emphasizes that the enforcement of development control has got a lot of benefits and, therefore, worthy of continuous implementation. The combinations of Cloke’s and Olujimi’s ideas altogether indicate a number of things. First, there is a need to adhere to the planning standards and development regulations so as to maintain a safe and conducive living environment. Second, it is seen that there are negative effects that are likely to occur as a result of violation of the laid down planning standards and development regulations.

Violation of planning standards is caused by a number of factors and occurs in different styles as well as at varying stages during building construction. For instance, in Yavatmal district of the Maharashtra state in India, 85% of developers violate due to very high costs of land, 10% do not comply because of administrative negligence while 0.5% is due to lack of awareness of such standards (Boob and Rao, 2012). Furthermore, lack of monitoring machinery and shortage of technical man power at the municipal level contribute to violations. Such violations particularly on setbacks and validity of existing rules mainly occur during land subdivision, in plan permission and in execution stage (ibid). In Dilla town in Ethiopia, causes for non-compliance and stages at which they occur are similar to the foregoing experience from India. In the list, Yohannes (2012) adds poor documentation of the plan resources, lack of required personnel, shortage of planning and implementing facilities and equipment, small financial capacity and utilization.

This paper considers the foregoing arguments valid in areas without development hindrances such as flat, relatively flat and gently sloping terrains. Specifically, it seeks to explore the...
drivers for the violation of building space standards in settlements with natural barriers such as hills and rocks.

1.1. The study context

The study was conducted in Mahina ward in Nyamagana district, Mwanza City. Mwanza is the second largest city in Tanzania located on the Southern shores of Lake Victoria on the Northwest part of the country. Mwanza City has a total of 1.325 square kilometer of land whereby 900 square kilometer (about 68%) is Water, largely Lake Victoria and the rest 425 square kilometer (32%) is dry land (Burra, 2015). It is often referred to as the Rocky City because majority of its settlements and neighbourhoods are developed on hilly and steep areas composed of underground and outcropped rocks that surround the city (see Figure 1).

![Figure 1: The urban landscape of Mwanza City and its vast neighbourhoods](Source: Google, 2018)

Administratively, the city is divided into two administrative districts: Nyamagana and Ilemela districts. By 2012, the city had a total of 706,453 people and the population of each district is relatively similar: 363,452 in Nyamagana and 343,001 in Ilemela (Tanzanian National Bureau of Statistics, 2012: 3).

Out of these districts, this study was carried out in Nyamagana district particularly in Mahina ward, which is one of the twelve wards in the district. Other wards that make up the district include Isamilo, Mirongo, Nyamagana, Pamba, Mbugani, Igogo, Mkuyuni, Butimba, Mkolani, Buhongwa and Igoma as presented on Map 1. Among these wards, Mahina ward was used to undertake and fulfil the objectives of this study.

1.2. The urban context and related institutions

Past master plans had been prepared for Mwanza, but only two had been adopted by the city. The 1992 Master Plan and 1993 Central Area Redevelopment Plan were prepared and adopted by the city for a 20-year planning horizon (Huang et al., 2017: 85-86). Reviews of previous master plans observe that the plans themselves were not effective in guiding urban spatial growth. Land use on planned land largely respects the original intent of master plans, but differences in built environments of planned versus unplanned settlements are not significant. Another trend noted is the prevalence of detailed planning schemes that operate in an independent and fragmented fashion due to the lack of General...
Planning Schemes (GPS). Detailed planning schemes are, often times, created but not followed by survey plans, which leads to development taking place in ways that are inconsistent with the DPS.

The current master plan for 2015-2035 has been developed and is nearing adoption. Until May 2017, the public commentary period on the plan had already been completed, and comments were submitted to the MLHHSD for their consideration and incorporation into the plan. The plan was officially approved and launched in September, 2017.

2. METHODS AND MATERIALS
2.1. Data collection techniques

A case study strategy and mixed research approach were relevant in this work. On the one hand, violation of building space standards by developers is, absolutely, a current issue that takes place in a particular context and hence a case study strategy was an appropriate lens (Yin, 1994; 2004; 2009; 2014). On the other hand, the first domain relates to the causes (the what) of violating building standards, which suggested a qualitative approach. Hence, qualitative methods and tools particularly interviews and observations, as Balnaves and Caputi (2001); Kombo and Tromp (2006) and Creswell (2009) provide, were employed. Also, Dublin City Council, (2005; 2011); Boyko and Cooper (2011); Lwin et al. (2012); De Folice (2012) and Pafka (2013) on the general site development standards express density as a measure of the relationship (the how) between buildings and their surrounding space quantitatively using unit measures.

Emanating from above, interviews, facilitated by interview guides, with house developers were conducted in order to understand the causes for non-compliance with building space standards. Similarly, key informant interviews (with the Mwanza City Council Town Planners) underscored urban development control practices in developing neighbourhoods and the resulting urban configuration. In investigating the actual behavior of house developers in completed and on-going building construction projects as Kombo and Tromp (2006) suggest, observations, photographing and measurements were useful in order to estimate the building standards adopted. Through observations, it was easy to pinpoint buildings which complied or not complied with building standards in the neighbourhood and a thorough documentation of the details was made on the observation sheet. During observations, in cases where evidences were important for complementary purposes, photographs were taken. These methods, therefore, dictated measurements of plots and buildings that seemed not to comply. Moreover, a rigorous review of the policies, laws and national space standards which guide building construction in Tanzania was done to provide a standardized framework of the building standards.

2.2. Results

Topography of the case study area

Apart from being located on the Northern Highlands of Tanzania which are generally characterized by high lands, Mahina settlement is located between 260 and 276 meters above the mean sea level. The landscape of the settlement is composed of hills, valleys, steep slopes and some gentle sloping terrains. Generally, almost 85% of settlement's spatial area is hills and steep slopes (see Figure 2). The geology of Mahina is also quite different in comparison with many other areas. The area has a largest proportion of land being covered by very huge rocks which are both opportunities and in some cases an obstacle in site development, during building construction processes as well as land governance as a whole.

*Figure 2: Topography in Mahina in a cross-sectional view*
2.3. Extent of violations and their spatial implications

The extent of violations was determined by investigating plot setbacks since the area is dominated by low-rise single storey buildings. Later on, these variables were used to determine the extent to which developers have complied with the plot coverage and plot ratios. Through field observations and measurement, results from Mahina settlement postulated that the extent of violation depended much on the type of plots. Tables 1, 2 and 3 show the building space standards which developers have adopted during housing construction in comparison with the official building space standards.

In high density plots, house developers built or extended houses more towards the edge of the plot on the front between 0 and 2.0 meters (10 out of 18 cases) and right sides of the plot between 0 and 1.0 meters (13 out of 18 cases). Houses were built in 1.8 meters on average and 1.0 meter away from the plot edge as opposed to 3.0 meters and 1.5 meters respectively. Although building development on the rear sides overshadowed the official limit by 0.4 meters, left side setbacks were generally observed to align with the stipulated standard (see Table 1). Such violations have also increased the plot coverages in individual plots as well as the overall coverage. In individual plots, plot coverages ranged from 38% to 81% while on average plots were developed by 61%. In a similar alignment, plot ratios in almost all plots, except in one plot, as well as the overall plot ratio exceeded the stipulated limit (between 0.38 and 0.81) while the average plot ratio of all plots was 0.61. These results imply high violation of building space standards; and the plots as well as the entire settlement are being densified.

In medium density plots, a slight different trend from that which was typical in high density plots was observed. The slight difference is resulting from the fact that due to large plot sizes and high income levels, house developers are flexible to orient buildings or remove obstacles particularly rocks available in plots so as to match the official building space standards. Very few houses were built close to the edge of the plot on the frontage at a distance of between 0 and 2.0 meters as only 8 out of 17 cases were observed. An almost similar tendency was observed on the side setbacks for almost all buildings adhered to a 3.0 meters on the right and left sides of plots. On the rear sides of the plots, except few buildings, the majority were built between 5.0 and 6.5 meters from the plot boundaries. Overall, developers exceeded the limits on the plot frontage and on the left side of the plot as the analysis showed that buildings were built 2.6 and 2.3 meters away from the plot boundaries as opposed to the required 3.0 meters. Consequently, the adopted limits have triggered plot coverages as well as plot ratios. The reality shows that the actual plot coverages range from 23% to 61% in varying plots with an overall plot coverage of 40% which are contrary to the stipulated 25%. These results also have affected the actual plot ratios as Table 2 clearly shows.
Furthermore, findings have demonstrated that as the plot size increases with an increased income, developers are tempted to greatly violate the building standards. In low density plots a number of building structures, besides the main building, were built for different purposes. These include income diversification through renting (residential and commercial rentals), poultry, animal husbandry and leisure particularly establishment of botanical gardens. As a result, the large portions of the plots particularly on the front and rear sides as Table 3 shows are consumed by subsidiary buildings to accommodate the different functions and activities undertaken by plot owners. Very peculiar, except one developer, the rest of developers (in 16 out of 17 plots) built their houses between a range of 2.0 and 8.0 meters from the plot boundary while the official standards require developers to undertake building construction activities at a minimum distance of 10.0 meters from the plot edge. Although the side setbacks were generally in line with what the permitted standards require, the surpassed front and rear violations still had a great impact on the plot coverages and plot ratios. As such, resulting plot coverages and plot ratios in individual plots ranged from 12% to 63% and 0.12 to 0.63 respectively in comparison with the permitted 15% and 0.15.

As much as house developers violate the specified building standards at plot level, the impacts spread over to neighbourhood, community and city levels. Within plots, the organization of buildings becomes incoherent and unpleasant jeopardizing the circulation, solid, liquid and storm water management systems. Also, the intended spatial alignment of buildings within plots and at street level as well as the definition of streets, as Figure 3 illustrates, lack making the settlement dysfunctional and unlivable.

2.4. Factors influencing developers to violate building space standards

Results from interviews conducted with the Mwanza City Town planner on the reasons why developers do not comply with the official space standards in planned areas have, on the one hand, revealed that insufficient staff and budget in the lands department for effective development control was overemphasized. Commenting on insufficient resources particularly staff, the City Planner stated:

“…The main problem is limited number of professionals in the department to accomplish all the duties conferred to the department with respect to our areas of jurisdiction... Development control is, therefore, done but not on daily basis in comparison with the pace of the building construction industry which is in progress everyday...” (Interview with Mwanza City Town Planner, April, 2018).

Also, lack of awareness by the majority of residents and developers on the specific space standards that need to be adhered to during building construction was second mentioned. The City Town Planner also argued that the stipulated space standards are too huge to be practically implemented by developers especially in the medium and low density plots. Moreover, individual and households income maximization through addition of buildings for the sake of increasing revenues in a single plot, as shown in Figure 3, was pointed out as another reason for violating official space standards.

On the other hand, from a total of 52 interviews carried out to developers and household heads results showed that the factors that influence developers not to comply with the official building standards were grouped into four as Figure 4 clearly presents. These were natural factors, technical factors, economic factors and social factors.

Figure 4: Major causes of violation of space standards
All 52 respondents mentioned natural factors i.e. the hilly and rocky landscape as the main factor that hinders them from complying with building standards (see Figure 5). In this aspect, respondents argued that due to the hilly and rocky nature of the settlement, it was difficult for them to comply with the stipulated building space standards as they could not remove the rocks in their plots to pave a way for housing construction. They were, therefore obliged to shift the building lines to the edges of the plot where building space was available. On this aspect, one developer who did not want to be known said:

“...It is the nature of the area that forces us not to comply. Some plots have huge stones to dismantle to make a spacious area enough for housing construction. Therefore, you find yourself automatically shifting to the sides of the plot with no such hindrances....” (Interview with Unknown respondent in Mahina, Household Head, April, 2018).

Moreover, 32 out of 52 respondents (nearly 62%) mentioned technical aspects particularly lack of awareness on the official space standards as the main reason for non-compliance with the building standards. Also, 19 out of 52 respondents (37%) agreed that income maximization in a plot attracted them to disobey the stipulated building space standards. This implies that such a group was aware of the existence of the official building standards but ignored the compliance. Types of violation included the construction of rental houses within plots, shops and urban agriculture especially poultry and animal husbandry. Closely tracked by income maximization, household heads pointed out an increase in household size through natural birth and extended families another influencing factor for violating the official building space standards. The violation that is manifested by this factor was either an additional of buildings in a plot or extension of existing building structures to accommodate the incoming population. During...
household interviews with one household head, he expressed the reason coherent to the increase in household size as presented in the following quotation:

“...The first house that I constructed on this plot adhered to all the stipulated space standards. But with time, the household size increased to an extent that it [the house] could not accommodate all family members sufficiently. Thus a need to build another house arose and the newly built house is the one that is seen to have violated the space standards...”. (Interview with Mr. Boniface Chapy in Mahina, Household Head, April, 2018).

Development control arrangements

Two main departments in the Municipal Council, the lands department and the construction department, are responsible for urban development control. Each department has its roles and responsibilities in controlling urban spatial development. The department of Lands is solely responsible for the preparation of spatial plans, surveying of plots, provision of title deeds and issuance of planning consents and building permits. The Construction department is responsible for conducting site inspections during site development [building construction] to check whether developers abide to the conditions specified in the building permits offered. Yet, the two departments are responsible for the provision of building permits whereby different professionals from the two departments approve the building permits in their respective slots. Basing on the above discussion on violation of building space standards, the study found out obvious that development control particularly during site development was ineffective. When urban professionals were asked on the ineffective of development control in their areas of jurisdiction acknowledged the presence of laws and regulations to oversee urban development. They insisted that some failures occur because of inadequate financial and human resources to conduct regular site inspections in various phases of building construction.

On the contrary, house developers mentioned low level of enforcement of the existing laws and regulations regarding development control in planned areas. In this regard, only 11 out of 52 developers (equivalent to 23%) who violated the stipulated space standards faced legal constraints. This drift was also associated with issues related to corruption particularly from affluent developers. As such, four developers admitted openly that they bribed the responsible officials and their charges were dropped and therefore walked out of the mess freely.

3. DISCUSSIONS AND CONCLUSIONS

The hilly and rocky landscape of Mahina ward represents many wards of Mwanza City. Therefore, the data collected from Mahina ward and results obtained can be used to describe the situation in Mwanza City not only in planned settlements which accommodate about 30% of the city’s residents but also those 70% living in unplanned settlements located on hills.

As most people within Mahina settlements have constructed their houses on slopping terrains with outcropped and underground rocks, they have not managed to comply with the stipulated building space standards due to such natural barriers. Closely tracking natural factors is the technical aspect particularly lack of awareness on the official space standards. The study has found out that all house developers are obliged to visit the City Council to obtain the building consent and permit which stipulate the building conditions and standards in the respective area and plot respectively. During interviews with house developers this was not the case as the majority often consults and uses their local artisans (mafundi) after buying plots from the Municipality and they never get building permits which allows them to start building construction activities. Some developers requested spatial [urban] development plans with building conditions to be available in their areas particularly in Ward and Sub-ward levels for easy access and consultation. However, I argue that the last two factors that drive house developers not to comply with building space standards through additional of buildings within...
plots for economic (revenue collection from additional rental spaces added) and social reasons (increase in family size) were a failure of urban development control. This implies that developers complied with building space standards while constructing the first buildings but due to lack of checks and balances as well as from experiences from other developers they were tempted to add some houses of extend those existing to meet their economic and social objectives. As such, setbacks which lay a foundation of plot density have been exceeded and so do plot coverages and plot ratios which are 61% and 0.61 respectively in high density plots. These limits have exceeded the permitted limits i.e. 40% and 0.40 by 52.5%. In medium and low density plots, the tendency was almost similar as presented in the foregoing presentation whereby the adopted plot coverages and floor area ratios deviated from the required building space standards by 37.5%.

Likewise, house developers have deviated from the official limits by 50% in low density plots. These results altogether, first, depict a high rate of densification at plot level which also spread over at street, settlement, community and city level. Secondly the results have revealed how plot size, income level and natural factors can contribute to violation of building space standards. From above, high rates of violations have been vivid in high density and the rate decreases with the increase of plot size. In other words, the landscape [hills] and geological nature of the settlement [rocks] coupled with low income levels drives house developers to violate building standards when rocks are located on the sides of the plot where buildings are supposed to be erected.

4. ACKNOWLEDGEMENTS

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5. REFERENCES


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Map 1: Administrative setting of Mwanza City
Source: Burra, 2015

**Table 1: Official vs adopted space standards in high density plots**

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<th>House No.</th>
<th>Building setbacks (meters)</th>
<th>Plot coverage</th>
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Source: Field data, 2018
Table 3: Official vs adopted space standards in low density plots

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Source: Field data, 2018
Figure 3: Typical violation practices in part of Mahina settlement

Source: Field data, 2018