

Neighbourhood Unit Residential Segregation in the Global South and Its Impact on Settlement Development: The Case of Dar es Salaam City

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Abstract: *This study explored the residential segregation as a factor of settlement disparities in Dar es Salaam City. The focus was drawn on the forms and factors of residential segregation in the city which, experiences informal urbanism. Disparities in settlement development underlie residential segregation patterns. However, there is a myth that segregation is not prevalent in Dar es Salaam owing to the mixed development in the formal and informal neighbourhood units. There is little knowledge about residential unit segregation occurring in cities, which have high informal settlements development. The study used both qualitative and quantitative data collection methods with a sample of 120 respondents of which: 15 house head from six wards, two from each municipality, making a total of 90 house head selected in the city and 30 local leaders all participated in this research. Questionnaires and in-depth interviews were tools used to collect information from the local leaders, key informants and municipal officials. Data obtained were classified and synthesised by using computing programme such as SPSS, Ms. Excel and ArcGIS. Neighbourhood unit segregation is suggested to be a result of income, spatial preference and ethnicity enclaves amongst Dar es Salaam city dwellers. It is evident that there is voluntary and involuntary residential unit segregation within the city, which consequentially imparts the urban form of the city. Most poor city residents are involuntarily segregated into the poor serviced neighbourhood while the rich enjoy voluntary segregation within the settlement. It is argued that sustainable place making need for more flexible and robust approach to provide the spatial advantages that are important for people with poor resources such as income. Implementation of mixed-income housing development programme would complement the anti-segregation initiatives in the urban design and strategized by the legal framework for urban planning and housing provision.*

Keywords: Residential segregation, Income segregation, Spatial preference segregation, Ethnic segregation and settlement disparities

1. Introduction

Settlement developments in both developed and developing countries have a history embedded with changes, which have occurred over a long period of time (Smiley, 2009). Focusing on developing countries under British owned colonies, different rules were established so as to create defence from other colonies. Developed settlements were based on those rules, which were segregative in nature (Hettige, 1992). Subsequently, there were settlements for the white' people, the Indians and native group which were predominantly black people. The white people's settlements were well planned and serviced but native groups' settlements were neither planned nor serviced and grew informally (Burton (2005), Brennan, (2007), and Smiley, (2009)).

The residential segregation in most urbanized cities tends to create uneven development and services provision. It also hinders the life opportunities to the poor. In addition, it has been the main cause of the development of squatter and informal settlements, mostly in African cities. For instance in Cape Town, South Africa, the shanty squatter settlements are a result of rich-poor segregation in the city (SAHO, (2015) and Dung, (2008)). Furthermore, the incapability of the government to adequately provide housing for the displaced poor in the city centre has lead to the occupancy of areas surrounding the rich people settlements of which some areas are disaster prone (SAHO, 2015 and, Hahn, 2010).

In other urbanized cities in developing countries, settlement developed as a result of the economic segregation of the poor, which led access to land and housing difficulties because of belonging in the lowest income group. These low-income earners are confined in the informal settlements

where land and housing are easily accessed. Ironically, the poor settlements surround high-income residential areas, which enabled the inhabitants to work as agricultural labourers or domestic servants, while others were employed in industrial and commercial establishments (K' Akumu and Olima, 2007). K' Akumu and Olima (2007) stated that, these squatter and informal settlements in most cities in developing countries are the consequence of the colonial capitalist development posed by the British who alienated the local people from control over their land in order to provide enough labour for the settler farms and emerging town centres (Hettige, 1992). Generally, the residential segregation resulted to the development of settlement disparities in the most urbanized cities and planned settlement because of the existence of legal framework which support the segregation in the city, spatial preference, income level of people and the ethnicity characteristics of the urban dwellers (Peter, (2009), Rasmussen, (2012)). This implied that, both voluntary and involuntary segregation contribute d to the settlement development within the cities.

Residential segregation is a widely researched urban phenomenon in both developed and developing countries (Muhammad *et al.*, 2015). Residential segregation comprised by both spatial and social segregation, which are not new phenomenon in urban studies (Decker, (2005); Smiley, (2009); Muhammad *et al.*, (2015)). It sorts population groups into various neighbourhood contexts and shapes the living environment and social space that result into classes of high, medium and low income groups (Hattige, (1992); Decker, (2005); Muhammad *et al.*, (2015)). Residential segregation occurs in two fold, which is either voluntary or involuntary. Involuntary segregation affects mostly people with low income. This phenomenon happens when lower income group is driven out

automatically, that is segregation through planning framework of the nation or the market force for land and housing in urban neighbourhoods. The lower income group is driven out automatically because it fails to afford part of the land or housing in the urban space, when such situation persists; the lower income relocate to the areas where it is easy to afford land, in most cases this includes hazardous zones. Involuntary segregation occurs when people themselves prefer to live in planned or in squatter settlement. Clark (1991) noted that some residential segregation in some part of America and Europe is influenced by spatial preference of the people. Some people with the same habits like high-income class and particular ethnic group tend to live in one neighbourhood and people with low income in other neighbourhood. Schelling (2010) reported that European and American people get separated along many lines and in many ways such as preference and income. There is segregation by sex, age, income, language, religion, colour, preference and status, comparative advantage and of historical location. Some segregation comes from organization practices; some intentionally organized; and some results from the interplay of individual choices that discriminate themselves.

Overtime, residential segregation has contributed to informal settlement development in urban areas. Low-income groups choose to live beside high-income groups informally to enjoy economies of scale such as social services easily available to them (Decker, 2005). Generally, social and spatial preferences create voluntary spatial segregation in which people of the same income level or similar ethnic group may be attracted to live in one particular neighbourhood in the city. Additionally, the planning, building policy and housing services ordinance in some countries influence social preference. These policies create image of socio-spatial division of households by income then formulate high density, medium density and low-density settlements. Moreover, the segregation comes from inaccessibility of the poor to affordable housing or land, inadequate provision of infrastructure in the high density residential areas. A good example is African countries, like Nigeria, Zimbabwe, South Africa, Kenya, and West African countries (Thong (1978), Hettige, (1992), Ifesanya and Nwokoro (2002); Smiley, (2009); Muhammad *et al.*, (2015); SAHO, (2015)).

2. Literature Review

Nature and origin of residential segregation in urbanized cities

The residential segregation traced back from several perspectives like preference perspective, human satisfaction perspective and economic perspective are discussed in detail;

Preferences perspective

Residential segregation can be influenced by preferences on sharing spaces within the built environment. Bolt *et al.*, 2008 argued that ethnic groups with similar income level or professional status or social class have preferences to live close to each other. Currently, researches identify many advantages of a particular community to live in an ethnic enclave neighbourhood. New immigrants living in an ethnic

enclave can have positive effects (Beckers, 2011; Musterd *et al.*, 2008; Philips, 2007). It can provide opportunities for housing market, employment or free from evils (Logan *et al.*, 2002; Zorlu and Mulder, 2008; Van Gent and Musterd, 2012). An ethnic enclave neighbourhood finds familiar culture, social support and a sense of security or belonging (Philips, (2007), Logan *et al.*, (2002)). Furthermore, family ties and ethnic facilities such as shops play a significant role for ethnic minorities decision to settle in the neighbourhoods with related ethnicity (Boschman and Marteen, (2013); Zorlu, (2009); Hedman, (2013); Logan *et al.*, (2002)). However, segregation thesis in Latin America and some part of Europe indicate that the preference of people to live at a particular neighbourhood sometimes depends on the spatial aspects of the settlement. Spatial aspects which determine the residing of people in certain settlements includes the settlement proximity to the sea shore, within or proximity to the forest zone, others along the mountain edge, others in plateau zone and others prefer to live closely to the shopping centres in order to perform different economic activities which help them to pass on the daily life. Conclusively, neighbourhood unit residential segregation is either socially or spatially determined (El Din *et al.*, 2012; Sotf *et al.*, 2009; Boschman and Marteen, 2013).

Human capital perspective

Residential segregation can be explained by ethnic differences in human capital accumulation status and other personal characteristics (Logan and Alba, (1993); Crowder, 2001). Poor ethnic group households have lower incomes, which result to narrow the opportunities of life on the housing market (Bolt, 2001). Households, which depend on the public housing, have limited neighbourhood choices. Neighbourhoods with high shares of public rented dwellings often accommodate the ethnic poor group. Apparently, the ethnic poor group face housing market constraints. Hence the residential segregation might be created as a result of household income differences. (Crowder, (2001); Bolt, (2001)). The human perspective towards the residential segregation is one among the strongest perspective, which perpetuates the occurrence and existence of segregation in the metropolitan cities in the world. It defines the affordability capacity of the people towards land and the housing market. Currently, land and housing market is determined by the free market economy. The demands for housing continue to increase while supply remains constant. This creates high price of both land and housing facilities and consequentially, create classes of have and have not within the community. Eventually, this results into involuntary residential segregation where people with high income or middle income level are able to buy land and housing facilities while others live in high class neighbourhoods. Those who are not able to buy the land and housing facilities suffer and live in the poor neighbourhood and informal settlements and sometimes reside within vulnerable areas like the river valley or along the edge of mountains (Doff *et al.*, (2010); Edewor, (2011); Zaami, (2012) ; UN-HABITAT, 2010)).

Stratification perspective

This perspective includes both preference perspective and the human capital perspective that is because stratification has different factors for different people in the settlement. Some people satisfied by their preference and others

ecological influence of the neighbourhood; hence it can create either involuntary residential segregation or voluntary residential segregation (Edewor, 2011). Additionally, stratification perspective sometimes known as human satisfaction perspective focus to the discrimination on the land market that limits the options for the mobility of ethnic minorities into more desirable neighbourhoods, especially for groups which are separated (Alba and Logan, 1992). Therefore, the most desirable neighbourhoods will be indigenous majority concentration neighbourhoods and ethnic minorities will be less likely to move into such neighbourhoods (Philips, 2007). The land market institutions such as housing institutions can have discriminatory effects, and reduce the opportunities of ethnic minorities to own either land or house (Alba and Logan, (1991); South and Crowder, (1998)). For example, lending institutions might have less trust in those belonging to ethnic minority groups compared to the majority, who as a result might have problems getting a mortgage (Albers, 2006). Philips (2007) noted that private landlords might prefer households from the majority ethnic group rather than from the ethnic minority group.

Stratification or fear of discrimination can especially affect neighbourhood choices of higher income people. While this group can afford to move to better neighbourhoods they will more often select into better concentration neighbourhoods than could be expected based on their human capital (Logan and Alba, 1993). The preferences perspective expects poor people want to live close to their own group with the same characteristics, higher income households will be more successful on the housing and land market, hence, if the preferences perspective applies, most often end up in neighbourhoods with own group concentrations. According to the human capital theory, poor select into a particular neighbourhoods because of their average lower income.

Testing and measuring residential segregation at a neighbourhood level

The residential segregation at neighbourhood can be tested and measured by different models depending on the type of segregation dealing with; religious segregation, racial segregation, ethnic segregation, income segregation, preference segregation as well as spatial segregation. For instance Schelling model of residential segregation is used in United States of America to test racial and ethnic segregation, also its concept used in Nigeria to test and to determine the magnitude of racial and religious segregation, in South Africa to test the racial segregation. Logit model of segregation which is also known as logistic segregation model is widely used in Brazil, Sri Lanka, China, Spain, France, Malaysia, United Kingdom, Indonesia, Asian countries and East African countries such as Kenya. Logit model is issued to test the residential preference and neighbourhood assimilation. Agent-based model is used to test the residential preference to live in informal settlement vis-à-vis formal settlement; it is used in the developing countries like Kenya, Nigeria, South Africa, Zimbabwe, Egypt, Latin America and central African countries. The mathematical model include both discrete and continuum segregation. Mental or cognitive model of segregation was used by Smiley in her different study of socio-economic segregation, geographical segregation and residential

preference especially in east African countries in 2000's. The residential segregation for this study employed mental mapping to measure the magnitude of the segregation in Dar es Salaam city.

Measuring Residential segregation

A mental map is psychological or internal representation of places. The term arose during the psychological turn in human geography in the late 1960s as a key component of behavioural geography, which concerned itself with addressing the role of environmental perception as a mediating factor between a human's action and their environment. Mental maps were viewed as a tool, a key of connection between someone understands of their environment and their spatial choices and behaviour. This was an explicit attempt to explain human spatial activities by understanding them overlain upon a foundation of human behavioural processes. Mental maps are one of many terms now known by the umbrella term of cognitive mapping (Gould and White, 1974).

Moreover, the mental mapping model now days is more simplified tool of testing, measuring and map the area characterised by certain features like segregation, because of introduction of new way of mapping scientifically that is through GIS technique, so based to this study residential segregation at a neighbourhood level and its impact to the urban quality of life, Mental mapping model will be incorporated by GIS so as to simplify the work and come up with critical information concerned segregation in Dar es Salaam City.

Statement of the problem

Developing countries have traditionally been characterised by less segregation and social polarisation compared to most cities in the United State of America, however there are many signs that show segregation in urbanised cities is increasing and result to the settlement disparities, which affect the quality of life. In some cities, local populations suffer from a concentration of inequalities: poor housing, low-quality education, unemployment, environmental pollution and difficulties to access some services like health, transport and water services. However, both income disparities and spatial preference leads to urban sprawl, environmental deterioration, and social exclusion and mainly create zones of richest people and, in between and poor people. While various current literatures show different causes of poverty and social deprivation in the city's neighbourhood but they do not mention segregation as source of those scenario. Therefore, this study is going to study the forms and factors of residential segregation in DaresSalaam City to understand the composition of residents within a neighbourhood and its spatial implication.

3. Methods

The claims raised through this research were validated by triangulating the data obtained against information from other sources so as to understand the existing residential segregation in the city, which give out three major forms of residential segregation in the city. Data were identified based on both primary and secondary data sources.

The study used mixed methods approach to collect and analyse data obtained from the respondents. The methodological flexibility of this approach allowed the use of both qualitative and quantitative data collection techniques in providing an empirical basis from which the researcher drew conclusions about the issues pertaining with residential segregation.

The three Municipalities (i.e. Ilala, Temeke and Kinondoni) in Dar es Salaam city were the main primary datacases, which helped to obtain the required information of each specific question. From each municipal two wards (Ilala: Jangwani and Kinyerezi; Temeke; Keko and Kijichi; Kinondoni: Kigogo and Bweni) were selected for detailed study where ward executive officers were interviewed. For each selected ward six sub-ward leaders were interviewed. Furthermore, data were obtained from the house head interviews. A total of 15 house heads were selected purposively from each ward, which made 120 total numbers of respondents.

Techniques used were questionnaires, in-depth interviews for officials and key informants. Also focus group discussion was conducted so as to get the reality of the residential segregation in the city. The secondary data were collected through documentary reviews focusing on the municipal profile and policies framework in the city. Also the observations technique as used in day-to-day community activities contributed to a mapping exercise that was able to present the concentration of activities in different parts of the city. These techniques were used concurrently to confirm, cross-validate and corroborate the findings.

4. Key Findings: Forms of Residential Segregation in Dar es Salaam City

The residential segregation in the city is categorised into three major forms which are based into the income of the residents, spatial preference or geographical influential and the ethnicity behaviour of the city's residents, however those categories create settlement disparities in the city. The following section presents detailed analysis of residential segregation in Dar es Salaam City;

Income residential segregation

A number of people in the city have low income, which force them to live in the lower income areas such as Keko and Kigogo. These people settle in the informal settlements that are characterised with poor houses and high density plots compared to Mbweni and Kijichi. High income people largely settle in planned areas which features low density plot with high value houses. Generally, the income disparities in the city create involuntary residential segregation where people separate from one settlement to another because of income variation (Table 1). The income segregation in the city influence residential segregation and hence settlement separation as it was explained by one of the respondent:

"Hili jiji liko hivi; Kinondoni kaskazini imetawaliwa na maeneo ya wenye pesa kama huko Mbweni Masaki, Msasani, Mbezi bichi, Mikocheni na Kunduchi ukilinganisha na Temeke na Ilala ambako maeneo mengi ni watu wakawaida: the city is divided like this, Kinondoni northern like Mbweni, Masaki, Msasani, Mbezi beach, Mikocheni and Kunduchi part is dominated by neighbourhood with higher income earners, compared to Temeke and Ilala where large part of their neighbourhood is dominated by lower income earners" (Interview 6 and 9, with Town planners of Ilala and Temeke municipality respectively, May 2016),

The city form follows income status of the people which lead to the settlement-income segregation (Figure 1, 2, 3). The higher the income of a person the more voluntary segregation happens as explained:

"Mimi nilikua naishi Kimara na nimejenga pale ila kwa sasa siwezi kukaa pale kwa sababu za kiusalama ila pia maeneo yanayotoa harufu mimi siwezi ishi kijana: I was living at Kimara but now I do not live there anymore because of security reasons but also right now I cannot live at stinking areas" (Interview 47, May 2016),

Increased income, increase the need for hygienic areas with high security (Interview 47). Spatially, income segregation affect the spatial distribution of people which make people to live separately from one income level to another income level within the single ward (Figure 1, 2, 3, 4, 5 and 6)

Figure 1, 2, 3, 4, 5 and 6 show the settlement disparities due to the income level of the residents in the wards. The blocks with moderate income level has characteristics of full services such as water, shopping services, road services that are in fair to good condition in planned settlements. Blocks with lower income earners are characterised by poor water services, roads, shopping services and flooding.

Table 1 Income Disparities in the City's Neighbourhood (n=90)

S/N	Ward Name	Monthly Income		Income Level
		TSH	%	
1	Kigogo	55000	4.2	Lower income
2	Jangwani	60000	4.6	Lower income
3	Keko	32000	2.4	Lower income
4	Mbweni	550000	41.8	High income
5	Kinyerezi	300000	22.8	High income
6	Kijichi	320000	24.2	High income

Scale: less than 4% per capital income – below poverty line
 4%-10% per capital income- low income earners
 10%-25% per capital income- middle income earners
 25% above, per capital income- High income earners
Note: the scale provided is according to this study

Source: Field Survey May, 2016

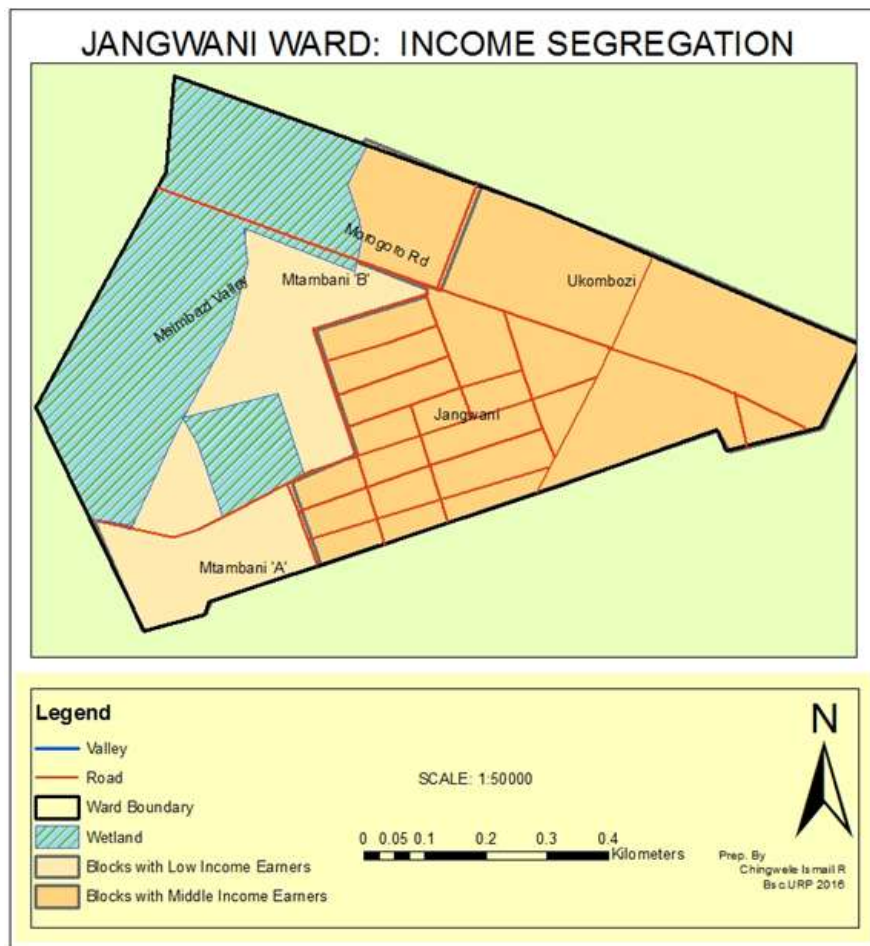


Figure 1: Jangwani ward: Income segregation
 Source: Field Survey May, 2016

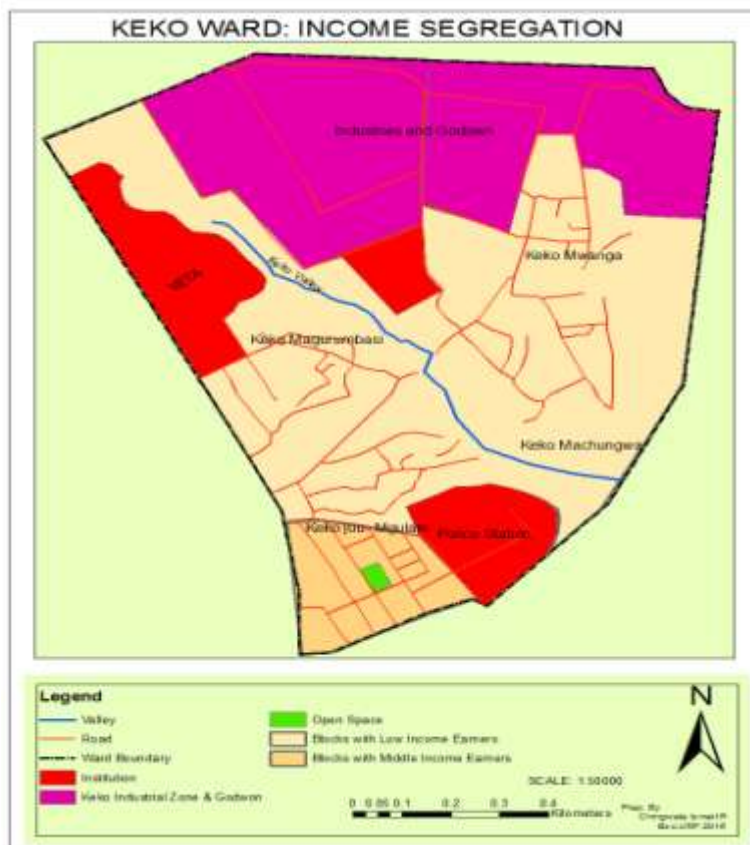


Figure 2: Keko ward: Income segregation
 Source: Field Survey May, 2016

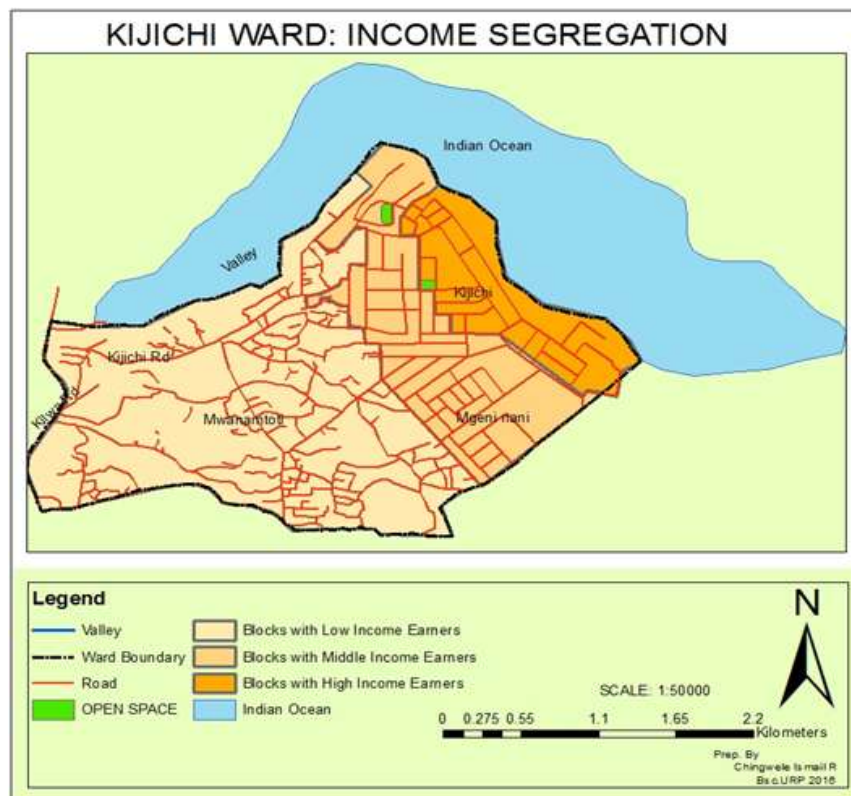


Figure 3: Kijichi ward: Income segregation
 Source: Field Survey May, 2016

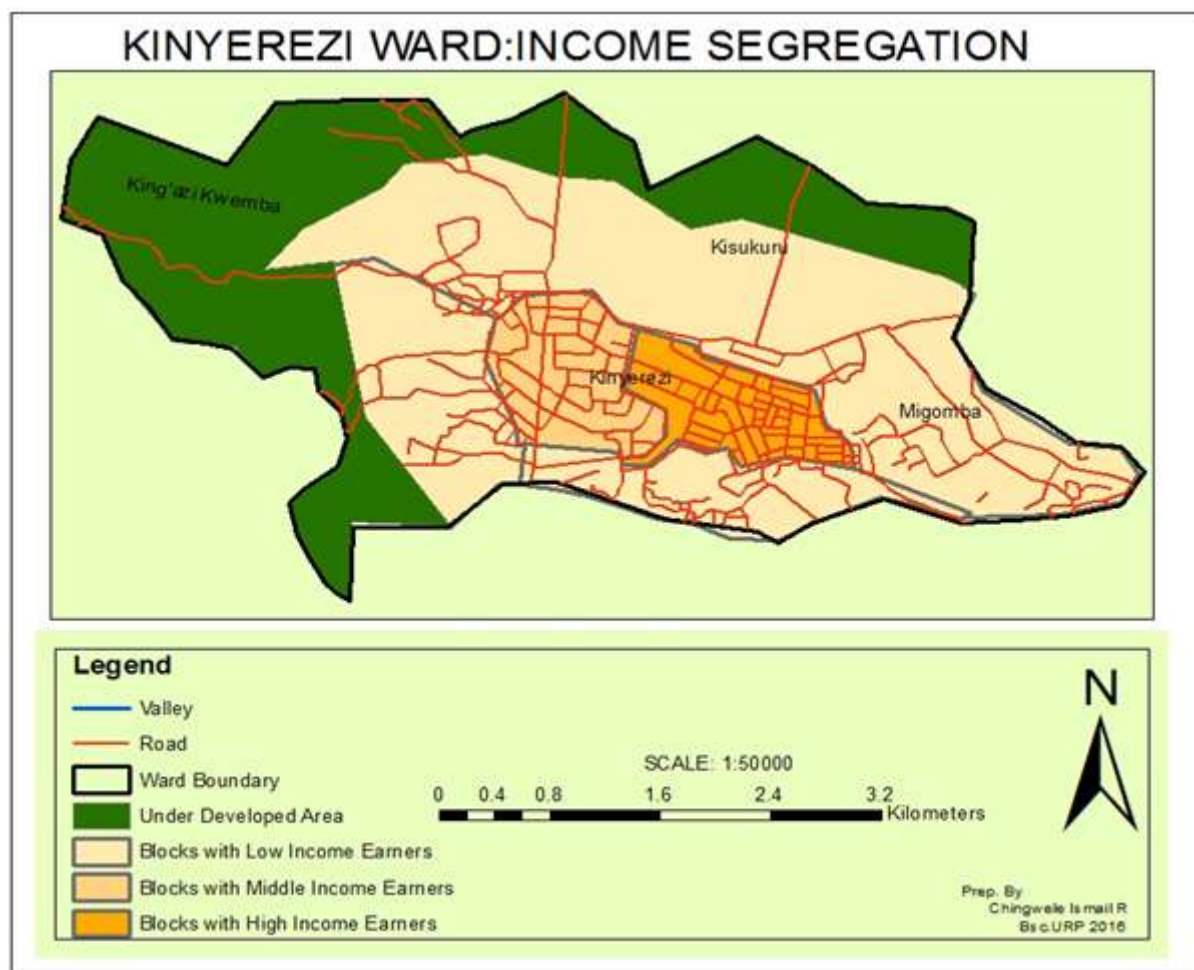


Figure 4: Kinyerezi ward: Income segregation
 Source: Field Survey May, 2016

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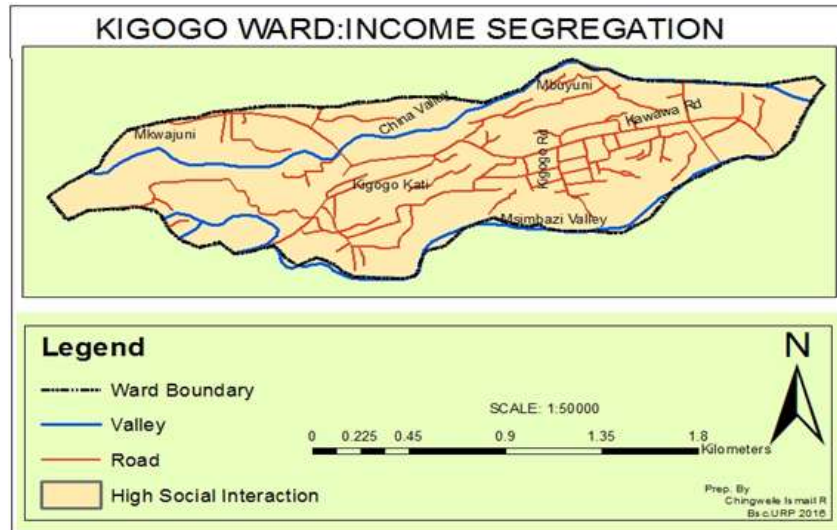


Figure 5: Kigogo ward: Income segregation
 Source: Field Survey May, 2016

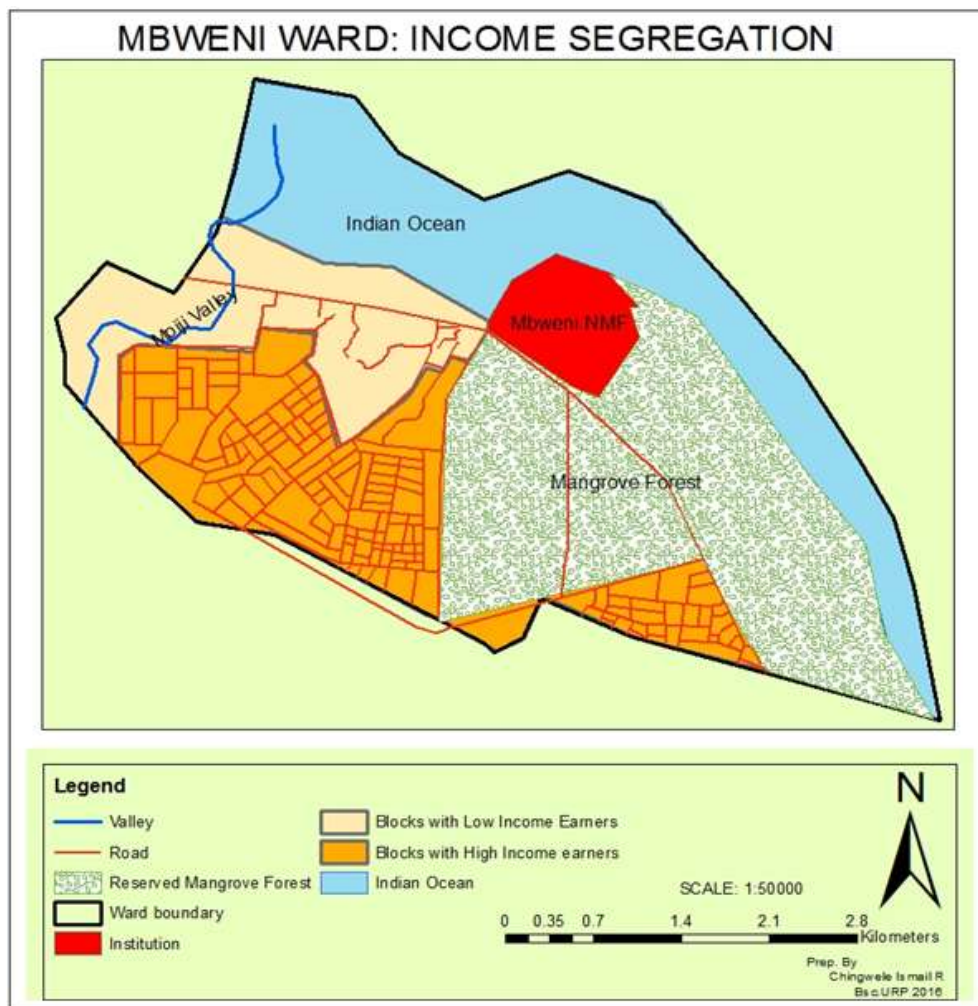


Figure 6: Mbweni ward: Income segregation
 Source: Field Survey May, 2016

The implication of Income disparities on Building typology

The income variation in the city tends to create involuntary residential segregation, which is caused by the issue of affordability. Residents with lower income fail to afford quality housing while moderate and high-income afford the

quality housing. The housing affordability is one among the determinants of housing typology in the settlement. The better the housing the higher the income of the people and hence, better housing typology (Figure 8).



Figure 8: Building typology in lower income neighborhoods with its infrastructure
Source: Field Survey May, 2016

Also the remain part of the residents in the city having middle and high income level can afford the cost of good

housing quality. Consequential, voluntary segregation emerge (Figure 9).



Mbweni gated house

Meisonate at Kijichi

Figure 9: Building typology in High-income neighbourhoods
Source: Field Survey May, 2016

Spatial Preference Residential Segregation

The spatial segregation is one among the forms of segregation in the city, where people move from one area to another area due to the spatial preference (Figure 10). Spatial segregation in the city caused by the preference of people towards plot size in the neighbourhood, landscape, vistas and ventilation of the area, accessibility available and the distant from the shopping centre. Good example of

settlement disparities is between Mbweni and Kigogo in Kinondoni municipality caused by people preferring large plot size, landscape of the neighbourhood and cross ventilation at the area. People live Kigogo because it is very close to the CBD, where they perform some small business activities so as to meet their daily needs.

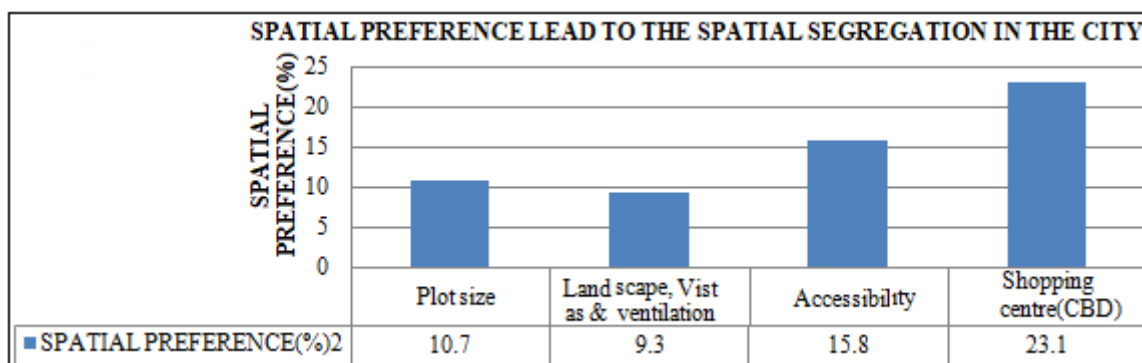


Figure 10: Spatial preference-residential segregation in the city (n=90)
Source: Field Survey May, 2016

Furthermore, the spatial preference in the city create voluntary segregation of residence in the city, where people move to the particular areas because of his/her reason, good example from the study areas in May 2016, some people live in an areas which have natural endowment such as beaches like Mbweni and Kijichi while others are attracted by the central business centre. Kigogo and Keko shows the prevalent of people valuing social interaction and accessibility towards the central business district. Jangwani residence prefer to live at that ward because of the presence of CBD while Mbweni and Kijichiare attracted to live at that area because of the geographical characteristics of the area including its slope towards the coast line, landscape and the cross ventilation, plot size and security. Therefore figure 10 indicates that the city's residents tend to live in the settlement where they have interest with. One can conclude that the residence segregates themselves depending on their

preference and that is voluntary residential segregation in the city.

Human Preferences in the City Neighbourhood

The findings show that the city residents preferred to live at the area where social interaction are very higher and close to the central business district regardless of their income level while some of them prefer to live out of the city where the plot size are very large and there is high security with low social interaction (Table 2). Also the higher income earners tend to reside out of the city due to the crime condition in the lower income neighbourhoods. However, the high-income earners prefer to live far from the CBD with less interaction. Large number of low-income earners prefers to be proximity to the central business district where in nature there is higher social interaction.

Table 2: Human Preferences in the City Neighbourhood (n=90)

Socio-Spatial Preference	KIGOGO (%)	MBWENI (%)	JANGWANI (%)	KINYEREZI (%)	KEKO (%)	KIJICHI (%)
Plot size	-	40.3	-	62.9	-	43.7
Land scape, Vistas & ventilation	-	43.6	-	-	-	33.9
Accessibility	33.4	-	29.1	30.3	-	20.0
Social interaction	47.1	-	26.7	2.1	45.8	-
Security	-	16.1	-	9.7	-	10.4
Shopping centre (CBD)	19.5	-	44.2	-	53.2	-

Source: Field Survey May, 2016

Urban Form Influence on Residential Segregation

One of the factors which lead to the spatial distribution of the residents in the city is the urban form which is determined by the planning ideology and its practices. Moreover, urban form influences choices which individuals have to make. Historically, Dar es Salaam city was divided into different zones based on race such as first zone for Europeans, second for Indians and Arabs and third for Natives (Smiley, 2009). These zones were adopted by the Dar es Salaam Master Plan of 1979 which show the segregated neighbourhood but not based on race as what colonialist did before. Therefore, some people prefer to live at Zone I, where is now dominated by high income earners and in other areas related to that zone, others prefer to live at Zone II where there is interaction with Indians and Arabs and others reside in Zone III where there is higher Native Interaction as well as high level of social interaction compared to those other zones. Geographically Zone I was located close to the Coast line, the people reside there because of the presence of the coast line, an example of a similar Zone I is Mbweni.

The adopted planning ideologies in the city were regularism and functionalism for Brownfield environment and garden city for Greenfield environment. The regularism and functionalism apply at Jangwani, Keko and Kigogo where the town planners in the city seek to provide health solution and accessibility in those wards through upgrading the settlements. The garden city ideology applied in the wards which were not much developed in peri-urban areas such as Mbweni, Kijichi and Kinyerezi. The difference between those two categories is; in regularism and functionalism planning ideology do not consider the space standard within the neighbourhood and aim to maximize space use in order to accommodate large number of residence in the areas, due

to that the field survey shows that the plot size in that neighbourhood is less than 400 meter square, while in the area where garden city planning ideology apply the space standard are highly considered as indicated in Table 3.

Table 3: Plot standard for the case study areas in Dar es Salaam Neighbourhood (n=90)

S/N	Ward Name	PLOT SIZE (m.sq)	Density
1	Kigogo	Less than 400	HD
2	Jangwani	Less than 400	HD
3	Keko	Less than 400	HD
4	Mbweni	800-1200	MD&LD
5	Kinyerezi	600-800	MD
6	Kijichi	800-1200	MD&LD

Source: Field Survey May, 2016

Findings show that the neighbourhood close to the CBD is dominated by very small plot sizes and developed informally and is also occupied by low income earners which their per capital income a month ranges from TZS 32, 000 to TZS 60, 000 while the Neighbourhood which is located in Peri-urban side such as Mbweni, Kijichi and Kinyerezi where the residence occupied the neighbourhood are middle and higher income earners with per capita income a month between TZS 300, 000 and TZS 550, 000 (Figure 11). That means, people with the same income level living together and working on the same income generating activities, mostly, informal trading activities. Ironically, planning ideology contributes to settlement disparities in the city by failing to control the informal settlement developed near the CBD.

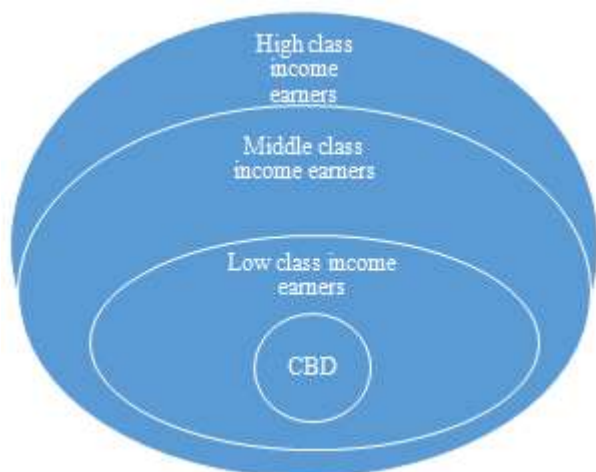


Figure 11: Urban form create involuntary settlement disparities in the city (n=90)
Source: Field Survey May, 2016

Inequality within the built environment of the city is one among the factors which influence settlement segregation in the city. It creates both social exclusion and spatial segregation. The housing market tend to influence residential segregation in the sense that people with high income afford the quality housing and those with low income afford the poor housing located in informal

settlement such as those in Kigogo, West part of Jangwani and Keko wards. Consequentially, people are involuntarily segregate themselves to these settlements within the city. Moreover, location of a house by such individually become influenced by the situation thereof (Table 4; Figures 12, 13, 14, 15, 16, 17). It is suggested that housing location and availability in the city create spatial segregation, which is either involuntary or voluntary.

Table 4: Housing location and availability

Housing location	Available Houses (%)
Kigogo	-85% moderate value detached houses -15% Multistory houses
Jangwani	-100% of East part of Jangwani dominated by block of flats -78% of West part of Jangwani dominated by Detached poor houses
Keko	-77% detached houses both poor and moderate condition
Kijichi	-65% Quality Detached and Meisonate houses which is higher value
Mbweni	-68% Meisonate houses which is very quality houses and higher value houses

Source: Field Survey May, 2016

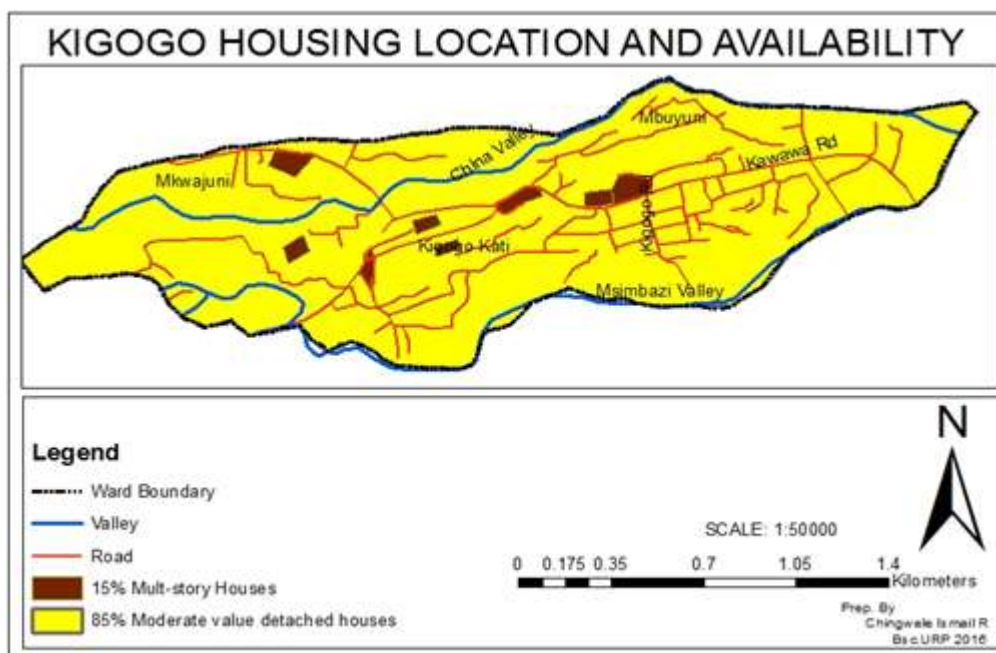


Figure 12: Kigogo Housing location and availability
Source: Field Survey May, 2016

The housing location at west part of Jangwani which are poor detached houses are located close to the Msimbazi valley which make people vulnerable during rainy season,

however that location indicate the spatial segregation of residents within the neighbourhood (Figure 13)

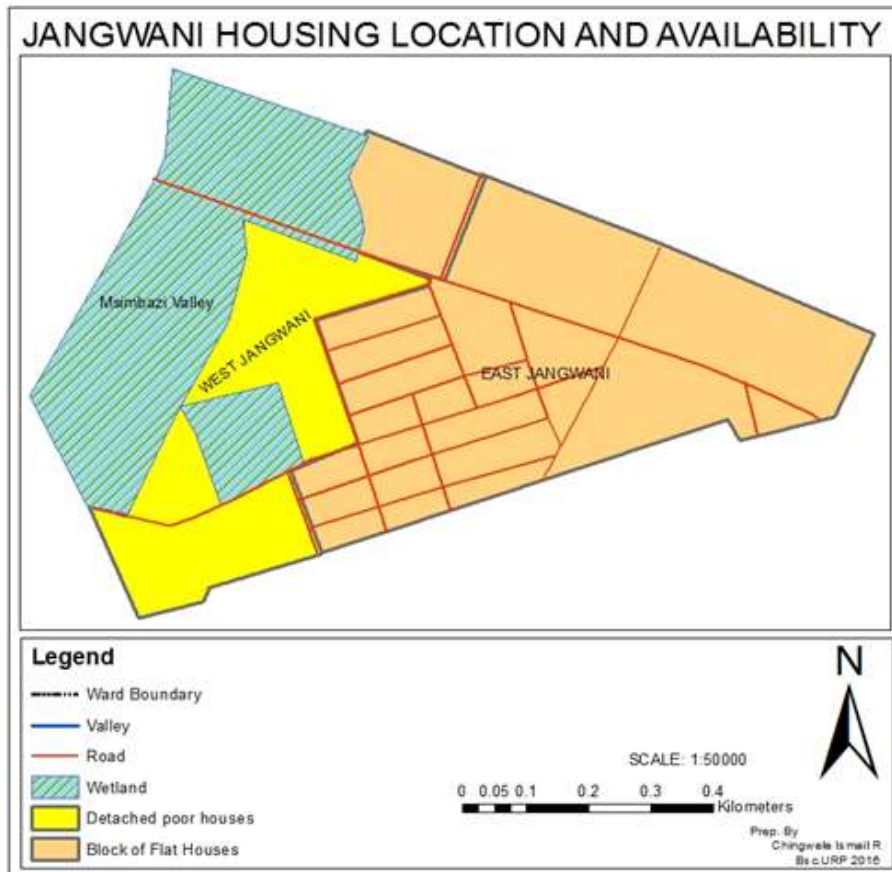


Figure 13: Jangwani Housing location and availability
 Source: Field Survey May, 2016

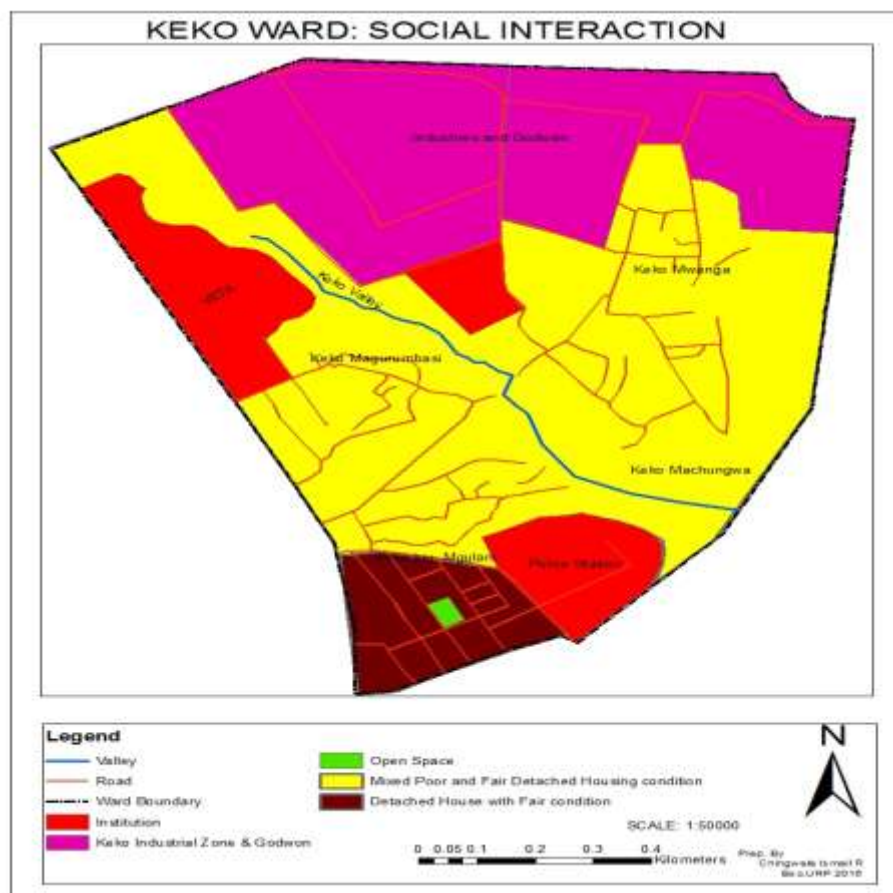


Figure 14: Keko Housing location and availability
 Source: Field Survey May, 2016

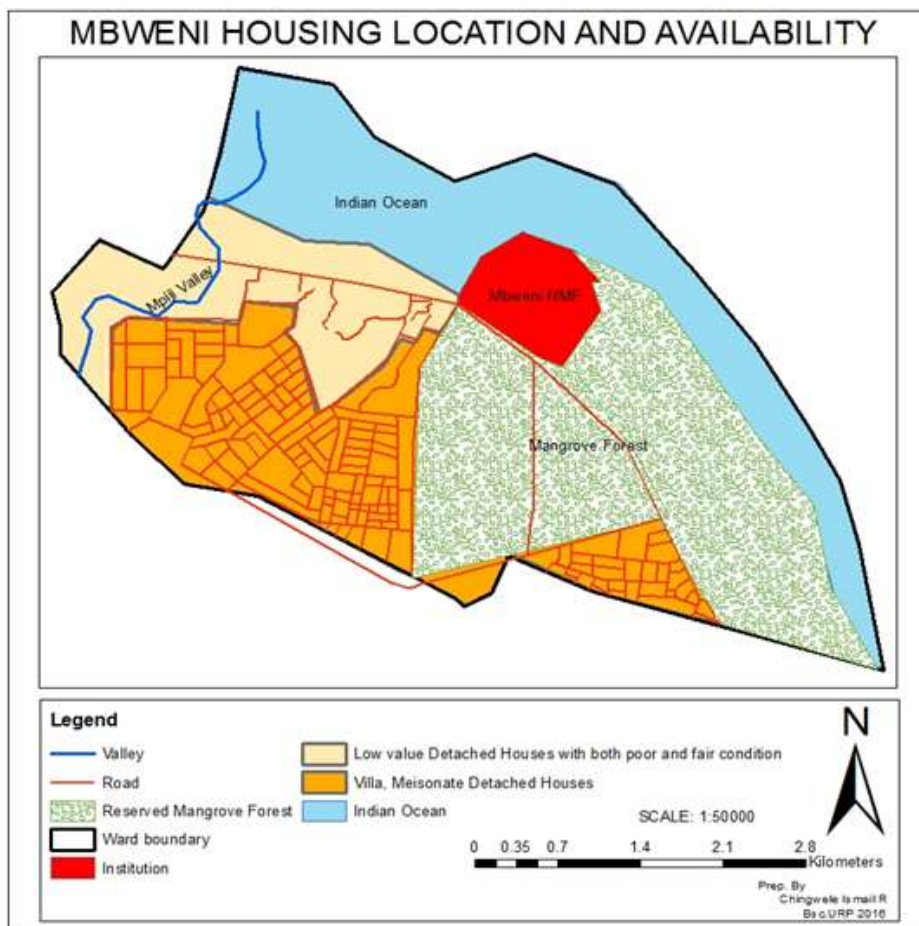


Figure 15: Mbweni Housing location and availability
 Source: Field Survey May, 2016

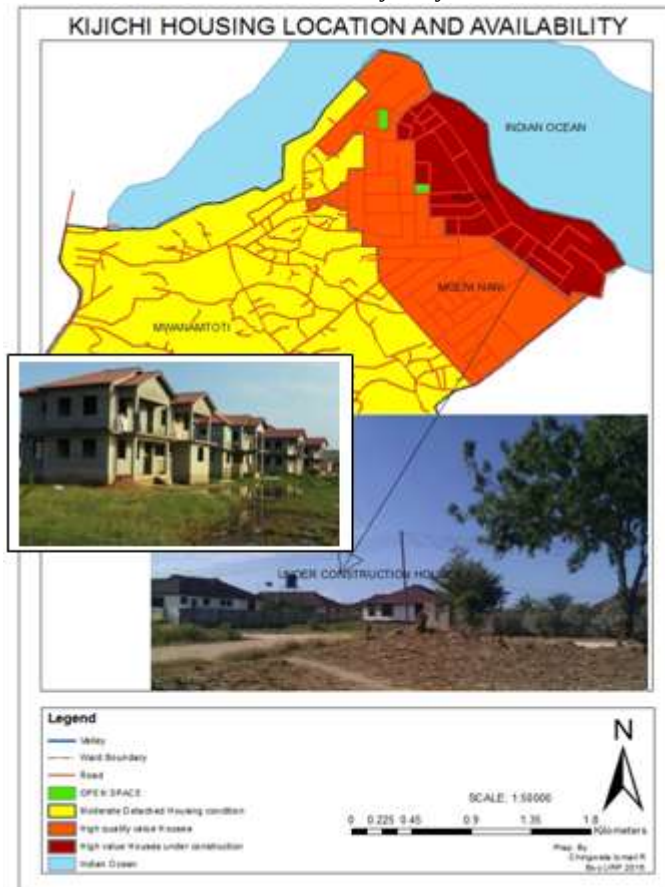


Figure 16: Kijichi Housing location and availability
 Source: Field Survey May, 2016

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Generally, the built environment in the city influence the spatial segregation due to the housing rent at specific ward, some people afford to rent high quality houses at Mbweni or Kijichi while others cannot afford the rent rate of such housing therefore, those people forced to live in the areas where the housing rate is lower and mainly that areas are

those proximity to the vulnerable areas like within Msimbazi valley for Kigogo and Jangwani ward as shown in the (Figure 17) also some reside in the squatter settlement like what happen at Jangwani ward and Keko ward as well



Figure 17: Vulnerable houses at Msimbazi valley
Source: Field Survey May, 2016

Accessibility and permeability

Accessibility and permeability is crucial to any neighbourhood within the built up environment. (Lynch, 1983). However, according to human behaviour; people are influenced to live in the accessible areas especially motor vehicle owners. Usually, they live in peri-urban areas for this case Mbweni and Kijichi. Others are influenced by social interaction rather than accessibility in the environment, these tendencies create segregation in the city because the people with the same behaviour of wanting more social interaction reside together at a particular area like Kigogo, Keko and west part of Jangwani ward and to a large extent they are

lower income earners. While for those who have the tendency of wanting more accessible areas rather than social interaction are attracted to reside in peri-urban areas. These are largely high-income earners who reside at Mbweni and Kijichi where social interaction is very low compared to Kigogo and Keko where the neighbours meet every morning. Nevertheless, the road infrastructure in the residential areas in the city influences the spatial preference residential segregation in the city because some residents tend to be attracted by the accessible infrastructure (Figure 18).



Figure 18: Accessibility in the settlement
Source: Field Survey May, 2016

Figure 18 depicts poor accessibility at the ward which push people to escape such settlement because of that road condition, however the findings reveal that the high income earners do not live in such settlements while for those who have low income tend to live at such settlement then the spatial preference affected by the affordability capacity of the residents.

Ethnic Residential Segregation

Ethnic residential segregation is prevalent in Kigogo. The dominant ethnic groups are Lugulu and Pogoro tribe from Morogoro of which is 90% of number of respondents (Figure 19). Economic migration is the main reasons for movement of people from up country regions. People from Morogoro have mostly settled in Kigogo explained below by the respondents;

“Mimi mwenyewe ni mpogoro kutoka Morogoro na nimechukuliwa kijijini na rafiki yangu, na ukichukua Kigogo kata yote ni walugulu yani kwa kifupi Kigogo imejaa wapogoro na walugulu”; I am a pogoro from Morogoro and I was taken from the village by my friend, and picking the Kigogo kati street it is all dominated by the Lugulu, in short the whole Kigogo is dominated by the Pogoro and the Lugulu (interview 21 with household head Kigogo Kati, may 2016).

“Hapa kwetu ukiacha mtaa wa Mbuyuni upande wa pili kule ukivuka barabara, upande huu watu wengi ni waislam”; Here after crossing the road on the second side of the road dominated by Muslim people (interview 19, with household head Kigogo, May 2016)

From other case study areas, Kijichi ward indicated the dominance of Ndengereko and Zaramo residing in the informal settlement adjacent to the planned settlements (Figure 20). Both Mbweni and Kijichi planned settlements are characterised with mixed tribes as explained by the respondent;

“Hili jiji lina ukabila usio onekana kwa macho lakini upo kwa mfano ukienda pale Kijichi utakuta watu wengi sana ni Wandengereko na Wazaramo isipokuwa lile eneo lililopimwa ndio lenye mchanganyiko wa ,makabila na mara nyingi kwa huku Temeke maeneo amabyo hayakupimwa utakuta wanaishi kabila moja au mawili yanayohusiana.” This city is characterised by invisible tribalism, for example at Kijichi ward dominated by Ndengereko and Zaramo except in the planned areas where mixed tribe reside, In

Temeke informal settlement are dominated by tribalism” (Interview 21, Town planners of Temeke Municipality May, 2016)

The domination of ethnic groups follows the major district distributor road within the city which, are Kilwa road zone, Nyerere road, Morogoro road and Bagamoyo road. Each zone has well defined income, preference and ethnicity residential segregation. A good example is the neighbourhood along Bagamoyo road dominated by people with high income compared to the neighbourhood along Kilwa road and Nyerere road. The three wards present a phenomenon that show the city is characterised by ethnic residential segregation, because people with the similar characteristics are attracted to live together, also those people who reside according to their ethnicity characteristics dominated by lower income level compared with the mixed in the settlement. The people with tribalism and regionalism mainly create informality in the city as Mpiji, Mwanamtoti and Kigogo informal settlement. Social networking remains the main factors for ethnic group settling in one area (Table 5). Social interaction at Kigogo, Keko, and Jangwani are very high compared to the Mbweni, Kijichi and Keko where the social interaction rate is below 5 index rate as shown in the (Table 5 and Figures, 19, 20, 22, 23, 24, 25, 26, 27)

Table 5: Social networking rate in each ward

$SI = \sum_{i=1}^n \frac{(W_i/r) (B_i/R)}{}$ where SI= Social Interaction w=Area covered by high income earners r= Total population of the blocks where the Index calculated B= Area covered by Low income earner R= Total population of the neighbourhood						
S/N	WARD	Wi (Ha)	r	Bi (Ha)	R	SI
1	Kigogo	0	15	640	90	0
2	Keko	3.6	15	432.4	90	2.3
3	Jangwani	225.9	15	14.8	90	4.9
4	Mbweni	389.9	15	71.9	90	20.7
5	Kinyerezi	104.5	15	292.9	90	19.8
6	Kijichi	109.5	15	179.8	90	14.6
SCALE Less than 5 index rate- High social interaction 5<SI<15 index rate- Moderate social interaction Above 15 index rate-low social interaction						

Source: Field Survey May, 2016

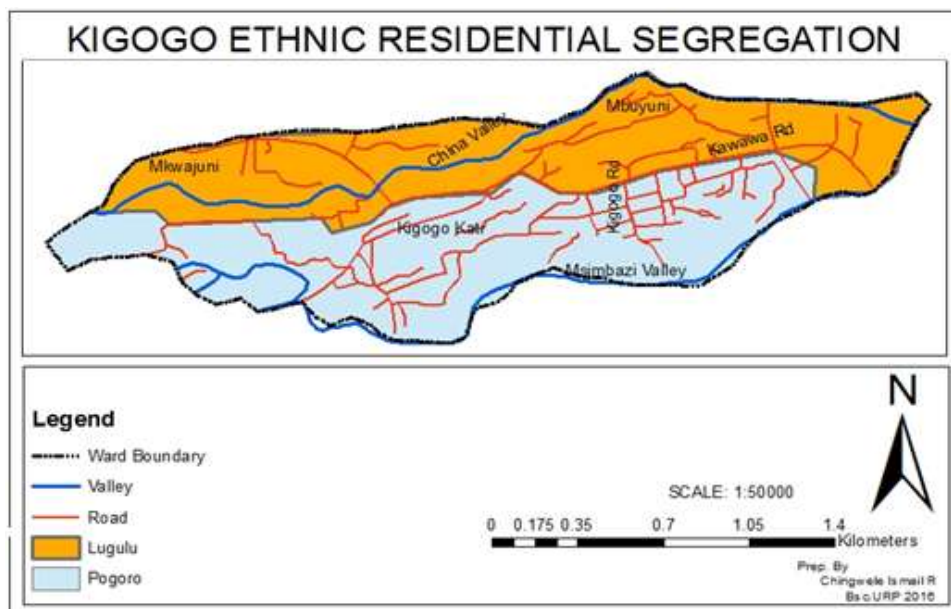


Figure 19: Kigogo ethnic residential segregation
 Source: Field Survey May, 2016

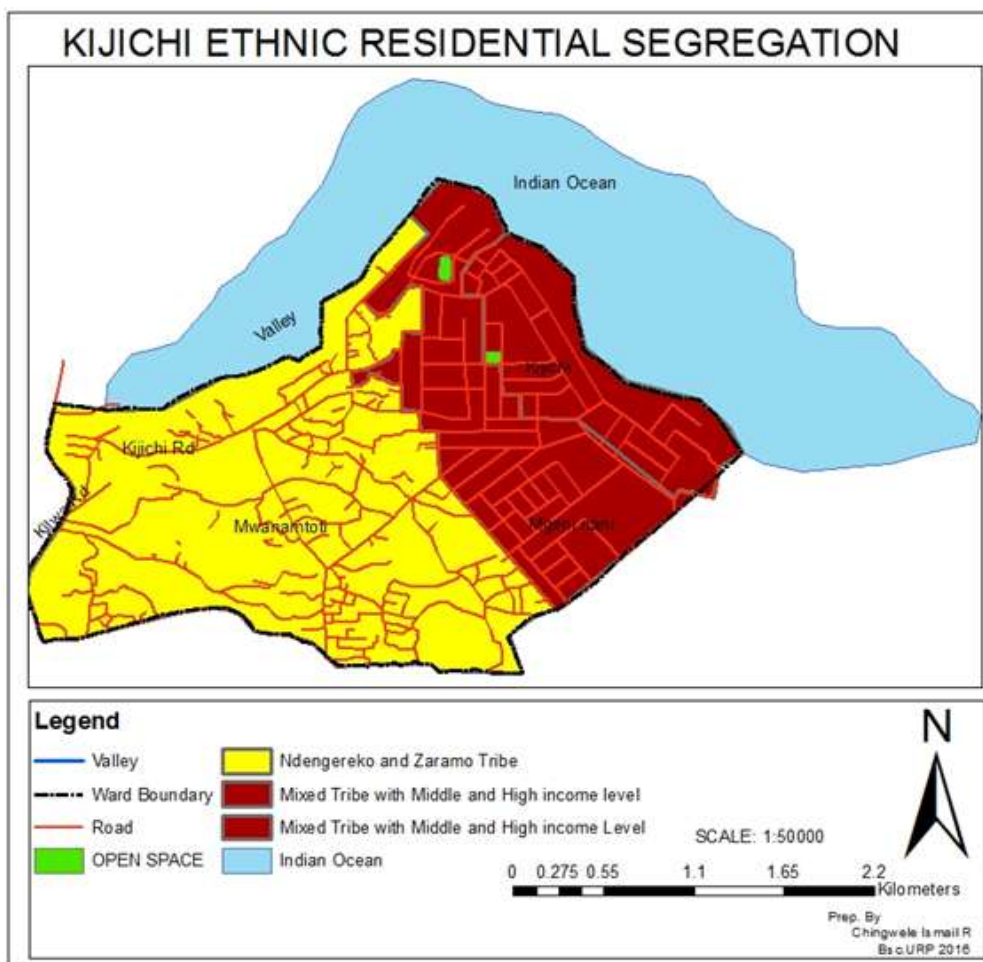


Figure 20: Kijichi ethnic residential segregation
 Source: Field Survey May, 2016

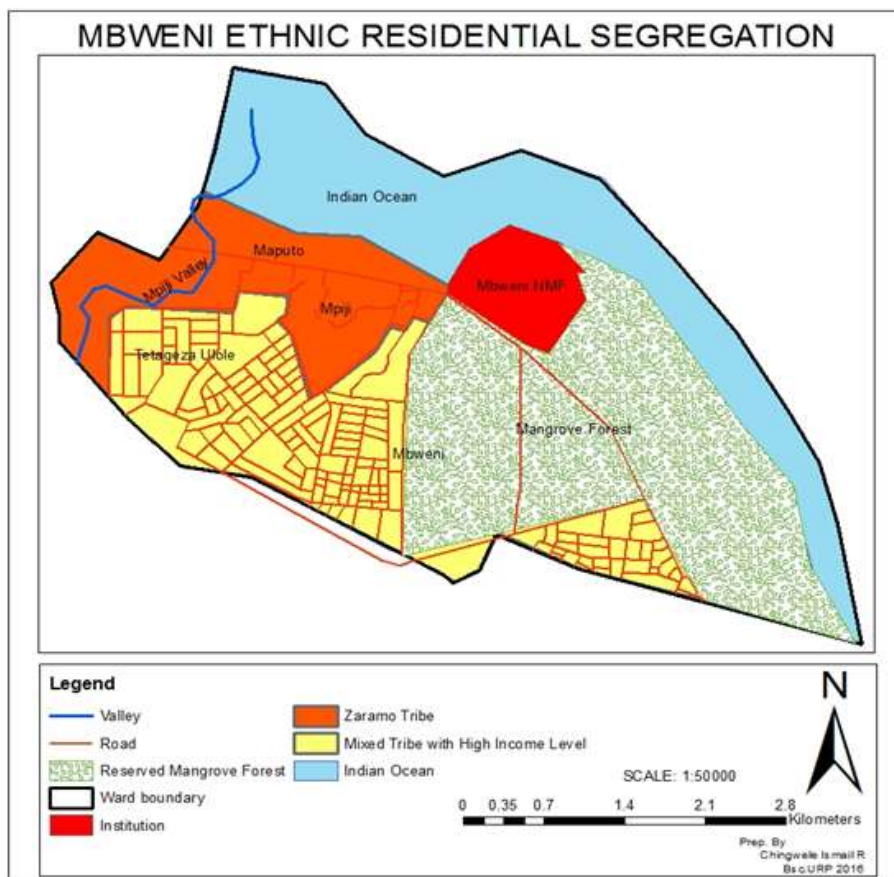


Figure 21: Mbweni ethnic residential segregation
 Source: Field Survey May, 2016

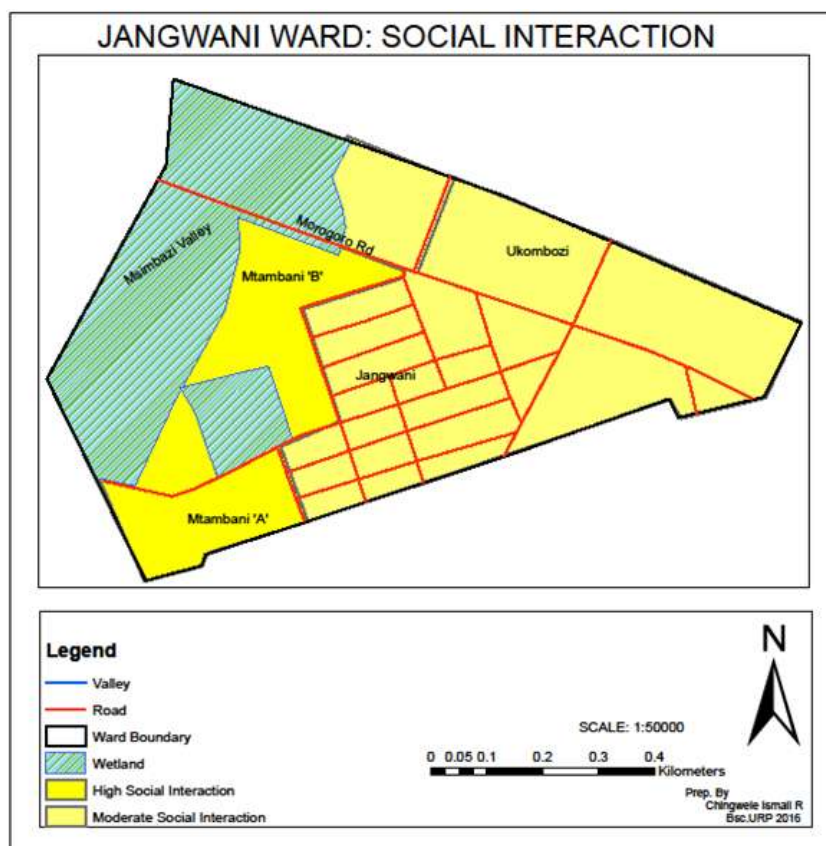


Figure 22: Jangwani social interactions
 Source: Field Survey May, 2016

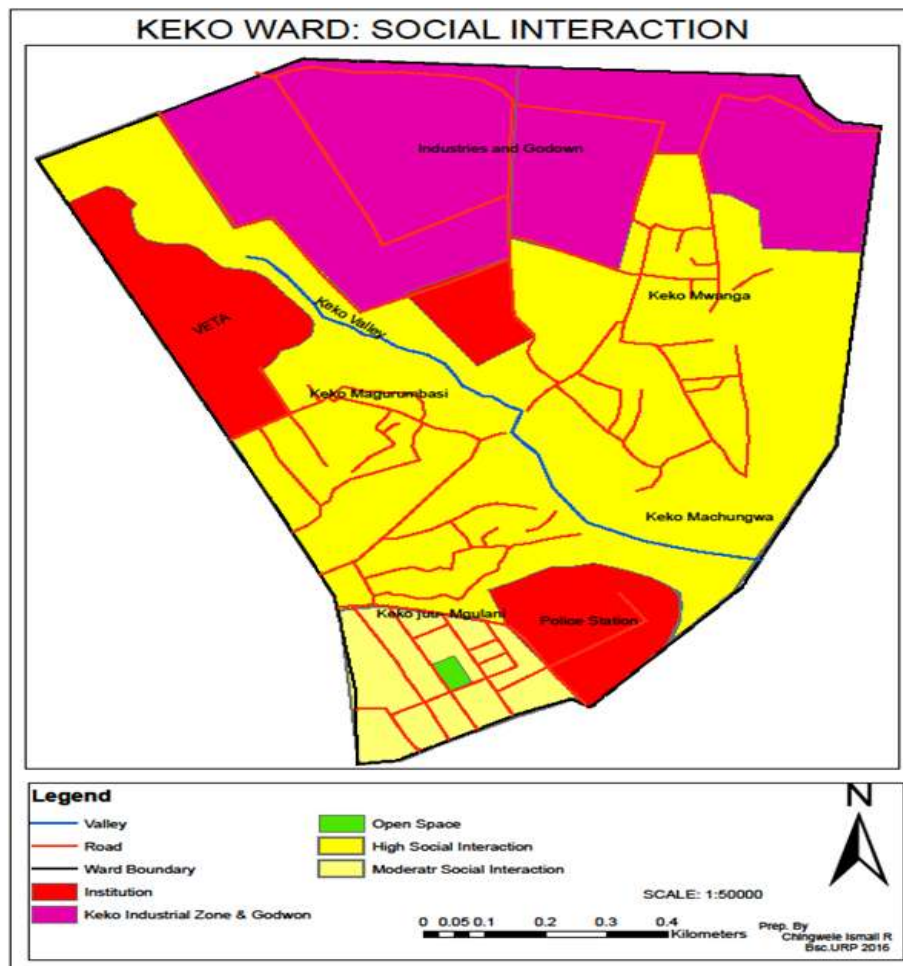


Figure 23: Keko social interactions
 Source: Field Survey May, 2016

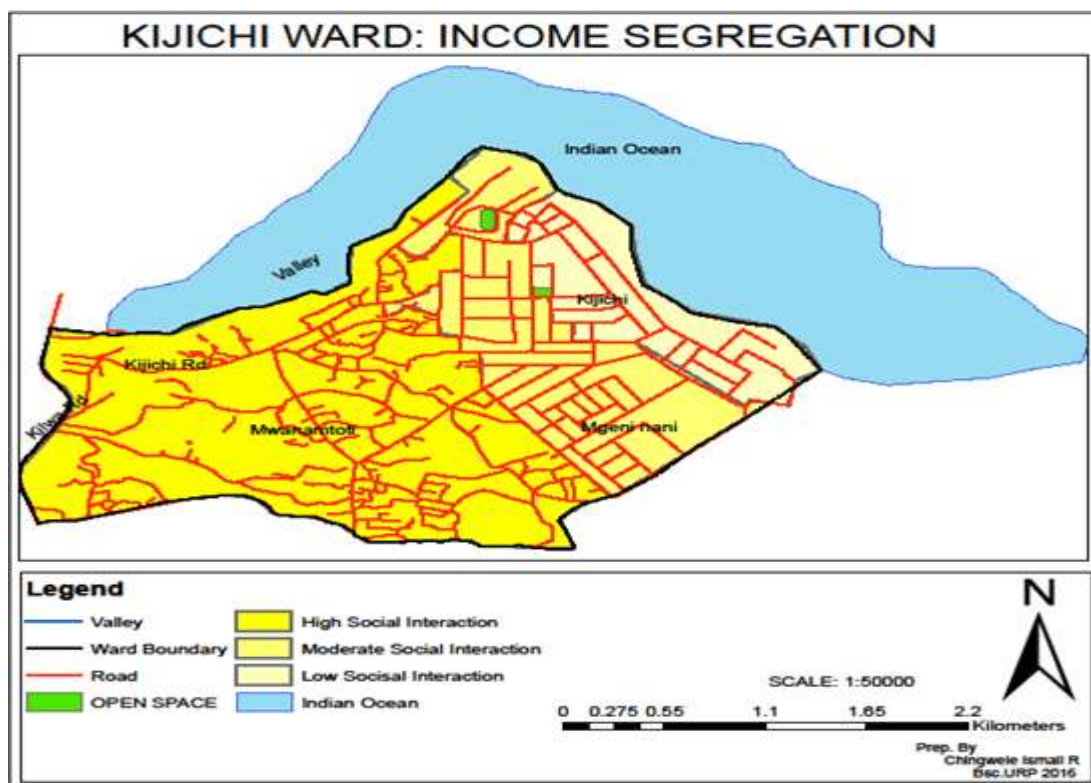


Figure 24: Kijichi social interactions
 Source: Field Survey May, 2016

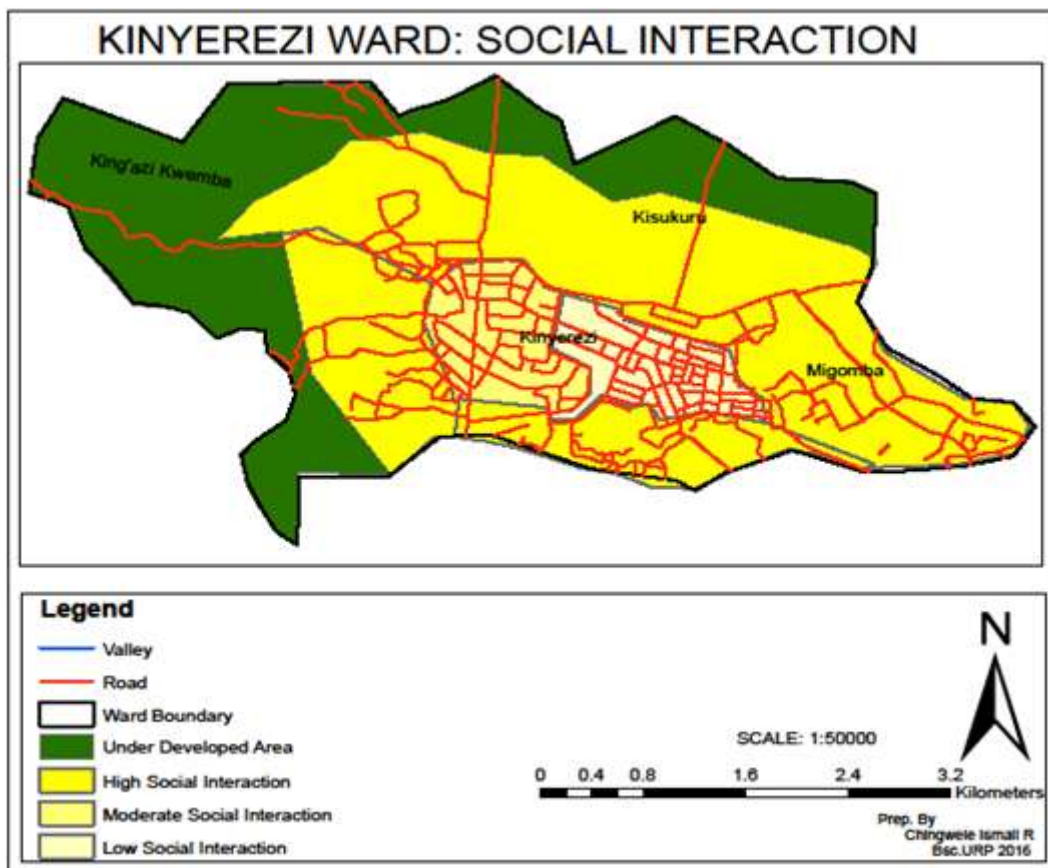


Figure 25: Kinyerezi social interactions
 Source: Field Survey May, 2016

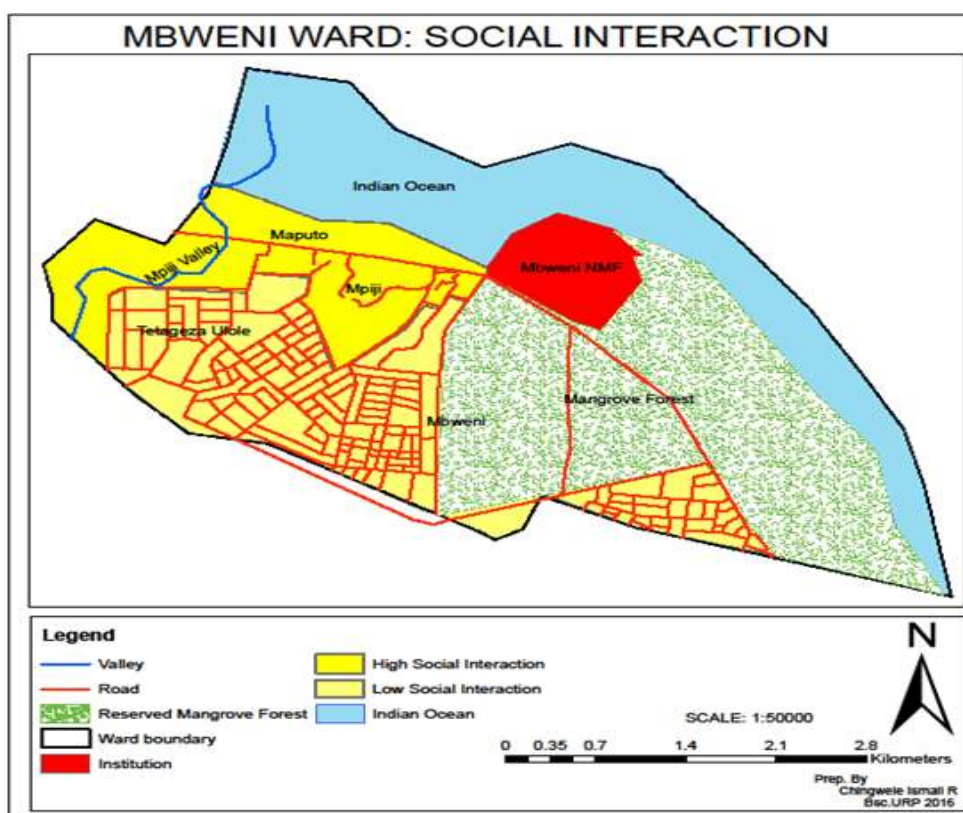


Figure 26: Mbweni social interactions
 Source: Field Survey May, 2016

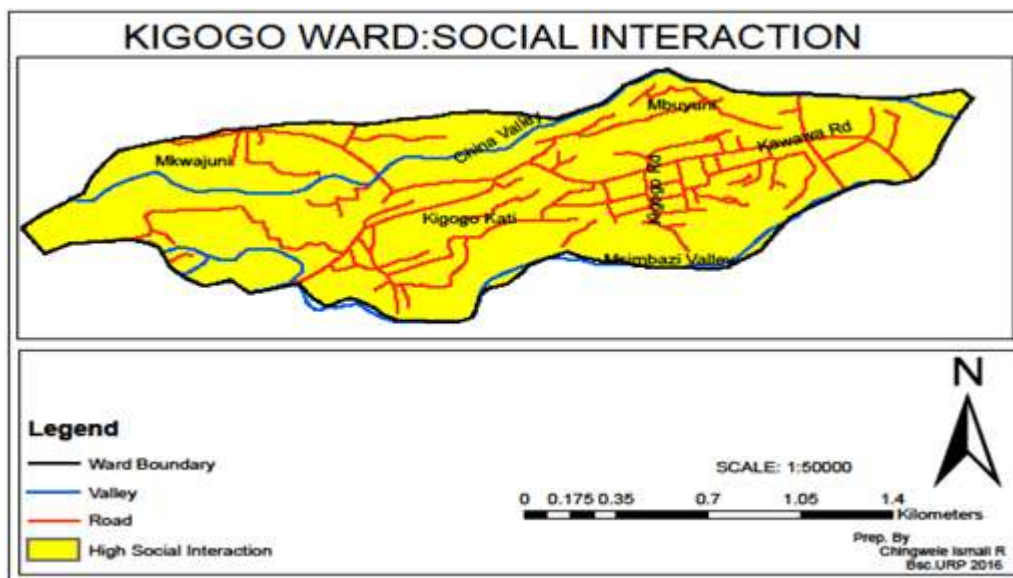


Figure 27: Kigogo social interactions
 Source: Field Survey May, 2016

5. Conclusion: Residential Segregation and Settlement Development

This study concentrated on analysing the residential segregation in the city. The analysis was based on the nature and extent of residential segregation and the ways the urban community is struggling to fit within the built environment. It is suggested that this phenomenon presents two forms of residential unit segregation which are either voluntary or involuntary. Dar es Salaam as one of the metropolitan city in the global south is faced with the challenges of residential segregation, which is either voluntary or involuntary. Residential segregation is voluntary when caused by social or spatial preference and it can be involuntary when caused by the income disparities. Both income disparities and spatial preference contribute to urban sprawl, environmental deterioration, and social exclusion and mainly create zones of richest and poorest people, which all together increase neighbourhoods' disparities. It is important to note that the urban planning framework and the guiding principles also contribute to residential segregation in the city.

Main forms of residential segregation in the global south manifest in terms of income, spatial preference and ethnicity. Generally the study draws three forms of residential segregation such as income residential segregation, spatial preference residential segregation and ethnic residential segregation which are caused by planning ideology, human ecological perspective, built up environment and income disparities. The findings reveal issues of affordability, which enhance residential segregation in the city and hence persistence of informal settlements. The study claims that the urban system of Dar es Salaam is fully characterised by residential segregation, which create settlement disparities. The housing structure and built up environment variables helped to determine the spatial development of the city as recognised on the maps provided. Moreover, the planning guiding principles and standards influence residential segregation. The zoning ideas, which are based on income level, are translated in actual plot provisioning in terms of high, medium and low-

density plots, which consequentially weaken social cohesion. It is commonly understood that the rich, middle and the poor would prefer low, medium and high density plots respectively. As long as urban form is not modified or changed, the weak support for social life to develop will remain. Scholars on the segregation thesis noted that income residential segregation result from income disparities (Bulamile, 2009; NBS, (2014); Nuottaniemi, (2007); Logan *et al.*, (1993)). Low-income people are driven out involuntary because they fail to afford part of land and housing within the well planned and serviced urban spaces (Thong, (1978); Hettige, (1992); Ifesanya & Nwokoro, (2002); Smiley, (2009); Muhammad *et al.*, (2015); SAHO, (2015)). Spatial preference creates the self-choice of living area (Clark, 1991). People with different interest tend to voluntarily segregate themselves to places near beach areas, Central Business District, Shopping malls, commercial zone, and offices. Spatial preference is affected by the income of a person. Planning laws and policies facilitate both voluntary and involuntary residential segregation (Schelling, (2010); Nuottaniemi, (2007)). Having density categories like lower density, medium density and high density, which have an implication to the built environment conditions, contribute to the involuntary spatial segregation within urban centres. It is suggested that a spatially segregated and hierarchical urban structure is less robust than an integrated and continuous urban system and hence one can argue that it is less sustainable from a social perspective. An important finding is that spatial segregation is not a phenomenon restricted to the poor areas only. The study showed that wealthy neighbourhoods are also affected by segregation phenomenon as its dwellers become disconnected from the surrounding neighbourhood. Ethnicity residential segregation as a result of colonialism persists in the global south cities (Kironde, (2007); Smiley, (2009)). Contemporary growing cities such as Dar es Salaam continue to embrace residing in the neighbourhood where the residents meet criteria of one's choice. Ethnicity residential segregation has expanded to encompass tribalism and regionalism (Hettige, (1992)). The study revealed existence of such ethnic segregation of which has an impact

in the continuing development of informal settlements. Although the segregation index is only 30.7%, the impact, which this phenomenon has on settlement development in Dar es Salaam, has to be given attention. Fragmentation of residential units imparts social cohesion and urban form. Generally, we argue that Dar es Salaam urban form is influenced by voluntary and involuntary segregation.

Hence forth, to attain sustainability in the city the designer and urban planners should develop the city, which is not composed of spatially segregated neighbourhoods. Sustainable place making need more flexible and robust approach and as such to be able to provide the spatial advantages that are important for people with poor resources such as income. This is highly relevant from an urban design perspective for two reasons. First, it is possible to identify segregated areas using a mapping model as already mapped in this study. Second, spatial segregation concerns could be incorporated into anti-segregation initiatives that prove to be effective. Although it is not possible to say that integration processes are hindered by urban form because there are other factors which hinder integration in the neighbourhood.

The anti-segregation initiatives must be complimented in the urban design approach such as smart growth and new urbanism in the city development. However, that initiative which might be established in the spatial planning and development department should be an approach, which contributes to increase knowledge about the spatial segregation conditions and its social consequences. Such insight would make possible to address issues related to urban segregation as well as address aspects regarding social sustainability, urban design, and policies that can be highly supportive to complement other interventions within anti-segregation initiatives. Earlier experience from studies on social segregation emphasize that coordinated initiatives, including engagement from all actors and institutions concerned, seem to have the greatest potential for successful results. The possibility for future anti-segregation initiatives to also include urban design practice, as an approach that so far be a part of the strategies within anti-segregation initiatives in Dar es Salaam city. In additional, implementation of mixed-income housing development programme, which would complement the anti-segregation, approach in the urban design and strategized by the legal framework for housing provision and urban planning which have the part of anti-segregation initiatives.

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