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Land use transformations incorporating social amenities since the last phase of the houses were occupied in 1983 in Buru Buru Estate, Nairobi, Kenya

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Abstract

Urban areas in Africa and Kenya in particular are faced with increased growth of planned settlements transforming into unplanned ones. The study therefore draws attention to this neglected aspect of transformation in housing by seeking to compare the emergent land use transformations in Buru Buru estate, Nairobi Kenya with the original design incorporating social amenities since the last phase of the houses were occupied in 1983. The study used case study research strategy and collected both qualitative and quantitative data using structured interviews, digital photography and analyses of archival drawings and satellite maps. The study established that at the original allocation of land use to different social amenities categories had been

greatly transformed during the last 20 years. Comparison of the emergent and original land use design led the study to conclude that there have been emergent land use transformations in Buru Buru estate since the final phase was occupied in 1983. The study recommends that professionals, developers and authorities need to play their roles effectively in the development of any housing unit in order to mitigate the phenomenon of emergent structures after occupation. The knowledge generated shall add to the knowledge base required by architects, urban designers, planners and developers in the planning and design of residential neighborhoods.

Keywords: Land Use, Original Design, Emergent Design, Social Amenities, Transformation

1. Introduction

1.1 Background to the Study

Formal cities are guided by the principles of urban planning in their formation. The design and regulation of the use of space in such a city focus on the physical form, economic functions, and social impacts of the urban environment and on the location of different activities within it. Shertzer, Twinam & Walsh (2016) ^[11] aver that, land use in formal cities is informed by ideological zoning both in the major zones and within each zone. This is done to prevent new developments from altering the initial design and is mostly controlled by regulatory framework. With time, majority of these zones lose their quality due to transformations.

Shelter being a human need is viewed as an important component of adequate standard of living in the Universal Declaration of Human Rights of 1948 and reaffirmed by subsequent international instruments. The right to adequate housing is therefore a universal right, recognized at the international level and in more than one hundred national constitutions throughout the world (Fatoye & Odusami, 2009) ^[4]. In Kenya, housing is captured in both the Vision 2030 and Constitution where access to adequate housing is one of the Constitutional Rights. However, large scale housing deficiencies and poor social and residential environments in forms of slums and squalors characterize most urban centers in the emerging nations of Africa, Asia and Latin America (Jiboye, 2004) ^[6]. Transformations that are carried out in residential neighbourhoods are the main reason adduced to these deficiencies.

Today, Kenya faces an increasing growth of planned settlements transforming to unplanned ones in her urban centers. In spite of several controls, the planned residential areas of her cities have experienced transformations in land use patterns. These transformations have been fueled by economic, social and physical factors. This scenario can be observed everywhere including the well-known informal settlements for the lowest income earners and also in housing estates for other income profiles. The social factors include urbanization which leads to increase in urban population causing spatial expansion of residential areas which are highly inhibited by inadequate space for expansion. In response to this challenge, developments are characterized by transformations of the existing built forms and land use.

In Nairobi, the residential zone that was set apart from the colonial days to house Africans was located on the East side of the city, today commonly known as Eastlands. The area is home for a number of estates, including Buru Buru, housing both low- and middle-income groups. According to Makachia (2005)^[7], Buru Buru was earmarked for the then emerging middle-income group and adopted the mortgage housing financing delivery strategy. This was a departure from the Rental and the Tenant Purchase housing finance models that were popular in urban housing delivery then. The earlier approaches involved huge state subsidies and over time had proved economically unsustainable. The government only offered guarantees for offshore funding in this new approach (Anyamba, 2006)^[11] and left the bulk of housing development to the private sector through mortgage loans that were to be paid over 15 to 25 years.

1.2 Problem Statement

Buru Buru estate has been undergoing transformations since its completion in 1983 when the last houses were occupied. Social amenities, as part of the neighbourhood, have been at the center of these transformations. The housing estate was planned using relevant planning and building regulations. The spaces for social amenities were therefore allocated and distributed in accordance with the set-out laws for such a development.

Today the scenario has changed as these amenities have undergone various land use and other forms of transformations which have significant effect on the residents and the neighbourhood at large. The basic problem clearly is that social amenities were not developed from the beginning of the scheme creating room for their informal development. The designs did not envisage the transformation that has culminated into the dysfunctional neighbourhoods now commonplace in formal housing like Buru Buru. Buru Buru estate is transforming to mixed use neighbourhood with the number of commercial activities rising on undefined spatial distribution. These activities are gradually taking over the areas initially designated for social amenities and congestion is unavoidable in this area, unless controlled, which can lead to health risks.

1.3 Research objective

To examine the land use transformation incorporating social amenities since the last phase of the houses were occupied in 1983 in Buru Buru Estate, Nairobi Kenya.

2. Literature review

According to Asib (2011)^[2], land use plays a significant role in all levels of planning, implementation and management. Urban land use comprises two elements namely, the nature of land use which relates to which activities are taking place where, and, the level of spatial accumulation, which indicates their intensity and concentration. Islam (1996)^[5] defined land use as the surface utilization of all developed and vacant land on a specific point, at a time and space. On the basis of human activities, urban land use can be defined as the utilization of urban land for the urban activities determining the spatial structure and distribution of urban land.

Land use in residential neighbourhoods would be concerned with the location, intensity and the amount of land development required for the various space such as the dwelling units (houses), infrastructure and social amenities.

Rahman and Rahman (2021)^[9] in their study on '*Migration, Urbanization and Land Use Transformation*' in Bangladesh found out that, due to unplanned urbanization, the immigrants are not able to achieve their expected benefits. According to them, reckless land use transformation was the ultimate result of massive migration in order to meet additional residential demands. Based on their conclusions of the satellite image analysis and focus group discussions, non-urban agricultural land use had transformed to urban land use for residential purpose. This was because of its good accessibility through well-defined network with ample business opportunities, health and educational facilities. According to a study by Stuczynski (2007)^[10] on '*Assessment and Scenarios of Land Use Change in Europe*,' the researchers used land use maps to analyse land use transformations. The land use was classified into six categories for ease of analysis. The changes in land use were grouped into three; Appearance and disappearance, growth and shrink and cluster size change of different land use categories. The current study used the same parameters to analyze land use in BuruBuru Estate, Kenya.

3. Materials and methods

The case study research strategy was used in conducting the study. it was deemed appropriate because the study sought to understand 'why' and 'how' transformations of social amenities occur in a formally designed housing estate in an urban area as advised by Yin (2002)^[12].

Nairobi County was considered an appropriate area for this particular study because it is the capital city of Kenya, the largest urban center and most urbanizing city in the country. The selection of Buru Buru estate as a case study area was motivated by the fact that transformation, the phenomenon in focus of the study, is highly manifested. In the past it had attracted many researchers on transformations including Makachia (2006)^[8]. The development the target study area had demonstrated characteristics which can be described as an extreme/deviant case. This, according to Patton (1987) would provide appropriate cases for study because of their unusual conditions or extreme outcomes. The researcher considered this to have great potential for recommendations to improve more typical land use programmes given the current scenario where there is no available public open space for the residents with all of them being changed into private properties.

Collection of empirical data utilized both unit and neighborhood surveys. Unit surveys entailed use of case study typologies. Data collection tools were satellite maps and time series aerial photographs. This collected detailed data on the study typologies from satellite images and the aerial photographs. Neighborhood survey used reconnaissance surveys with satellite maps and consultants' drawings as data collection tools. This collected data to give evidence on land use transformation. Key sources for the data were archives, satellite images, aerial photos and government publications.

Data analysis involved archival study of the original Buru Buru estate as planned where architectural drawings of the area were obtained from the estate architects. Satellite maps and time series aerial photographs were analysed though they could only be traced from 2002 up to the time of the study. This helped in understanding the typological transformations of social amenities.

Anonymous observations were also done to establish how the available space had been utilized in terms of activities, displays and the built forms. This entailed both the physical observation for documentation of the existing situation and mapping the transformations through identifying the key changes. Anonymity enabled the researcher to observe behaviour without influencing the people in a particular direction. Observations also exploited digital photography and sketches to free target respondents from answering interview questions relating to observable facts of transformation.

The interviewees were residents of Buru Buru estate who had lived there for over twenty years. They were considered information rich because they had witnessed the transformations as they unfolded and had a lot of qualitative data at their disposal. This was done through snowballing where referrals from the court chairperson or the gate keeper were made. The interview guide had structured closed, fixed response questions where respondents were required to choose answers from among the same set of alternatives. Respondents were however probed to provide further information.

Buru Buru was developed in phases and ranges from phase I to phase V. The interviews were concentrated in phase III which was considered as appropriate since it was the center of the development; two phases were developed before it and two others after. Most of the social amenities were also located around this phase making it rich in terms of information. The interviews were carried out on consecutive weekends when the respondents were likely to be in their houses. Architects were also interviewed to establish the original design of the estate.

Multiple sources of evidence were used to ensure corroborate gathered data. These included: document analysis, interviews, observation and aerial photographs. The significance of using multiple sources is to triangulate

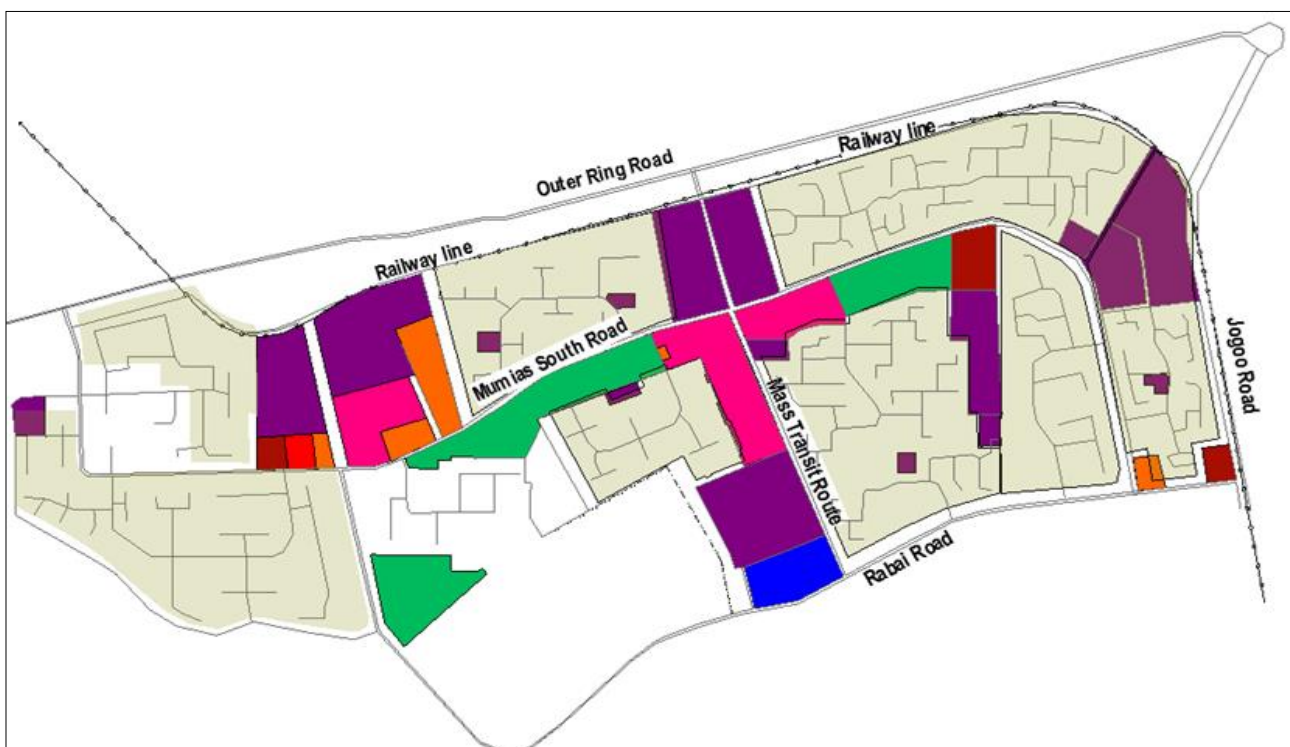
evidence and develop converging lines of arguments as Farmer, *et al.* (2006)^[3] advises.

4. Findings and discussion

The study sought to establish the basis for planning and designing Buru Buru estate. Interview with an architect revealed that the estate was planned and designed according to planning regulations governing such a housing project. The design therefore complied with the relevant regulations on densities and allocation of social amenities. These were mostly located along Mumias South Road which was the major circulation path for public transport with a few along Rabai road which was an alternative route and the Mass transit route. The social amenities that were included during the design stage and whose location was along the main roads were; public open spaces, religious, educational and health facilities.

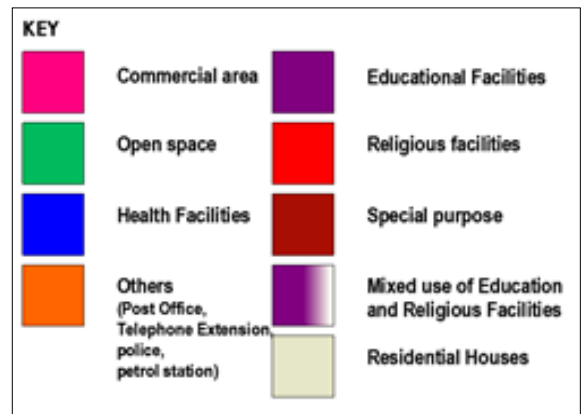
The designers allocated space for, 'special purpose' which was supposed to cater for any social amenities that were not captured during the design stage. Apart from the social amenities that were allocated for, the design made provision for some infrastructural facilities which included post office, telephone extension, police and petrol station.

A commercial center was centrally located away from the residential area for ease of access by all users and to allow a sense of privacy to the residential space. However, the designers did not envisage heavy commercial activities such as shopping malls and supermarkets that are now prevalent. When the development of the housing units was complete the project was handed over to the City Council, the current social had not been developed. Nevertheless, with the allocated spaces, it was the obligation of the Council to see to it that they were developed accordingly. Fig 1 shows the original design of the estate as envisioned while Fig. 4.2 gives the current status following emergence of several unplanned structures.



Source: Overlaid Mutiso Menezes International (Consulting Architects) MMI drawing

Fig 1: Land use as originally designed



Source: Overlaid Goggle Map

Fig 2: Land use as emerged

The study established that social amenity, which included communal open spaces, religious facilities, special purpose and schools, were located along the main spine which acted as a linkage to the whole scheme. Through this arrangement, the public was restricted to the main spine where public

transport was restricted. The clusters in the residential areas where cluster roads terminated formed courtyards which were meant for landscaped greenery, parking, and children’s play area. The road network of the area is captured in Fig 3.



Source: Goggle Map

Fig 3: Road network

4.2 Land Use Transformations

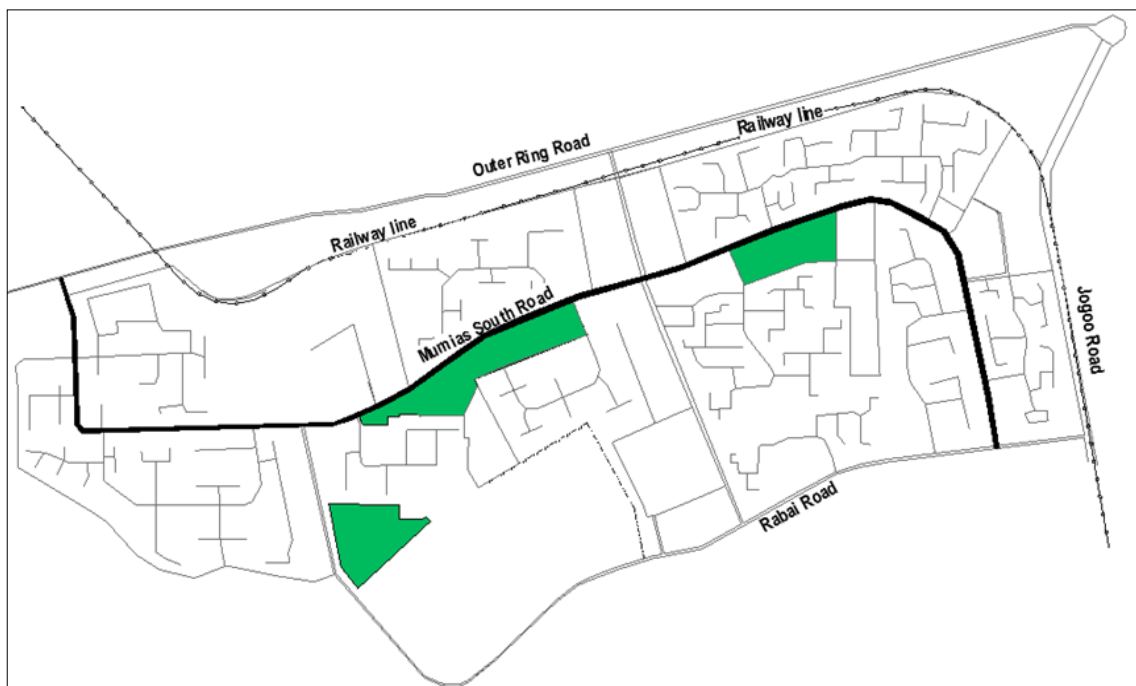
Study sought to establish the land use transformations since the estate was occupied in 1983 by assessing the establishment of certain social amenities in the area. These are:

4.2.1 Public open spaces

During the design, among the social amenities that were incorporated were the public open spaces. With the garden city model, these were significant in the design. They were quite outstanding in the whole scheme as the lungs of

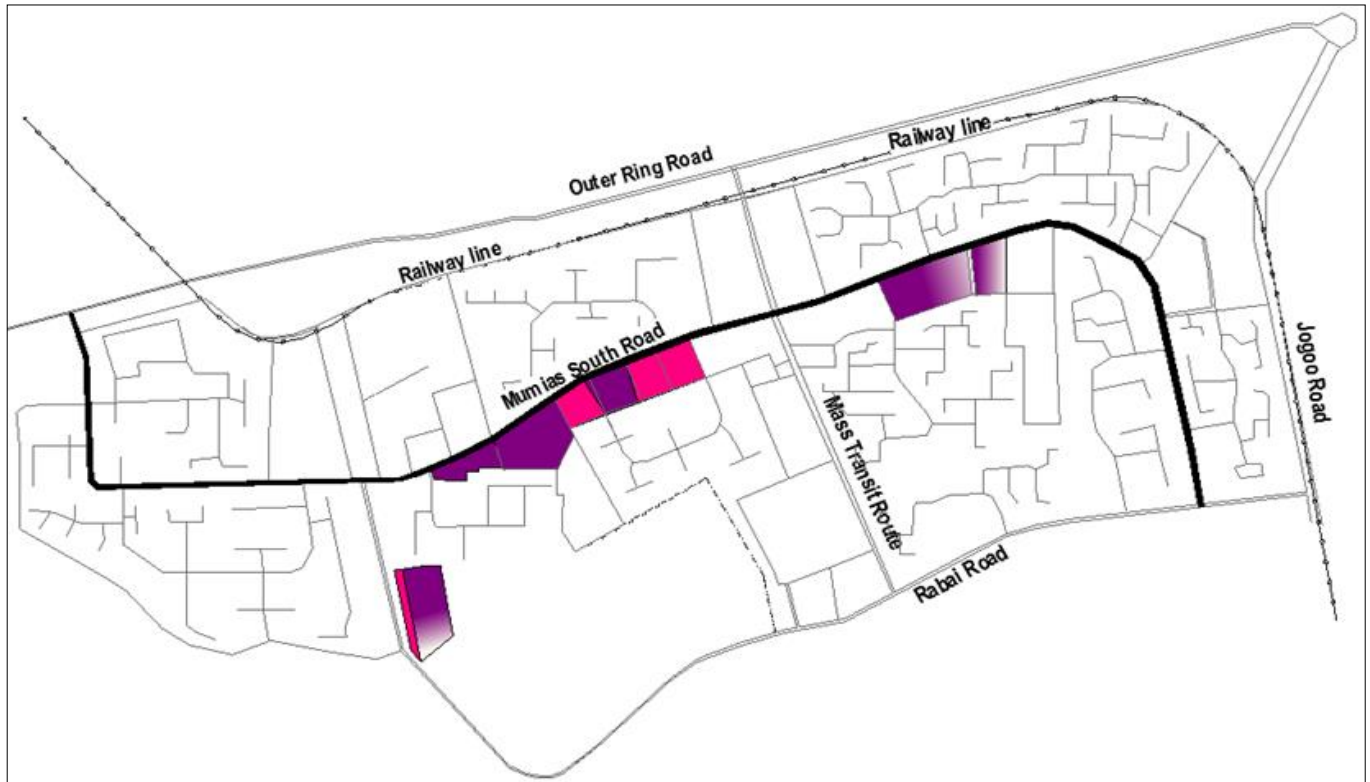
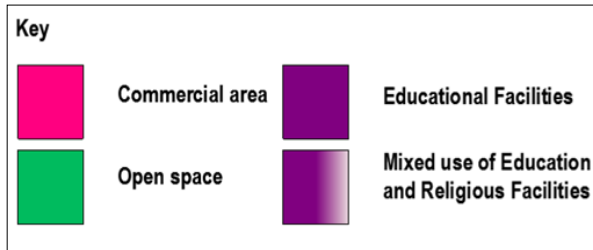
residential neighbourhood. Located along the main roads where public transport was concentrated, they could easily be accessed by all residents.

The estate however has drastically transformed. The public open spaces have been illegally or irregularly allocated to developers for economic gains. The neighbourhood has no public open space for social activities. In one of the spaces, multilevel buildings have come up changing completely the skyline that was intended in such areas. Figure 4.4 shows the public open land use space as designed while 4.5 shows the public open spaces land use as emerged.



Source: Overlaid MMI drawings

Fig 4: Public open space land use as designed



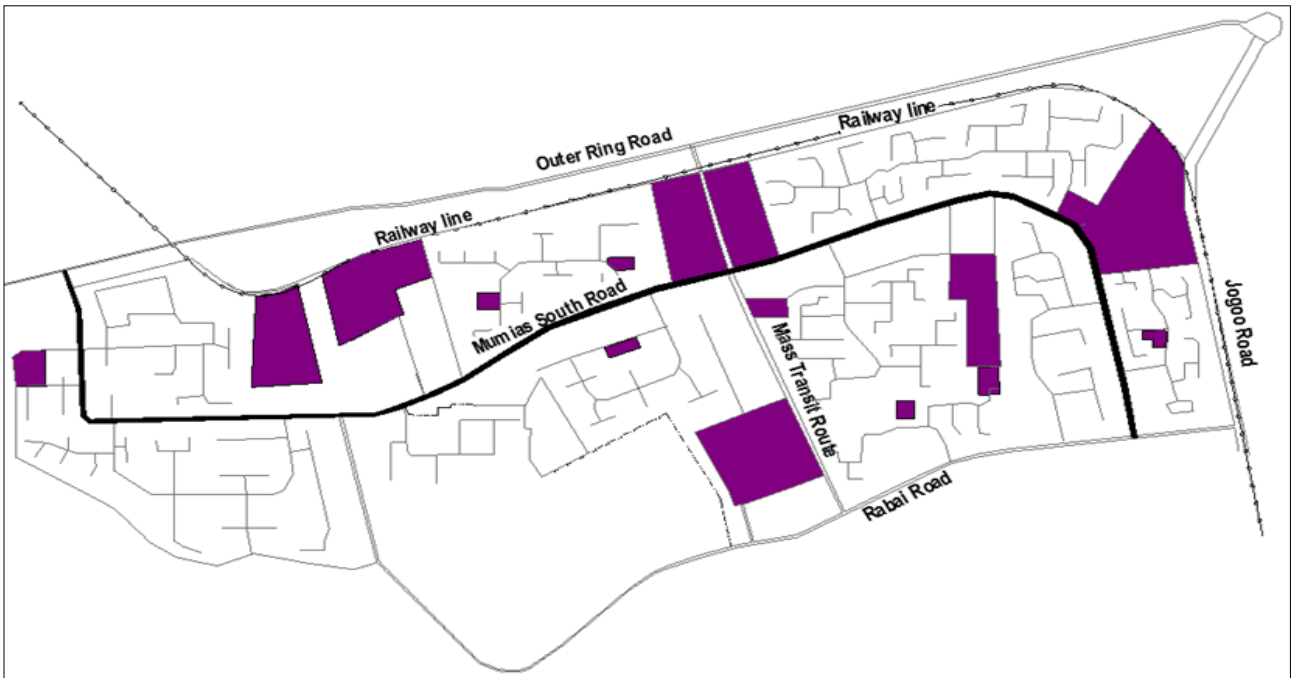
Source: Overlaid Goggle Map

Fig 5: Public open space land use as emerged

4.2.2 Education facilities

The allocation of education facilities, during the design, depended on the number of housing units. This dictated the distribution of nursery, primary and secondary schools. Allocation for a college for religious studies was also done. Transformation of education facilities is evident where the areas allocated for education facilities have transformed either to fully residential or religious facilities. There is also a kind of mixed use where education facilities incorporated religious facilities.

On the other hand, some residential houses have transformed to education facilities either fully or partially. In addition, it is worth noting that some commercial buildings have incorporated education facilities such as colleges and student accommodation. Some space originally designated for education facilities have disappeared whereas others have appeared. Generally, the education facilities allocation has really increased. Fig 6 depicts the education facilities land use as planned while Fig 7 shows the current status.



Source: Overlaid Goggle Map

Fig 6: Education facilities land use as emerged



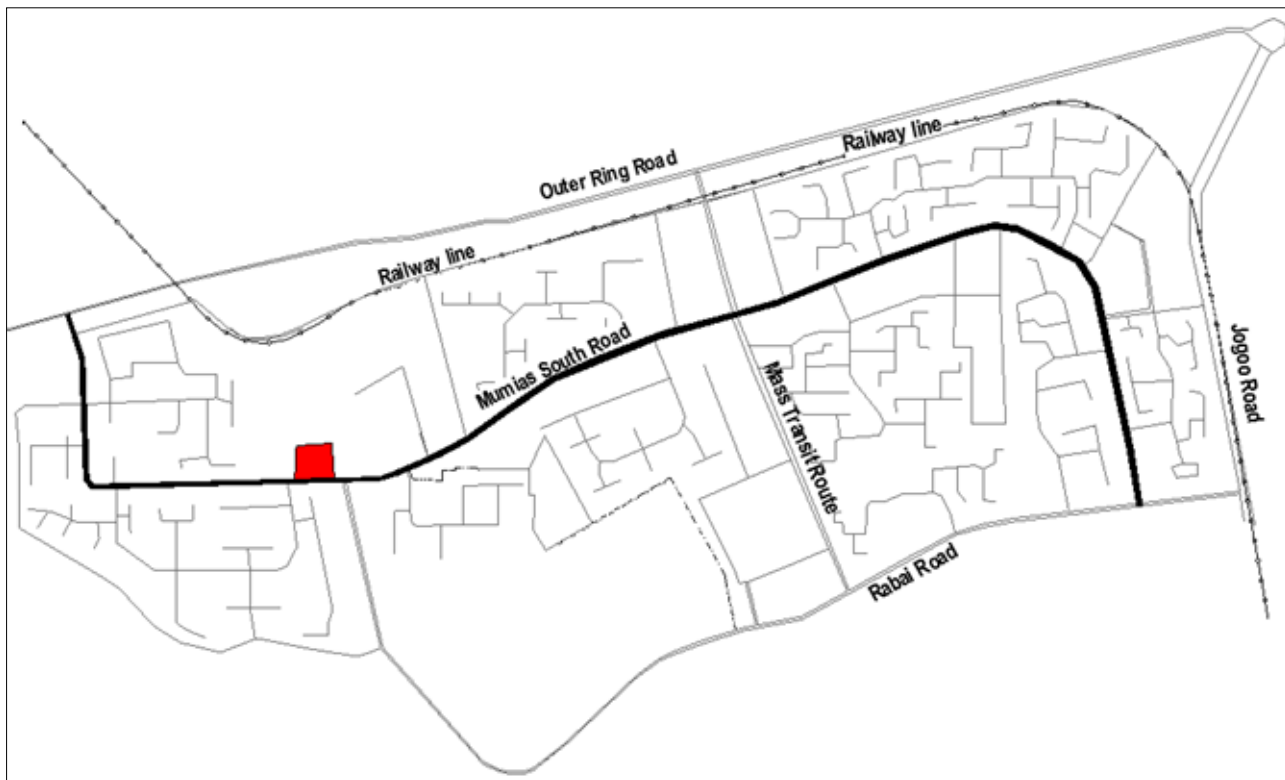
Source: Overlaid Goggle Map

Fig 7: Education facilities land use as emerged

4.2.3 Religious facilities

According to the original design, there was only one allocation for religious facilities. Due to transformations however, religious facilities have increased in number with many being incorporated in the education facilities. Currently, there are quite a number of religious facilities in the residential areas; some of the housing units have been

converted to religious facilities or altogether demolished and transformed. This had happened contrary to the design which had allocated distinct spaces for education and religious facilities. These facilities have tremendously increased in the neighbourhood in relation to the original design. Fig 8 and 9 show the religious facilities land use as designed and as it has emerged respectively.



Source: Overlaid MMI drawing

Fig 8: Religious facilities land use as originally designed



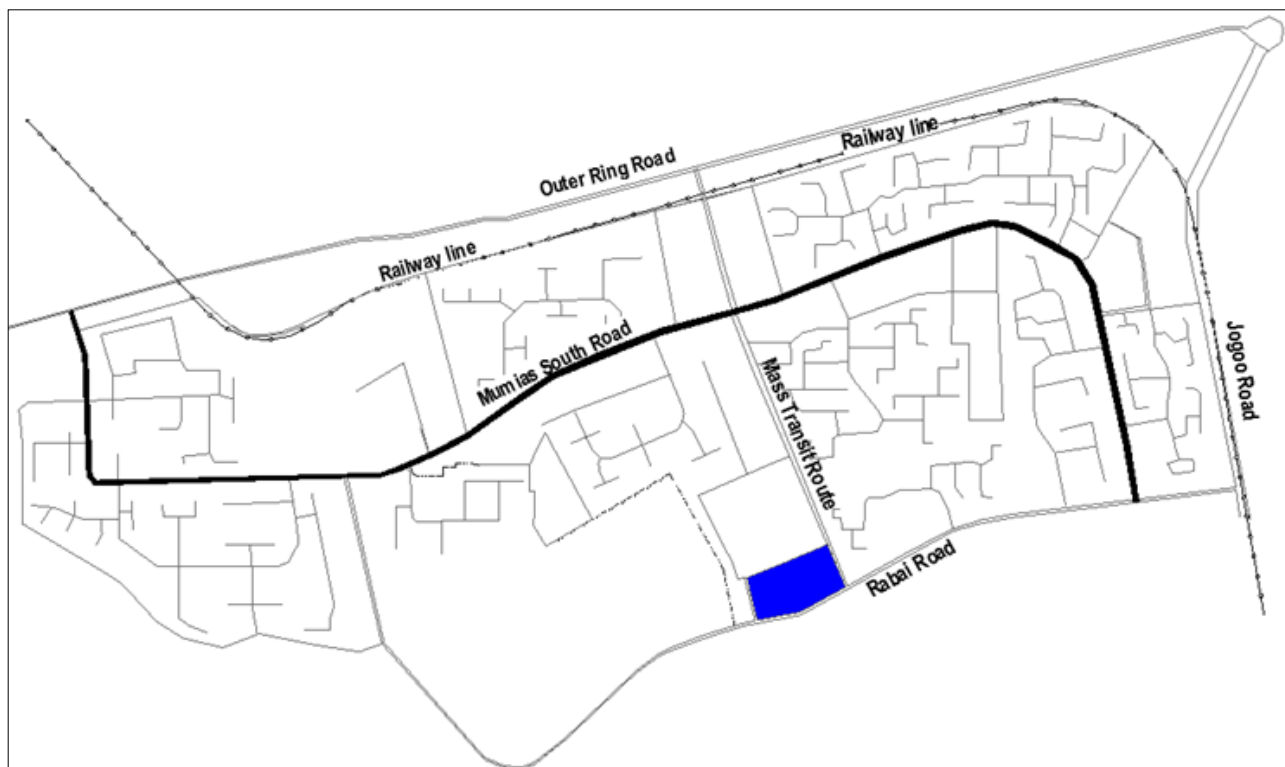
Source: Overlaid Goggle Map

Fig 9: Religious facilities land use as emerged

4.2.4 Healthcare facilities

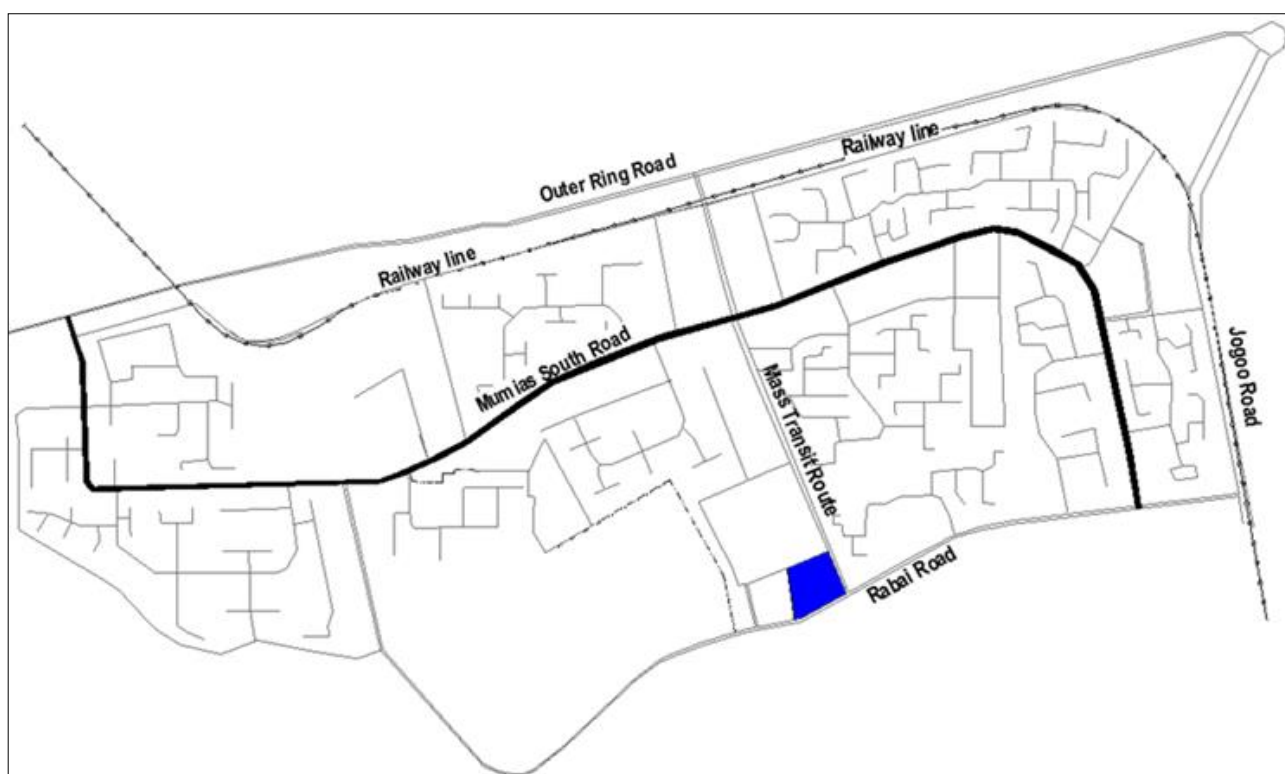
The designers had allocated one space for a health facility in the scheme during the design. The space however had been sub-divided into two with part of the hospital space being developed in to residential units that have been sold out.

There are quite a number of clinics located in the commercial building with others incorporated in the religious facilities. All the health facilities however are privately owned. Fig 10 and 11 show the scenario as designed and the current situation respectively.



Source: Overlaid MMI drawing

Fig 10: Healthcare facilities land use as originally designed



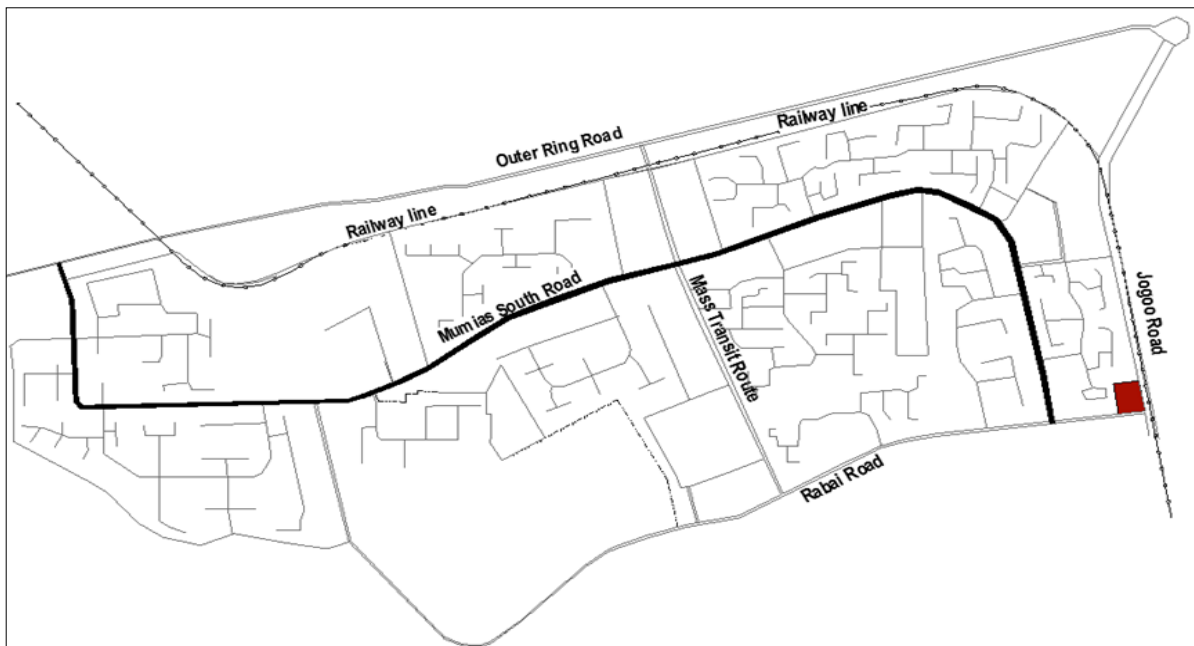
Source: Overlaid Goggle Map

Fig 11: Healthcare facilities land use as emerged

4.2.5 Entertainment facilities

One of the special purpose spaces had been allocated for an entertainment facility. The emergent scenario indicates that this has remained the same with no transformations.

However, other entertainment facilities have come up in the commercial area. Fig 12 shows both the designed and the current status



Source: Goggle Map respectively

Fig 12: Entertainment facilities land use both as originally designed and emerged

5. Summary of findings, conclusions and recommendations

5.1 Summary of key Land use transformations.

The current situation in Buru Buru estate is depicted by the following four land use transformation characterization:

1. **Disappearance of different land use categories:** land allocated for a certain use has been used for a totality different use hence the planned use fails to exist. This means that such classification is completely lost through transformation.
2. **Appearance of different land use categories:** Sports and childcare facilities had not been designed for were

- now part of the social amenities in the study area.
3. **Shrink of different land use categories:** The amount of land use originally designed for health care facilities reduced because it was transformed and converted for residential use.
4. **Growth of different land use categories:** Land use in some categories especially residential housing increased to accommodate the said category at the expense of the classifications originally allocated.

Fig 13 summarizes this state

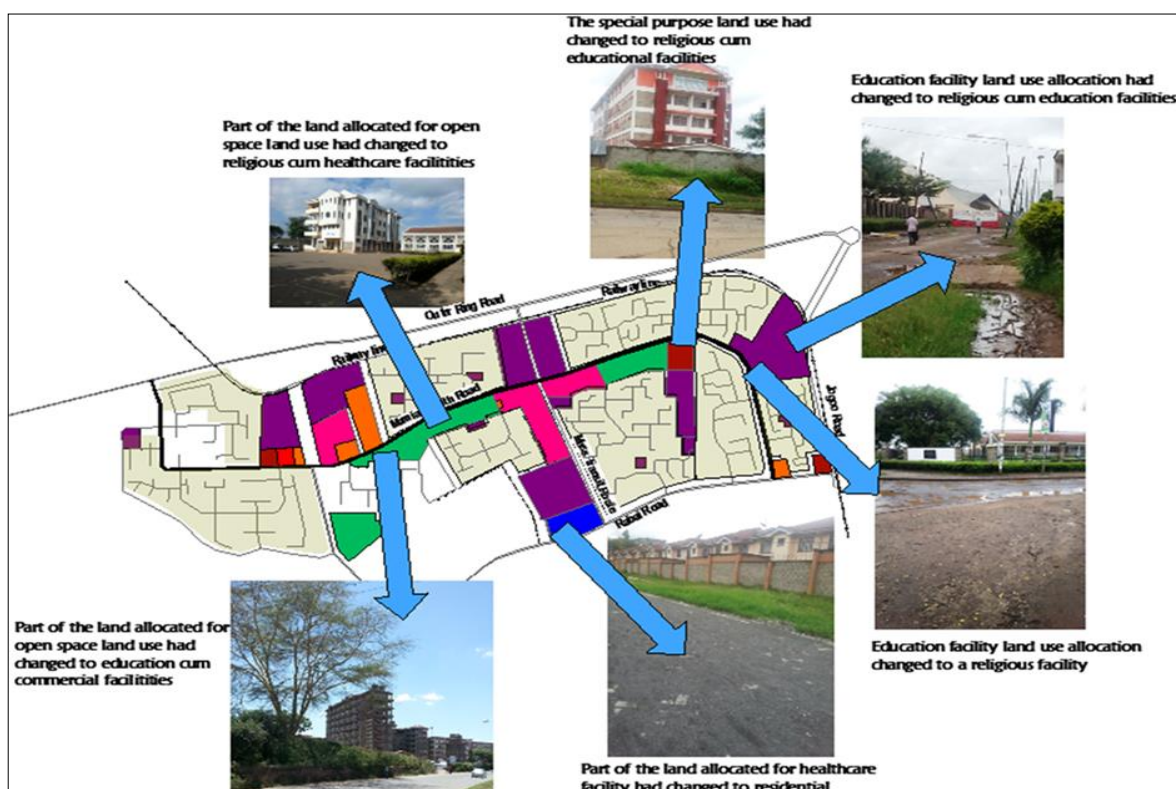


Fig 13: Land use transformations at neighborhood level

5.2 Conclusion

The study concluded that the original allocation of land use to different social amenities categories had been greatly transformed during their implementation. This had resulted in either disappearance, appearance, shrinking or growth of different land use categories.

5.3 Recommendations

The study makes the following recommendations:

1. The designing of social amenities in a residential neighbourhood requires an understanding of the different categories of these facilities. It is expedient that all the land use categories are allocated for during the planning and design stage without leaving anything to chance to cater for any eventuality where a certain category is missing and ad hoc decisions have to be

2. Developers need to be properly guided to ensure that any development that conforms to the laid-out laws and regulations need to be completed as designed by the professionals. This will safeguard against giving room to transformations that may not be regulated and unsatisfactory to the users.
3. Authorities need to enforce the laid down regulations on developments to ensure conformity to the laid down standards. Illegal and irregular allocation of public open space to private developers need to be discouraged as well as allowing change in land use even in the face of possible conflicts with other land uses.

5.4 Suggestion on Way Forward

The study proposes a model of Buru Buru Estate in Fig 14.

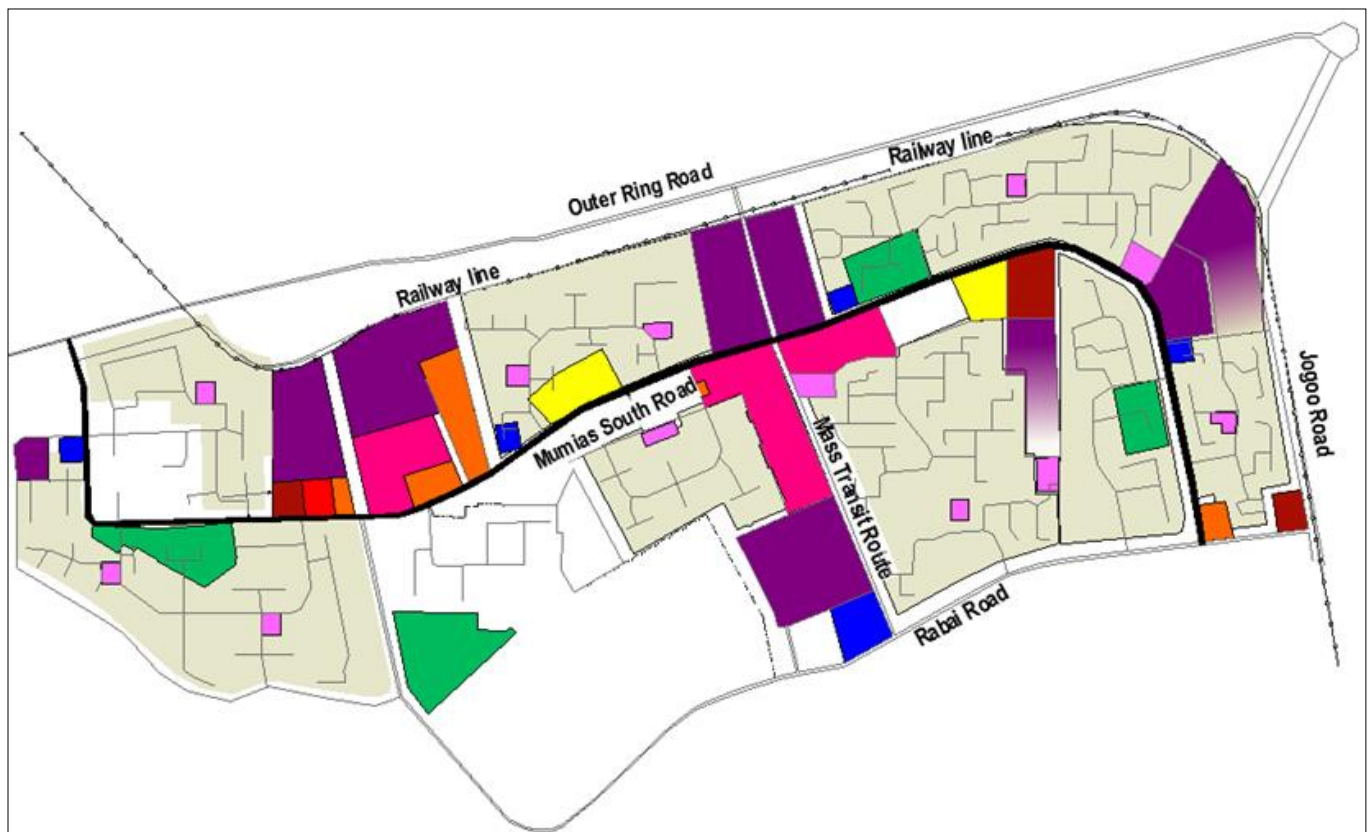
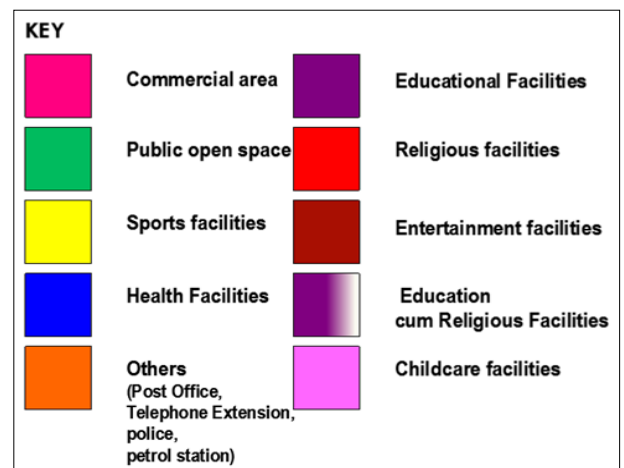


Fig 14: Model of Buru Buru Estate

5.5 Areas for Further Research

Since this study dwelt on social amenities in a mortgage housing scheme, other researches could look into site and service and starter units. The concentration was on social amenities but further researches could look into other areas of residential neighbourhood.

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