

Impacts Of Urbanization On Land Use Planning, Livelihood And Environment In The Nairobi Rural-Urban Fringe, Kenya

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Abstract: The expansion of the cities into the rural-urban fringes is creating direct and indirect impacts with those living there facing new challenges and opportunities in meeting their life needs and accommodating the by-products of urbanization. Although urbanization in these areas provides opportunities for employment, better housing, education, knowledge and technology transfer, and ready markets for the agricultural products, increase in population places enormous stress on natural resources and existing social services and infrastructure. This paper, using a multiple theoretical framework and qualitative research approach, attempts to describe the positive and adverse effects of urbanization on land use planning, livelihood and environment in rural-urban fringes, using the Town Council of Karuri, within Nairobi rural-urban fringe, Kenya, as a case study.

Index Terms: Environment, Land use, Livelihood, Planning, Rural-urban fringe, Urbanization.

1 INTRODUCTION

The process of urbanization is one of the most important dimensions of economic, social and physical change in developing countries such as those in Sub-Saharan Africa (Rakodi, 1997: 1; United Nations Centre for Human Settlements –UNCHS, 2001: 271). Like in other parts of the developing world, the urban population in Africa is expected to double by 2025 (Hall and Pfeifer, 2000: 3). Rapid urban population growth means an increasing demand for urban land, particularly for housing, but also for various other urban uses. In many countries, the increasing demand is most likely to affect (or is affecting) rural-urban fringe areas (Aguilar, 2008; Aguilar and Ward, 2003; Tacoli, 1999 and 1998). As the city expands, the rural-urban fringe experiences its direct impact with those living there facing new challenges and opportunities in meeting their life needs and accommodating the by-products of land use changes. Although urbanisation of these fringe areas provides opportunities for employment, better housing, education, knowledge and technology transfer, and ready markets for the agricultural products, increase in population places enormous stress on natural resources and existing social services and infrastructure (Rees, 1992; Rees and Wackernagel, 1994). This paper attempts to describe the positive and adverse effects of land use change. This paper does not claim to have ‘discovered’ a full answer as to what are the impacts of urbanisation on Nairobi fringe.

However, it does offer a window for partial understanding of urbanisation in the fringe and its impacts using a broad lens of a qualitative enquiry. On the other hand, it was not the intention of the paper to provide ‘solutions’ to (or a better way out of) urbanisation in the fringe problems as is common with studies done by urban planners’ heeding to the John Friedmann’s (1987: 38) call for planning to “attempt to link scientific knowledge to actions.” This paper however, in general, sought to provide information that create an understanding of issues affecting urbanisation in Nairobi rural-urban fringe in a way that can inform the process of policy development rather than proposing activities or normative prescriptions on how to address land use problem (*for more on planning theory see*, Thuo, 2008; Mairi, 2006: 13; Faludi, 1973: 1-8).

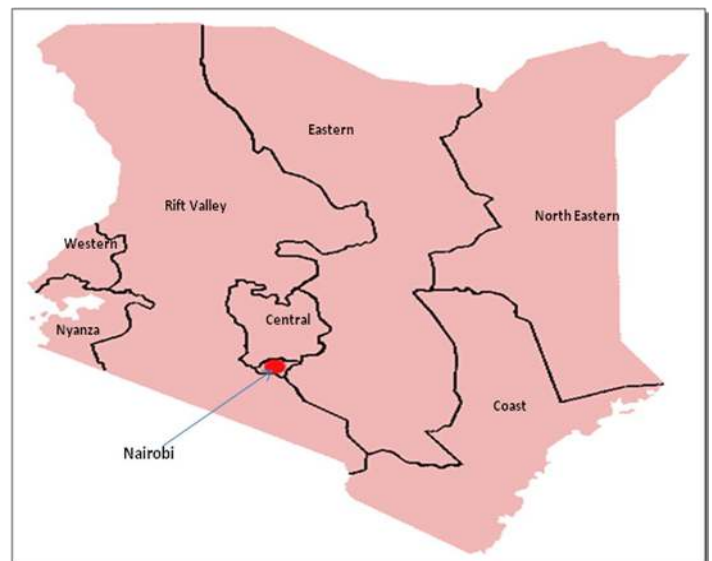


Figure 1: Location of Nairobi in Kenya, also indicating other provinces of Kenya.

This paper is based on qualitative research that focused on a case study- Town Council of Karuri (hereafter referred as TCK) (See figure 1 and 2 below) of Kiambu County in Kenya. This research seeks a qualitative understanding of a place (rural-urban fringe), and processes and perceptions associated with

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it. In-depth interviews with diverse individuals and groups were done, documents reviewed and, casual and participants observations were also made.

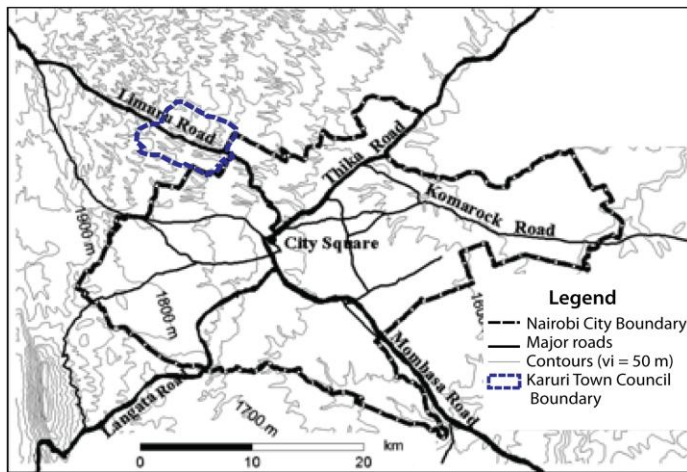


Figure 2: Showing the Town Council of Karuri in the context of Nairobi city. The map also indicates topography and major roads.

2. LOCATING THE IMPACTS/CONSEQUENCES OF URBANISATION

The next section of this paper is structured along the broad headings which are solely meant to aid in the discussion on the impacts and not to portray issues addressed as mutually exclusive of each other. The paper appreciates that impacts are interrelated and recursive.

2.1 Changing labour and market conditions

Rapid urbanisation of the rural-urban fringe, have brought new income opportunities for the people who originally had to contend to either working on their *shambas* (farms) as farmers or labourers, or seeking for paid job opportunities in Nairobi city. With increase in population from new comers, who are urban based in terms of their employment, the villagers have an opportunity to start small scale business such as shops, to cater for the increasing needs of the new comers. Other than opportunity to do business, there are also opportunities in the busy construction sector within the area as new houses are coming up in their midst. One of the community leaders commented that “until recently, only options available for our people were farm work and ‘*Jua Kali*’ [informal sector] jobs in the city.... Now new jobs are right in our midst.... Our people now are engaged in construction work, shoe repair, sale of groceries, and other service-oriented jobs” (*Interviewee 3*). This indicates that there is an increase in new income opportunities for the local people. This resonates with the Town Council of Karuri Strategic Plan, which cites that: The informal sector, commonly referred to as *Jua Kali* is very crucial and strategic base for industrial development in Karuri. ‘*Jua Kali*’ sector accounts for an approximate total of 5000-6000 job opportunities (TCK, 2007: 5). This is more so keeping in mind that “these new urban based dwellers are more moneyed than we are but it is to our advantage.... Our lives are improving because of them being in our midst” (*Interviewee 3*). With more money than the indigenous residents implies that they have a higher purchasing power than the indigenous residents. This has improved the sources

of the income for the villagers in the face of reduced prices of agricultural produce. The high costs of living due to the influx of a new group of people have brought about competition for the locally available goods and services. This echoes Tacoli who observed that:

...rural non-farm employment and agricultural activities among [rural]-urban [fringe] residents are an increasingly important element of livelihood strategies. Multi-activity at the household or individual level helps decrease vulnerability to shocks and stresses and stabilise incomes which may otherwise vary widely on a seasonal basis. For better-off households, diversification as a cross-sectoral investment can be described as an accumulation strategy (Tacoli, 2002: i-ii).

Due to the closeness to the city and interaction with different groups of people, people in rural-urban fringe are usually more exposed to the outside ‘world’ than the people in a more rural environment (*Interviewee 4*). This means that these people are likely to be aware of availability of a formal job either in their midst or in areas outside their localities. These as already mentioned, result from reduced importance of agriculture and also the educational curriculum that emphasizes ‘white collar’ jobs after training. This is supported by an agricultural officer who during focus group discussion commented that, “agriculture, for a long time, has been associated with lack of formal education The appearance of new source of employment (urban related jobs such repair and other service provision activities) offers a new opportunity for a more ‘decent’ job” (*Interviewee 5*). Jobs other than agricultural ones are held in high esteem. This probably can be explained by the experience most of the family members have had with non-paid farm work especially in family coffee farms. Traditional smallholder farming system in the area has been family oriented with low returns from the sale of crops’ outputs, and usually characterized with the expectation by the parents for young men and women to contribute unpaid labour with little participation in decision-making and, in some cases especially for young women, limited access to land through inheritance (*Interviewee 6*). The increase in rural non-farm job opportunities and social awakening of the young men and women through interaction with new comers, have made them access ‘decent income’. This decent income has however, negatively affected farming and more specifically smallholder farming due to labour shortages given that they also have to deal with the other consequences of land use change. Other than having a new source of income through employment, smallholder farmers have also got in their midst a ready market for their farm produce due to the increased number of non-farming residents. The smallholder farmers are now growing fast maturing crops such as spinach, tomatoes, *sukuma wiki* (kale) which have a ready market among the residents. The new mode of farming can be supported on a small piece of land, which is now common in the area after successive subdivision of land by many of families in the area. However with the problem of access to clean water and increased soil and water pollution, it is left to be seen how this farming enterprise will fare in the near future. Other than pollution, there is widespread surface water scarcity in the area as evidenced with predominant use of borehole as the

main source of domestic water. These fast growing crops require large amounts of water for their health growth, which quality and quantity is diminishing. As the population increases, pressure for conversion of more farmland for residential purposes will also increase, and thus an opportunity for farmers to increase production by buying additional parcels of land in their locality will not be available. According to Tacoli, “[d]emand from urban consumers for high value horticultural produce can stimulate production by small farmers, but, at the same time, the expansion of urban centres often involves competition over the use of essential natural resources such as land and water” (Tacoli, 2002: ii). Another, new dimension of farming that has benefited from the ready local market is dairy cattle keeping. According to the livestock officer “... people are now practicing zero grazing...a small plot of land [can be used to] keep 10 cows.” With liberalization of the sale of the dairy products in Kenya during the early 1990s, farmers do sell raw milk direct from the farm to the consumer, and therefore most people have utilized this avenue to switch their agricultural production from coffee farming to dairy farming in a zero grazing system. Most of the feed for their livestock are bought from the shops in form of concentrates or bran. It was however, mentioned of farmers going to Nairobi to buy by-product from breweries industry and also crop stalks from the local and city food markets. This livestock production system is being endangered by increasing pressure from residential uses, and more so by the uncollected solid waste in form of polythene papers. Other than problems associated with the waste, there are also conflicts with the non-farming residents who are complaining of the foul smells from the stables and, as the number of these residents increases in excess of the smallholder farmers, they are likely to influence decision making against livestock keeping in most of the urbanised areas thus jeopardizing the continuity of this promising enterprise.

2.2 Land sale and land conversion

Land in the rural-urban fringe is expensive when compared with land prices of the same quality of land in a more rural setting. This is advantageous to the landholders in that they are able to sell their portions of land and buy bigger ones in further rural distances. This is happening to a good number of landholders in the areas who have sold either their whole parcel of land or just some portions of it and bought some land in Rift Valley province (*Interviewee 2*). The impact of this post election incident is likely to influence the sale of land by those thinking of buying a bigger portion in other tribally sensitive areas, given that most of those evicted from the Rift Valley province had sold their entire parcels of land. Other than selling their highly prized rural-urban fringe land to buy cheaper and bigger parcels in the more distant rural areas, some of landholders are selling portions of their land and using the proceeds to construct rental residential houses in the remaining portions. However, this group is the minority and from different information sources it was evident that most of these people are just mesmerized at the prospect of getting more money from sale of land that agriculture itself cannot guarantee them in their entire farming life. For example a ¼ an acre at Ruaka village was going for nearly Kenya shillings (Kshs) 5 million and more than Kshs 6 Millions for the plots fronting the main road. This has become an envy of the far flung interior villages as reflected by a comment by one of the smallholder farmers who said that “in Ruaka [one of the rapidly

urbanizing villages] land have become like gold... People are selling their land like a hot cake. ... They are having a lot of cash” (*Interviewee 4*). These sentiments reflects that although negative land use conversion consequences are being felt by almost all people in the area, the beneficial aspects are experienced by only few, especially those with land near the paved roads. The same sentiments reflecting an even more unstable position in regard to agriculture was from one of the agricultural officer, who during focus group discussion, commented that it is hard to “get 6 Millions (in reference to Kenya Shillings) from a ¼ an acre of land even if one is to cultivate it for the entire lifespan.” In cases where farmers are not prepared to re-invest the money, they end up misusing the money and some of them are now destitute with no home or any source of income. Ruaka village, one of my study sites, was rife with stories of such people who sold their land and never invested. A comment by one of the government officers, and which led me to select Ruaka as one of my study sites, was that, “other people are not culturally, socially and economically prepared in re-investing the land sale proceeds and thus they end up using all their money on drinking and other ‘things’” (*Interviewee 1*).

2.3 Changing social, cultural and lifestyle structures

The personal impacts of social or cultural changes are very subjective. There is no one precise way to measure them. To understand them fully requires one to conduct long-term ethnographic field work. However, in this study the use of qualitative research methodology helped to capture the lived reality of individuals as it relate to those changes through the ‘shadows’ (McDonald, 2005: 456). As newcomers join the villages as residents, they do so as individuals or with minimal involvement of an indigenous resident. These people are mainly from Nairobi city though there was also mentioning of few incidences of people shifting from rural or other rural-urban fringe areas to the case study area. Their main attachment to the area is the residential service they get from the land as a place of residence. They still maintain their urban contacts and have little or no attachment to the area (*Interviewee 2*). These new comers have their jobs elsewhere and so they rarely depend on the villages to meet their income needs. They rarely participate in community activities such as burials, clan or family groups’ activities and also most don’t belong to local investment groups. These activities are necessary for the residents to access communal support within the community though these new comers are not part of it. This can be explained by their coming to the areas from other areas where they had already established such networks. Another reason which may have made the case study to be a unique one, where new comers don’t join local social groups, is because unlike in some rural-urban fringe where people buy a huge chunk of land either as cooperative or the land is bought by a dealer or a company who then subdivide and sell to all new members, the TCK area (case study area) constitute smallholder settlement villages which had existed long before the colonial time or at independence. Therefore, indigenous residents have kinship ties through the clan or families and most land though registered with title deed still undergo some (neo-) customary procedures before being transferred. As such land ownership can be traced from one great-grandparent all down to the current holder/occupant. That’s landholding transfers had been predominantly through inheritance. To the most of the original residents the new

comers don't constitute part of them but this as already mentioned may be as a result of diverse factors. However, as land continues to be converted for residential purposes there is likelihood that the new residents may be the majority in the near future. Additionally, as a result of the new interactions and availability of non-farm employment, attachment to land which has been the major source of livelihood for many households is continuously waning especially among the young people. For a long time, inherited land among the Agikuyu community, who are native to the Kiambu area of the Nairobi fringe, was held dearly and could not be traded in the market. It could however be exchange among close relatives. Land was "seen as a sacred thing, [and was] passed from one generation to the next..." (Interviewee 5). With increased demand for land, this belief is fast losing meaning when smallholder farmers are approached with lot of cash offers in exchange for their pieces of land which are declining in terms of agricultural productivity day after day due to problems associated with urbanisation. Land now especially to the young people is becoming a commodity which can be traded in the market, and it not uncommon to see the 'land for sale' signs in most of the areas. To the older generation, this is a cause for sorrow and as most has such sentimental attachment to their inherited pieces of land that one of them said "over my dead body! I cannot sell the bones of my father (in reference to the father's grave on the piece of land) to an outsider. His spirit will haunt me all the way to my grave" (Interviewee 8). This is however a common belief among most people who are still holding their small pieces of the family land, which explains why there are "patchy residential land use development resulting to sprawl" (Interviewee 3). There are a tales and examples of the people who have been affected by the curse after selling their family land. Among the examples are the people who sold their parcels of the land and spent all their money drinking and are the now 'desperate,' and proletarians who are working in remaining farms or in urban businesses (Interviewee 8). The existence of the curse could not be ascertained but I think awareness of such belief makes some people fear selling pieces of the family land, but as already mentioned, some ingenuity has evolved and people are selling family land which are small and then buying bigger parcels elsewhere as if to 'cheat the ancestors' according to one of the residents (Interviewee 4). The post election violence where most people in the affected areas lost all their life savings and investments, and a number of people losing their life have been interpreted along the 'curse' discourses, and its effect on future sale of land remains to be seen. The change in the "emotional and cultural attachment to land is being manifested by people now consider it appropriate to bury their dead in public cemeteries" (Interviewee 2). With land use change also come a group of people who are not indigenous to the area. These people usually have urban connections either through jobs or businesses and come from rural areas that are different from the case study area. Given that costs of land in the fringe are higher than land in far flung rural areas, it is likely that the new migrants have more financial resources than the locals. Also, from my own experience and from various key informant interviews, most of the newcomers are more educated than the indigenous residents. They still maintain connections in their areas of origin while in the city, together with the link and networks they had formed once in the city. These links form informal networks through which life needs can be met and so the newcomers have wider interaction space than the

indigenous people. The interaction with newcomers has been crucial in giving the indigenous people a new sense of life and connections different from that which they have been used to. The interaction has, also allowed some to build new and extended social, economic, political and cultural networks with new groups of people who in most cases are better educated, economically secure and better exposed to the 'outside' world (Interviewee 4). These interactions with outsiders, who are not tied to local norms and customs, are allowing the indigenous people especially youths and women to exercise a new form of power by aligning themselves with values of the newcomers. As already noted, most of the smallholder farming system thrive from non-paid family labour, which is accessed by the older members of community through coercion and threats of cultural curse to the young men and women. With the newcomers and urbanisation of their areas, young men and women can now access new opportunities for work in their midst and afford to rent a residential unit away from their parents. The idea of being ostracized is fading away as new members, who do not subscribe to the practices of the villages, join their midst. As one the government officers put it, "Interaction with 'outsiders' has increased the awareness of local residents of the opportunities outside their surroundings" (Interviewee 1). Other than getting the leeway to exercise their socio-economic rights, the cosmopolitan nature of villages is allowing people to transcend what Tacoli (2002) calls "[t]raditional divisions of labour along gender lines." According to Tacoli these divisions of labour affect the way individuals access the opportunities availed by the urban growth and also on the way they respond to constraints resulting from such growth. The new interactions are thus exposing them to the opportunities outside their surroundings, such as job opportunities in the city, in other urban areas in Kenya and also in countries abroad. These far flung opportunities are making it easy for these people to broaden their job options. This is moreso for the young men and women who are now able to transcend the traditional division of labour and, can now work in jobs such as bar attendant, entertainment industries, and home-making among others, in the city or in other areas without fear of being stigmatized by the members of their community group (Interviewee 5). This accord with the observation among the Mali people of West Africa, who migrate from their rural areas to work in far distance areas in order to take up jobs which if done in their immediate neighbourhood "can attract considerable social stigma, and distance is [seen as] a way to safeguard their own and their families' reputation" (Tacoli, 2002: 7-8). Within the rural-urban fringe, the emergence of the newcomers in the area brought about new social relations which are not tied to local customs and social norms. According to Koskey (1997: 280), African customs and social norms are area specific and lack universal adherence, and therefore the newcomers, who are from different social and cultural backgrounds, are not bound by the constraints that their original localities exercised on their lives. Many of these customs put limitations on, or discourage, individual goal seeking, in favour of communal pursuits. Thus when the new residents are away from their former cultural custodians and enforcers, most people feel relieved and chose to exercise their individual life goals at an expense of the communal goals. This is placing moral and social bonds of families in the rural-urban fringe, who have to interact with such 'free' individuals in their midst, under severe strain especially among their young children who sees the new

group of residents as progressive (*Interviewee 4*). There is, however, a problem in that rights of livelihood necessities, especially to those still practicing farming, is mostly dependent on land resources. This is moreso for the young people before they get foothold on non-farm work. Breakdown of social norms and customs is also breaking family ties with very young people choosing to leave their parent's home and be independent. Once they leave they are usually unable to get a foothold on the urban economy due to their limited skills and age, and in such cases some have ended up in illegitimate economy such as a life of crime, illicit activities such as drug peddling, prostitution among other social vices. Among the newcomers who are causing migraine to the both indigenous and other newcomer (owning self-built house) residents, are tenants from the city who are attracted to the rural-urban fringe by the low house rents, and the seasonal labourers who come to the area during the coffee peak employment period in the remaining neighbouring coffee estates. They are usually single men and women. These categories of people are thought of as contributing to the increase incidences of the venereal diseases in the areas, though the contributions from the city nearby cannot be underestimated. The major concern according to one of the residents is that "these areas are now hotspot.... Our young girls are getting involved with men when we go for work. These men [silence], you know [silence] are bad, I mean they are bad... They have brought city immorality to our good village. I will take my girls to a boarding school soon" (*Interviewee 6*). The opinionated comments notwithstanding, the cases of the HIV/AIDS and other venereal disease were reported to be on the increase in the area (TCK, 2007) and increased urban population with no ties to local norms and customs may be partly playing a role in it. The newcomers especially tenants are not tied to norms of the area and usually have no long term commitment to the areas as they can move out within a short term notice or without a notice to the housing landlords. These are the people whose history is unknown (life history is crucial in building communal/social trust and network) and therefore, most people are at risk of having as a neighbour people with criminal history without their knowledge. This is worsened by the existence of semi-permanent cheap houses which are affordable by people who can as well be termed as vagrants in real sense of housing: These people rent a unit/room and proceed to stay with minimal or no furniture and or other household goods. These are the people who can commit a crime and run away without anyone noticing that they are moving out of the area. Worst situations are where criminals run away from the city having committed a crime and come to hide in the rural- urban fringe when the search for them is intense in the city (*Interviewee 8*). Emergence of new group of people with no ties to social controls of their areas of residence has led to criminals from other areas coming to hide in the fringe areas once they commit crimes in other places. Rural-urban fringe in Nairobi had at one time become synonymous with the crime. This is partly due to the fact that there are no adequate services such as police services and these people are not tied to the informal sanctions of the community which are rural-based and family oriented in nature. Cases of rape, house breaking, car-jacking are now constantly being reported in the area. Although it is not easy to link these crimes with the newcomers, their contribution in adding a big number of 'unknown and unaccountable' to the community cannot be discounted in finding the explanation to

the problem of the increasing crimes. The indigenous residents and mostly smallholder farmers, then, are in a dilemma in that their agricultural enterprises are being negatively affected by the urban growth and their security is being compromised by the crimes. However, when faced with new challenges that are more complex than their social structures and institutions can handle, there is usually a mixture of opinion about what to do next. The forces of urban growth seems stronger against the poorly resourced farmers and although they may express some negative sentiment against newcomers, the new reality is yet to dawn to the most of them that they are being edged out and it 'may be them who will go'; where to, no one seems to know.

2.4 Planning and development control

Rural-urban fringe is an area described as an administrative twilight zone (Bentinck, 2000: 148). It is an area where there is no outright authority on any one institution due to the challenges of urbanisation which existing institutions are not structured to handle and which cut across different administrative boundaries. It is where government level actors are clashing or conflicting on various responsibilities and mandates. These clashes and conflicts end up leaving most of the land use issues not being addressed or, at worst, leading to conflicting land use planning decisions. Land issues and moreso, the resultant environmental consequences, cut across local authorities. Also, issues are too complex to be handled by existing weak local governments. Land use planning in rural-urban fringe, are handled by different line ministries independently. Decisions making on land use fall under various government institutions among them agriculture, forestry, physical planning, transportation, and environment. Local councils have the mandate to enforce development plans. Other institutions include Community Based Organisations, NGOs, and religious organisations. This has not made management of this rural- urban fringe any easier; conflicts have occurred among the institutions that have separate goals and mandates but deal with the same issue, land. For example, Ministry of Agriculture recommends the control of subdivision to a minimum of $\frac{1}{2}$ acre while local councils and the Ministry of Lands recommends for a smaller size of $\frac{1}{8}$ of an acre (*Interviewee 2*). The Physical Planning Act of 1996 on the other hand mandates the Director of Physical Planning to prepare a Local Development Plan while local councils are mandated to implement the plan. These different actors need to be considered during plan preparation, approvals, and implementation. This is not happening and has resulted to lack of legitimacy of plans produced and thus lack of wide-scale acceptance by different actors. Existence of problems in land use plans preparation and implementation means that most of the residential developments in the area are not authorized and, as such their statuses are not known by the government and the local authority. This is supported by the informant who said that "... informal processes of land use development are the cause of all these [problems]" (*Interviewee 2*). It is a "rapid urbanisation [that] does not correspond with the availability of infrastructural facilities and social amenities" (Republic of Kenya, 2008: 22). It has led to an increased population in the Nairobi Fringe in a rate that even if it is authorized most local authorities have no capacity to handle. As another informant put it, "where do we get money to cater for the expanding population? No enough money from the government... Population is increase day after

day. No industries... only residential houses" (*Interviewee 5*). As mentioned earlier, most local councils have limited revenue base. The Town council of Karuri (TCK) Strategic Plan identifies this as a problem by indicating that "due to the narrow revenue base, the council is not in a position to undertake development projects that can generate more income (TCK, 2007: 17). Due to the unplanned nature of residential land use developments, neighbourhood concept is also lacking in the housing developments. This residential estates lacks adequate service line and in most of the cases with no road setbacks. These new developments lack facilities such as markets, sports field, or other community centres to which the residents can identify with. Instead, ribbon developments of informal roadside markets that provide groceries and other consumable products are occurring all over the area. As these informal businesses on semi-permanent structure continue to expand alongside residential houses, land use conflicts are expected to emerge. The road networks were also not design to cater for the today's vehicular traffic generated due to population increase in the rural-urban fringe. The roads were just connecting the then small peri-urban centres around the city. Most of the land use activities then were farming and most areas were being served by city buses which were co-owned by the City Council of Nairobi and the Stage Coach Company, the company was known as the Kenya Bus Service. The collapse of the bus company and the continued increase in population in the area has meant that the residents had to cope with disorganised public transportation. As one of the informants put it, "the collapse of Kenya Bus Service (this was Nairobi City Council managed public transport) meant that any Tom, Dick and Harry will now provide us with transport.... These people have no heart.... They charge fares as their heads tells them... [There is] no one to tell them what to do (*Interviewee 10*). Traffic congestions are now beginning to be experienced all through to the city centre. This is partly due to the narrow roads which have not been expanded to cope with the increased traffic. Traffic jams are being experienced in the morning and in the evenings. The traffic jams and lack of any organized public transport between the city and the rural-urban fringe areas (*Interviewee 9*). The other problem being experienced here is that of inadequate health facilities and services. This is due to population increase without corresponding increase in such facilities. However as will be mentioned later, this has led to mushrooming of private clinics and use of herbal medicines. This problem of congested public facilities is also being replicated in most of publicly run facilities such as schools. However, while compared with other more rural areas of Kenya, although these facilities are congested they are available and accessible. One does not need to travel for long distances to get treatment because whereas one may not have the patience to queue in public health centres, private clinics are within the reach (*Interviewee 8*). Other than uncontrolled land subdivision resulting into residential development without services and infrastructure, these development are the scattered on the landscape in a haphazard manner, a manifestation of sprawl. The sprawl is manifested by patchy residential land use development. The residential houses are spotted all over the landscape and intersperses with smallholder farming activities. Majority of the 'urban looking' residential houses are located along the main roads and are usually high-rise flats and apartments. However, there are other low density houses in not so deep interior from

the main roads. In addition semi-permanent village houses are present both at the interior and along the main roads. The indigenous residents, whose land is not as prime for residential subdivisions as those near the tarred roads, still maintain their rural-like homes in the villages in far deeper locations of the area. All over the case study area there is no uniformity in the way houses are built in terms of the design and the pattern. You get some places with a cluster of dense high-rise houses or low density houses then a separation of an agricultural land which is still under cultivation. This scattered or leapfrog land use development is most costly in respect to providing services and facilities. This kind of dispersed residential land use also causes unnecessary land consumption because uncoordinated land use will, once the area becomes dense, leave agriculturally unusable fragmented open spaces, as already evident in some areas. These fragmented spaces cannot be used for agriculture due to the problems associated with domestic wastes disposal. Further these spaces may remain open with no use for a long time since new residential developer will be attracted to newer areas where congestion and pollution is minimal/low. Sprawl in residential land use development is a condition that comes with it a variety of problems. The sprawling residential settlement is reducing land available for farming either directly through conversion or indirectly through negative consequences on agriculture such as pollution from domestic wastes. This is leaving many people destitute given that they are not used or prepared to participate in urban economy (*Interviewee 2*). Further, the dispersed urban residential land uses have resulted to the decline in the functions of formally designated commercial centre. During land consolidation in 1950s, there were areas which were set aside for commercial activities and which later developed into market centres. These centres also served as administrative centres. However, as a result of uncoordinated land subdivisions for residential purposes especially along the main roads, there has been mushrooming of shopping and other commercial activities outside the formally designated areas. This has led to the abandonment of these urban centres, with some of centres hardly having any visible activity going on. Earlier on, these centres used to serve as business centres, health clinics were located here and people working in the area such as government officer and teachers resided in them (*Interviewee 1*). Decentralization of residential and business purposes as a result of unplanned urban growth have led to the economic decline of these centres since few people frequent them and also as a result of outward movement of the people who used to live there in favour of residential houses in the former roadside farmlands where it is more spacious, accessible and private. Even the original residents now do not need to go to these centres since they can sell their farm produce on informal markets now located along the main roads and outside some of the new commercial areas and also buy whatever they needed there. It is worth noting that, most of the affected urban centres are those located in the interior part of the villages. The initial purpose of their location in the interior part was to stimulate uniform development of the area, by avoiding developments from only occurring along the main roads (*Interviewee 1*). Due to the condition of the access roads to the interior areas, it has come as a blessing to most businesspeople who are taking advantage of the relaxed regulation on the location of the business activities by renting or building premises along the main roads. I also gathered

from the field that, as result of population increases, police services have become inadequate. This led to the interior commercial centres and residences becoming easy target for violent robberies and house breaking, and therefore most people started migrating to the areas near/along the main roads where presence of police patrols is assured, once rental residential housing started to come up. Therefore these market centres have become 'ghost towns' (*Interviewee 2*). Another unfortunate aspect of uncontrolled land subdivision for residential purposes in the rural-urban fringe that are not backed by corresponding investment in social and technical infrastructure or services is that they cannot attract investment in the production sector. Infrastructure plays a key role in attracting investment in different areas (Mireri, 2000: 11). Lack of infrastructure and services discourage many investors who would like to invest in industrial development or any other development likely to create employment in the area. This therefore leaves land use conversions to be merely for residential purposes. This as an informant put it, makes the areas just "dormitories' for city workers", and "the consequences are quasi-urban settlements with no economic base and therefore lacking facilities for self supporting community" (Republic of Kenya, 1983: 11). This aspect of the areas being dormitories for city workers means that they (city worker) are not full participant in the development of their areas of the residence. They work in the city and that is where their service taxes go. This leaves the rural-urban fringe authorities in these areas without adequate finances to provide services for the residence. With "no attempt to locate those activities attracting them [those working in Nairobi] to remain and work in these areas" (*Interviewee 1*), the already existing problems will persist in the areas. There is no integration of the city workers residing in rural-urban fringe with the activities going on in the area or with the indigenous residents. As one of the informants put it that "people wake up early in the morning and head for work in the city... You only see them at night when they come back... It is like they are always on the move" (*Interviewee 8*). The people living and working in these areas sees those working in Nairobi but living in their midst as unworthy neighbours who are just there to share with them their limited resources. They are further accused of contributing to rising of the rent and thus making it unaffordable to the non-farm workers who have worked and lived in the area for a long time (*Interviewee 8*). A government report carrying a comment on the area put it that, "...influx of Nairobi residents ...has brought about an increase in house rent and congestion" (Republic of Kenya, 2008: 54). The indication of the magnitude of congestion of land uses in otherwise formerly expansive rural areas cannot be described any better than by one of the original residents, practicing smallholder farming, when he commented that, "you cannot relieve your bladder anywhere and anyhow now.... You are not sure that someone is not seeing you. People have become so many ... [that] whichever direction you face you are likely to see someone. It is no longer the way it was.... No grass to lie on or trees to take shelter on. It such a terrible place..." (*Interviewee 7*).

2.5 Changing land use and the environment

Although they are not prevalent in Nairobi fringe, squatter settlements exist. Such settlements are not planned for by the government and due to their illegal status (these settlement are not only informal but illegal in terms of land ownership),

the government or local councils may not provide services to them as it would be akin to legitimizing their illegality. Therefore, even in the planning intentions as contained in various local councils strategic plans and programmes such settlements do not feature anywhere in the priorities. This is supported by one of the government officers who said that "you know government can only plan for what it knows... [Given that] even that which it knows about, it may not be in position to provide for" (*Interviewee 1*). With many farmers subdividing their parcels or selling their entire farmlands, landlessness is likely to be a major problem and squatting on public land or on flood plains is likely to be on the increase. Regarding environmental problems, the most obvious ones are those that are associated with the land conversions from agricultural to non-agricultural uses. These conversions as in other rural-urban fringes transforms not only the immediate land that becomes urbanized but also affect much larger areas, as can be seen in "...the changes of the rural landscape and ecology that is driven by production activities that respond to urban-based demands" (Simon, 2008: 12). In such situations, there is increased need for water and other natural resources, and goods and services. New developments are in need of materials for the construction of buildings, roads and other components of the urban fabric. Generated solid wastes are disposed of on open-air sites with little or no provision for protecting surrounding soil and water from contamination. In most local councils in the Nairobi rural-urban fringe, there are no sewerage systems and piped water. Few years ago the area had few residents and the pit latrines and shallow drinking wells were prevalent. With the area becoming more urbanized several challenges are becoming manifest. As one of the informants put it "... what do you make of this? Pit latrines with shallow well near them! ... That's why we are always sick" (*Interviewee 8*). This is the common perception most people now have pertaining to the conditions in their residence and the safety of their domestic water sources. The problem is becoming worse with the pollution of the surface water from surface run-offs carrying sewage matter, garbage and sediment from homes and construction sites, and waste water from agro-processing industries which are being continuously emptied into the river channels. This is the concern that even the Health Department has identified as needing an urgent priority by indicating that, "lack of sewerage system is a major health risk... as for the other wastes disposal let me not comment about it. It is everywhere" (*Interviewee 5*). The seepage of waste into the aquifer and also the diversion of household liquid wastes by impermeable (because urbanisation produces extended impermeable surfaces of bitumen, tarmac, tiles, and concrete, there is tendency for flood run-off to increase..." (Goudie, 2006: 131) surfaces and drainage into water sources are likely to be disastrous to the residents as the area continues to densify without adequate waste management systems. Other threats to the water sources in the area includes siltation, reclamation of wetlands for vegetable farming, use of fertilisers and pesticides and other chemicals which are washed into the rivers as run-offs. Pollution from municipal and agro-processing industries has also continued to undermine water supply sources. The depletion of vegetation cover during land conversions has left some of the areas; their top-soils is hence eroded during rainy seasons. This not only lead to loss of aesthetic impression of the physical environment, but also contributes to the siltation of and ultimate blockage of drains,

hence contributing to flooding. The inadequacy of water supplies is likely to lead to water scarcity against the increasing demand due to the population increase. In the study areas the Development Plan had as early as 1983 identified that "most rivers have insufficient and polluted water (Republic of Kenya, 1983: 67). World Water Resources Institute, WWRI (2000), estimates water resource in Kenya at per capita per annum of 673m³, thus putting Kenya in the rank of "chronic water shortage state" category. The report further foresees the fall of water supply to 235m³ by 2025 as the population increases. The supply could be even less if water resource base constituting among others, water catchment forests now less than 2% of the total land mass, continues to deplete. Degradation of water resources is also attributed to inappropriate farming methods that arise out of the excess pressure on land resources due to intensive farming. Increased number of households is producing considerable amounts of liquid waste. This waste have nitrates and phosphorous from soaps and detergents. This is causing eutrophication of water bodies as evidenced by the presence of algae blooms and other vegetation on some of the local private dams. Further, most of the waste from households flows in poorly constructed/maintained drainage channels or on open plots leaving it stagnant for a long period of time (*Interviewee 1*). The stagnant waste water according to Simon (2008: 13) creates an environment for disease breeding insects such as mosquitoes and other organisms. Water scarcity is also likely to cause conflicts, especially among the horticultural and river valley farmers. Tacoli elsewhere identified water scarcity to be a problem in rural-urban interface especially affecting the low income groups (Tacoli, 2002: iii), majority of whom, are smallholder farmers. Different types of solid wastes are generated from the residential houses. The existing in most of the local councils' wastes collection arrangement caters for the commercial centres only, and as already mentioned, these centres have been overtaken in terms of activities and densification by areas initially not designated as commercial centres. Furthermore, most local councils "has never prepared a strategic solid waste management plan. This means that there is no coordination in the way solid waste is managed within the council. This is evident by the way solid waste is strewn all over the place especially on the roadsides (see Photographs 1 below) and on the river valleys and, sometimes heaping up on vacant plots. This waste, as already mentioned, is providing a breeding ground for diseases pathogens and pests which are potentially harmful to public health. Further, the waste is usually unsorted and thus constitutes all kinds of waste including clinical waste (*Interviewee 7*). The solid wastes also contain polythene papers and plastics which have created an eyesore in most of the areas. During a windy day, one is treated to spectacular objects flying all over the area. These polythene wastes are blocking river channels and the drainage systems. The blockages cause flooding by storm water when it rains. The flooding destroys crops along the river valley and weakens foundation of some of the houses, once it erodes the top-soil given that most of the areas are sloppy. Apart from causing flooding problems, these polythene wastes cause problems for livestock in that, farm animals sometimes ingest the polythene which then block their digestive system and may sometimes cause death or stunted growth (*Interviewee 5*). Since there are no significant industrial activities in some areas of Nairobi rural-urban fringe, air pollution is not a major problem.

However, shallow pit latrines usually produce pungent smell especially during the hot sunny days. Also as the area continues to be dense, there is likelihood of air pollution from the exhaust fumes from the increasing number of vehicles. There is also noise pollution from metal and wood workshops, and other repair and flour milling establishments which are all over the area. Given that most of the interior roads are not paved, problems of dust are experienced by most of the residents and it is evident from the colouring of the roofs and also on the surrounding vegetations by the dust from the brown soils. Some cases of respiratory and eye problems can be attributed to soil dust especially to children. Pungent air is also experienced from the farms keeping livestock and poultry. The smell is evident to any person passing through or visiting some of the areas, and from residents who are complaining bitterly about it. One of the informants put it that "you cannot sleep during the day! Smell from the poultry farms is unbearable" (*Interview 8*).



Photographs 1: Solid waste disposal on the roadsides along Gachie- Ndenderu road in TCK.

Environmental problems and the resulting conflicts reflect diverse interest that different individuals hold towards the rural-urban fringe. The smallholder farmers, who are the indigenous residents to the area, favoured the area to remain and continue to be considered agricultural. Conversely the other residents and tenants who were mostly newcomers to the area, cannot understand why farmers should not just relocate their farming to 'rural areas' where such activities are prevalent. The result of diverse interests is a mix of farming and residential land uses. This, as already mentioned, can be attributed to the informal ways in which land use subdivisions are being done and, consequent pattern of incompatible land uses. The incompatibility of land uses is not only being experienced in terms of residential and farming land uses, but also by other types of land uses, which are located in haphazard manner depending on available of land on sale. In one area I observed a school and a light industry located adjacent to each other notwithstanding that the noise from the industry was evident and high for any meaningful concentration by the students. Religious buildings are also coming up alongside commercial and residential land uses. This brings noise problem especially on Sundays when some of the charismatic churches use public address system, and as if trying to outdo each on who has the most powerful equipments they blare the area with sermons and music. One of the government officers in reference to the scenarios

commented that, "lack of effective land use control and co-ordination lead to individuals making isolated decisions...Today this one is building a cowshed, the other one is putting up a bar, another one a church, and the other a residential house.... Surely, what a mixed grill can these (land use developments) be?" (*Interviewee 1*).

3. CONCLUSION

From the foregoing discussion in this paper, there is clear evidence that land conversion in the Nairobi rural-urban fringe is leading to social, cultural, economic and environmental transformations of this space. Although these transformations are bringing positive change to community members in TCK, not all actors are experiencing the benefits. Some members of the indigenous group have taken advantages of new opportunities in terms of networking with newcomers to access resources not present in their surroundings. Others have taken advantage of economically better-off newcomers to start businesses to cater for their service needs. There are however members of the community who are alienated from their livelihood when circumstances lead them to sell their land. This is particularly for rural-oriented landholders who sell their land to urban residents without adequate preparation on the ways to re-investing the sale proceeds. The sale of land is thus creating a new class of landless actors who either become labourers on the construction sites or on the remaining farms after selling their land. The increase in the number of the landless is likely to lead to mushrooming of squatters housing settlements on public lands. Unplanned residential development is resulting in a housing sprawl. The sprawl is affecting the initially planned commercial centres which are now falling into disuse. The consequences of sprawling land development have been an encroachment of residential land uses into an agricultural-oriented rural economy that is not well prepared to handle the challenges of urbanisation. Furthermore, the residential land developments are not backed with corresponding investment in social and physical infrastructure such as roads, security, water supply, sewerage systems and other public utilities. As a result of the lack of investment in these infrastructure and services, these residential developments are generating environmental problems such as water pollution, soil erosion, waste generation and destruction of vegetation cover. Land conversion is producing intended and unintended consequences in the Nairobi rural-urban fringe. These consequences are leading to the transformation of social, cultural, environmental and economic aspects of the Nairobi rural-urban fringe. Although some of the transformations are leading to improvement of livelihood for a number of actors, some transformations are insidious in that they are leading to communal and social breakdown among the indigenous group, and also affecting the environmental quality of a the Nairobi rural-urban fringe. These insidious effects are in turn affecting agriculture as a viable enterprise in these areas.

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