

Understanding Households' Residential Location Choice in Kumasi's Peri-Urban Settlements and the Implications for Sustainable Urban Growth

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Abstract

This study was conducted against the backdrop of the rapid physical expansion of Kumasi and the concomitant growth of peri-urban settlements of mainly residential land use around the city's main built-up area. Adopting the case study approach and selecting Abrepo and Esreso as study areas, it sought to understand the factors that inform households' decisions to live in Kumasi's peri-urban settlements. Based on households' likelihood of change of residence in the future and their stated residential location preferences, the implications for sustainable urban growth were examined. The study found that family relations, relatively low land price and house rents as well as work-place proximity were the most significant reasons underpinning households' choice of the urban periphery. In view of the aggregate cost reducing advantages associated with the urban periphery therefore, the study concludes that rapid expansion of the city into peripheral areas due mainly to residential development will continue to occur. It therefore suggests that urban development policies that aim at securing liveable conditions and promoting mixed-use development in the dominantly commercial central areas of the city will be crucial to managing growth and averting unsustainable urban expansion.

Key words: location choice, peri-urban, sustainable urban growth, urban planning

1. Introduction

Cities of the developing world are experiencing unprecedented demographic change leading to rapid urbanization. In many of these cities, the interaction between the complex forces of globalization and local processes of urbanization have resulted in rapid expansion of urban areas into transition zones between fully urbanized land and areas formerly occupied by agricultural use (Adell 1999; Webster, 2002). As a contemporary form of urbanization, the unfettered multiplication and growth of peri-urban areas, continues largely, as a natural concomitant of the need to accommodate rapid population growth and to meet the attendant space demands of various socio-economic activities. Additionally, Pacione (2009) asserts that rapid peri-urbanization in major cities of developing countries demonstrates a gradually changing focus of urban life from the traditional Central Business District.

Within the urban-rural continuum of many rapidly urbanizing cities, peri-urban areas have emerged to serve various functions. In cities of the Global South, the urban periphery serves as the attraction points of investment in land intensive industrial activities, accommodates the overspill of industrial activities from congested city-core whilst housing the urban population excesses (McGregor et al (eds) 2006; Adell 1999). In many African cities on the other hand, as a result of the physical expansion of urban areas as well as the *in situ* reclassification of villages and smaller towns, peri-urban areas have emerged to play the dominant role of providing places of residence for a heterogenous mix of urban population, both migrants and indigenes (Browder *et al.* 1995; Simon *et al* 2004).

In Ghana, rapid peri-urbanization is a common feature that can be observed in all the major towns and cities. The growth of peri-urban settlements is an on-going process resulting mainly from rapid urban population growth and the need for individuals and households to acquire land for residential development in order to meet the attendant housing requirement. As the second largest city in Ghana, Kumasi has since the past five decades experienced rapid population growth and physical expansion into surrounding areas formerly occupied mainly by agricultural use and forests. Home to over two million residents currently, the city's population has nearly tripled since 1970, with current growth rate estimated at 5.4 percent per annum (Ghana Statistical Services, 2002). Over the past five decades, its physical size has more than quadrupled from an area of 25sqkm to 150 sqkm with radius extending some 7 kilometers from its center (Adarkwa and Post (eds), 2000). Consequently, many previously agricultural areas, extending some 20 to 40 kilometers radius from the city center (Simon *et al* 2004), have been engulfed into the city's main-built up area. These peripheral locations accommodate a disproportionately larger share of the total resident population within the Kumasi Metropolis.

Despite the rapid influx of urban population of various socio-economic status into Kumasi's peri-urban zone to acquire of land for housing development, evidence of the reasons that underpin such location decisions remain largely anecdotal, supported by limited or no empirical evidence in many cases. This in part, is because

academic research on the urban periphery is quite recent, dating back to the early 2000s. Besides, the compendium of literature that have been produced over this period of research have focused largely on definitional issues, the livelihood implications of the conversion of agricultural land into urban uses and the challenges of environmental resource management in these areas¹. It is therefore not uncommon, to find academics draw on and apply standard residential location models of mainly American and Western European origins to attempt to explain this phenomenon in the Ghana despite the contextual differences.

Moreover, urban containment policies aimed at averting unsustainable expansion have become central to realising the goals of sustainable urban growth the world over. Within the urban space, the impact of residential land development on urban expansion and overall city size is enormous and conspicuous. It is estimated that residential land takes over 50 percent of all major urban land uses (Harvey and Jowsey, 2004). Within the Kumasi metropolis for example, it is estimated that residential land use constitutes 44 percent of the total developed urban land (Kumasi Metropolitan Assembly, 2010). It therefore becomes obvious that the success of urban strategies to address the almost overwhelming challenges of sustainable urban growth will depend, to a larger extent, on the ability of urban planning to shape the aggregate outcome of residential land acquisition decisions of households in the urban space. In order to realize this, urban planning will need to understand current patterns of households residential location in order anticipate potential location patterns in the future and to tailor-make growth management strategies that can shape such location decisions towards the realization of stated sustainable growth objectives. The motivation of this paper is grounded in the acknowledgement of this basic but extremely important reality.

This paper therefore aims at achieving three major objectives. First, it seeks to understand the factors that inform households' residential location choice in two of Kumasi's peri-urban settlements and how far they are explained by standard urban residential location choice models. Secondly, the study aims to understand and to possibly predict the likely future residential location choice of households' currently occupying rented accommodations or living rent-free in family accommodations. This is achieved by examining the likelihood of change of residence among these households in the future and their stated residential location preferences. Finally, the paper examines the implications of households' stated future residential location preferences for sustainable urban growth, emphasising the potential impacts these will have on Kumasi's spatial structure, the associated unsustainable lifestyles and overall challenges for growth management.

The paper follows in four sections. The first section discusses relevant literature on the urban periphery and residential location choice to set the entire study within the appropriate theoretical framework. The second section discusses the methodology adopted for the study while the penultimate section presents and discusses the results of field data gathered. The implications of the data analysis, recommendations and conclusions are discussed in the final section.

2. The Urban Periphery and Households' Residential Location Choice: A Review of Literature

2.1 The Urban Periphery/Peri-Urban Interface

A Survey through literature shows conceptual controversies surrounding what constitutes the peri-urban interface and hence, a lack of a single, all-encompassing definition. The divergent viewpoints can be attributed to the contextual differences between cities of the developing world where peri-urbanization is pronounced and the inherent difficulty that this presents for any attempts at arriving at 'universal' definitions and generalizations (McGregor *et al* (Eds) 2006). It is also seen as both the cause and consequence of inadequate attention and specific research devoted to understanding the peri-urban zone, particularly in the African context (Adell, 1999). The existing literature however, shows that two key definitional approaches are adopted in explaining what constitute the urban periphery/peri-urban interface. The first approach, through empirical studies, sets discrete spatial limits in defining the peri-urban zone. Leading exponents suggest a distance of about 30-50kilometres beyond the urban edge as a reasonable generalization for the extent of the peri-urban zone in large cities (McGregor *et al* (eds) 2006). Major metropolises may however, have wider zones. Webster (2002), suggests for example, a distance of about 150 kilometres from the main built-up area of cities; and 300kilometres in the case of Chinese cities as constituting the peri-urban interface. Adopting this approach, it is estimated that Kumasi's peri-urban zone stretches some 20 to 40 kilometres radius around the city's main built-up area (Simon *et al* 2004; Phillips *et al*, 1999; cited in McGregor *et al* (eds) 2006). Simon and colleagues (2004,) further, distinguishes two broad zones within the peri-urban interface namely; *zone of direct impact*- which experiences the immediate impacts of land demands from urban growth, pollution, inter alia; and *wider market-related zone of influence*- recognizable in terms of the handling of agricultural and natural resources products.

Contrary to setting discrete spatial limits, the second perspective adopts a broad, integrated and functional

¹ See the works of Rakodi, 1998; Brook and Dávila, 2000 (eds.); Simon and Colleagues, 2004; Allen 2003; Webster, 2002; McGregor *et al* (eds) 2006, among others)

approach and considers the urban-rural continuum in defining peri-urban areas. In this sense, the PUI is conceptualized as the;

“...the transition zone between fully urbanised land in cities and areas in predominantly agricultural use. It is characterised by mixed land uses and indeterminate inner and outer boundaries, and typically is split between a number of administrative areas” (Rakodi 1998, as quoted in Webster 2002, p5).

The discrete-spatial-limits approach is helpful in establishing how far the peri-urban zone may stretch and the extent of urban influence at measurable distances away from the main built-up area. The urban-rural continuum approach is also useful in understanding the functional linkages and interactions between the city-core and the periphery. In essence, both definitional approaches are adopted and implied where the term is used in this study. In addition to the attempted definitions, most of the authors identify some distinctive peculiarities to describe peri-urban areas in the areas of the socio-economic composition of population, land use and environmental characteristics and spatial governance. The zone may be populated by a mixture of low income migrants engaged mainly in informal economic activities (Browder *et al.* 1995) and urban middle-class commuters as well as industrial entrepreneurs (Allen, 2003). As transition zones, peri-urban areas exhibit a complex mix of land use, land tenure and environmental characteristics (McGregor *et al.* 2006). Many of these areas lack proper land use planning and adequate provision of basic infrastructure leading to poor environmental conditions and emergence of informal settlements (Allen 2003).

Institutionally, Peri-urban areas often fall within separate administrative jurisdictions with the resultant institutional fragmentation weakening municipal governance and planning controls. Consequently, the responsibility for the provision and maintenance of infrastructure in these areas often lie with different municipal authorities and departments (Simon *et al.*, 2004). The uncertainty that arises as to which institution administers which specific area explains the challenges faced in transport, water, energy, waste management and general environmental management situation in many peri-urban settlements (Allen, 2003).

2.2 Households' Residential Location Choice

The standard theoretical reference adopted for this purpose is the access-space-trade-off model of Alonso (1964). The foundations of Alonso's model however, are constructed on earlier works such as the work of Von Thunen (1826). Thunen's model assumes a homogenous and mono-centric space over which there is equal ease of transport in all directions. Consequently, the price of land is determined by the revenue-earning capacity of different uses at different locations relative to a central market (Harvey and Jowsey, 2004). Given that transport cost increases with increasing distance from the central market, rent-paying capacity of a particular agricultural land use and hence the price of land also decreases. The key principle derived from model therefore is that whereas the amount of space available increases geometrically at distances away from the central market, land prices tend to fall in order to compensate for increased transport costs.

Alonso's (1964), access-space-trade-off model adopts the basic approach of Von Thunen. However, it replaces the central market with the Central Business District (CBD) as the focal point of all household employment; and introduces the idea of mutual substitutability between land and non-land factor inputs (McCann, 2001). Other implicit assumptions in the model include the fixity in the supply of urban land, the principle that land goes to the highest and best use and notion of rational individuals whose choices are underpinned by utility maximization motives given the constraints facing them. Mutual substitutability between the consumption of land and non-land inputs means households substitute in favour of more land consumption at distances farther from the CBD to offset higher transport costs imposed. Similarly, within the vicinity of the CBD, households consume less space because land prices at such central locations are very high.

The access-space-trade-off model also shows that Maximum utility is derived from minimum travel time and costs related to work and non-work trips as well as non-monetary factors such as space, air quality, peace, locational prestige, and neighbours among others. Additionally, it follows in reality that as income increases people tend to have higher preference for space and luxurious sub-urban housing. Although land values fall as distance increases from the CBD, house prices on the other hand, tend to rise (Balchin *et al.* 2000). Housing in peripheral locations is therefore more expensive because of the positive locational attributes such as better environment and open spaces. Improved transport connectivity between the core and the periphery and rising private car ownership means that mobility challenges are easily overcome. This implies that for high income households, peripheral locations become preferable because they can afford to pay higher rents for luxurious accommodation whilst travel cost become less significant because of higher income and private car ownership. Low income groups on the other hand, tend to trade-off between commuting costs and housing costs. Given their lower income levels and relatively smaller space consumption, they tend to have higher preference for central locations because of the advantage of living closer to their workplaces in the CBD area.

Summarising, the key issues on peri-urban areas and the principles underpinning the access-space-trade-off model discussed can be integrated into a composite theoretical framework for this paper. Given their location relative to the main built-up area of the city, residents in peri-urban areas are expected to cover relatively longer

commuting distances to the city centre for work and non-work related purposes. However, the level of transport costs including time imposed will depend on the level of urban transport infrastructure development and transport system efficiency. The potential effect on households' decisions will depend on the sensitivity of their incomes to either accessibility needs or space needs.

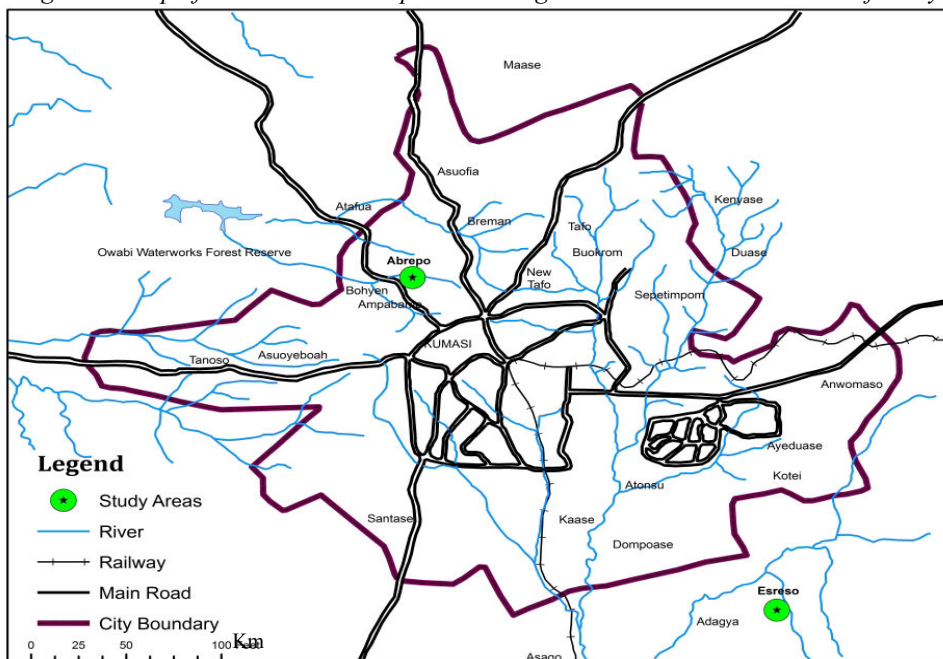
Moreover, the fact that the urban periphery accommodates a complex mix of population of various socio-economic status implies that, location decisions there are informed by the interplay of many dynamic factors including the cultural context that are not adequately captured by the standard access-space-trade-off model. These aspects are explored in this paper. Finally, the very attributes of peri-urban areas present both location-specific advantages and challenges which ideally, should influence households' decision to choose accommodations there or not. In principle, peri-urban locations can offer adequate space at relatively lower price. However, the unplanned and poorly managed nature of such locations can potentially impose challenges with regards to access to socio-economic facilities and services which in turn can affect convenience within the vicinity of the dwelling.

3. Research Approach and Methods

The paper adopted the case study approach and focused on two of Kumasi's peri-urban settlements as study areas. Guided by Simon and colleagues' (2004) estimation of Kumasi's peri-urban interface as extending some 20 to 40 Kilometres from its centre, Abrepo and Esreso, located within the inner to the middle segments of Kumasi's peri-urban zone were selected as study areas. Figure 1 shows the Kumasi Metropolis and the selected case study settlements Abrepo is located at the North-western part of the Kumasi metropolis, about 6 kilometres from the city's main built up area. Esreso, on the other hand, is located about 12 kilometres in the south-eastern part of Kumasi. Another criterion applied to the selection of the case study areas was their location within separate local administrative jurisdictions, a key distinguishing feature of peri-urban settlements. Thus, whereas Abrepo falls within the administrative boundaries of the Kumasi Metropolis, Esreso, despite maintaining physical contiguity and strong functional linkages with the city of Kumasi, is located in the Bosomtwe Kwanwoma District.

Currently available census data estimates a resident population of 10,146 and over 2,500 in Abrepo and Esreso respectively (Ghana Statistical Services, 2000). A study by Owusu-Ansah and O'Connor (2006) indicates that physical expansion of the Kumasi metropolis into the village lands of Esreso dates back to the mid-1980s. In the subsequent years, Esreso continues to experience rapid in-migration of urban population, the development of luxurious sub-urban housing and the expansion of Kumasi's industrial activities into its village lands (Simon *et al.* 2004)

Figure: 1 Map of the Kumasi Metropolis showing the Peri-Urban Settlements of Study



Based on the size of resident populations, representative samples of 100 and 200 households were selected from Esreso and Abrepo respectively. Structured questionnaires were designed, tested through a pilot survey and administered through personal interviews to collect primary data on a range of relevant socio-economic variables at the household level. Thus in total, 300 households, representing about 10% of total households in the study

areas were accidentally selected and interviewed. Using semi-structured interview guides and through phone interviews, primary data was gathered from relevant departments within the Kumasi Metropolitan Assembly. Desk-study of relevant research publications and reports was also done to complement the primary sourced data. In accordance with the main objectives of the paper, the field survey instruments were designed and the personal interviews conducted in manner that would enable household-heads to give in retrospect, accounts of the factors that informed the choice of their current peri-urban locations. Beyond this, the study sought to understand and to possibly predict the likely future residential location choice of households' currently occupying rented accommodations or living rent-free in family accommodations. Given their occupancy status, these households were considered more likely to change residence and hence the emphasis placed on understanding their location preferences in the future. In essence, these category of households were asked to indicate their likely/preferred occupancy status in the future (i.e whether owner-occupation, renting, or living rent-free in family accommodations) as well as their preferred locations in the urban space should they decide to change residence. The implications for sustainable growth of Kumasi and its surrounding areas were derived based on the analysis of the likely impacts of stated future residential location preferences of these households. Survey results have been presented and discussed in this paper using correlations, parametric and non-parametric tests as well as descriptive statistics of mainly percentages and measures of central tendencies where appropriate.

4. Results and Discussions

4.1 Background Description of Households' Attributes

A survey of households' origins and previous places of residence indicated that nearly a quarter of them are originally from Esreso and Abrepo and therefore have extended family relations. This lends credence to the occurrence of *in situ* reclassification by which previously small farming villages have gradually been engulfed into the contiguous built-up areas of the city of Kumasi. The remaining 75% of residents were migrants most of whom had moved from neighbouring urban and rural communities.

Among the migrant population, about 20% had lived within the inner ring road and CBD areas of the city of Kumasi before moving to their present peri-urban locations. These were largely households displaced from the central location of the city due to the continuous conversion of residential properties into commercial uses to meet the increasing demand for the latter. Over half of migrant households on the other hand, had once lived outside Kumasi's CBD area but within the inner segments of the city's peri-urban zone. This means that, for majority of households, movement occurred from one peri-urban settlement to another but at distances farther from their previous locations. The remaining proportion of migrants' (20%) origins could be traced several kilometres from their present location. Majority of the residents (92% and 90% in Abrepo and Esreso respectively) had lived in the study areas for close to 20 years as of the time of the survey, supporting claims that housing development in many of Kumasi's peri-urban areas started in the mid-1980s.

Average family size at Esreso and Abrepo was 4 persons ($SD=1.6$). Single person households constituted 5% of all households surveyed. On the average, there were 5 independent households mostly occupying traditional compound houses with other relatives. Families lived in three main occupancy types. About 20% of households were owner-occupiers while 46% lived in private rented accommodation. Quite surprisingly, some 34% of households who were indigenes lived rent-free in traditional family compound houses. Others served as caretakers of new homes and houses under construction for which the owners are living elsewhere in Ghana or abroad.

4.1.1 Household Employment and Incomes

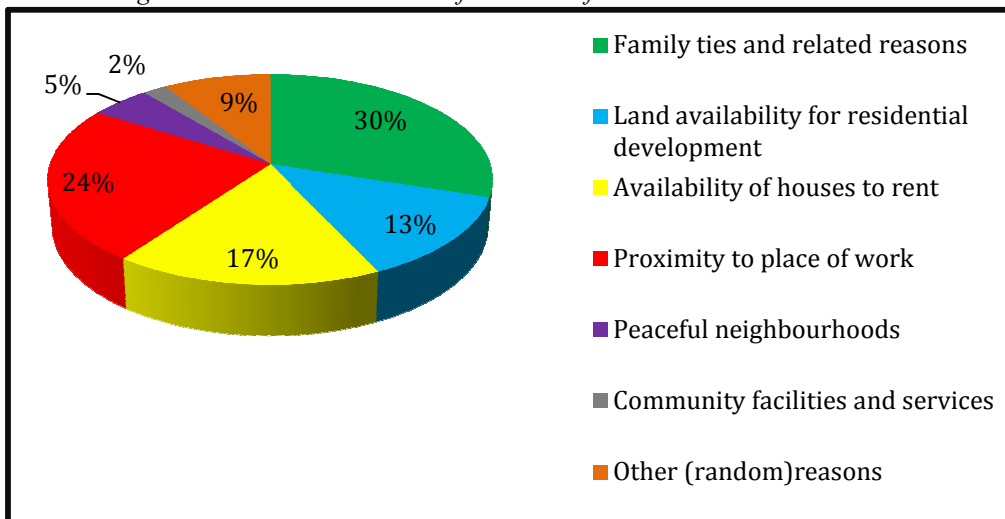
Household employment influences the commuting patterns and costs. Total household employment at Esreso and Aprepo was 74% with about 70% of households having on average, one member, in addition to the household-head working ($SD=0.5$); for most families, these were the husband and wife. Employment in sales, within the private informal economy, was high, representing nearly 50% of household-heads and other working members of households respectively. Professional and Technical related employments constituted 23% and 26% of household-heads and other working members of households respectively. Employment in agriculture was on a significantly low side due to the declining importance of agricultural activities in these peri-urban settlements as former agricultural lands are invaded by residential land use.

The most recent Ghana Living Standards Survey estimates average annual household income as GH¢1,217.00 (GSS, 2008). Data on income groupings at the national level is however, non-existent. The median household income per annum in the study areas was GH¢4,800.00. Earnings around GH¢3,396.00 and GH¢7,200 represented the 25th and 75th percentile annual incomes respectively. The highest annual income recorded in Esreso and Aprepo was GH¢24,000; only 2% of households earned this income. Thus judging by earnings, the peri-urban areas of study are resident to a mix of households of different socio-economic status.

4.2 Reasons for Households' Residential Location Choice

Many reasons accounted for the location of households in the peri-urban settlements of study (see figure 1). Nearly one-third of households surveyed, indicated that having relatives living in their current places of residence, influenced their decision to either acquire land for housing, rent accommodation or live rent-free in family compound houses there. It is therefore not surprising that about 34% of households considered indigenes, lived rent-free in family compound houses in these peri-urban settlements. The importance of proximity to family and relatives in location decisions, identified by the survey is a significant factor that is not captured by traditional urban residential location models.

Figure: 1 Households' Reasons for choice of current Peri-urban locations



Source: Author's Field Work, March 2012

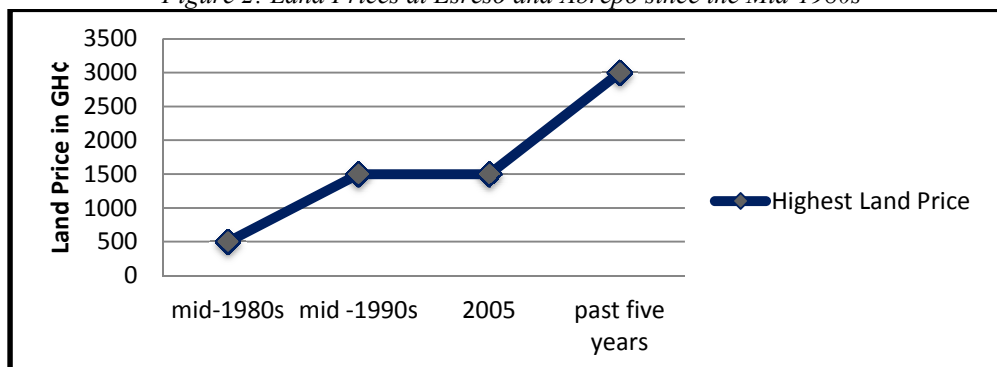
The proximity of the peri-urban locations to the work-place was indicated by about 24% as the key location choice consideration. Locational attributes including peaceful neighbourhoods, good environmental quality and the availability of supporting facilities and services were not of paramount consideration in many households decision to live at Esreso and Abrepo.

4.2.1 The influence of Land price and House Rents on Location Choice

Owner-occupier households (20%), being they migrants or indigenes, made land acquisition decisions and would therefore have their location choices influenced by the price of land. Similarly, the decisions of occupants of rented accommodation (46%) would be influenced by prevailing house rents and how they compare to other areas within the city as well as its periphery.

The average residential plot size for owner-occupiers was 742m² (80×100 feet). As shown in figure 2, the price of residential plot has been increasing sharply since the early 1980s when the village lands of Esreso and Aprepo began to receive high demand for residential land. Around this period, standard residential plot sold for GH¢500.00. Due to rapid in-migration and the resultant increased acquisition of residential land, price increased in three-folds around the mid-1990s and early 2000s. The highest land price recorded over the past five years was around GH¢3,000.00; about twice higher than prices around 2005.

Figure 2: Land Prices at Esreso and Abrepo since the Mid-1980s



Source: Author's Field Work, March 2012

Despite the sharp increase in the price of residential land in these peri-urban settlements, the average price of GH¢3,000.00 obtained over the past five years, remain considerably low compared to the average price of

GH¢18,400.00 and GH¢36,800.00 at prime locations in the main built-up areas of Kumasi over the same period. Owner-occupier households indicated that the relatively low price of land accounted for their choice to live at Esreso and Aprepo.

Similarly, households occupying rented accommodation cited the relatively lower rents charged as the reasons for choosing to live at their current peri-urban locations. House rents ranged between GH¢5.00 and GH¢120.00 depending on size, with a median monthly rent of GH¢10.00. Many households spent less than 10% of their incomes on house rents and over 70% on food, utilities and other components of their expenditure annually. Although earnings were generally low, households' assessment of prevailing rents indicated that 68% considered rents charged for their accommodations affordable compared to other locations they considered within and outside the central areas of Kumasi. Whereas 21% identified no significant difference between rents charged at their current and other locations considered, 7% were of the view that rents are high given their income levels.

There was an inverse relationship between family size and the size of households' rented accommodations; $X^2(17.58, n=138) = 16, p < 0.05$. About 94% of households with family sizes equal to or exceeding the prevailing average of 4 lived in single-bedroom houses. The reason is that although rents are relatively cheaper, many households cannot afford to obtain suitable size accommodation that meets family needs given their lower incomes. This is in stark contrast to the dominance of affluent households occupying luxurious and spacious accommodations at the urban fringe in many European and American cities.

In their location decisions, both owner-occupier households and renters admitted their choice involved trading-off the high access to essential commercial and service functions at the city centre for low land prices and house rents at their current peri-urban locations. In actual sense however, most of them indicated that they would not live in the CBD areas of the city even if land or housing was made available at prices similar to that in the urban periphery. This according to them was due to the prevailing negative locational attributes such as overcrowding, poor air and physical environmental quality as well as excessive noise associated with commercial activities.

Despite the low land prices and house rents at their current peri-urban location, these areas also present other negative locational attributes including inadequate supply of facilities and services such as water, electricity (in the case of the newly developing areas of Esreso) and poor accessibility resulting from poor surface conditions of access roads and the main arterial routes connecting this settlements to the city. It was gathered that the peak periods of rapid land acquisition in Abrepo and Esreso predates any attempts at formal land use planning and basic infrastructure provision by the appropriate utility service providers in the Kumasi Metropolis. Esreso find itself in a peculiar situation where it falls administratively, under the Bosomtwe district but maintains physical contiguity and functional interactions with the Kumasi metropolis. Located within 'fuzzy' boundary between these two local administrative jurisdictions, the lack of clear responsibility for the provision of infrastructure and services as well as governance resulting thereof, continue to affect infrastructure supply. This partly explains residents' limited access to essential community facilities and services.

4.2.2 The Influence of Work and Non-work related Travels on Location Choice

The importance of travel distance and costs in households' residential location choice depended on the types and location of employment. About 50% of all workers were engaged in sales/trading activities in the informal economy while a quarter was engaged in professional and technical related works. Table 2 provides a summary of the location of household employments for both single and multiple worker households. This excludes employment in agriculture.

Table 2: Location of households' Employment

Location of Employment	Percentage
Home-based	25
Kumasi's CDB Area	24
Diffused Locations	51
Total	100

Source: Author's Field Work, March 2012

About 25% of workers, engaged mainly in sales/petty trading had their activities located in the immediate vicinity of their dwelling (i.e. Home-based activities). Thus issues related to work-place accessibility were not of major importance in their location choice as they would work within the vicinity of their homes wherever they lived. More than half of households' employments were dispersed mostly towards surrounding communities within and outside the Kumasi metropolis but not the CBD area of the city.

The CBD area of Kumasi served as the centre of employment for nearly a quarter of workers surveyed. This does not however imply a declining importance of the CBD. The 24% of household work trips that terminated in the CBD area involved an average trip frequency of 5 every week, (SD=1.7). Moreover, many of the sales workers travelled frequently to the city centre to purchase goods at wholesale prices to sell at retail prices in the surrounding communities. Besides, almost all households travelled at least once every week to the city centre

for non-work related purposes to access shopping, banking, postal and administrative facilities and services due to the lack of these essential facilities and services at their peri-urban locations. Thus, despite the decentralization of living areas, the Kumasi metropolis continues to maintain its traditional monocentric structure with all the peripheral settlements depending on the service, commercial and administrative functions it provides.

Private car ownership was low, with more than half of workers commuting to work by public transport. Although commuting distances were generally shorter (less than 12 kilometres), travel times were longer and very expensive with many inconveniences. Daily commuting time ranged between 50 minutes and 1 hour during peak hours in the mornings and late-afternoons respectively. In the case of workers in the central areas of the city, commuting time usually exceeded 1 hour for a trip that should take less than 30 minutes provided the transport system performed efficiently. Daily transport costs were high, ranging between GH¢2.00 and GH¢5.00; and about twice the estimated costs for multi-worker households using public transport.

The long hours of travel and relatively higher transport costs were not a function of distance but rather, the result of poorly developed transport infrastructure. It was observed that surface conditions of the main arterial roads linking these peri-urban communities to other areas within and beyond the Kumasi metropolis were poorly developed. Consequently, traffic movement was extremely slow resulting in extreme peak-time congestion. Besides, the lack of properly designated bus stops and untimed movement of public transport in general resulted in longer waiting times. According to the respondents, trips are often fragmented by transport operators in order to charge higher fares for the same distance covered. Another challenge indicated by commuters was that, public transport usually gets overloaded in the peak periods of travel due to the wide mismatch between available service capacities and the number of daily commuters.

Despite the commuting challenges and higher travel costs, households demonstrated higher preference for peri-urban locations compared to the central areas of Kumasi. The study however, gathered that although land price and household rents are relatively lower at the urban periphery, congestion and associated negative effects were experienced at both the central and peripheral areas of the city. The high travel cost imposed were therefore compensated by low land price and house rents.

4.3 Households' Stated Future Residential Location Preferences and the Implications for Sustainable Urban Growth

On the basis of the overall locational attributes at the urban periphery, both positive and negative, the survey sought to elicit the likely future residential location plans of households. In doing so, attention was focused on renters and free-occupiers (constituting over 75% of all households interviewed) since unlike their owner-occupier counterparts, they have much flexibility to choose where to live in the future. On their future location choices, nearly all these households indicated higher preference for locations at Kumasi's periphery citing land availability at cheap prices and low rents as the main reasons. Generally, the negative locational attributes at the city's main built area such as excessive noise, poor local air quality were mentioned as significantly repelling factors. Although these households acknowledged that the city furnishes a variety of essential facilities and services, given the aggregate cost reducing advantages associated with the peripheral locations however, they were willing to trade-off the advantages at the former location for those at the latter.

The current rate of peri-urbanization and the associated negative impacts are the manifestations of the aggregate location choice decisions of households already living in the urban periphery. This combined with the stated future residential location preference of the larger share of renters and free-occupiers will therefore have wider implications for sustainable management of the amount, extent and rate of urban expansion.

The long term effect of the decisions of many households to live in the urban periphery can be assessed by first forming a scenario of the potential urban spatial structure that will emerge in the process. The current land-use structure of the city of Kumasi shows a conspicuous separation between the dominantly residential areas in its periphery and the single traditional city centre dominated by commercial activities. Thus the city continues to maintain its traditional monocentric structure whilst the rapid expansion of its peripheral residential areas is occurring without simultaneous decentralization of employment and key functions. Should this process continue unfettered around the existing spatial structure, unsustainable lifestyles will emerge as the centripetal tendencies created by such structure will result in a larger share of work and non-work related trips terminating in the city. Given that vehicular ownership in all major cities in Ghana is also increasing rapidly, motorised commuting trips will also increase in the face of poor public transport system in the city. Corollary carbon emissions will increase compromising local environmental quality whilst causing extreme congestion at the city core.

As the study has shown, the current pace of expansion has already overwhelmed any attempts at development control and the provision of environmental infrastructure and services. This is evidenced by the lack of adequate supply of basic facilities and services in the urban periphery. In addition to high costs and inconvenience associated with daily travels, many households cited erratic supply of electricity and water, lack of basic ancillary facilities and poor waste management systems as the main challenges encountered at their current peri-

urban locations. Unfettered expansion will therefore further compound these challenges. Many of these peripheral settlements will stand the real risk of developing into slum conditions with the continuous influx of low income urban migrants. Besides, the resultant sprawl and leapfrog development will further increase the cost of infrastructure provision and compromise efforts to ensure sustainable growth of the city of Kumasi and its surrounding areas.

Moreover, the higher stated preference for accommodation at the urban periphery indicated by households, signal a strong and growing housing market in these area. Should developers continue to respond to this market signal, as is currently happening in all the major cities of Ghana, more land at these peripheral locations will continue to be acquired for housing development. The cumulative impacts will contribute to the rapid expansion of the city beyond sustainable limits.

Last but not least, ensuring urban food security has become a major challenge of sustainable place-making in the twenty first century. The causes of urban food insecurity are many ranging from policy failures to the negative effects of urbanization and climate change. In addressing these challenges, the protection of prime agricultural land in the urban development process remains undoubtedly, the basic prerequisite to building relatively self-sufficient urban centres that provides a range of socio-economic opportunities whilst feeding its ever increasing population. In all the major cities in Ghana, the fast pace of unfettered peri-urbanization has and will continue to result in the invasion of land suitable for agricultural development by residential and other urban related land use activities. The impacts have manifested in reduced food production and depletion of peri-urban livelihood sources. Against this backdrop, the impacts of uncontrolled expansion of the urban periphery on ensuring urban food security are not far-fetched.

4.4 Managing Growth and Averting Unsustainable Urban Expansion

The urban land and property market in Ghanaian cities including Kumasi operate largely on *Laissez-faire* principles. Urban containment policies are non-existent and Individuals and households' freedom to choose where to live to a significant extent are neither shaped nor constrained. Rather, they follow the grain of the formal and informal urban markets. The preparation of planning schemes by the metropolitan assembly in excess of what might actually be needed, at the request of landowners, have also acted to facilitate the free workings of the market by encouraging rapid urban expansion, land speculation and associated sprawl and leapfrog development. In order to manage growth and avert the on-going expansion of the urban periphery beyond unsustainable proportions, the planning system needs to become proactive in not only shaping but also influencing people's residential location choices in the urban space. Given the current situation where customary landownership rights seem to confer the right of use decision on landowners, urban containment policies should not only be practical but also appealing to all stakeholders in a manner that does not connote direct and undue interference in property rights.

The key to managing urban growth towards sustainable outcomes are inherent in the growth process of the city itself. Global trends and best practices have indicated that major cities can play the dual role of providing high level commercial and service functions as well as accommodating a significant proportion of the population that access these functions. The concept of mixed-used development (i.e. mixing residential with commercial and service functions) has emerged, perhaps as the best approach to addressing housing shortage in major cities whilst averting undesirable urban expansion and associated unsustainable lifestyles that result from rapid urban/peri-urban developments. The current situation where the central areas of Kumasi are dominated by commercial and service functions have and will continue to compound the city's housing crisis. The high day population as opposed to the significantly low population at night in the central areas of Kumasi is also an indication of the extent of under-utilization of the most valuable space of the city. Corollary, any attempts at managing the city's rapid expansion should emphasise, among other things, specific strategies that could be adopted to promote housing development in the dominantly commercial central areas of the city.

Many areas in the city of Kumasi have already shown signs of the need for large scale redevelopment and or redevelopment of single buildings. Evidence of structural deficiencies and dereliction can be found within some 2 to 5 kilometre radius from the city centre. These areas include Adum, Kejetia, Amakom, Asokwa, Bantama, Asafo Ashanti New Town, Fante New Town, Oforikrom, Santaase, Pataase and many other places. It appears however that throughout the city, there are isolated schemes of redevelopment mainly of single buildings that are not guided and co-ordinated by any plan whether authoritative or indicative. Property owners in their redevelopment schemes are not required to replace existing buildings in a manner that can help supply the critical stock of housing needed. Rather, over the years, the ever increasing demand for commercial and service space has culminated in redevelopment schemes where old residential buildings have been replaced with commercial buildings; virtually the entire resident population that formerly occupied these houses in the central locations of Kumasi have been evicted or displaced in the process. In view of this, more people are expected to be displaced as current trends already shows high preference to convert residential units into commercial due obviously to the higher returns associated with the latter. This means that more and more households who have

already demonstrated higher preference for the urban periphery will be forced to relocate there.

An effective urban management strategy aimed at containing expansion associated with residential development should offer households a choice when it comes to making residential location decisions. In order to achieve this, large scale redevelopment schemes need to be coordinated and managed to ensure mixed residential and commercial uses are developed as a way of concentrating both uses on a reasonably compact scale. Large areas of deteriorating environment and structural deficiencies need upgrading and regeneration to enhance liveability and improved the quality of locational attributes. This way, households, particularly low and middle income groups as well as highly skilled labour with small family sizes will be offered the choice of deciding to live in the city or its periphery. With improved environmental conditions, higher accessibility to employment and services as well as the availability of affordable housing available, this category of households will be attracted to live in the city central areas of the city.

The success of this strategy is contingent on partnership between land and property owners, developers and the metropolitan authority. Most importantly, housing that meets the needs of different income groups should be supplied in the process to attract the required groups of people needed for sustainable place-making. The successful implementation of this strategy will ultimately make the central areas of Kumasi attractive as places for people to live and to make a living, optimise the use of urban land and contribute to slowing the pace of rapid expansion into peripheral areas mainly for the purposes of residential development.

5. Conclusion

This research was conducted against the backdrop of rapid expansion of Kumasi resulting in the emergence of settlements of mainly residential land use around the main built-up area of the city. The overarching aim of the study therefore was to examine the significance and interplay of land price, rent and distance to work in households' decision to live at city's peri-urban settlements. It further sought to assess the implications for sustainable urban development and growth management in rapidly urbanizing cities in Ghana. Drawing on urban residential location theory and adopting a mixed research and the case study approaches, 300 households were surveyed in two of the peri-urban settlements of Kumasi. These were Abrepo and Esreso selected because of their location within separate administrative jurisdiction, and the in the inner to the middle segments of Kumasi's peri-urban zone where urban influence is stronger.

The study identified that work-place proximity; relatively low land price and house rents as well as family relations were the most significant reasons underpinning households' choice of the urban periphery. Despite the lack of adequate supply of infrastructure, difficulty in commuting to work and high transport costs, households indicated higher preference for the urban periphery to the central areas of Kumasi. This was due to the high cost of land, low housing supply, congestion and poor environmental quality in the latter. Based on the findings, it also provided some lessons for the application of the access-space-trade-off model in explaining residential location choice in the context of Ghanaian cities.

In view of the aggregate cost reducing advantages associated with the urban periphery however, the study concludes that rapid expansion of the city for the purposes of residential development will continue unfettered. It therefore suggests that urban development policy that aims at securing liveable conditions and promoting housing development in the dominantly commercial central areas of the city is crucial to managing growth and averting unsustainable urban expansion.

Further research in the area of integrating residential location choice into sustainable urban development and growth management is considered relevant in carrying this research work forward and ultimately offering practical solutions to the almost overwhelming challenges facing many rapidly urbanizing cities in Ghana.

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