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LAND USE CHANGES AND ITS EFFECTS ON THE PROVISION OF SOCIAL FACILITIES TO RESIDENTS OF THE KUMASI METROPOLIS OF GHANA

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Abstract

The extent to which changes in land use has affected the availability and usage of social facilities were studied. Emphasis was placed on four (4) facilities – pipe-borne water, sewage channels, sanitary sites and public open spaces. The stratified, simple and purposive sampling techniques were used to select 327 respondents made up of building owners, chiefs and government land institutions. Ten communities in the Kumasi metropolis of Ghana formed the study area. Geographic Information System (GIS) tools were employed to map out changes in land use in the study communities. Results of the study showed that residents in the Kumasi metropolis were denied of all the four social facilities as a result of illegal allocation of lands meant to provide these services. Homes were unable to be connected to the service lines of the water company while others had interruptions in the flow of water. Again residents had difficulties disposing of refuse and waste water from their homes. Open spaces provided on maps were virtually absent on the ground. However, where some of these facilities existed, they were highly inadequate compared to the existing population. Residents, therefore, survived by adopting alternative ways of accessing the facilities most of which were financially costly and detrimental to the health of residents. The practices adopted also encourage environmental decay and finally affects the beauty of the metropolis. Based on the findings, this research recommends that future research investigates how changes in land use affect the health of residents in the Kumasi Metropolis.

Keywords: *Ghana, Land, Land Use Changes, Social Facilities, Traditional Authorities, Kumasi Metropolis.*

Introduction

Every town plan must show five distinct parts or lands use (Rangwala, 2009). These parts are: the core area or the Central Business District (CBD), industrial lands, residential lands, peripheral lands and open spaces. Open spaces here refer to lands that are reserved for the provision of social facilities to residents of a community. Such facilities are numerous and include markets, cemeteries, utility lines, recreation sites, sanitary sites, roads and sewerage systems. The provisions of social facilities are basic services that towns and cities must provide for its residents and must be available for use (Green and Manns, 2008). These facilities are therefore included in the planning of towns because the unplanned locations or absence of these facilities creates constant burden to a community and its residents (Rangwala, 2009). The burden the absence of social facilities could create for a community includes economic, health, environmental and social decay.

In Ghana, the provision of social facilities is normally the responsibility of the government (Frantzen and Post, 2001). Nonetheless, the 2000 Population and Housing Census identified social facilities to be inadequate in most Ghanaian cities and towns (Ghana Government, 2005). In the Asante region as provided by the census, access to pipe borne water ranges from 1.7% (Ahafo Ano South District) and 82.5% (Kumasi metropolis). With regards to liquid waste, 33% dispose off on streets, compound of homes and other unhygienic methods whiles 20% dispose of solid waste in bushes, rivers, streams and other unapproved places.

At the same time, Ghana's population is increasingly becoming urbanized (Songsore, 2002) and the phenomenon has put pressure on urban land uses in the country (Asenso-Okyer *et al*., 1993). The pressure consequently leads to changes in land uses which become the footprint of responses to specific economic, demographic and environmental conditions (Zhang *et al*., 2010). In addition, the situation has led to shortage in housing supply (Ghana National Development Plan as cited in Ahadzie and Amoa-Mensah, 2010). Research work in the late 20th and the 21st centuries has described spatial development in the Kumasi metropolis of Ghana to be very poor resulting from land use changes (Koop, 1998;

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Hueber and Veer, 2001; Owusu-Ansah and O'connor, 2010).

Land Administration and Management in Ghana

Since the colonial era, the administration of lands in Ghana has been a shared responsibility between the traditional setup and the government. Both institutions are autonomous in the execution of the administration process. The traditional setup that owns the vast majority of lands in Ghana (Karikari, 2006) is responsible for the allocation of lands to land users and also facilitate the documentation of land such as the issuance of lease. Except in few towns, the traditional setup in any community in Ghana is always headed by a chief (a male traditional leader and custodian of a community's lands). The other aspects of land administration (planning, utilization, documentation, control, revenue mobilization among others) had until October 2008 been performed by the government through six autonomous institutions. These autonomous institutions were the Survey Department (responsible for surveying and mapping of lands), Town and Country Planning Department (responsible for land use planning), Lands Commission (responsible for managing government lands and keeping land records), Lands Valuation Board (responsible for valuing lands), Land Title Registry (responsible for registering lands) and the Office of the Administrator of Stool Lands (responsible for collection of land rent and sharing it between the government and the traditional authorities). Each of these institutions had its regional and occasionally district offices, but maintained their headquarters in Accra, the nation's capital. The regional and district offices of these institutions receive instructions and directions from their respective headquarters.

Because of the identified weaknesses in the structure for the administration and management of lands in Ghana, resulting in tenure insecurity, difficulty in assessing lands, haphazard development, land disputes and litigation among others (Forkuor, 2011), the Land Administration Project, initiated a move to unit four of the autonomous government land institutions under one umbrella. This dream came into fruition in October 2008 when a Lands Commission Act; Act 767 was passed by the Ghanaian Parliament into law. The unified institutions are the Survey department, the Lands Commission, the Lands Valuation Board and the Land Title Registry. The project is also establishing Customary Land Secretariats across the country to assist the traditional setup perform its part of the land administration process.

The significance of the study is rooted in the fact that land serves as the microcosm of all development and it 'represents the main form of wealth accumulation and the principal source of economic and political power' (Odame-Larbi, 1998). There can therefore be no development without reference to the land factor. Also the development of a well planned and good urban settlement requires among others the provision of social facilities (Karley, 2009 as cited by Braimah and Asamoah, 2011).

The objective of the paper was to examine how land use changes has affected the provision and usage of pipe borne - water, sanitary sites, sewerage channels and public open spaces in the Kumasi metropolis of Ghana. These four facilities were chosen because together with electricity, they are very basic infrastructure that any community must have.

Study Area

Kumasi is the second largest city in Ghana and its geographical location is latitude 6.35°-6.40°N and longitude 1.30°-1.35°W (Adarkwa, 2011). The city attained a metropolitan status in 1987 and its population according to the 2010 population and housing census is 2,035,064 (Ghana, 2012). The metropolis covers an area of 254 square kilometers (Adarkwa, 2011) and it is made up of about ninety suburbs. Ten out of the ninety suburbs formed the study areas (table 1). Figure 1 shows the geographical locations of the study communities in the metropolis.

Table 1 Description of Study Communities/Suburbs

Community	Location in Metropolis	Class of Suburb	Year of layout Preparation	Year of revision of layout
Bomso	Eastern	First	1959	-
Daban	Southern	First	1981	-
Nhyiaeso	Central	First	1961	-
Kentinkrono	Eastern	Second	1961	-
Buokrom	Northern	Second	-	1975
Apatrapa	Western	Second	1978	-
Ayigya	Eastern	Third	1966	1978
Denkyemuoso	Western	Third	1979	-
Nkontwema	Northern	Third	1990	-
Anyinam	Southern	Third	1991	-

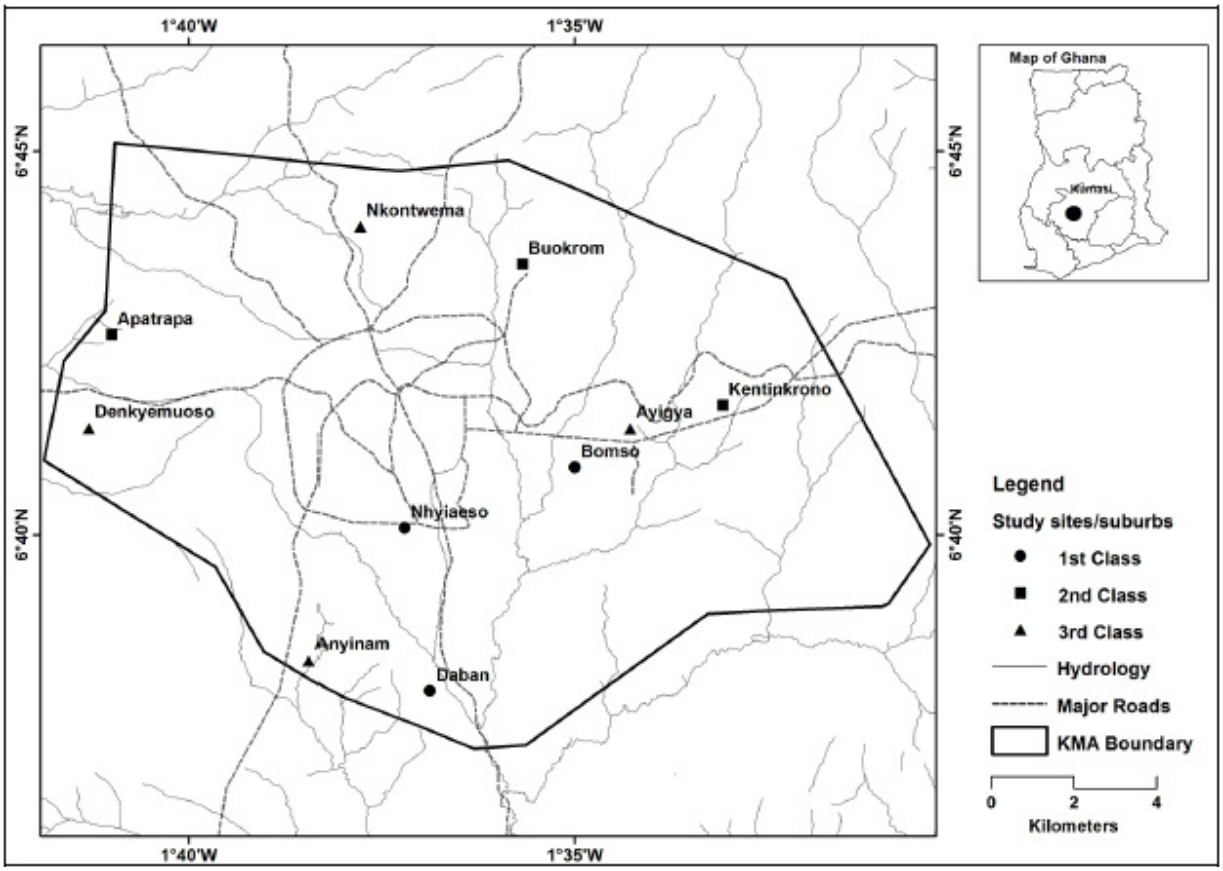

Figure 1 Location of study communities in the Kumasi Metropolis
Source: Town and Country Planning Department, Kumasi.

Methodology

Type of Research Design

The cross-sectional research design was adopted for this study. By this design, a cross section of the population of the Kumasi metropolis was chosen, interviewed and the results generalized to obtain an overall picture of the problem investigated.

Data Source and Instrument for Data Collection

Both primary and secondary sources of data were used. Primary data were obtained using self - designed questionnaire, oral interviews and field observation. The questionnaire consisted of a blend of open - ended and close - ended questions that were administered to the sampled population of building owners. Recipients were allowed time to complete the questionnaire independently and they were collected the same day. Information

from chiefs and heads of two government land institutions were obtained using the face-to-face method of oral interview. Field observation of the pattern of land development also formed part of the field data collection. Secondary data was obtained from government land institutions.

Sampling

In order to obtain an accurate data, the metropolis was stratified into first, second and third class communities. The stratification was based on the 1992 classification of suburbs of the metropolis. This stratification by the Lands Commission was based on two factors - demand for land and state of infrastructure (road network and essential services) of suburbs of the metropolis. From the classification, first class communities had 17 suburbs, second class had 25 suburbs and third class had over 48 suburbs.

Based on the available stratification, three communities each were purposely selected from the first and second classes of communities and four communities selected from the third class. The justification for the four communities in the third class is that, according to the stratification, there are more communities in the third class than the first and second classes. The purposive sampling method was used to ensure a geographical representation of the metropolis in the selected sample.

In each selected community, thirty - three buildings and their owners were randomly selected from parcels of lands where land use changes have occurred. The random selection was to ensure that each building has an equal chance of being selected. Chiefs of the study communities and a Unit Committee member (a person locally elected to help in the governance of the community) also formed part of the sample. In addition, the heads of two government land institutions - Town and Country Planning Department and the Development Control Unit (responsible for controlling physical developments in the metropolis) were also selected. These two institutions have their responsibilities directly related to the utilization and development of lands in the metropolis. Information was also obtained from an engineer of the Ghana Water Company Limited (GWCL). Table 2 shows the sample frame from which the sample was collected for the study.

Table 2 Target and Sampled Population

Unit of Enquiry	Target Population	Sampled Population
Building Owners	1954	311
Government Land Institutions	5	2
Chiefs	12	10
Unit committee	10	4
TOTAL	1981	327

Data Analysis and Processing

Data collected were analyzed using both qualitative and quantitative techniques. The Geographical Information System was used to determine land use changes. Hard copy maps of study communities obtained from the Town and Country Planning Department of the metropolis were scanned and georeferenced using ESRI's ArcGIS softwares. A set of data on buildings in the Kumasi metropolis were obtained from the Survey Department of Ghana. These two data sets were overlaid in a GIS environment to determine changes in land use. Data from questionnaire were analyzed using the Statistical Package for Social Science (SPSS).

Analysis concentrated on land allocation procedures in study communities, conformity of buildings to approved layout plans and available social facilities in communities and in individual buildings. Environmental and health implications of the absence of social facilities were also examined.

Results and Discussion

Land Allocation Procedure in the Kumasi Metropolis

The allocation of lands is executed by the traditional setup (a chief, queen mother or abusuapani-head of the royal family). Based on the information obtained from the field, there was no spatial uniformity in the procedure for the allocation of lands in the study communities. Generally, however, the allocation of lands begins with an applicant who approaches a traditional authority to express an interest in a parcel of land(s). Because lands are not sold in this part of Ghana, the traditional authority asks for 'drink money' (cost of leasing the desired plot) from the

applicant. The amount charged depends on a number of factors including the applicant's relationship with the traditional authority, political affiliation and connections, location of the plot and demand for plots in the community. Normally, it is the preferred plot(s) that is allocated to the applicant. This leads to a situation where lands are allocated without reference to the approved layout plan of the community. After the payment of the drink money, a site plan is issued by the chief of the community. With the site plan, the applicant goes to the appropriate government institution to begin registering his or her land. However, it was observed that most applicants begin development on the plot once the drink money has been paid to the traditional authority.

Evidence of Land Use Changes in the Kumasi Metropolis

An approved plot in the context of this research refers to a plot used for the purpose for which it was earmarked. Where a plot is used for any purpose other than that for which it was earmarked, it is referred to in this research as unapproved plot.

Table 3 Approved and Unapproved Plots in Study Communities

Community	Class of community	Total number of buildings	Building on approved plot	Building on unapproved plot
Daban	First	951	928	23
Bomso	First	1,089	1,025	64
Apatrapa	Second	652	336	316
Kentinkrono	Second	2,276	2,126	150
Buokrom	Second	2,331	2,153	178
Ayigya	Third	3,192	3,069	123
Anyinam	Third	804	513	291
TOTAL		**11,295**	**10,150**	**1,145**

Table 3 shows that in seven out of the ten study communities whose data were available, there were as much as 11,295 buildings out of which 1,145 were unapproved, showing evidence of land use changes in the metropolis. All the unapproved buildings were located on public lands.

Buildings on parcels of lands where land use changes had occurred did not show any specific spatial pattern except Kentinkrono and Buokrom communities where some of the wrongly placed buildings showed either an L-shaped or linear pattern.

Effects of the Land Use Changes on the Provision of Social Facilities

Pipe - Borne Water

Approximately 58% of 301 respondents had supply of pipe - borne water from the Ghana Water Company Limited (GWCL). Most of such respondents were from the first and second class communities. Such respondents complained about interruptions in the flow of water and thereby have to supplement the service with ground water (either by borehole or well) developed on their compounds.

However, a significant percentage (42.2%) of the 301 respondents had no pipe borne water in their houses. Respondents in this category were mostly from third class communities. They gave varied reasons as to why they do not have the facility in their houses but prominent among them were that the service lines of the GWCL are far from their houses and connecting to it was costly to them. Others attributed the problem to obstruction as a result of the development of buildings. A few, however, attributed the problem to complicated application procedures, bribery and corruption.

The Metropolitan Engineer of the GWCL in an interview blamed the interrupted water supply partly to the development of unauthorized buildings. According to him, service lines are provided to a community base on the approved number of houses contained in the layout of that community and a projection on the number of people expected to live in such buildings. Therefore, when there are additional buildings constructed where they are not supposed to be developed, they affect the flow of pipe water, and houses at the extreme ends of the community suffer as a result of interruptions in the flow of pipe borne water. Also inhabitants of such unauthorized buildings may find it difficult accessing the service from the company because service lines may not be laid close to their houses. This explanation from the engineer was found to be valid because from the data collected; respondents from the extreme ends of the

metropolis – Apatrapa, Denkyemuoso, Daban and Buokrom had the highest complaints with regards to interruption in water supply or difficulty in accessing the service.

The difficulty in assessing pipe borne water in the study communities and the resultant increasing dependence on ground water has the tendency of depleting ground water as explained by Miller 2001. The 2000 Population and Housing census estimated 13.3% of drinking water in the metropolis was from boreholes and well. A further research on how the increasing dependence on ground water for domestic uses is affecting the water table in the Kumasi metropolis is recommended.

Sanitary Sites

Sanitary sites are provided in communities to serve as transit points of refuse generated mainly from homes for final disposal elsewhere. Also, toilet facilities are built on such lands for public use. Data from the field showed that a significant number of such allocations had been used for residential purposes. The inadequate sanitary sites posed possible health and environmental threat to residents as some residents were observed to be disposing refuse in residential compounds. Public toilet facilities were far lower than what was planned.

Residents in the study communities, however, showed little worry about the inadequate sanitary sites in their communities. This is because residents survived by adopting alternative methods which included open disposal of domestic refuse in residential compounds, bushes and gutters, burying and burning of refuse among others (table 4).

Table 4 Methods of Refuse Disposal

Method	Frequency	Valid Percentage	Cumulative Percentage
In Streams	7	3.3	3.3
In Bushes	20	9.5	12.8
Refuse Company	85	40.5	53.3
Burning or Burying	56	26.7	80.0
Sanitary Site	42	20.0	100.0
TOTAL	**210**	**100**	
Unanswered	101		

In the table, as much as 80% of 210 respondents used other methods apart from sanitary sites to dispose their domestic refuse. Twenty percent of the respondents relied on the available sanitary sites in their communities because they could not afford the charge. Most of such respondents were from the third class communities. These respondents have to rely on the available sanitary sites because they could not afford other alternatives. The large number of unanswered questionnaire may be that such respondents were using unapproved methods but were afraid to disclose them.

Irrespective of whatever method being used, there were problems residents had to grapple with. Those who engaged companies complained about the delay in picking the refuse leading to the accumulation of refuse in homes. Indeed, the researchers observed several of this in all the three first class communities. Also, such respondents complained about the service charge which according to them was costly. Respondents who burn refuse also complained about sustaining the method especially during the rainy season. Also, such refuse are not segregated and it has possible negative effects on the soil. Respondents who dispose refuse at available sanitary sites complained about the distance they had to cover before reaching the facility.

The inadequate sanitary sites and the difficulties in sustaining alternatives pose possible environmental and health hazards to residents in the metropolis. This is evident in the observed stock pile of refuse in homes waiting to be picked by refuse companies, and the open disposal of refuse.

Sewerage Channels

With the exception of Nhyiaeso that had a well constructed drainage channel for the discharge of household sewerage, none of the study communities had the facility well developed. Though, portions of second class communities had the facility, septic tanks were mainly used to collect waste water from houses (figure 2) instead

of the sewerage channels (gutters). It should be stressed that a significant portion of the respondents dispose waste water from their homes directly into streams and other water bodies in the second class communities. In third class communities as shown in figure 3, most of the homes discharge waste water into streams and in the open. It was observed on the field that waste water discharged in the open, passes through other houses till it dries up.

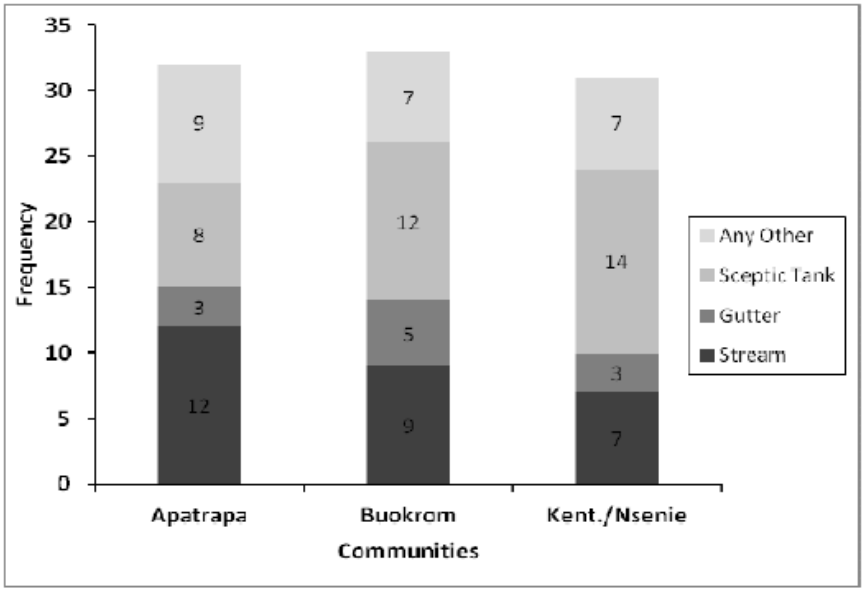

Figure 2 Disposal of Waste Water in Second Class Communities

Land use changes were however found not to be the sole reason for the absence of sewerage channels in the study communities. This is because on parcels of land where land use had been complied with, there was no such facility. However, on portions of land where land use changes had occurred, the problem was more pronounced. For example, at Bomso where a parcel of land earmarked as cemetery had been used for residential purposes, occupants of that land were facing serious difficulty with regard to domestic waste and rain water disposal.

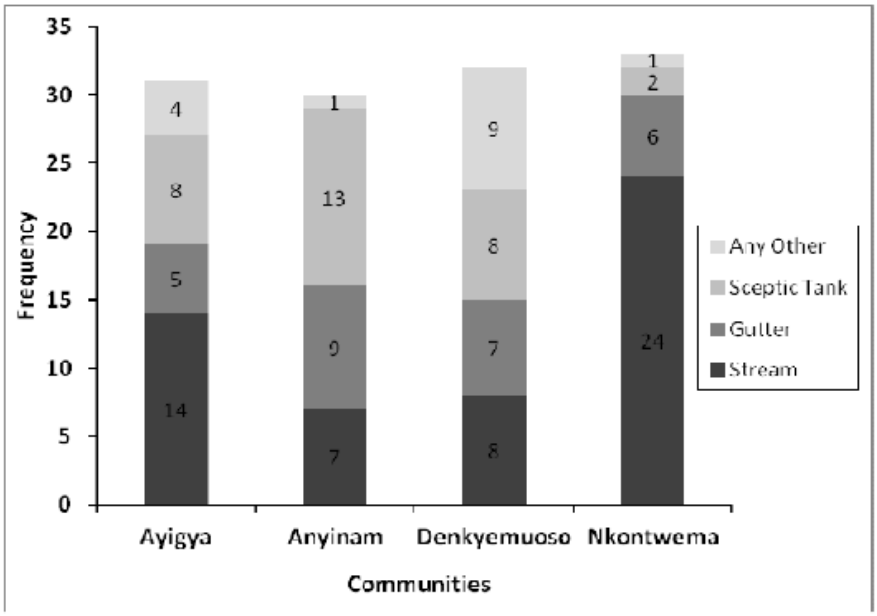

Figure 3 Disposal of Waste Water in Third Class Communities

A land - lady on that parcel of land complained:

"rain water has broken my fenced wall twice as a result of no outlet for rain water that enters this house. After going through much difficulty, I had to plead with the owner of the next house to allow me construct a gutter through his house to carry waste and rain water from my house".

In another instance on the same parcel of land, whilst the researcher was interviewing a land - lord, a woman came out of a bathroom to collect the waste water and threw it on the compound of the house. Subsequent probing led to the fact that there was no outlet for waste water from the house because buildings had surrounded the four corners of the house. Waste water was therefore collected with a container and when full it is emptied on the compound of the house.

It is important to note that a situation such as described above has possible environmental and health implications with respect to the breeding of mosquitoes, cholera and flooding with its associated complications.

Public Open Spaces

Public Open Spaces (POS) on layout plans in Ghana are lands reserved for recreation and other social events for residents of communities. Data from the field proved that, lands allocated for such purpose in all the study communities had either been used for residential or religious buildings. Some residents in the first class communities (Nhyiaeso and Bomso) silently protested against the absence of such facility by turning undeveloped building plots into football or volley ball pitches (figure 4). A respondent from Anyinam in expressing her feelings about the allocation of POS in her community for residential and religious purposes said:

"the previous chief did not allocate any of the POS, but the current chief has allocated all such lands. This chief can even sell finger nails"

Conclusion

This research has proved that land use changes exist in the Kumasi metropolis of Ghana and the changes have adversely affected the provision and usage of pipe borne water, sanitary sites, sewerage channels and public open spaces. The situation has possible implications to the environment and health of the residents in the metropolis. The problem has been created as a result of the sloppy procedure for the allocation of lands and the inability of the city authorities to rectify the problem as it occurs. Future research into how land use changes affect the environment and health of residents in the metropolis is proposed.

Recommendations

From the problems identified and the discussions made, two recommendations are made:

Firstly, traditional authorities should be educated at appropriate seminars, lectureships and workshops about the implications of allocating lands without recourse to the approved plan layout. Many of the traditional authorities interviewed had the belief that once they own the

lands, there should not be any restrictions as to their use. The chiefs therefore perceive layout plans as attempts by the government to undermine their authority as owners of the land. The land administration project should therefore speed up the establishment of the customary land secretariats which by design is to assist through training traditional land owners about their management of lands.

Secondly, city authorities must ensure that the remaining lands earmarked for the provision of social services are kept intact. Such lands must quickly be used for the purpose for which it was earmarked. This will prevent traditional authorities from allocating such lands.

References

Adarkwa, K. K. (2011), The Role of Kumasi in National Development-Kumasi as a Central Place. In Adarkwa K.K. (Ed.) *The Future of the Tree: Towards growth and development of Kumasi:* (14-34). Kumasi: Upk.

Ahadzie, D.K. and Amoa-Mensah, K. (2010), Management Practices in the Ghanaian House Building Industry. *Journal of Science and Technology,* 30(2), 62-104.

Asenso-Okyere, K. W., Atsu, S.Y. and Irene S. (1993), Communal Property Resources in Ghana: Policies and Prospects, Discussion paper No. 27. Accra: ISSER.

Braimah, I. and Adom-Asamoah, G. (2011), Provision of Social Services in the Kumasi Metropolis, Ghana. In Adarkwa K.K. (Ed.) The *Future of the Tree: Towards growth and development of Kumasi:* (14-34). Kumasi: Upk.

Forkuor, D. (2011), Land Allocation and Its Effects on the Spatial Planning and Development of Kumasi Metropolis. An unpublished Ph.D thesis submitted to the Department of Geography and Rural Development, KNUST, Kumasi.

Frantzen. A. and Post. J. (2001), Toilets in Kumasi: Burden or Boon. In Adarkwa K.K. and Post, J. (Eds.), *Fate of the Tree* (123-136). Accra: Woeli Publishing Services.

Ghana Government (2005), *Population and Housing Census.* Accra, Ghana: Ghana Statistical Service.

Ghana Government (2008), Lands Commission Act, 2008 Act 767. Accra, Ghana: Ministry of Lands and Forestry.

Ghana Government (2012), Population and Housing Census. Accra, Ghana: Ghana Statistical Service.

Green, C. and Mans, G. (2008), Equitable Availability of Social Facilities (online). Available:http://www.csir.co.za Date Assessed: 29th July, 2010.

Hueber S. and Veer, de Chris (2001), Urban Spatial Management in Kumasi. In Adarkwa K.K. and Post J. (Eds.), Fate of the Tree: (183-198). Accra: Woeli Publishing Services.

Karikari, B. I. (2006), Land Ownership, Planning and Spatial Development in Urban Ghana, Seminar on Land Administration in Africa, Nairobi, Kenya (May 22 to 25, 2006).

Koop, K. (1998), The Impact of Government Land Management on the Development of the City of Kumasi. *Journal of Applied Geography and Development,* 52, 52-70.

Kumasi Metropolitan Assembly (2006). Development Plan for Kumasi Metropolitan Area, 2006-2009. Kumasi.

Lands Commission (1992), Classification of Suburbs into in the Kumasi Metropolis. Kumasi.

Miller, G.T, (2001), *Living in the Environment: Principles, Connections and Solutions*. (12th ed.) Brooks/Cole.

Odame-Larbi, W. (1998), The Draft Land Policy of Ghana. A paper presented at a workshop on land use planning, Accra, Ghana (September 17, 1998).

Owusu-Ansah, J.K., O'connor, K.B. (2010), Housing Demand in the Urban Fringe around Kumasi, Ghana. *Journal of Housing and Built Environment,* 25(1).

Rangwala, S.C. (2009), *Town Planning*. (22nd ed.). Charotaz Publishing House PVT. Ltd, Gujaret.

Songsore, J. (2002), *Towards a Better Understanding of Urban Change, Urbanization, National Development and Inequality Ghana.* Accra: Ghana University Press

Zhang, Y., Guindon, B., and Sun, K. (2010), Measuring Canadian Urban Expansion and Impact on Work-Related Travel Distance: 1966-2001. *Journal on Land Use Science*, 5 (3), 217-235.