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Promoting Green Infrastructure in Kumasi: Challenges and Strategies

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Abstract
The study investigated the causes and effects of the reduction of green spaces in the city of Kumasi, as well as the challenges in the management of green spaces. Data for the study were gathered through interviews, documentary reviews and observation. The causes and challenges of maintaining green spaces included inadequate collaboration between institutions engaged in the planning and management of the city, inadequate capacity and lack of control by the city management over a greater part of the city's lands. The effects included the near loss of the garden city status of the city and reduction in the number of green spaces for recreation, parties and relaxation. To help promote and preserve green spaces in the city, it is recommended that the managers of the city develop various policies, programmes and projects to support green living and create a participation strategy for all major stakeholders in the creation and management of green spaces. City authorities should institute an annual Green Space Awareness education in the city, encourage private developers, owners of housing facilities and educational institutions to maintain private gardens and green spaces and help improve the collaboration between and among key stakeholders and institutions in the management of green spaces in the city.
Keywords: Green Infrastructure, Green space, Cities, Kumasi, land use, climate change

1. Introduction

As urbanisation increases across the globe and natural environments become fragmented, the importance and relevance of urban green spaces for biodiversity conservation becomes more relevant (Goddard, et al, 2009). Urbanisation and its environmental impacts are hitting hard on the developing world including Ghana where less is being done to address them. Rapid urban expansion is impacting negatively on green areas in cities in developing countries. According to the UNFPA (2007), urban growth is taking place at a scale that is very much unprecedented. It estimates that more than 50% of the global human population are now living in urban areas. This translates into higher demand for land for various purposes and the rate of development is such that many city managers in the developing world find it very difficult to finance the management of green spaces. They are often re-zoned into other land-uses and this negatively affects the size of green spaces. Contributing to this reduction are the ever increasing land rent in urban areas due to increasing demand for land for various activities. The city of Kumasi in Ghana where the study was conducted is expanding rapidly and the reduction in green spaces is on the rise. Though urbanisation is on-going at a faster rate, the need for green spaces in the city is as ever before.

Geddes (1915) emphasized the need for conservation of greens in cities when he insisted that *"The case for the conservation of nature and for the increase of our accesses to her must be stated more seriously and strongly than is customary. Not merely begged for on all grounds of amenity, of recreation and repose, sound though they are, but insisted upon. On what grounds? In terms of the maintenance and development of life*"(Wilson, 2008:12). Incorporating nature into our cities and conserving and preserving city landscapes have existed since the beginning of urban planning. This is supposed to ensure aesthetics, health, recreation and amenity (Wilson, 2008). The concept of Geddes, which portrayed the connection between the city and its region indicates a certain unity of climate, soil, vegetation, industry and culture. His concept of the regional city incorporating place, folk and work can be equated to the strands of modern sustainability, which are, the environment, society and economy (Hough, 2004 in Wilson, 2008).

According to Hough (2004), landscape architects sought to improve the appearance of cities and the health of their people by providing areas for rest and recreation for the crowded urban population. Howards' Garden Cities of Tomorrow Concept (Howard, 1902) outlined a model of a self sustained town with planned satellite communities surrounded by green belts, carefully balanced areas of residences, industry and agriculture (Wilson, 2008). Other landscape architects such as Olmsted who designed the New York Central Park viewed the park as an extension of the rural character into the city. This is the precursor to the modern concept of greenways as a string of green areas connected into a system of protected land and managed for multiple use (Fabos, 1995; Ahern, 2000 cited in Wilson, 2008). The above indicates that the incorporation of greenery into the development of the city is not a new concept.

The components of Green Space in urban areas include everything in cities that has vegetation. This encompasses the entire working landscape in cities that serve roles such as improving air quality, flood protection and pollution control (Girling and Kellett, 2005 in Wilson, 2008). According to Wilson (2008) the common types of urban green spaces include doorstep and communal green space (including balconies and courtyards), private gardens, institutional land, local parks, district and regional parks, river corridors and floodplains and coastal zones.

It is an established fact that the urban green spaces provide a wide range of benefits. These include aesthetics, environmental and economic benefits (Caspersen, et al, 2006). Urban green spaces provide ecosystem services and have the likelihood of providing positive impacts on quality of life, human health and well-being. They also provide opportunities for people to interact with nature. These make them vital in fostering a wider interest in nature conservation issues (Goddard, et al, 2009). In the view of Zitkovic (2008), green spaces in cities contribute significantly to quality of life as they are places of exercise, relaxation and social interaction. They also contribute to water filtration and absorption, nutrient cycling, air filtration and noise buffering. In addition, the availability of vegetation and greenery in a city strengthens its resistance to erosion, floods and droughts and also the promotion of healthier biological processes including pollination. In this view, biodiversity can be protected, promoted and enhanced. They also support a variety of species and habitats.

The decimation or lack of greens in cities has various implications. According to Herzele and Wiedeman (2003), lack of green spaces and children's playground was a major reason for people moving out of the city of Leuven in Belgium. Also, the movement of people to rural like settings is partly attributable to the lack of greens in cities. Zitkovic (2008:2) posits that *'the lack of established green space is a factor of urban sprawl as people move to the edge of a city closer to rural setting that feels like a healthier environment'.*

2. Measures for Promoting and Preserving Green Spaces

Various measures have been adopted globally to make cities greener especially in the developed countries. These include the encouragement of vegetation near residential and other properties and residential gardens, the integration of biodiversity goals into urban planning and creating strategic gap and green wedges which penetrate urban areas and are used to preserve landscape and wild life links between town and country. Others include green belts and green ways and networks. These can be applied in various ways to address the decimation of green areas in cities. The most effective measure in most cases is enforcement of strong green laws and environmental policing.

3. Practices aimed at ensuring urban green space development: the Case of Copenhagen

In discussing green spaces in cities, Copenhagen provides a very relevant example. Majority of urban inhabitants in the Netherlands have good access to green spaces. About 66.67% of urban residents have access to green spaces on foot and 83% by bicycle. The Netherlands realised the need for green spaces long ago and made conscious efforts to plan for and maintain them. The country has developed various policies to support green living (Caspersen, et al, 2006).The following discussions are extracts from Caspersen, et al, (2006). The Netherlands initiated the Greater Copenhagen green infrastructure in the 19th century when the defense ring consisting of forts and moats around Copenhagen was abandoned. This area was developed and it became the first "green ring" of Copenhagen. Other areas were later developed. City planning also played a key role in this green structure. For instance the city plan of 1908/1909 proposed a system of interconnected green areas and nature parks. In 1936 a green master plan that defined a number of interconnected green areas was published. The plan constituted the background for different activities that aimed to provide better access to recreational areas especially in the northern parts of Copenhagen. The plan was comprehensive and visionary; hence it had a major influence on several of the plans that were to follow and also on land use development in the region (Caspersen, et al, 2006).

The city developed its popular plan called the FINGER PLAN in 1947. It planned the green infrastructure to include both local recreational areas as well as more distant recreation and leisure areas. In 1960 and 1963 new plans based on the first master plan were published. In 1974 a plan for a third green ring in the region, consisting of the existing lakes, the two river valleys "Mølleådalen" and "Vejleådalen" and the landscapes around Copenhagen was proposed by the board of conservation. The final and most comprehensive plan was released in 1989 and it was considered as a modern version of the Finger Plan from 1947.

From the above, it is realized that the city made conscious efforts to promote and protect green areas. It kept on revising these plans over and over again. Private institutions were involved in these plans and their implementation. The management of the plans and their implementation has also been very good. However, many cities including Kumasi have not had the benefit of such foresight and are now faced with repairing and restoring green spaces.

4. The city of Kumasi: Location, size and management

The city of Kumasi is located in Ghana in the Western part of Africa. It is in the middle belt of Ghana. It is about 270km north of the national capital, Accra. It covers a total land area of 254 square kilometres, stretching between latitude 6º35″N– 6º40″N and longitude 1º30″ W– 1º35″W, with an elevation which ranges between 250 – 300 metres above sea level (KMA, 2010). According to Fynn (1971), the city of Kumasi was founded in the 1680s by King Osei Tutu to serve as the capital of the then Asante Kingdom. It came under British colonial influence and control in 1890. The city of Kumasi has a strategic location and political dominance. Based on these factors, it developed into a major commercial centre in the olden days and even this time. This is because major trade routes converged in the city (Dickson, 1969). The city expanded and continues to expand in terms of population, social life and economic activities. It serves as a destination for immigrants from all over the country, especially the northern parts of Ghana. These factors and many more have endowed it with its pivotal role in the vast and profitable distribution of goods in the country and beyond (KMA, 2010).

The city is managed by the Kumasi Metropolitan Assembly (KMA). The Local Government Act 462, 1993 and Local Government Legislative Instrument LI 1614, 1989 established the Kumasi Metropolitan Assembly (KMA) to manage the city. Furthermore, these legal frameworks have empowered KMA with legislative responsibilities to promulgate rules and byelaws, giving legal effect to its decisions. The Local Government Act 462 (1993) and legislative instrument LI (1614) has also given the mandate to KMA to become a Planning Authority to formulate policies, programmes and projects as well as to mobilize resources within its jurisdiction to undertake development projects.

5. Some Green spaces in the city of Kumasi

The city used to have beautiful layout with a lot of greenery and therefore was called the "Garden City of West Africa". It had a variety of trees and flowers found in front of residential areas. It also had trees and greens along the numerous streams. Some of these green patches acted as windbreaks. It was also well endowed with trees of different shapes and sizes that decorated its streets. These trees formed canopies, which provided natural shades and offered adequate protection to both residents and visitors against unfriendly weather conditions. Some green areas and 'gardens' in the city during the 1960s were the Adehyeman Gardens, directly opposite the Kejetia Lorry terminal and Kejetia Roundabout Gardens. The others included the Asafo Tennis Court, which has now been transformed into a lorry terminal and the Kumasi Children's Park, located behind the SDA Church at Amakom, along the N6 (National road 6). This is perhaps the only garden that seems to have survived the test of time and yet to be touched, as far as rezoning entertainment grounds and green areas into commercial centres in the Kumasi Metropolis is concerned. Also parks that served as green areas in the city during this era were the Prince of Wales Park, located adjacent the Kumasi Zoological Gardens; the Abbeys Park at Ash-town; the Jackson Park near the Prempeh Assembly Hall; the Kotoko Park, also known as Cricket, behind the Manhyia Hospital; the Addo's Park behind the Manhyia Palace; the Dogo Moro Park at Asawasi and the Rivoli Park at Bantama (Arku, 2013). About 90% of these parks have lost their greenery and many have been re-zoned into other uses. Some of the large green areas in the city currently are the Kumasi Zoological Gardens and its environs, the Residency (between the Golden Tulip Hotel and the residency and its neighbourhoods) and the Kwame Nkrumah University of Science and Technology campus. From the above account it is evident that the greenery of the city of Kumasi has reduced in recent times. This is as a result of the effects of the urban sprawl and population growth that are gradually altering the natural environment. Estate developers have and continued to encroach upon the green reserves. Even the few patches of greens along the waterways have been cleared for industrial, religious, residential and agricultural purposes. City managers and authorities are finding it difficult to stop the reduction of the greeneries in the city. Measures implemented so far seem not to be working effectively to address the reduction of the greenery in the city.

From the foregoing, there is therefore the need to identify appropriate means by which city authorities could maintain or improve the green landscape of the city of Kumasi. The paper therefore sought to achieve the following objectives:

i. To investigate the causes of the reduction of green spaces in the city
ii. To identify the effects of the reduction in greeneries in the city
iii. To assess the challenges in the management of green spaces in the city
iv. To draw lessons from best practices to help promote and preserve green spaces in the city

6. Methodology

The study applied mainly qualitative methods in its investigation. Observation was a key method applied in this study. The writers drove through all major streets and corners in the city and also visited existing green areas. This helped to ascertain the actual state of these spaces. Documents including the Medium Term Development Plan of the city were reviewed to ascertain the nature of green spaces in the city as well as gather additional information about the city. Other reports and articles on managing green spaces were also reviewed. All these

documents provided information on the state of green spaces in the city and how to manage them. Interviews were also conducted with 150 respondents across the length and breadth of the city. They included city authorities (2%), house owners (28%), students (20%), and the general public (50%). Data from these sources were analysed and the results are presented below.

7. Results and Discussions

7.1 Characteristics of Respondents

There was an equal distribution of respondents between males and females among the 150 respondents. Out of the number interviewed, 24% and 14.7% had lived in the city of Kumasi for a period of between 1-10 years, and 11-20 years respectively while the rest had lived in the city for over 20 years. Table 1 indicates the various proportions of the respondents and the duration of their stay in the city.

Table 1: Period of stay of respondents in Kumasi

	Males		**Females**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**
Period of stay in years						
1-10	20	26.7	16	21.3	36	24
11-20	10	13.3	12	16	22	14.7
21-30	15	20	13	17.3	28	18.7
31- 40	12	16	20	26.7	32	21.3
41+	18	24	14	18.7	32	21.3
Total	75	100	75	100	150	100

Source: Field work, 2013

About 20% and 18.6% of the respondents interviewed were between the ages of 21-30 and 31-40 respectively. The remaining were over 41 years of age. Based on these age categories, it could be deduced that the majority of the respondents have seen the changes taking place in all forms in the city over a long period of time. These categories of respondents have the ability of indicating the actual changes in the nature of green spaces that have taken place in the city over the last 20-40 years. Table 2 provides the age distribution of the respondents.

Table 2: Age range of respondents

Age Range	No.	%
21-30	30	20
31-40	28	18.6
41-50	30	20
51-60	25	16.7
61+	37	24.7
Total	150	100

Source: Field work, 2013

7.2 Key issues of the study

The interviewees responded to questions bordering on relevance of green spaces, location of green spaces, nature of green spaces, change in green space areas in the city, effects of the changes, causes of the changes and challenges relating to the management of the spaces and the way forward.

7.3 Relevance of Green Spaces in the city

The respondents gave diverse views on the relevance of green spaces in the city. All the respondents at least knew the importance of maintaining green spaces in the city. Table 4 indicates the views of the respondents. About 41.3 percent of all the respondents indicated that green spaces are important for shade, meeting places and play areas for all calibre of persons. Also 18.7 percent of the entire respondents were of the opinion that green spaces help in the beautification of the city and also protect water bodies while 23.3 percent were of the view that they serve as buffer for development, nature reserve and improves upon the quality of air in a particular location. Green spaces also help maintain the micro climate of local areas. This was opined by about 16.7 percent of the total respondents in this study. From the above, it is realised that respondents see green space to be areas for relaxation, providing shade, a means of beautifying the city, protecting micro-climate and water bodies and wild animals in the city. These findings are in line with the views of Zitkovic (2008), Caspersen et al, (2006) and Goddard et al (2009).

7.4 Location of Green Spaces in the city

All the respondents were able to identify certain green space areas in the city. These included the Ridge area, some streets in the city, school campuses and the Kumasi Children's Park area. From these, the various types of green spaces in the city can be categorised as follows:

i. Stretches along main roads and streets

These are few and cover only major roads and streets. These include Sisanso-Oforikrom road, Justice Hotel Junction to the Amakom Traffic light and the GNAT Hall junction to the Rail crossing at Asawase. The others include roads in the ridge and residency areas of the city and the Bekwai roundabout to the Santasi roundabout.

ii. Greens of educational institutions

These areas include various campuses and compounds of public basic, secondary and tertiary educational institutions in the City. All these schools are keeping green areas on their campuses. Examples include the Kwame Nkrumah University of Science and Technology campus and the Anglican Secondary School area. There are many more examples of these dotted in the city. The phenomenon of browning the greenery exists in the schools where school fields and lawns have been intensively used for other cultural activities like funerals and church services without maintenance. The over use of the school field kills the grasses and turns the green fields into bare grounds (brown) with high risk of erosion.

iii. Public offices and working areas

These areas surround public offices and working areas in the city. Some of these places in the city include the Adum Post Office area, Ministries and the Regional Coordinating Council office area.

iv. Public Residential areas

These include areas officially designed as residential areas for public sector workers in the city. These areas include the Ridge part of the city and the residency of the Regional Minister of the Ashanti Region.

v. Marshy and water courses

These are areas left untouched because their use need a lot of engineering works and resources to convert them into other uses. The few stretches of greens along water bodies are left to protect these water bodies. An example of these areas in the city is the stretch of land from the South Suntreso Junction to the Parks and Gardens area on the Santasi Bekwai roundabout area road.

vi. Public Parks

These areas in the city include the Kumasi Zoological Garden, the Cultural Centre and the Kumasi Children's Park. These parks are few in the city.

vii. Greens by Private Residences in the city

Some private residential areas and facilities have few trees and grasses planted by them. This is spread across the city. Whilst some private property owners choose to landscape the undeveloped portions of their lands other use concrete pavements.

viii. Cemeteries

The undeveloped parts of the few public cemeteries contain some greens. Unfortunately, encroachment has reduced these green spaces. Also, the culture of concreting and labeling graves has contributed to the browning of cemeteries in the city. Incidentally, the respondents do not mention cemeteries as green spaces in the city.

This type of green spaces as discussed corresponds with the categorisations by Wilson (2008). But from the above forms of green spaces, it is realised that most of them fall into public places. In these public areas, the city authorities have fairly firm control over the lands than other private areas. These areas were also planned and the greens integrated into them.

7.5 Density of Green Areas

The highest concentration of green areas (80%) is in public areas where the land is under the direct control of the city or government agencies. The core areas of some suburbs that have grown to form part of the city have few green spaces. There are few trees in front of some residential areas and on lands that are not fit for human habitation and economic activities. The central business district of the city also lacks green spaces. All the green areas have been replaced with buildings for commercial and other purposes. About 95% of the buildings in the central business district (CBD) do not have trees by them. Also the areas bustling with economic activities are without green spaces. Though all the respondents associated green areas with certain form of relevance, about 75% of them were of the view that the economic returns on these parcels of land are higher than green spaces and that may be the reason why there are few green spaces in the CBD.

7.6 Changes in land uses in the city

As the city of Kumasi expands exponentially, land uses change in terms of size and green areas diminish. Analysis of secondary data indicated that open spaces covered a total land area of 28.8km^2 representing 11.5 percent of the total land area of Kumasi in 1995. This has however reduced to 23.9km^2 in the year 2013 representing 9.6 percent of the total land area. The distribution of the various land uses and their change over time since 1995 is presented on table 3. Residential land use has on the other hand, increased from 109.3km^2 (43.7%) as at the year 1995 to 115km^2 (46%) in the year 2013. Also whereas the proportion of developed area increased by 17km^2, between the year 1995 and 2010, the undeveloped areas which comprise parks, nature reserves and open spaces decreased by the same figure (see table 4). This can be attributed to the fact that many people in the city have in recent times been clearing trees, filling waterlogged areas with sand and blocking the path of river bodies with all manner of objects just to pave way for them to start residential and other forms of physical development.

Table 3 Proportion of Developed and Undeveloped Lands in the Metropolis

Land Use	1995		2000		% change	2005		% change	2010		% change
	km^2	%	km^2	%		km^2	%		km^2	%	
Developed Area	187	74.8	191.3	76.5	2.3	197.5	79	3.3	204	81.6	3.29
Undeveloped Areas	63	25.2	58.2	23.5	-7.6	52.5	21	-10.6	46	18.4	-12.3
Total	**250**	**100**	**250**	**100**	**-**	**250**	**100**	**-**	**250**	**100**	**-**

Source: Town and Country Planning Department of KMA, 2014

Table 4 Land use structure of Kumasi

Land use	1995		2000		% change	2005		2013*		% change
	Area (km^2)	%	Area (km^2)	%		Area (km^2)	%	Area (km^2)	%	
Residential	109.3	43.7	109.6	43.8	0.5	110.3	44.1	115	46	0.8
Industrial	10.3	4.1	10.6	4.2	2.4	10.3	4.1	9.9	4	-0.1
Commercial	6	2.4	6	2.4	0	6	2.4	6	2.4	0
Education	43.8	17.5	43.8	17.5	0	43.8	17.5	42.8	17.5	0
Civic and cultural	18.8	7.5	18.8	7.5	0	18.1	7.3	17.9	6.8	-0.5
Open space	28.8	11.5	28.1	11.2	-2.6	28.1	11.2	23.9	9.6	-0.7
Circulation	33.1	13.3	33.1	13.3	0	33.4	13.4	34.6	13.9	0.5
Total	250	100	250	100	-	250	100	250	100	-

Source: Town and Country Planning Department of Kumasi Metropolitan Assembly, 2014.
* Projected

7.7 Changes in the Green Space in the city

About 80% of the respondents were of the opinion that they have witnessed a reduction in the size of green spaces in the city but could not provide clear figures to that effect while the remaining could not actually indicate whether there has been a change or not. A comparison of figures 1 and 2 (showing the vegetative cover of Kumasi between 1986-2007) indicates clearly that the greens space in the city has actually reduced at an alarming rate since 1986.

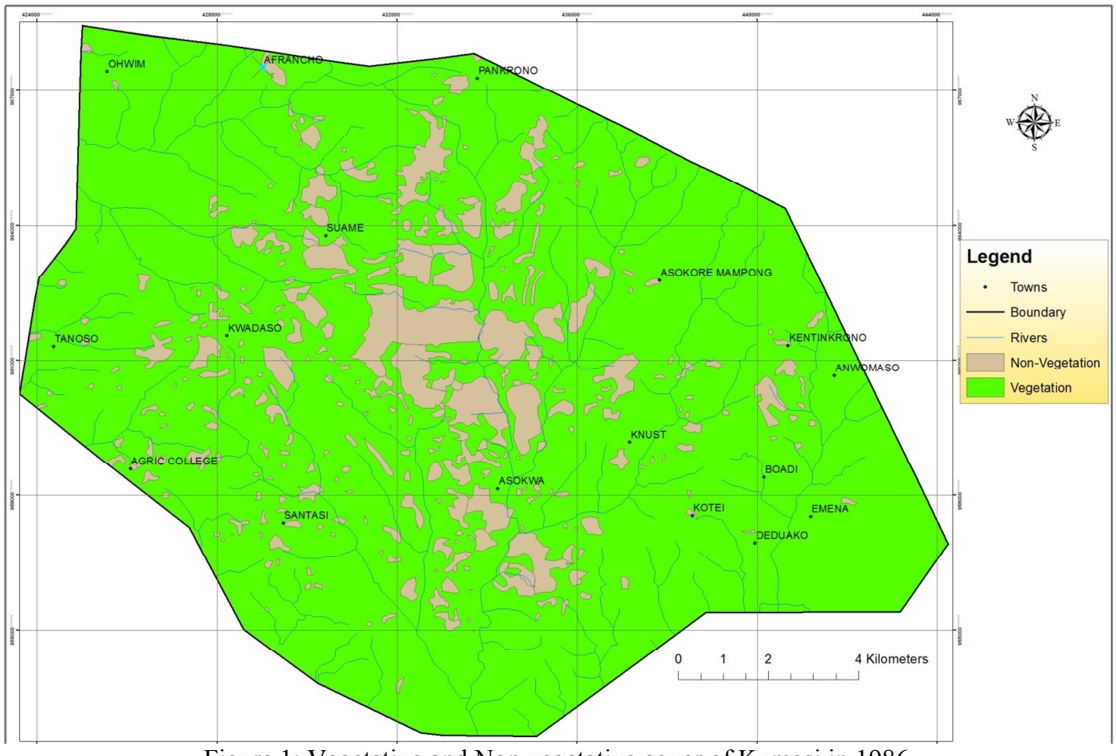

Figure 1: Vegetative and Non vegetative cover of Kumasi in 1986
Source: Adopted from Campion and Venzke (2013)

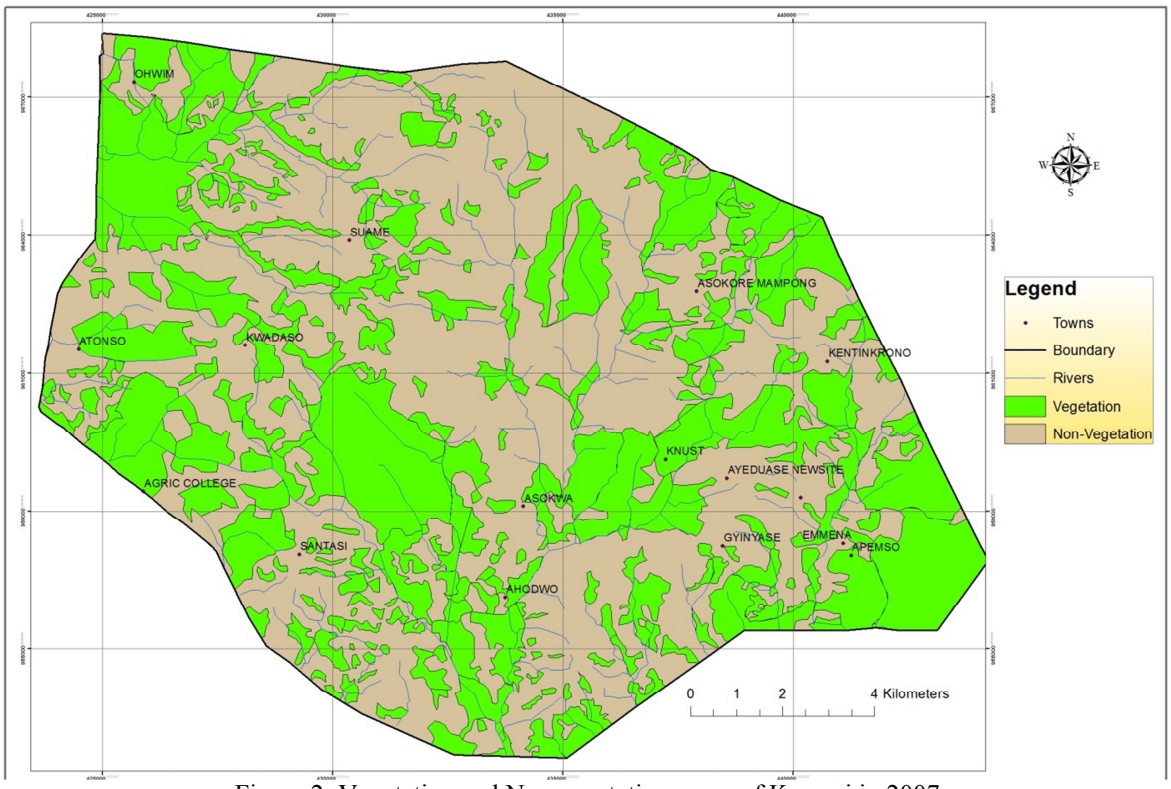

Figure 2: Vegetative and Non vegetative cover of Kumasi in 2007
Source: Adopted from Campion and Venzke (2013)

It can be seen that the vegetation cover of Kumasi has reduced significantly between the year 1986 and 2007 and this supports the findings of Campion and Venzke (2011) that the beautiful landscape of Kumasi is being replaced with the construction of urban facilities.
Those who indicated the declining change in the green spaces attributed it to the following factors as indicated in table 5 below.
Table 5: Causes of reduction in green spaces

No.	%	Causes of reduction in Green Spaces
75	50	Lack of control over all lands by city authorities
90	60	High land rent for other uses in the city
80	53	Poor understanding of many local residents and land owners in the city of the relevance of green spaces
60	40	Lack of comprehensive spatial plan for the creation, maintenance and management of green spaces
25	16.7	Construction works and utility services providers cutting down trees to protect their installations
55	36.7	Poor management of green spaces thus making them havens for criminal activities and dangerous reptiles (snakes)

Source: Fieldwork, 2013
From the above, it could be deduced that the major causes of the reduction in green spaces is the form of land ownership in the city, understanding of the importance of green areas by local residents, business interest as against that of the environment and lack of adequate plans for the management of these spaces. Further discussions with authorities revealed that inadequate funding and weak collaboration among land management institutions involved in managing green spaces and also the lack of strict laws to protect these areas are some of the causes of their reduction. An interview with a representative of the Town and Country Planning Department (TCPD), KMA revealed that the problem of sprawl was affecting the preservation and maintenance of green spaces in the city. The TCPD is under-resourced and unable to carry out regular monitoring of physical developments.

7.8 Effects of the reduction of green spaces on the city

The likely effects of the reduction in the coverage of green spaces in the city can affect society in various forms. From the respondents' point of view, the likely effects of the reduction of green spaces are indicated in table 6.

Table 6: Likely effects of reduction in green spaces

No.	%	Effects
100	66.7	loss of Garden city status of the city
48	32	Climate change and its consequences such as flooding and rainstorms causing disasters
76	50.7	lack of places of recreation, parties and relaxation
43	28.7	poor air quality in parts of the city

Source: Fieldwork, 2013

These effects on the city as indicated by the respondents are real. In recent times, there has been complains by authorities and ordinary citizens about the loss of the green vegetative cover of the city and the likely implication for its garden city status. The gardens and trees that made the Queen of England to pronounce the city as such are almost gone. Though there are a few disasters such as flooding in the city, not all can be attributed to this. Some of these are due to building in waterways and indiscriminate disposal of waste. Based on the above analysis, it is evident that the reduction in green spaces has negative effects on the city, its people, status and development and therefore ways must be found to address the phenomenon. The section following provides recommendation from the interviewees and also good cases across the globe to help the city manage and remedy the threat of green spaces reduction in the city.

8. Lessons for managing green spaces in the city

The respondents indicated that to effectively manage the green spaces in the city and increase their coverage, the measures presented in table 7 should be adopted.

Table 7: Measures to promote green spaces in Kumasi

No.	%	Measures to promote green spaces in the city of Kumasi
143	95	City planning authorities should zone specific areas as green spaces and develop and maintained them
99	66	Collaboration between land management agencies in the city should be enhanced
113	75	People in the city should be educated on the needs and importance of green spaces
15	10	No green spaces should be re-zone for other purposes
80	53	Punitive fines should be imposed on those who encroach upon green spaces in the city
54	36	City authorities should acquire all green spaces in the city to enhance control

Source: Fieldwork, 2013

Based on the above and other best practices from literature, the following recommendations are made to help sustain and enhance green spaces in the city of Kumasi for the benefit of all.

i. The city authorities should develop various policies, programmes and projects to support green living. A green space spatial plan should be formulated and implemented. The plan should cover the development of areas zoned purposely as green areas and how existing green spaces should be managed. Also, all streets in the city should be aligned with trees as they are all public spaces under the direct control of the city authorities. A comprehensive green space management plan should also be designed and implemented. A key institutional structure for the enhancement and management of green spaces involving all the key stakeholders relevant to the development of the sector should be instituted. In all these, the city authorities should make conscious efforts to implement all green space policies, plans and programmes.

ii. The city authorities must improve collaboration between and among key stakeholders and institutions in the management of green spaces in the city. There are many agencies in the city involved in the management of green spaces. These include the Town and Country Planning Department, Department of Parks and Gardens, National Disaster Management Organisation, Traditional Chieftaincy Institutions in the city and a variety of Non Governmental and Community Based Organisations. All these stakeholders are important as they play various roles. The Metropolitan Assembly should be the leader and create the forum and the necessary enabling environment for the collaboration.

iii. City authorities should encourage private developers, owners of housing facilities and educational institutions to maintain private gardens and green spaces. This is important because many housing facilities and properties are owned by private persons and institutions in the city. This will go a long way to bring back the greens to the city. The City Authorities should institute awards for owners of housing facilities that comply with this. This will impress upon others to follow suit. This is because about 67.3% of the total land use in the city is for residential, educational and civic and cultural purposes (KMA, 2010). The best reward system could be in the form of implementing a bonus system for home owners to green certain percentage of their lands in exchange for the same percentage reduction in their annual rent to the city authorities.

iv. The city authorities should institute Green Space awareness education in the city. Though the survey indicated that the people of the city have some awareness on the importance of maintaining green spaces in the city, there is still the need to create more awareness on this. The city authorities through its organs and

departments should institute a half yearly green awareness campaign in the city. Various private radio stations in the city can be used. Also community campaigns and educational institutional campaigns should be instituted to improve the collaboration between and among key stakeholders and institutions in the management of green spaces, encourage private developers and owners of housing facilities to maintain private gardens and green spaces. These would go a long way to reduce the dwindling green spaces in the city.

9. Conclusion

The relevance of green spaces to mankind is very enormous and should be promoted and enhanced in any city. Conscious efforts by all including especially the city authorities should be made to achieve this. Based on these benefits, landscape, green space and ecological features should be included in city spatial planning frameworks. In the case of the city of Kumasi, the city authorities should develop various policies, programmes and projects to support green living and create a Participation Strategy for all stakeholders in the creation and management of green spaces.

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